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ACCIDENT PREVENTION PLAN FOR SITE 22 GEIGER KEY HAWK MISSILE SITE NAS KEY WEST FL

4/1/2015

RESOLUTION CONSULTANTS

ACCIDENT PREVENTION PLAN

SITE 22 — GEIGER KEY HAWK MISSILE SITE
NAVAL AIR STATION KEY WEST, FLORIDA

Revision: 0

Prepared for:

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Contract Number: N62470-11-D-8013
Delivery Order Number: JM85

April 2015

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EXECUTIVE SUMMARY

This Accident Prevention Plan (APP) has been developed in accordance with ER 385-1-92, *Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste Activities.* The APP covers each of the applicable APP elements identified in Appendix A of Engineering Manual (EM) 385-1-1 (United States Army Corps of Engineers 2008). An APP is a safety and health program and policy document.

This APP interfaces with Resolution Consultants' overall safety and health program and policies, and is applicable site-wide for all planned investigations at Naval Air Station Key West, including the Site 22 Geiger Key Hawk Missile Site (see Section 2.d). A Site Safety and Health Plan (SSHP) specific to Resolution Consultants activities is included as Appendices H to this APP. This plan covers elements outlined in Section 28.A.02 b of EM 385-1-1.

The purpose of this APP is to establish site-specific safety and health procedures, practices, and equipment to be implemented and used to protect personnel from the potential occupational safety and health hazards associated with the field investigation activities. The APP assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are conducted.

Project work will be performed in accordance with applicable federal, state, and local government safety and occupational health laws and regulations including Occupational Safety and Health Administration standards 29 Code of Federal Regulations 1910.120 and 1926.65. The content of the APP is subject to review and revision, as new information becomes available.

This APP has been developed based on known and anticipated potential hazards that may arise during performance of project tasks. At least one copy of the APP and applicable SSHP for the specific site, and the Resolution Consultants' United States Operations Safety, Health, and Environmental (SH&E) Manual, will be maintained in a readily accessible onsite location for review at all times during all field activities. The requirements established by this APP are mandatory and apply to all Resolution Consultants employees, subcontractors, and any other personnel entering designated work areas at the project sites during active field operations. Record keeping will be maintained in accordance with this APP and the applicable SH&E Program Standard Operating Procedures. In the event of a conflict between this APP, the SSHP, the Standard Operating Procedures, and/or federal, state, and local regulations, workers shall follow the most stringent/protective requirements.

CHANGES TO THE APPROVED APP

It is understood that this APP is a dynamic document and changes in the scope of work, field changes, or unanticipated site conditions may require APP modification and approval in order to retain field safety compliance with contract requirements, EM 385-1-1 (United States Army Corps of Engineers 2008), and the Occupational Safety and Health Administration regulations. All changes to the APP shall be prepared by the SH&E Manager, and approved by the Program Manager and Task Order Manager. All such modifications will be supplied to Naval Facilities Command for review and approval.

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List of Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
APP	Accident Prevention Plan
CFR	Code of Federal Regulations
CSP	Certified Safety Professional
DOT	Department of Transportation
EM	Engineering Manual
ERP	Emergency Response Plan
ERT	Emergency Response Team
EZ	Exclusion Zone
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSI	Hazardous Substance Inventory
SDS	Material Safety Data Sheet
NAS	Naval Air Station
NAVFAC	Naval Facilities Command
NIOSH	National Institute for Safety and Health
OSHA	Occupational Safety and Health Administration
PHSP	Programmatic Health and Safety Plan
PPE	Personal Protective Equipment
SCBA	Self-contained breathing apparatus
SH&E	Safety, Health and Environmental
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
SSHO	Site Safety and Health Officer
THA	Task Hazard Analysis
TLV	Threshold Limit Value
TOM	Task Order Manager

1. SIGNATURE SHEET

This Accident Prevention Plan (APP) was prepared for employees performing field activities at Site 22 Geiger Key Hawk Missile Site at the Naval Air Station (NAS) Key West, Florida. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present at the project sites. While it is not possible to discover, evaluate, and protect in advance against all possible hazards that may be encountered during the completion of the project, adherence to the safety and health program requirements of this APP will significantly reduce the potential for occupational injury.

By signing below, I acknowledge that I have reviewed and hereby approve this APP for the field activities at NAS Key West, Florida. This APP has been written for exclusive use by Resolution Consultants employees and its subcontractors. This APP was written for specified site conditions, dates, and personnel, and must be amended if these conditions change.

Plan Preparer:

eallen@ensafe.com Digitally signed by eallen@ensafe.com DN: cn=eallen@ensafe.com Date: 2015.04.17 08:47:29 -05'00'

Date: April 17, 2015

1.a Eric Allen, CSP, CHST
Safety, Health, & Environmental Representative
Resolution Consultants

Plan Review:

Date: April 20, 2015

1.b. Todd Haverkost
Task Order Manager
Resolution Consultants

Plan Concurrence:

jknopf@ensafe.com Digitally signed by jknopf@ensafe.com DN: cn=jknopf@ensafe.com Date: 2015.04.17 08:34:59 -05'00'

Date: April 17, 2015

1.c. John Knopf, CSP
Safety, Health, & Environmental Manager
Resolution Consultants

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2. BACKGROUND INFORMATION

2.a. Contractor

Resolution Consultants, a joint-venture between AECOM and EnSafe Inc., is the prime contractor.

2.b. Contract Number

The project is being conducted under the Comprehensive, Long-term Environmental Action Navy contract number N62470-11-D-8013, Delivery Order JM85.

2.c. Project Name

Expanded site assessment; Site 22 Geiger Key Hawk Missile Site

2.d. Project Description

A new 4-inch extraction well will be installed during this investigation to facilitate an upcoming free product recovery pilot test. Groundwater samples will be taken at the new extraction well. A geologist/engineer will log geologic conditions based on soil cuttings during drilling.

Existing monitoring wells will be sampled throughout the site.

2.e. Project Location

As depicted on Figure 2-1, Site 22 is located at the Geiger Key Hawk Missile Site on NAS Key West in Key West, Florida.

2.f. Contractor Accident Experience

A copy of the Occupational Safety and Health Administration (OSHA) 300 form is included in Appendix A.

2.g. Phases of Work and Hazardous Activities Requiring an Task Hazard Analysis

Tasks planned as part of field operations that require a Task Hazard Analysis (THA) include mobilization/demobilization, land survey, vegetation removal, geophysical survey and intrusive investigation, drilling, and monitoring well sampling

THAs for each of the investigation tasks are included as part of the Site Safety and Health Plan (SSHP) discussed in Section 9.gg. of this APP.

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FIGURE 2-1
PROPOSED SAMPLE LOCATIONS
SITE 22 - GEIGER KEY HAWK MISSILE SITE
NAS KEY WEST
KEY WEST, FLORIDA

Legend

Site Boundary

Notes:
Groundwater flow direction is inconsistent at Site 22 which is indicative of tidal influence on the surficial aquifer.

0 50 100 Feet

NAVFAC Naval Facilities Engineering Command

RESOLUTION CONSULTANTS

REQUESTED BY: T. Deck	DATE: 2/2/2015
DRAWN BY: kburnum	TASK ORDER NUMBER: JM85

X:\Navy\NAS_KeyWest\Figure 17-1 Site 22 Proposed Sample Locations.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,

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3. STATEMENT OF SAFETY AND HEALTH POLICY

Resolution Consultants believes that the safety and health of our employees and the responsible stewardship of the built and natural environment are critical elements to business growth and success. Resolution Consultants demonstrates commitment to this fundamental responsibility by embracing "Safety" as one of our Core Values. Resolution Consultants has developed and implemented a Safety, Health, and Environmental (SH&E) Programmatic Health and Safety Plan (PHSP) for United States operations, which establishes the framework to maintain effective SH&E management, monitoring, measurement, documentation, communication, and methods to promote continuous improvement.

SH&E Programmatic Health and Safety Plan Overview

The SH&E PHSP is based on proven management principles and practices. It consists of an organized framework that is continually monitored and periodically reviewed in response to changing internal and external factors. The system is designed to record SH&E actions, program performance, assist in communications, awareness, facilitates auditing, and management involvement and review. All Resolution Consultants employees are responsible for maintaining compliance with the PHSP, SH&E Policy, and Safe Operating Procedures. This SH&E Management System is based on the four-step problem solving process of "Plan-Do-Check-Act" methodology, which incorporates five major operational components:

- **Policy** — A clear SH&E Policy is the central focus of the PHSP. Resolution Consultants management and employees are fully committed to maintain compliance with this policy. Resolution Consultants' current corporate safety and health policy statement detailing the commitment to providing a safe and healthful workplace for all employees is included as Appendix B of this APP.

- **Planning** — A comprehensive plan of action supports the achievement of the SH&E Policy.

- **Implementation and Operation** — Resolution Consultants management provides the resources, including human and financial, for effective SH&E management. The PHSP includes procedures and systematic controls for the application of the resources.

- **Checking and Corrective Action** — Performance and the effectiveness of SH&E controls are continuously monitored and evaluated. Corrective actions are taken as necessary.

- **Management Review** — The PHSP is reviewed and continually improved with the aim of improving overall SH&E performance.

Through implementation of the PHSP, Resolution Consultants has established a uniform, systematic, and cost-effective approach to addressing safety, health, and environmental issues and concerns associated with Resolution Consultants personnel and services. The PHSP has been structured to align itself with the key elements of OSHA regulations.

Redacted copies or excerpts of the PHSP may be made available at the discretion of Resolution Consultants without waiving its right to maintain the confidentiality of such materials.

SH&E Policy Overview

It is the policy of Resolution Consultants to provide a safe and healthy work environment for all of its employees. Resolution Consultants considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency and shortcuts. Resolution Consultants believes that every accident and every injury is avoidable and every reasonable step will be taken to reduce the possibility of injury, illness, or accident.

Resolution Consultants is fully 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 strive to ensure that our operations do not pose unreasonable safety or environmental risks. In all of our activities, we will develop and implement appropriate systems and procedures designed to comply with applicable laws, legislation, licensing requirements, and stakeholder expectations.

In order to guide the implementation efforts required by this policy, the Resolution Consultants Management Committee, Program Management Team, and Regional Leaders collaborate to establish SH&E programs that:

- Incorporate a “ZERO injury” and “environmental sustainability” philosophy into design standards and project review processes.

- Recognize those who contribute to their improved SH&E performance.

- Comply with all applicable SH&E rules and regulations at the local, state, and national level.

- Meet client SH&E requirements and standards.
- Where no specific regulation exists, comply with Resolution Consultants standards and appropriate industry practices.
- Report on performance relative to short- and long-term SH&E metrics designed to help achieve established goals.
- Consult with, listen to, and respond to employees, customers and partners in order to continuously improve their SH&E performance.

All employees will be responsible for:

- Conducting themselves in accordance with directives, standards and procedures established by their applicable SH&E program.
- Temporarily suspending their personal work activities and requesting guidance from their supervisor before continuing a task when they identify a condition or practice that creates a serious safety, health, or environmental risk.
- Immediately reporting safety, health, and/or environmental incidents to their supervisor.

Resolution Consultants SH&E policy is formally reviewed annually. However, if substantial changes occur in legislation, organization and/or other business drivers, changes may be made on an interim basis.

Safety Program Goals

Consistent with the Resolution Consultants corporate SH&E policy, the safety program goals under this contract are ZERO injuries and accidents.

SH&E Standard Operating Procedures

Resolution Consultants SH&E Standard Operating Procedures (SOPs) establish minimum safety requirements and guidelines for Resolution Consultants United States operations and business lines. Resolution Consultants has developed individual SOPs that serve as the basis for the safe execution of specific tasks associated with field operations. These range from stop work and management authority, to the safe execution of confined space entries. Numerous SOPs are referenced throughout this APP and are included as Appendix C. A copy of the SOPs will be kept onsite at all times.

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4. RESPONSIBILITIES AND LINES OF AUTHORITY

4.a. Statement of Responsibility

Resolution Consultants has the ultimate responsibility for the successful implementation and management of Resolution Consultants' activities at NAS Key West in correlation to this APP.

4.b. Personnel Responsible for Safety

All personnel are responsible for continuous adherence to the safety and health procedures presented in this APP and attached SSHP during the performance of work. No person may work in a manner that conflicts with the intent of, or the inherent safety and environmental precautions expressed in these procedures. After due warnings, the company will dismiss from the site any person who violates safety procedures.

The Resolution Consultants organization chart for the management of safety at both the corporate and project level for this project is presented as Figure 4-1. The positions/responsibilities presented in the organization chart are discussed below.

Program Manager — Mr. Ken Vinson

The Resolution Consultants Program Manager is responsible for supporting the establishment and oversight of the overall health and safety program presented in the APP.

SH&E Manager — Mr. John Knopf, CSP

The Resolution Consultants SH&E Manager is a Certified Safety Professional (CSP) with 19 years of experience in managing safety and occupational health at hazardous waste site cleanup operations.

The SH&E Manager is responsible for developing, maintaining, and overseeing the implementation of the APP and SSHP. The SH&E Manager will approve the APP and SSHP prior to final submittal. Specific responsibilities of the SH&E Manager includes the following:

- Approve the appointment of the Site Safety and Health Officer (SSHO) and ensure that he/she has the appropriate training and competencies to perform the duties.

- Participate in quality control planning such as development of Quality Control Plans, safety and health checklists, and perform design and system safety analyses as appropriate.

- Visits the project as needed to audit the effectiveness of the safety and health program.

- Provide safety and health expectations and flow down requirements for subcontractor statements of work.

- Be available on a 24-hour basis for consultation with SSHO during onsite emergencies or as needed.

- Coordinate any modifications to the safety plans with the SSHO and Task Order Manager (TOM), as required.

- Evaluate occupational exposure monitoring/air sampling data and adjust APP/SSHP requirements as necessary.

- Provide continued support for upgrading and/or downgrading the level of personal protective equipment (PPE).

- Participate in the investigation of unplanned events, high loss potential incidents, and accidents.

- Assist in development of onsite training, which will be provided by the SSHO.

Task Order Manager — Mr. Todd Haverkost

The Resolution Consultants TOM represents the company in all aspects of the project work and is responsible for the following:

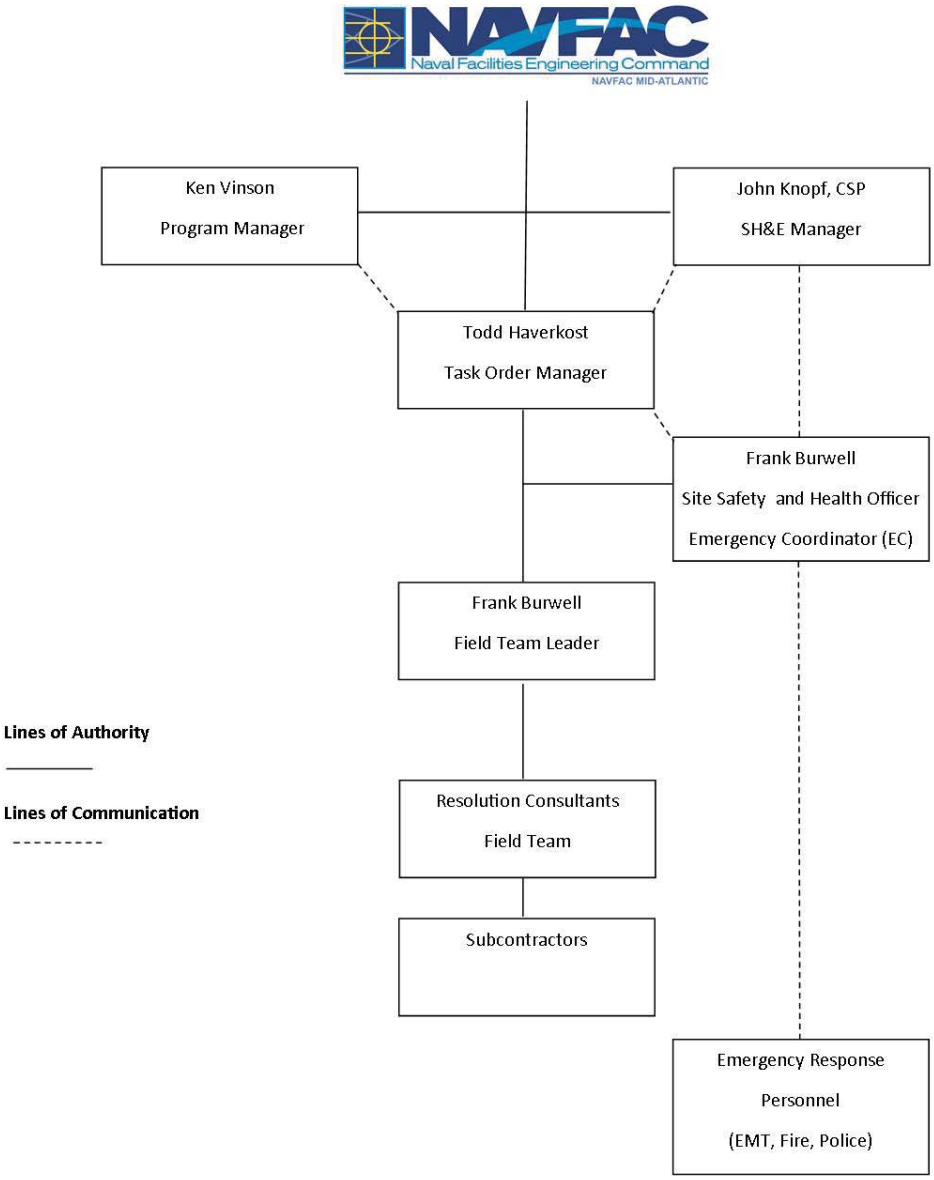
- Providing leadership by, among other things, setting an example for all site personnel through actions and words regarding the importance of proper health and safety practices and holding project staff accountable for safety performance.

- Coordinating all work performed by Resolution Consultants personnel and subcontractors for the project.

- Ensuring the APP/SSHP is approved prior to commencing field operations.

- Ensuring all required PPE, other types of equipment and instruments, safety incentives, and other safety-related items are budgeted and provided.

Figure 4-1 Safety Organization Chart



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- Ensuring that subcontractor "Statements of Work" include appropriate safety provisions and expectations.

- Ensuring that safety and health requirements are covered during kickoff meetings.

- Participating in the investigation of, and ensuring that unplanned events, high loss potential incidents, and accidents are properly reported to Naval Facilities Command (NAVFAC).

- Notifying the SH&E Manager of any changes in the scope of work or site conditions, and ensuring that the APP/SSHP is updated to address new hazards.

- Immediately stopping operations in the event of an emergency or serious hazard, in order to protect personnel and the environment.

- Preparing and submitting required work progress reports.

Site Safety and Health Officer — Frank Burwell

The SSHO will be onsite at all times when work is being conducted. The SSHO's resume is provided in Appendix D. The SSHO will be responsible for managing, implementing, and enforcing Resolution Consultants' health and safety program in accordance with the accepted APP. The SSHO will be a competent person that can identify existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures to eliminate them. The SSHO will have the authority and is responsible for the following actions:

- Be present during investigation operations to implement the APP/SSHP.

- Inspect site activities to identify safety and occupational health deficiencies and correct them.

- Coordinate changes/modifications to the APP/SSHP with the SH&E Manager, TOM, and Site Supervisor.

- Conduct project specific OSHA training.

- Ensure all field personnel, including any subcontractor personnel, assigned to the project have satisfied requirements for training and medical surveillance as specified by 29 Code of Federal Regulation (CFR) 1910.120, and that records of training and medical approval are available and maintained for each person.

- Oversee compliance with the APP/SSHP procedures and OSHA regulations through daily inspections.

- Serve as a member of the quality control staff on matters relating to safety and health.

- Stop work if unacceptable safety and health conditions exist, and take necessary action to re-establish and maintain safe working conditions.

- Operate and maintain air monitoring equipment required at a site for airborne contaminates and prepare air monitoring reports.

- Maintain all required safety and health records (e.g., OSHA 300 Logs, incident/accident reports, training certificates and qualifications, equipment checklists, safety plans, air monitoring data and reports, etc.) throughout the life of the project.

Site Supervisor — Frank Burwell

The Site Supervisor will manage the onsite investigation operations in accordance with the approved Work Plan and APP/SSHP. The Site Supervisor will coordinate all onsite personnel and equipment conducting investigation operations in a safe manner. The Site Supervisor will coordinate all work with the SSHO to ensure that all safety concerns are adequately addressed and controlled. The Site Supervisor will immediately stop work in the event of an emergency or serious hazard in order to protect personnel and the environment. The Site Supervisor will work with the SH&E Manager, TOM, and SSHO in coordinating changes/modifications to the APP/SSHP, as needed.

Field Personnel

Field Personnel will be responsible for understanding and following the APP/SSHP and performing their work in a safe and responsible manner. Specific responsibilities will include the following:

- Act in a responsible manner at all times in order to prevent incidents, injury, and/or exposure to themselves and their co-workers, this includes exercising Stop Work Authority if needed.

- Report any and all incidents, including near misses, to the Site Supervisor or SSHO.

- Attend and participate in all daily health and safety tailgate meetings.

- Participate in the development of THAs as required, and follow the provisions as outlined in the final THAs.

- Follow instructions and directions of the Site Supervisor and SSHO.

- Utilize the prescribed PPE provided for each task.

- Following all field safety procedures for safe work practices (e.g., the buddy system, communication, site control, decontamination, evacuations, and related emergency procedures).
- Perform only those tasks they have been instructed to perform if they are trained, qualified, and capable of performing safely at the time of assignment.

- Report any personal condition that could affect their safety and/or the safety of co-workers (e.g., fatigue, drowsiness, severe illness, impairment by prescription medications, influence by drugs and alcohol, emotional stress, or other condition).

- Ensure that no work tasks are performed in deviation from the APP/SSHP and/or the initial instructions of the Site Supervisor and SSHO.

Site Visitors

Site visitors will:

- Participate in a site briefing before leaving the administrative office or site entry point.
- Follow all site rules and instructions.
- Be escorted at all times by authorized personnel unless otherwise approved by the SSHO.
- Wear PPE provided.

Conformance of everyone with these responsibilities is necessary to achieve the goals of the APP/SSHP. Failure to do so could result in removal from the site.

4.c. Names of Competent and Qualified Personnel

Competent persons are qualified individuals that can identify existing and predictable hazards in the working environment or working conditions that are dangerous to personnel and have authorization to take prompt corrective measures to eliminate them (see Appendix E).

Planned tasks requiring the designation of competent persons at Site 22 include drilling contractors. Competent persons for these tasks are listed below.

Title	Inspection Role	Name	Proof of Competency
TBD	Drill Rig	TBD	TBD

Note:
TBD = To be decided

4.d. Competent Person Work Requirements

In order to complete certain specified tasks (drill rig operation, excavation inspections, etc.), a designated competent person must be on site to perform the required daily inspections of certain equipment and/or operations. No work may be performed on these tasks unless a competent person is present on the job site. The training requirements for competent persons are specified in the SH&E SOP 5-202-*Competent Person Designation.*

4.e. Pre-Task Safety and Health Analysis Requirements

THAs are used to identify hazards and hazard controls associated with a specific job function. THAs focus on the relationship between the workers, the task, the resources required to complete the task, and the work environment. These variables must be evaluated to identify the potential hazards associated with the task. Once identified, steps can be taken to eliminate, reduce, or control the hazards to an acceptable risk level. Guidelines for developing THAs are located in SH&E SOP 5-209-*Hazard Assessment and Project Planning*.

4.f. 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 SH&E SOP 5-002-*Stop Work Authority for Unsafe Work*. Whenever the SSHO 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 Site Supervisor be unable or unwilling to correct the unsafe conditions, the SSHO is authorized and required to stop work, which shall be immediately binding on all affected Resolution Consultants employees and subcontractors. Upon issuing the stop work order, the SSHO 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 SH&E Manager and TOM have concurred that workplace conditions meet acceptable safety standards. Reviewing and updating the appropriate THA and other documentation may be necessary to document the change.

All stop work actions must be documented in the field notes and immediate contact made with the Resolution Consultants TOM.

4.g. Lines of Authority

Figure 4-1 illustrates the lines of authority for the personnel responsible for project safety.

4.h. Noncompliance Policies and Procedures

Resolution Consultants management takes employee non-compliance with safety requirements very seriously. Personnel not following procedures are warned and counseled on the proper safety procedures and if the problem persists are again counseled with notations made in their permanent record. Continued non-compliance can lead to termination of employment.

Resolution Consultants has developed the following progressive discipline policy for the violation of safety requirements. Extremely careless or reckless violations may results in immediate termination. All instances of progressive disciplinary action will be handled in conjunction with the sponsoring joint–venture employer (EnSafe or AECOM) Human Resource Department.

First Violation: An oral warning will be given for the first violation of a SH&E requirement depending on the severity of the violation. The employee will be informed by his or her supervisor of the violation and of the correct safe practice or procedure. The supervisor will review with the employee all applicable safety and health workplace requirements and guidelines. The employee must sign a statement indicating understanding of those requirements and guidelines. The supervisor should inform the employee that future violations will result in higher levels of discipline and may lead to dismissal.

Second Violation: The employee may be given a written warning for the second documented safety and health requirement violation. This warning will specifically identify the violation. The warning will also refer the employee to applicable safety and health requirements and guidelines for review, and also show the date the employee previously read and signed the statement of understanding of safety and health requirements and guidelines. The employee, the employee's supervisor, the department head, Human Resources, and the employee's personnel file receive copies of the warning.

Third Violation: The employee may be given a final warning for the third documented violation of safety and health requirements or guidelines. This warning will specifically identify the violation. It will also state that any further violation of safety and health requirements and guidelines will result in dismissal. All persons who receive a copy of the previously written warning will receive a copy of the final warning.

Any Subsequent Violation: The employee may be dismissed for a subsequent violation. If dismissed, the employee will receive a letter specifically identifying the violation of the safety and health requirement or guideline, as well as rights of appeal through the grievance process.

Immediate Termination: On occasion, an employee can commit a violation of a safety and health requirement or guideline that is so careless and reckless, or that so endangers life or property, that it can be considered imminently dangerous. When this occurs, an employee can be dismissed immediately, without benefit of any warnings. An employee dismissed in this fashion will receive a letter specifically identifying the violation and setting out his/her right of appeal within the grievance process.

Discipline for Subcontractor Personnel: If noncompliance actions are committed by subcontractor personnel, Resolution Consultants will recommend that the employer discipline the employee. If the action continues, Resolution Consultants will have the employer remove the employee from the site. If the employer refuses to adhere to our requirements, they may be dismissed from the project.

Documentation: Employee warnings and disciplinary actions will be documented using Resolution Consultants' Corporate Memorandum format in a manner consistent with the requirements of this policy and the sponsoring joint–venture employer (EnSafe or AECOM) Human Resource Department.

4.i. Manager and Supervisor Accountability

Managers and supervisors are responsible for enforcing safety and health as part of their job descriptions. They are ultimately responsible for protecting the welfare of the employees, as well as minimizing the potential liability associated with on-the-job accidents. Annual performance reviews and incentive plans for managers and supervisors include the assessment of both the individual's safety performance as well as their project safety performance.

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5. SUBCONTRACTORS AND SUPPLIERS

5.a. Subcontractor and Supplier Identification

The following types of subcontractors and suppliers will be utilized for field activities at NAS Key West:

- Drilling Contractors
- Underground Utilities Locators

5.b. Subcontractor and Supplier Safety Responsibilities

Subcontractors

Each Resolution Consultants subcontractor is responsible for assigning specific work tasks to their employees. Each subcontractor's management will provide qualified employees and allocate sufficient time, materials, and equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required PPE and adherence to all applicable SH&E performance or regulatory standards.

Resolution Consultants' SSHO will be responsible for ensuring subcontractor compliance with the APP/SSHP. Specific responsibilities of subcontractor employees include:

- Compliance with the requirements of their Scope of Work.
- Participate in development of a SSHP with THAs for their work activities.
- Maintain a safe and healthy work environment.
- Compliance with the APP, contract requirements, laws, regulations, and Engineering Manual (EM) 385-1-1.
- Review the APP to ensure that the health and safety requirements of their specific tasks are satisfied.
- Provide trained and experienced workers for the specific work activities.
- Participate in the Daily Safety Tailgate Meetings.

- Identify additional training needs for unique tasks.
- Enforce company- and project-specific rules and procedures during work activities.
- Report all incidents and participate in the investigations.
- Participate in routine site inspection activities.
- Ensure all equipment brought to the site is in proper working order, is routinely inspected and maintained in safe working order.

5.c. Suppliers

All suppliers of safety-related items are required to provide approved and/or appropriate materials for the project, and meet applicable specifications, testing criteria or third party certifications. These items will be inspected upon receipt by the SSHO.

Each hazardous material supplied for site use will be accompanied by a Material Safety Data Sheet (SDS) and will be added to the site list of hazardous materials. These materials must be pre-approved for use by the TOM and SSHO prior to being brought onto the jobsite. SDSs and the list will be maintained by the SSHO.

6. TRAINING

6.a. New Hire Safety Orientation Training

Employees will be provided with safety and health orientation prior to the start of work. All orientation training will be documented in writing by data, name, content, and trainer. The training will, at a minimum, include:

- Requirements and responsibilities for accident prevention and the maintenance of safe and healthful work environments.
- General safety and health policies and procedures and pertinent provisions of EM 385-1-1.
- Employee and supervisor responsibilities for reporting all accidents.
- Provisions for medical facilities and emergency response and procedures for obtaining medical treatment or emergency assistance.
- Procedures for reporting and correcting unsafe conditions or practices.
- Job hazards and the means to control/eliminate those hazards, including applicable THAs.

6.b. Mandatory Training and Certifications

Personnel who participate in field activities associated with this project must be qualified Hazardous Waste Operations and Emergency Response (HAZWOPER) workers (unless otherwise noted in specific THA or by the SSHO), and must meet the training and medical monitoring requirements. Personnel must have successfully completed training, meeting the provisions established in 29 CFR 1910.120 for 40-hour training and 8-hour annual refresher training. Additionally, onsite management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive at least eight additional hours of specialized hazardous waste operations management training. Appendix F contains project personnel HAZWOPER training and medical monitoring documentation.

Medical Monitoring

Resolution Consultants personnel performing onsite work that may result in exposure to contaminant-related health and safety hazards are enrolled in the medical surveillance program that complies with OSHA standard 29 CFR 1910.120 (f)/29 CFR 1926.62 (f).

They will have successfully completed a pre-placement occupational physical examination and annually thereafter. The medical surveillance program meets the following requirements:

- The physician's opinion concerning the employees' abilities to perform the assigned work shall be provided to the SH&E Manager or designated company HR representative.
- The required written physician's opinion shall be made available upon request.
- All medical records are maintained in accordance with 29 CFR 1910.1020.
- Examinations are given at least once every 12 months unless the attending physician believes a longer interval (not greater than biennially) is appropriate.
- Examinations are administered by a licensed physician who is certified by the American Board of Preventive Medicine.

Medical examinations must meet the requirements specified by the licensed physician. The physician takes into account site-specific contaminant issues during the examinations. This examination has been designed to meet the requirements of 29 CFR 1910.120 (f) requirements for hazardous waste site operations. The employee will be informed of any medical conditions that would result in work restriction or that would prevent them from working at hazardous waste sites.

Resolution Consultants will certify that all employees have successfully completed a physical examination by a qualified occupational health physician and will supply certification of medical clearance for each onsite employee. Certification of medical surveillance program participation is provided as Appendix F. The certifications include employee name, date of last examination, and name of examining physician.

6.c. Procedures for Periodic Safety and Health Training

The SSHO will maintain training/certification records on site for all personnel as well as track training expiration dates. Prior to expiration, the SSHO will coordinate training of all site personnel with the TOM to maintain valid training/certification requirements.

6.d. Emergency Response Training

Resolution Consultants will provide training in the handling of emergency situations that may arise from project activities or equipment operation. Prior to commencement of project activities, all site personnel will be trained on the posted emergency telephone numbers, location and use of spill kit materials, directions to the hospital, location and use of fire extinguishers, location of first aid kits, and the persons who are certified in first aid and CPR. Additional details on applicable emergency response training and procedures are provided in Section 9.b, Emergency Response Plans.

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7. SAFETY AND HEALTH INSPECTIONS

7.a. Daily Job Site Safety and Health Inspection

The SSHO will conduct daily jobsite health and safety inspections/audits to identify new or previously unidentified hazards, verify the effectiveness of hazard control measures, observe workers performing tasks, and provide feedback to workers. Deficiencies that pose a significant safety hazard will be corrected immediately, or work will be stopped in the affected area until the deficiency is corrected. The daily jobsite health and safety inspection will be documented in the SSHO logbook.

Safety and health issues and deficiencies identified during the "weekly" level inspections, and the actions, timetable, and responsibility for correcting the deficiencies, will be recorded on an inspection form. Follow-up inspections to ensure correction of any identified deficiencies will also be conducted and documented on an inspection form.

Resolution Consultants will establish a safety and occupational health deficiency tracking log that lists and monitors the status of safety and health deficiencies. The log will be available, be updated daily, and will provide the following information:

- Data of deficiency.
- Description of deficiency.
- Name of person responsible for correcting deficiency.
- Projected resolution date.
- Date actually resolved.

Table 7-1 lists the safety and health inspection requirements for field operations at the NAS Key West Site 22.

Table 7-1
Safety and Health Inspection Requirements

What	Who	When	Documentation
General Site Conditions	SSHO	Daily	Log Book
	SSHO	Weekly	Safety Inspection Form
	Task Order Manager	Monthly	Safety Inspection Form
	SH&E Manager	Quarterly	Safety Inspection Form
Tools and Equipment	Users	Daily	Tag and Remove Defective Items from Service
PPE	Users	Upon issue and daily thereafter	Reported to SSHO for log book entry

7.b. External Inspections and Certifications

External inspections are not expected for this project. In the event that an OSHA or other regulatory agency inspection, Resolution Consultants will immediately notify and provide NAVFAC the opportunity to accompany Resolution Consultants on the inspection. Resolution Consultants will provide NAVFAC a copy of any citations or reports issued by the inspector and any corrective action responses to the citation(s) or report(s).

8. ACCIDENT REPORTING

All accidents and incidents that occur on site during any field activity will be promptly reported to the SSHO and the immediate supervisor in accordance with SH&E SOP 5-004-*Incident Reporting*. If any Resolution Consultants employee is injured and requires medical treatment, the Site Supervisor will contact the Resolution Consultants **SH&E Manager and the TOM immediately**. The Site Supervisor will initiate a written report, using the ***Supervisor's Report of Incident*** form (or equivalent). The report will then be provided to the Regional SH&E Manager 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 OSHA Form 301 or equivalent) must be provided to the SSHO within 24-hours after the accident has occurred.

All accidents/incidents will be investigated in accordance with SH&E SOP 5-603-*Incident Investigation and Review*. Copies of all subcontractor accident investigations, whether accomplished in accordance with their own procedures or SH&E SOP 5-004-*Incident Reporting*, will be provided to the SSHO within five days of the accident/incident.

All personnel at the work site shall use the buddy system, staying within sight of their partner. If a partner becomes incapacitated or severely ill, an ambulance shall be called. In the event that a cessation of work is ordered, all personnel should:

- Assist the SSHO and/or Site Supervisor, if required, in decontaminating the victim and/or administering first aid.

- Leave the contaminated area and undergo decontamination prior to entering the worker rest area.

- Assist emergency response personnel when requested.

All workers receiving medical treatment by a physician will obtain a release from the physician on the date of treatment stating one of the following: (1) the employee is not fit for duty, (2) the employee is fit for restricted duty, or (3) the employee is fit for duty.

8.a. Exposure Data

Resolution Consultants will maintain records of all exposure and accident experience incidental to the project work including Resolution Consultants personnel and subcontractors. These records will include exposure work hours and a log of occupational injuries and illnesses (OSHA Form 300 or equivalent).

8.b. Accident Investigations, Reports, and Logs

NAVFAC requires that all injuries be reported as soon as reasonably possible, but no later than 24 hours. Notification of accidents, injuries, and illnesses will be evaluated and reported in accordance with applicable NAVFAC requirements. The SH&E Manager will report the incident to NAVFAC by completing a Contractor Significant Incident Report (CSIR). The SH&E Manager will review all documentation associated with the incident, and will assist in the performance of any necessary accident investigation or other follow-up. The TOM will ensure that the recommendations resulting from any investigation are implemented without delay.

Daily records of all first aid treatments not otherwise reportable will be recorded on a first aid treatment form and furnished to NAVFAC upon request.

8.c. Immediate Accident Notification

An accident that has, or appears to have, any of the consequences listed below will be immediately reported by Resolution Consultants to NAVFAC. The following accidents will be investigated in depth to identify all causes and to recommend hazard control measures:

- A fatal injury/illness
- A permanent totally disabling injury/illness
- A permanent partial disabling injury/illness
- The hospitalization of three or more people as inpatients resulting from a single occurrence
- Accidental property damage of $200,000 or more

Resolution Consultants will also notify OSHA when three or more employees are hospitalized or if a fatality occurs relating to work activities.

9. PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE SAFETY MANUAL

Based on the scope of site investigation activities, all applicable safety plans, programs, and procedures to address risk and compliance requirements were identified and are described below.

9.a. Layout Plans

Exclusion Zones (EZs) will be established surrounding each site.

9.b. Emergency Response Plans

The Resolution Consultants site team will hold an emergency response plan meeting during mobilization and prior to fieldwork to discuss and define the following:

- Personnel roles and line of authority
- Safe distances from emergency location
- Evacuation/Hospital route, procedures, and pre-determined meeting place
- Medical emergency and communication procedures
- Emergency alert and response procedures
- Emergency equipment and location onsite

The Emergency Response Plan (ERP) will be discussed during initial site training and discussed regularly during the Daily Tailgate Safety Meetings. Annually, or as needed, the SSHO and the TOM will review the ERP and make any changes necessary to keep the ERP current with new or changing site conditions and information. The SSHO will conduct drills monthly or more frequently if conditions change to evaluate the response and testing the effectiveness of the ERP. Conditions that may lead to an emergency situation during field activities will be addressed in specific THAs as tasks are identified. These conditions include:

- Fire
- Vehicle collisions or rollovers
- Environmental release
- Unintended detonation
- Severe weather
- Medical emergency due to heat/cold stress, physical/physiological incident, allergic reactions

A map is included in Figure 9-1 of the work location. The SSHO will determine the proper rally points as appropriate.

9.b.(1) Procedures and Tests

In accordance with the above, a test drill will be conducted on an as needed basis to evaluate the effectiveness of the ERP and to ensure all employees on site are adequately accounted for. The drills will consist of mock simulations of differing events requiring emergency response and will be applicable to the type of work being conducted on the site.

Drills will consist of responding to a medical emergency, striking utility lines, environmental releases (i.e., spills), fires, and other typical onsite emergencies as determined applicable to the SSHO. Using the protocols outlined in the subsections below, personnel will be required to perform emergency shutdown operations of equipment/tasks, follow proper evacuation and emergency procedures, and assemble at the pre-determined safe places of refuge where the SSHO will take head-counts of onsite personnel using the Site Control log for the project site. Based on the parameters established for the drill (e.g., medical emergency versus spill response), the list of contact numbers for the appropriate local and company specific emergency notifications will be reviewed with all site personnel as a part of the drill.

A post-drill analysis will be performed by the SSHO to analyze the response actions of site personnel and determine their effectiveness (evacuation times, routes, muster points, accountability, contacts, etc.). If any deficiencies are noted, adjustments to the ERP will be made by the SSHO and site personnel re-trained on the appropriate course of action for the type of emergency.

The SSHO will be responsible for the overall direction and implementation of the ERP, and for overall coordination of any emergency response actions. Specific ERP responsibilities of the SSHO include, but are not limited to, the following:

- Notifying facility police, fire department, and other offsite emergency units, as required
- Notifying the TOM and providing updates as conditions change
- Directing offsite emergency response personnel to the scene and providing assistance
- Site control
- Completing any follow-up reports

FIGURE 9-1
PROPOSED SAMPLE LOCATIONS
SITE 22 - GEIGER KEY HAWK MISSILE SITE
NAS KEY WEST
KEY WEST, FLORIDA

Legend

Site Boundary

Notes:
Groundwater flow direction is inconsistent at Site 22 which is indicative of tidal influence on the surficial aquifer.

0 50 100 Feet

NAVFAC Naval Facilities Engineering Command

RESOLUTION CONSULTANTS

REQUESTED BY: T. Deck	DATE: 2/2/2015
DRAWN BY: kburnum	TASK ORDER NUMBER: JM85

X:\Navy\NAS_KeyWest\Figure 17-1 Site 22 Proposed Sample Locations.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,

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- Rescuing personnel
- Accounting for all site personnel and visitors
- Providing emergency first aid
- Preventing further injury of personnel
- Providing current status of the incident to the SH&E Manager
- Ensuring that onsite emergency response personnel don the proper PPE if needed
- Assisting onsite emergency response personnel with treatment and transport of sick/injured
- Providing medical background information of the sick/injured and applicable site health and safety information to the offsite emergency medical responders
- Accompanying sick/injured personnel to hospital
- Accounting for all site personnel using the Site Control Log (Sign-in Log)

Resolution Consultants personnel, subcontractors, and visitors will be responsible for:

- Reporting any site emergencies to the SSHO or Site Supervisor
- Knowing the exit location and evacuation route(s) within the exclusion zone
- Knowing the pre-planned evacuation assembly point and going there in the event of an emergency
- Assisting emergency response personnel as requested

Emergency Recognition and Prevention

An emergency is an unplanned event that threatens the safety of site personnel. Compliance with this APP can assist in the prevention of anticipated site emergencies. These emergency situations

can easily be recognized by visual observations, worker complaints, safety audits, and/or monitoring instruments.

Safe Distances and Places of Refuge

The SSHO will determine safe distances and places of refuge. Prior to the start of each workday, the SSHO will hold a safety meeting with all personnel and discuss the following, as applicable:

Evacuation routes from work areas
The assembly point (both primary and secondary) to be used in the event of an emergency
Locations of the nearest fire extinguishers and spill containment equipment
Discussion on specific safety and health concerns of personnel

Evacuation Procedures

The SSHO will establish site evacuation routes. Evacuation notification will be three long blasts on an air horn, vehicle horn, or direct verbal communication. If evacuation is necessary, all personnel are to:

Gather equipment to the extent safely possible
Evacuate to the vehicle(s) location, and prepare to move out

Emergency Procedures

Upon discovering an emergency, the following series of events will occur:

- Notify personnel
- Establish communication
- Stop work activities, if necessary
- Lower background noises (shut down equipment)
- Begin emergency procedures (order is dependent on the situation)
- Survey casualties
- Assess “Airway, Breathing, Circulation” of each patient
- Request aid, if necessary
- Assess existing and potential hazards to site personnel and offsite populations
- Allocate resources
- If a certified EMT is in attendance, help extricate and stabilize victims
- Evacuate all non-essential personnel

Alerting and Communications

An employee alarm system will consist of the use of air horns or verbal instructions, either directly or via radio. Air horn signals, (and hand signals if necessary) will be established and employees will be trained in the signals and appropriate response. Telephones will be used to contact offsite emergency responders. Contact lists included in the SSHP will be posted in the site offices, and a copy will be kept in site vehicles. The following information will be communicated:

- Name of the person reporting the emergency
- Telephone number at the location of the person making the call
- Name of the injured person, if known
- Description of the emergency
- Exact location of the emergency
- Actions already taken
- Assistance required

Coordination with Local Emergency Agencies

Local or base authorities and emergency services will be contacted prior to initiation of work. The work objectives and onsite capabilities will be explained, as well as the most likely emergencies.

Preferred contact procedures will be established and the response capabilities of local or base responders will be determined. Resolution Consultants will ensure there is good coordination between our emergency plan and base requirements. Contact agencies, points of contact, and phone numbers will be provided in the SSHP.

Emergency Response Team

During emergency response operations, safety and health requirements put in place to protect site workers must be maintained. The SSHO will be alerted of the accident or incident that happened, which requires the Emergency Response Team (ERT) response and/or recovery operations.

Response to hazardous substances release will be limited to immediate action available due to equipment and training, (i.e., oil or fuel spills of small quantities). Responding facility emergency response personnel have authority for the site upon arrival. Project ERT personnel will assist local facility emergency response personnel, as needed.

The project ERT will notify base emergency response personnel, project personnel, and NAVFAC in the event of a hazardous substance release. Team response is limited to the confining or recovery of small spills using a spill containment kit, shovel, and approved container with lid. Training of personnel is in accordance with 29 CFR 1910.120(q)(6)(ii).

A first aid kit must be maintained on site and checked weekly (EM 385-1-1 section 03.B.02). A log of items used will be maintained.

Project personnel will rely on base emergency response personnel through the use of the 911 emergency notification system and/or base emergency notification system.

If an injury or illness requires more than first aid, but is not an emergency, the employee will be taken to a pre-determined clinic for examination or observation. If the injury or illness is considered an emergency, emergency services will be contacted to transport the victim to the local hospital or emergency care facility.

9.b.(2) Spill Plans

Potential hazardous spills control measures:

- Provide for secondary containment where required by regulation or contract, and where a spill could result in significant hazard or economic loss

- Provide other appropriate engineering controls to prevent environmental releases to the ground, water, or air. These will be identified in THAs or environmental permits (or equivalent)

- Provide equipment and personnel to perform emergency measures to mitigate spills and control their spread

- Dispose of contaminated materials

- Provide a decontamination program to clean previously uncontaminated areas.

Spill Contingency Plan

In the event of a spill or release, Resolution Consultants will:

- Take immediate measures to control and contain the release, including contacting local emergency service providers, if necessary
- Isolate and contain hazardous release areas
- Deny entry to the spill area to unauthorized personnel
- Stay upwind, keep out of low areas
- Keep combustible materials away from the spilled material
- Collect samples for analysis to determine that cleanup is adequate
- If liquid, prevent the discharge from traveling beyond site boundaries
- Prevent spilled materials from reaching storm water receptacle, ditches, creeks and drainage canals
- Take caution when handling drums and containers
- Notify base and NAVFAC

Notification of Spills and Discharges

All environmental spills or releases of hazardous materials (e.g., fuels, solvents, etc.), whether in excess of the Reportable Quantity or not, will be reported according to the sequence identified for the site.

Resolution Consultants will notify base and NAVFAC immediately of any spill or discharge. Resolution Consultants will make all regulatory notifications for Resolution Consultants generate spills.

In determining whether a spill or release must be reported to a regulatory agency, the Site Supervisor will assess the quantity of the spill or release and evaluate the reporting criteria against the state-specific reporting requirements, the applicable regulatory permit, and/or client-specific reporting procedures. **If reporting to a state or federal regulatory agency is required, Resolution Consultants has 15 minutes from the time of the spill/release to officially report it.**

9.b.(3) Fire Fighting Plan

In any fire situation, it is important to act quickly and decisively in order to contain the spread of the fire. Regardless of the size and nature of the fire, and Resolution Consultants' ability to respond, all fires will be reported immediately to the local fire department. The SSHO will:

- Sound the fire alarm (local or auxiliary);
- Determine the extent of the fire;
- Notify Fire Department — 911 (Fire Department is to be notified of any fires larger in size than a wastebasket); Provide the following information:
  - Name of Facility
  - Address, including nearest cross street(s)
  - Exact location of the fire within the site
  - Provide name and phone number
- Coordinate and manage fire suppression efforts until the additional personnel arrive
- Coordinate the evacuation of injured or non-essential personnel from the site upwind following the evacuation procedure
- Check attendance
- Provide emergency first aid as required
- If the SSHO has determined that it is safe to do so, site personnel may use available onsite fire extinguishers on incipient stage fires only

- Remove or isolate flammable or other hazardous materials, which may contribute to the fire
- Clear access routes for emergency vehicles
- Fire Department officials will determine when it is safe for re-entry.

Documentation and Review

After the response, Resolution Consultants will prepare an Incident Report. It will include such things as a chronological history of the emergency, facts, action, personnel present, sample results (if collected), summary of injuries, and possible exposures. For spills and releases, it will also include:

- Description of material spilled, including identity, quantity, and a copy of the waste disposal manifest
- Exact time and location of the spill and the description of the area involved
- Containment procedures utilized
- Description of the cleanup procedure employed at the site, including disposal of spill residue
- Summary of the communications Resolution Consultants had with other agencies

This report will be given to NAVFAC within two days of the incident along with immediate verbal notification. The report will also contain a critique of the response and modifications to this APP will be made if necessary to adequately address subsequent emergencies.

9.b.(4) Posting of Emergency Telephone Numbers

Emergency phone numbers, call signs, and detailed instruction for obtaining emergency response and medical assistance will be posted in the SSHP Section H.14.4, Table H-8. This includes a detailed hospital route map and approximate times and distances. All personnel will be trained on the emergency alert systems in place at the work site.

Safety and Health Information

The Resolution Consultants SSHO will have the appropriate safety and health information available in an area commonly accessed by workers. The information will be maintained current, readily available to affected workers, and protected against the elements and unauthorized removal.

Required postings and general safety awareness reminder posters will be used to communicate information to site participants. The required postings will include copies of the current:

- APP
- THAs
- OSHA Form 300 (if injury has occurred)
- Safety and Health promotional posters
- Date of last lost workday injury (if injury has occurred)
- OSHA Safety and Health Poster
- A highly visible map showing the route to the nearest emergency room
- Emergency contact numbers

Each office/project site where Resolution Consultants has established a presence will have the appropriate labor posters. Ensure local and state posting are included. At a minimum, ensure OSHA's Occupational Safety and Health Act Poster (OSHA 3165) is available onsite and communicated to all affected employees. It is anticipated that all postings will be maintained in the site vehicle in the absence of a dedicated site office.

9.b.(5) Man Overboard/Abandon Ship

This section is not applicable to this project.

9.b.(6) Medical Support

Onsite medical support during project execution will be available from two or more individuals who are trained in First Aid and CPR and bloodborne pathogens. A list of individuals and dates of First Aid and CPR training is depicted in the table below and copies of the certifications provided in Appendix G. Onsite first aid kits will meet the requirements of EM 385-1-1. First aid kits are Type III, 16 unit kits, including one pocket mouthpiece or CPR barrier. Kits will be checked prior to use, and at least weekly when work is in progress to ensure that contents are replaced as used. If a unit is available, personnel will be trained in the use of the Automated External Defibrillator.

Resolution Consultants Personnel	First Aid (Date of Completion)	CPR (Date of Completion)
Frank Burwell	9 December 2013	6 December 2013
Thomas Deck	22 October 2014	22 October 2014

Emergency medical support contact information is contained in the SSHP. Employees can contact emergency personnel by dialing 911 or the appropriate base emergency services contact number. The dispatcher will contact, fire, and/or helicopter evacuation services. The emergency reference sheet attached to the SSHP provides the numbers of the nearest medical center and Resolution Consultants safety personnel. Emergency phone numbers can be found in the SSHP Table H-8 for all jobsites.

9.c. Plan for Prevention of Alcohol and Drug Abuse

Resolution Consultants is committed to providing a safe and healthy workplace for all employees. Consistent with this commitment and in keeping with the federal Drug-Free Workplace Act of 1988, it is the policy of Resolution Consultants to maintain a drug-free workplace.

Key Provisions

Resolution Consultants policy prohibits employees from being under the influence of alcohol or drugs or improperly using medication in any way that could diminish, or raise questions concerning, an employee's ability to perform at his or her best while performing services for or on behalf of Resolution Consultants. While on duty, employees will not use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances.

This policy also prohibits the sale, possession, manufacturing, and/or distribution of illegal drugs, and/or other controlled substances in the workplace or while on company business off premises. Compliance with this policy is considered a condition of employment.

Violations of this policy will be considered to be gross and willful misconduct and will result in disciplinary action, up to and including termination. Any illegal substances discovered in the workplace will be turned over to the appropriate law enforcement agency and may result in criminal prosecution.

Employee Responsibilities

When a worker is impaired by the use of drugs or alcohol, he or she threatens the safety and well-being of everyone at a worksite. As a Resolution Consultants employee, you must do the following to protect workplace safety:

- Understand Resolution Consultants' drug-free workplace policy
- Follow it and set a good example for others by working drug and alcohol free
- Seek help if you or your co-worker(s) need it
- Notify management if you observe use of or impairment from drugs or alcohol that could threaten the health and safety of co-workers

Confidential help is available, at no cost to employees. If you and/or a co-worker are struggling with drug or alcohol problems, turn to services such as:

- Those provided through the Resolution Consultants sponsoring employer HR department.

- The ***Substance Abuse Treatment Locator:*** (800) 662-HELP or www.findtreatment.samhsa.gov.

If an employee observes drug-free workplace policy violations or obvious, on-the-job impairment you believe poses an immediate danger to any worker on the job:

- DO NOT DELAY or ignore the situation
- ACT to prevent the worker from committing the unsafe practice, if at all possible
- NOTIFY your supervisor (and/or SSHO) *immediately*

Supervisors Responsibilities

When a worker is impaired by the use of drugs or alcohol, he or she threatens the safety and well-being of everyone at a worksite. While it is the responsibility of every employee to work drug free, supervisors can be the first line of defense by taking appropriate action when a worker may be impaired.

Supervisors must familiarize themselves with Resolution Consultants' drug-free workplace policy and be able to explain it to others. In addition, you must ensure that your workers understand their responsibility to:

- Know the Resolution Consultants drug-free workplace policy
- Follow it and set a good example for others
- Seek help if they or their co-workers need it
- Notify you/management if they observe drug or alcohol use or impairment that threatens safety

Supervisors can play a powerful role in improving workplace safety by intervening and encouraging workers with alcohol or drug problems to seek help. Both on and off the job, symptoms of alcohol or drug use may be **physical** (chills, smell of alcohol, sweating, weight loss, physical deterioration); **emotional** (increased aggression, anxiety, burnout, denial, depression, paranoia); and/or **behavioral** (excessive talking, impaired coordination, irritability, lack of energy, limited attention span, poor motivation).

While different types of drugs produce different physical symptoms or behaviors, there are numerous ways that misuse affects work behavior — and ultimately job performance and safety. It could be a sign of a drug or alcohol problem if a worker is:

- Arriving late, leaving early, and/or often absent
- Unreliable and often away from assigned job
- Careless and repeatedly making mistakes
- Argumentative and uncooperative
- Unwilling or unable to follow directions
- Avoiding responsibilities
- Making excuses that are unbelievable or placing blame elsewhere
- Taking unnecessary risks by ignoring safety and health procedures
- Frequently involved in mishaps and accidents or responsible for damage to equipment or property

Supervisors are not expected to perform the role of police officer or counselor. Since part of the supervisors job is to assess employees' job performance to ensure that all necessary tasks are completed in accordance with specifications and deadlines, supervisors primary role in enforcing the policy is to be observant. When an employee begins to show a consistent pattern of problem behavior, supervisors should take action. Focusing on job performance, even when the problem may be caused by drugs or alcohol, allows the supervisor to balance both the rights of the individual employee to privacy and fair treatment and the rights of the work group to a safe, secure, and productive environment.

Do not wait until someone gets hurt to address a worker's drug or alcohol misuse. If you suspect a worker has a problem, follow company guidelines, which include these steps:

- Start documenting evidence of declining job performance

- List specific incidents (include date and time) and be concrete about what job functions/responsibilities were affected

- Share this documentation with the appropriate company official who is qualified to advise you on how to handle the situation (human resources manager)

- Meet with the employee and tell him/her that you are concerned about his/her job performance. Describe specific incidents and problems using your documentation as a guide

- Ask the employee if he/she has any explanation for the problem. Offer the opportunity to make the connection between alcohol/drug use and performance, but don't accuse the employee unless you have “reasonable suspicion” and are going to require a drug test

- Define what must be done to correct the performance problem and specify the consequences for the employee if the problem is not corrected

- Refer the employee for professional assistance if he/she has admitted that drug or alcohol use is the root cause of the performance problem. Even if the employee has not admitted he/she has a problem, reconfirm your concern and suggest he/she seek assistance since personal problems-including, but not limited to, alcohol and drug use — are often the root causes of these types of job performance issues

- Set a timeframe for improvement and be willing and able to follow through on your promises about consequences

When a worker has a problem with alcohol or drugs, Resolution Consultants employee assistance programs provided through Resolution Consultants sponsoring employer healthcare benefits are generally the best places to turn for help since they are confidential. Some additional free and confidential resources include:

- Substance Abuse Treatment Locator
  1-800-662-HELP
  www.findtreatment.samhsa.gov

- Alcoholics Anonymous (AA)
  (212) 870-3400
  www.aa.org

- Narcotics Anonymous
  (818) 773-9999
  www.na.org

- Al-Anon
  1-888-4AL-ANON
  www.al-anon.alateen.org

- National Council on Alcoholism and Drug Dependence Hopeline
  1-800-NCA-CALL
  www.ncadd.org

Testing for Drugs and Alcohol

Employees who are under the influence of alcohol or any controlled substance have the potential for interfering with their own and their coworkers' safe and efficient job performance. Drug and/or alcohol screening may be required:

- Of any applicant to whom a job offer has been made

- Of any employee where there is reason to believe that he or she may be using illegal or non-prescribed drugs or may be under the influence of drugs and alcohol. "Reason to believe" includes an injury or accident at work where there is reason to believe that employee impairment may have been a factor. "Reason to believe" may be based on objective symptoms such as the employee's appearance, behavior or speech

- As part of occasional follow-up testing if the employee is found to have breached these policies but has been permitted to remain employed

- As required by client contract, project, or if an employee is employed in a safety-sensitive position. Under these limited circumstances, employees may also be subjected to pre-employment and random drug screening

An employee's cooperation with such drug or alcohol screening tests is required as a condition of employment. The employee's refusal to cooperate with such a request and to provide a specimen may result in termination where there is reason to believe that the employee has violated this policy and the employee's refusal to cooperate has prevented a medical determination of his or her condition. Any violation of this policy may result in immediate termination.

Employees found to be under the influence of or consuming such substances will be immediately removed from the job site. Contractors shall enforce the drug-free workplace requirements.

Any employee under a physician's treatment and taking prescribed narcotics or any medication that may prevent one being ready, willing, and able to safely perform position duties, shall provide a medical clearance statement to his/her supervisor.

9.d. Site Sanitation Plan

Smoking, Eating, and Drinking

Eating and drinking will be permitted only in designated areas at Resolution Consultants project sites. Smoking will be permitted only in areas designated by SSHO and situated in locations that are not in the immediate vicinity of activities associated with work site activities. Additionally, the SSHO will designate each smoking area giving primary consideration to those personnel who do not smoke.

Personnel actively involved in the performance of certain activities will not be permitted to smoke, eat, drink, or use smokeless tobacco, except during breaks (e.g., HAZWOPER Controlled work areas).

Water Supply

Water supplies will be available for use onsite and will comply with the following requirements.

Potable Water

Drinking Water: An adequate supply of cool water will be supplied and will be kept in water coolers in the support zone onsite. The water cooler will be kept closed and appropriately

sealed to protect the drinking water integrity. Personnel will be instructed to wash their face and hands prior to drinking.

Potable water can be provided in the form of approved well or city water, bottled, 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 maintained at the project site and all outlets dispensing non-potable water should have posted the following: "CAUTION — WATER UNSAFE FOR DRINKING, WASHING, OR COOKING." Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers/supplies of non-potable water used will be properly identified/labeled as such.

Toilet Facilities

Chemical toilet(s) will be available for site personnel and visitors. A minimum of one toilet will be provided for every 20-site personnel, with separate toilets maintained for each sex, except where there are less than five total personnel onsite. The toilet will be equipped with toilet paper, toilet paper holder, locking door, and adequate ventilation.

For mobile crews where work activities and locations permit transportation to nearby toilet facilities (e.g., gas station, or rest stop), onsite facilities are not required.

Washing Facilities

Site personnel will wash hands and face after completing work activities and prior to breaks, lunch, or completion of workday.

Personal Cleaning Supplies

Cleaning supplies at project sites will consist of soap, water, and disposable paper towels or items of equal use/application (e.g., anti-bacterial gels, wipes, etc.).

Clothing and PPE

All PPE will be kept clean at all times and maintained in accordance with the manufacturer's requirements.

Sanitation

General Work Areas

At all times, work areas will be kept free of dirt and debris that may impact the safety of site personnel and visitors. All trash receptacles will be regularly emptied.

Break Areas and Lunchrooms

Site personnel will observe the following requirements when using break areas and lunchrooms at project sites:

- All food and drink items will be properly stored when not in use
- Food items will not be stored in personal lockers for extended periods in order to prevent the potential for vermin infestation
- Perishable foods will be refrigerated whenever possible
- All waste food containers will be discarded in trash receptacles
- All tables, chairs, counters, sinks, and similar surfaces will be kept clean and free of dirt, waste food, and food containers at all times
- Refrigerators used to store food items will be maintained at 45 degrees Fahrenheit and emptied of all unclaimed food items weekly
- Routine cleaning of refrigerators will also be performed on a regular basis

Housekeeping

- All work areas shall be kept clean to the extent that the nature of the work allows;
- Every work area shall be maintained, so far as practicable, in a dry condition; where wet processes are used, drainage shall be maintained and platforms, mats, or other dry standing places shall be provided, where practicable, or appropriate waterproof footgear shall be provided;

- Protruding objects or placement of materials on paths or foot traffic areas present a problem with regard to slips, trips, falls, and puncture wounds. Personnel will use a reasonable amount of effort to keep slip, trip, and fall hazards to a minimum;

- Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal; and

- At no time will debris or trash be intermingled with waste PPE or contaminated materials.

9.e. Access and Haul Road Plan

This section is not applicable to this project.

9.f. Respiratory Protection Program

This section is not applicable to this project.

9.g. Health Hazard Control Program

All operations, materials, and equipment associated with this project will be evaluated/assessed to determine the presence of hazardous environments or if hazardous or toxic agents could be released into the work environment. Additional hazard assessment will be conducted if a change in conditions occurs.

The THA procedures will be used to identify all substances, agents, and environments that present a hazard and recommend hazard control measures. Engineering and administrative controls will be used to control hazard and in cases where engineering or administrative controls are not feasible, PPE use will be mandated. These controls are detailed in the THAs applicable to the project site and have been included in Attachment 3 of the SSHP.

The analyses will identify the workplace and activity evaluated; the name of the person certifying that the evaluation has been performed; and the date of the evaluation.

Operations, materials, and equipment involving potential exposure to hazardous or toxic agents or environments shall be evaluated by an Resolution Consultants certified industrial hygienist, CSP, or other competent person. Exposure, through inhalation, ingestion, skin absorption, or physical contact, to any chemical, biological, or physical agent in excess of the acceptable limits specified in the most recently published American Conference of Governmental Industrial Hygienists (ACGIH)

guideline, "*Threshold Limit Values and Biological Exposure Indices,*" or by OSHA, whichever is more stringent, shall be prohibited.

Identification of Principal Hazards

The following are the principal hazards that can be anticipated while conducting field investigations:

- Chemical hazards
- Biological hazards
- Physical hazards

Hazard/Risk Management

Resolution Consultants has adopted and implemented the composite risk management process, which includes the following steps:

- Identification of the hazard
- Assessment of the hazard
- Development of controls and risk decision
- Implementation of controls
- Supervision and evaluation during task performance

Hazard Identification

A concise statement is prepared identifying the conditions that reflect actual or potential conditions that can cause injury, illness, or death of personnel, damage to the environment, damage or loss of equipment, or degradation of the production goals.

Exposure Control

The following methods will be utilized for the control of exposure to hazardous or toxic agents and environments:

- Substitution, if the substitute process or product is determined to provide the same outcome and to be less of a hazard

- Engineering controls (such as local/general ventilation), to limit exposure to hazardous or toxic agents and environments within acceptable limits

- Work practice controls, when engineering controls are not feasible or are not sufficient to limit exposure to hazardous or toxic agents and environments within acceptable limits

- Appropriate PPE (i.e., respirators, gloves, etc.) and associated programs shall be instituted when engineering, work practice controls, or material substitution are not feasible or are not sufficient to limit exposure to hazardous or toxic agents

Personal Protective Equipment

The purpose of PPE and clothing is to protect individuals from chemical and physical hazards. Specific work tasks with unique hazards and/or PPE requirements will be evaluated or reevaluated prior to beginning work. This task review will be led by the SSHO, and will include knowledgeable individuals such as the worker(s) and the supervisor. PPE requirements, based on this assessment are found in the SSHP and in the THA for the specific task. All workers must be trained in the requirements of the APP, SSHP, and the applicable THAs prior to beginning work.

Requirements for task and activity-specific levels of protective clothing are presented on the THAs. Personnel performing site tasks shall use the appropriate level and type of PPE specified in this APP for each individual task. This APP makes provisions for use of the following levels of PPE, in accordance with the hazards and contamination level anticipated for each task or operation.

Level D Protection

Level D protection is the minimum protection required for project personnel and visitors at the site. Level D protection may be sufficient when no contaminants are present or work operations preclude splashes, immersion, or the potential for unexpected inhalation or contact with hazardous levels of chemicals.

The following equipment will be used for Level D protection:

- Coveralls or other suitable fieldwork clothing

- Persons exposed to vehicular or equipment traffic, including signalpersons, spotters, or inspectors, shall wear high visibility apparel meeting American National Standards Institute (ANSI)/Safety Equipment Association 107 Class 3 requirements

- Work boots with either steel or composite safety toe meeting the ANSI Z41 standard (steel-toe boots should not be utilized during use of geophysical instruments during anomaly avoidance and related activities)
- Safety glasses or goggles as needed
- Hardhat if overhead hazard or heavy equipment is encountered or operated (hard hats should not be worn avoided during anomaly avoidance unless overhead hazards are present and, if worn, should be secured with chinstraps)
- Leather work gloves
- Hearing protection, earplugs, and/or earmuffs as needed
- Raingear and Rubber Boots (if required)

Should personnel encounter an unusual odor, discolored soil, or an unknown item, they will immediately notify their supervisor and will evacuate the site upwind of the suspected item. The SSHO will notify the TOM of the actions taken.

Modified Level D protection will incorporate all of the above with the addition of chemical protective gloves (nitrile), tyvek coveralls, and rubber over booties for biological hazard avoidance if necessary.

Level C Protection

Level C protection is the next higher level of PPE that encompasses Level D and incorporates additional safety equipment. Level C will be upgraded to if the need for respiratory protection is found by the SSHO. The main components of Level C are as follows:

- Full-face or half-face, air purifying respirators (National Institute for Occupational Safety and Health [NIOSH] approved)
- Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls)
- Gloves, outer, chemical-resistant
- Gloves, inner, chemical-resistant

Level B Protection

Level B protection is the next higher level of PPE that encompasses Level C and incorporates additional safety equipment. Level B will be upgraded to if the need for respiratory protection is found by the SSHO. The main components of Level B are as follows:

- Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved)
- Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls)
- Gloves, outer, chemical-resistant
- Gloves, inner, chemical-resistant
- Boots, outer, chemical-resistant steel toe and shank

Level A Protection

Level A protection is the next higher level of PPE that encompasses Level B and incorporates additional safety equipment. Level A will be upgraded to when directed by the SSHO. The main components of Level A are as follows:

- Positive pressure, full face-piece SCBA, or positive pressure supplied air respirator with escape SCBA, approved by NIOSH
- Totally-encapsulating chemical-protective suit
- Gloves, outer, chemical-resistant
- Gloves, inner, chemical-resistant
- Boots, chemical-resistant, steel toe and shank
- Disposable protective suit, gloves, and boots (depending on suit construction, may be worn over totally-encapsulating suit).

Proper PPE Selection

The selection of the PPE will be done after a thorough evaluation of the hazards involved at the site during each phase of the operation. All persons entering the site area will put on the required PPE according to established procedures in this APP.

Hazard and risk assessment is a continuing process to be conducted by the SSHO, throughout the duration of the project. Changes in specific PPE or levels of PPE may be required in accordance with information obtained from implementation of site activities and data derived from the other sources. As a general rule, levels of PPE will need to be reassessed if any of the following occur:

- Appearance of previously unidentified or anticipated chemicals, conditions, or task hazards
- Airborne concentrations of known chemicals exceed action levels
- Ambient weather conditions changes impacting the use of assigned PPE
- A new task is introduced or a previously assigned and evaluated task is expanded in scope

Specific levels of protection will be modified when onsite conditions warrant, and based upon the revisions presented in the SSHP for a specific location. The decision to change levels of protection will be made by the SSHO with concurrence from the TOM and the SH&E Manager. Levels of protection will not be downgraded without prior approval from the SH&E Manager.

Head Protection

Resolution Consultants employees and visitors will wear hard hats that meet the requirements of ANSI Z89.1 (as indicated by the manufacturer's label) if there is a potential of exposure to flying/falling objects or overhead hazards. Hard hats can be removed in break areas or where their use presents potential safety hazards. Ear protection and face shields may be attached to hard hats. The following criteria will be followed:

- No modification to the shell or suspension is allowed except when such changes are approved by the manufacturer

- Hard hats shall be worn with the bill facing forward unless the SSHO has determined exceptions for certain trades in order to accommodate appropriate mission accomplishments

- No ball caps, knit caps, or other headdress shall be worn under the hard hat that could interfere with the fit or stability of the hard hat

- Protective headgear and components shall be visually inspected on a daily basis for signs of damage (dents, cracks, etc.) that might reduce the degree of safety integrity originally provided

- Headgear will be periodically inspected for ultraviolet degradation as evidenced by cracking or flaking of the helmet

- Drilling holes or in any way changing the integrity of the hard hat is prohibited. Alterations that will reduce the dielectric or impact strength will not be made.

Eye Protection

Eye and face protection equipment shall meet the requirements of ANSI Z87.1, and bear a legible and permanent "Z87" logo to indicate compliance with the standard providing side protection. When required to wear eye protection, persons whose vision requires the use of corrective lenses in eyeglasses shall be protected by one of the following:

- Prescription safety glasses providing optical correction and equivalent protection

- Protective glasses with side shields designed to fit over corrective lenses without disturbing the adjustment of the glasses

- Goggles that can be worn over corrective lenses without disturbing the adjustment of the glasses or goggles that incorporate corrective lenses mounted behind the protective lenses

The SSHO will ensure that suitable eye protection is available and provided to all onsite personnel.

The use of eye protection by all personnel will meet the requirements of the following minimum requirements:

- Provide adequate protection against the particular hazards for which they are designed
- Be reasonably comfortable when worn under the designated conditions
- Fit snugly and not unduly interfere with the wearer's movements
- Be durable
- Be easily cleaned and sanitized

Contact lenses do not provide adequate eye protection. Contact lens wearers must use the same additional eye protection as non-lens wearers. Persons whose vision requires correction and who are required to wear eye protection may wear goggles or spectacles of one of the following types:

- Spectacles whose protective lenses provide optical correction (prescription)
- Goggles that can be worn over corrective (prescription) spectacles without disturbing the adjustment of the spectacles
- Goggles that incorporate corrective (prescription) lenses mounted behind the protective lenses

Hearing Protection

Hearing protection will be worn, as appropriate, whenever sound-pressure levels exceed 85-decibel A-weighted sound level steady-state expressed as a time-weighted average or 140 decibel A-weighted impulse, or as desired by individual workers when working around noise-producing equipment. Hearing protection worn by personnel will comply with the requirements of 29 CFR Part 1910.95(j), and will provide a minimum noise reduction rating of at least 21.

Hearing protection will be worn at all times when normal conversation becomes difficult at distances of three feet or less, such as during the operation of heavy equipment. The use of hearing protection and its necessity will be detailed in the applicable THAs for the individual tasks.

Foot Protection

All workers entering designated fieldwork areas will wear sturdy leather or leather/synthetic combination work boots with safety toes that provides adequate ankle support and provide adequate protection for the task being performed. Sandals and other open-top footwear are not acceptable in designated fieldwork areas.

Hand Protection

Employees will use appropriate hand protection when exposed to hazards that could cause injury to the hands. Gloves must resist puncturing and tearing, as well as provide any necessary chemical resistance. Generally, leather or Kevlar gloves will be worn during material and equipment handling activities and Nitrile gloves will be used for chemical protection as indicated in the THA developed for the specific task and during biological hazard avoidance.

Traffic Safety Vests

When working on or near public roads and when working around moving vehicles at designated field work areas, all personnel will wear traffic safety vests, shirts, or similar colored garment so as to provide high visibility to drivers/operators (e.g., Class I, II or III as required).

PPE Use

All site personnel will be given initial PPE-specific training. This training will be given by the SSHO prior to personnel participating in site operations where PPE is required. All personnel receiving PPE training will be required to demonstrate an understanding of the training topics and the ability to correctly use the PPE. This will be accomplished through the SSHO supervising and visually inspecting each individual's ability to properly don and use the PPE during its initial use. Upon completion of the training and after each employee has successfully demonstrated the requisite understanding, the SSHO will complete any applicable training completion form.

PPE Program Effectiveness

The jobsite shall be evaluated to determine if the incorporated PPE levels are adequate based upon the site conditions and contaminants detected. If additional work tasks are added to the Statement of Work, after approval of this APP, the TOM and SSHO shall identify and assess the task hazards, and relay that information to the SH&E Manager. The SSHO, in conjunction with the SH&E Manager, will prepare an amendment to the APP/SSHP and submit the amendment for approval to NAVFAC. The amendment will be added to the APP/SSHP upon approval.

The SSHO will ensure PPE use complies with all applicable OSHA, NAVFAC, and Resolution Consultants requirements.

PPE Inspection and Care

Maintenance of PPE can vary greatly, based upon the complexity of the PPE and the intricacy of the repair involved. The SSHO will become familiar with the manufacturer's recommended maintenance, and when possible, repair defective PPE. If unable or unauthorized to conduct the repair, the SSHO will return the item to the manufacturer for repair, or to procure a replacement.

The SSHO will be responsible for ensuring that PPE is in good, clean, working order prior to the initial issuing of the PPE. Once issued, site personnel will ensure that re-usable articles of PPE are maintained in a clean, sanitary fashion. During the work task, co-workers should periodically inspect each other for the proper use of PPE. For items used inside an EZ, site personnel will follow

the requirements of the Site-Specific Decontamination Plan, and ensure that the PPE is properly decontaminated in the Contaminate Reduction Zone before removing the item from the EZ.

9.h. Hazard Communication Program

Resolution Consultants will implement a hazard communication program on field projects managed by the SSHO responsible for maintaining a list of hazardous materials used on the site, as well as SDS's for each hazardous material. Details of the program are contained in SH&E SOP 5-507 — *Hazardous Materials Communication WHMIS* which includes the development of a site-specific Hazard Communication Plan, complete with inventory log, which will be developed for the project site.

The program establishes procedures for Resolution Consultants employees and subcontractors who handle and store chemical products at project sites. It ensures that hazards of all chemicals purchased are evaluated and the information concerning their hazards is transmitted to employees. The delivery of information is to be accomplished by employee training, container labeling, and other forms of warning and SDSs. All SDSs are requested from the suppliers at the time of order. If not available, then a recent SDS will be downloaded off the Internet.

The requirements defined in this program apply to all Resolution Consultants facilities, projects, employees, and subcontractors, which receive, use, handle, store, transport, or distribute hazardous substances.

All hazardous substances found in a particular workplace shall be listed on a Hazardous Substance Inventory (HSI). The HSI will be reviewed at least annually. New hazardous substances entering a workplace (e.g., project-specific materials) shall be added to the HSI upon receiving and reviewing the SDS. The HSI includes the following information:

- Product name
- Chemical name (if different from product name)
- Manufacturer's name
- Approximate typical quantity
- Location of substance (i.e., work area)
- Description of use

A copy of the most current HSI, along with the corresponding SDS and a copy of this program (or site-specific program), will be available onsite for review by all employees. The name of the material (product or chemical) on the HSI must be consistent with the SDS for that material. A site map will be attached to the inventory showing where inventoried substances are stored. The inventory and site map will be updated as frequently as necessary to ensure accuracy.

Safety Data Sheets

Resolution Consultants does not manufacture, package, or distribute hazardous commodities. However, as an end user, Resolution Consultants must maintain hazard documentation for each hazardous substance used on each job site. This documentation will take the form of a listing of all onsite hazardous substances, and copies of manufacturer developed SDSs for each listed item.

A SDS shall be available for every hazardous substance used or stored on each job site. Copies of all SDS's will be maintained onsite as an Appendix to the site-specific SSHP. All site personnel will be briefed as to the location of the SDS's, and will have immediate access to examine any SDS at any time during their work shift.

SDSs received for consumer products, articles and other materials not covered by this procedure will be maintained and made available to employees.

For on-going projects, each SDS associated with a material no longer in use will be marked as obsolete and the date it was obsolete. At the completion of any project, the accumulated SDSs will be maintained as part of the project records. NO SDS ASSOCIATED WITH ANY PROJECT WILL BE DESTROYED.

Employees are required to report any hazardous substance found at the project site that is not on the list of hazardous substances. The report is to be made to the TOM and Site Supervisor. If no SDS accompanies a hazardous substance, the manufacturer, distributor, or importer will be immediately notified and requested to provide one as soon as possible. The request will be documented in a letter or telephone log. If this request is not honored, the SH&E Department will be notified.

When purchasing hazardous substances, the verbal or written purchase order will request an SDS be sent with the shipment. For each facility and/or project, the SDS will be kept along with the HSI in a location that is readily accessible to all employees at all times during their work periods.

Additionally, the SDSs and HSI will be available to employees for review in such a way so that the assistance of a supervisor is not necessary.

Labels

All hazardous substances received from outside suppliers will conform to legal requirements and display on each container, as a minimum, the following:

- Identification of the hazardous substance(s)
- Appropriate hazard warnings such as an Hazardous Materials Identification System and/or National Fire Protection Association-type label
- Name and address of the manufacturer, importer, or other responsible party

Any failure to have a label on the container at the time of receipt will be cause to refuse delivery of the product in addition to the following guidance:

- Stationary process containers may have signs, placards, process sheets, batch tickets, operating procedures, or other written material in lieu of fixed labels on the containers, as long as the alternative method conveys hazard information. The written materials will be readily accessible to the employees in the work area.
- Although the practice is not recommended, if an employee will use the hazardous substance in a portable container immediately, the portable container need not be labeled when the substance is transferred from the labeled container. The term “immediate use” is intended to mean that the hazardous chemical will be exclusively under the control of and used by the person performing the transfer at all times and work will be completed within the current work shift.
- Containers of hazardous substances transferred from labeled containers and not intended for the immediate use of the employee performing the transfer must be labeled in accordance with a hazardous materials identification system or an equivalent commercial system
- Labels on incoming containers will not be removed or defaced

- Labels or other forms of warning will be legible, in English, and prominently displayed on the containers, or readily available throughout each work shift

- Container size is not the determining factor in deciding if a label is required; ALL containers of hazardous chemicals must be labeled

Hazard Communication Training

Due to the nature of our business, the information and training provided to Resolution Consultants employees with regard to hazard communication will take two forms: general and specific. General training and information will include the following:

- The elements and requirements of the OSHA Hazard Communication standard (29 CRF 1910.1200) and applicable state regulation

- Tasks and operations where hazardous substances are present

- The location and availability of the written Hazard Communication Program, including the list(s) of hazardous substances and SDS's and how employees can obtain and use hazard information

- The methods and observations that may be used to detect the presence or release of a hazardous substance, such as personal and area monitoring, continuous monitoring devices, visual appearance or odor of hazardous substances when being released, etc.

- The physical and health hazards of the substances in the work area

- The measures they can take to protect themselves from these hazards, including specific procedures implemented for the project or shop to protect employees from exposure to hazardous substances, such as appropriate work practices, emergency procedures, and PPE to be used

- The project- or shop-specific details of the Hazard Communication Program, including an explanation of the labeling system and the SDS's, and how employees can obtain and use the appropriate hazard information

- Information for their physician to receive, regarding hazardous substances to which the employee may be exposed according to provisions of this section

- Freedom from discharge or other discrimination due to the employee's exercise of the rights afforded pursuant to the provisions of the Hazardous Substances Information and Training Act

Site-Specific Hazard Communication Training regarding safe handling and use of hazardous materials found on the HSI will be presented during site-specific training programs. This training may be for specific hazardous materials or for groups of hazardous substances, including flammable/combustible liquids, compressed gases, organic solvents, corrosives, and toxic metals. Additional specific training will be provided to the affected employees any time a new hazardous substance is introduced into the workplace (e.g., project specific substances) and/or when an employee is reassigned. All training conducted will be documented and copies of the documentation included in the permanent project files.

The SSHO must ensure that project personnel can immediately obtain the required information about chemicals of concern during an emergency.

Handling Controls and PPE

When engineering and work practice controls or substitution are either infeasible or insufficient, appropriate PPE and chemical hygiene facilities will be provided and used for the transportation, use, and storage of hazardous or toxic agents.

When irritants or hazardous substances may contact skin or clothing, chemical hygiene facilities and PPE will be provided. PPE may include suitable gloves, face/eye protection, and chemical protective suits. Required task-specific PPE are identified in the THAs.

The certified industrial hygienist, CSP, or other competent personnel will determine the scope and type of protective equipment.

Special attention shall be given to selecting proper chemical protection when working with materials designated with a “skin” notation by Occupational Exposure Limits. Such materials may produce systemic toxic effects through absorption through broken or unbroken skin.

When eyes or body of any person may be exposed to hazardous or toxic agents, suitable facilities for quick drenching or flushing of the eyes and body will be provided in the work area for immediate emergency use and shall be no more than 10 seconds from the hazardous material.

Emergency eyewash equipment must be provided where there is the potential for an employee's eyes to be exposed to corrosives, strong irritants, or toxic chemicals. The emergency eyewash equipment must irrigate and flush both eyes simultaneously while the operator holds the eyes open.

Storage prior to transportation of hazardous chemicals, materials, substances, and wastes will be under the supervision of a qualified person. Transportation, use, and storage of hazardous or toxic agents will be planned and controlled to prevent contamination of people, animals, food, water, equipment, materials, and environment.

All storage of hazardous or toxic agents shall be in accordance with the recommendations of the manufacturer, OSHA, and National Fire Protection Association requirements and accessible only to authorized personnel.

Disposal of surplus or excess hazardous or toxic agents will occur in a manner that will not contaminate or pollute any water supply, ground water, or streams; and will comply with federal, state, and local regulations and guidelines.

Containers used to hold hazardous or toxic agents should not be used to hold other materials unless they have been managed or cleaned under hazardous waste and Department of Transportation (DOT) regulatory requirements. Every hazardous or toxic agent being transported for disposal shall be transported with a copy of the substance's SDS whenever applicable.

Persons who prepare shipments of hazardous chemicals, materials, substances, and/or wastes that are defined as hazardous material under DOT regulations, are required to be DOT trained, certified, and issued an appointment letter in accordance with Defense Transportation Regulation 4500.9-R, Chapter 204.

9.i. Process Safety Management Plan

This section is not applicable to this project.

9.j. Lead Abatement Plan

This section is not applicable to this project.

9.k. Asbestos Abatement Plan

This section is not applicable to this project.

9.l. Radiation Safety Program

This section is not applicable to this project.

9.m. Abrasive Blasting

This section is not applicable to this project.

9.n. Heat/Cold Stress Monitoring Plan

Heat Stress

Heat stress is one of the most common (and potentially serious) illnesses that affect site workers. When site personnel are engaged in operations involving hot environments, a number of physiological responses can occur, which may seriously affect the health and safety of the workers. These affects can be eliminated or controlled through the use of a comprehensive heat stress prevention and monitoring program.

It is the responsibility of the SSHO and each employee to ensure that temperature stress controls are adequate for the site conditions and tasks. All employees, and specifically the SSHO, are empowered and expected to stop or modify work and take any precautionary measures to prevent temperature related illnesses.

Individuals vary in their susceptibility and degree of response to stress induced by increased body heat. Heat stress can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors including environmental condition, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at work sites, regular physiological or area monitoring (as appropriate) and other preventive precautions are vital. Factors that may predispose a worker to heat stress include:

- Lack of physical fitness
- Lack of acclimatization to hot environments
- Degree of hydration

- Level of obesity
- Current health (i.e., having an infection, chronic disease, diarrhea, etc.)
- Alcohol or drug use
- The worker's age and sex
- Prior history of heat stress

Effects of PPE

The amount, and type of PPE worn, directly influences reduced work tolerance and the increased risk of excessive heat stress. PPE adds weight and bulk, severely reduces the body's access to normal heat exchange mechanisms (evaporation, convection, and radiation), and increases energy expenditure. Therefore, when selecting PPE, each item's benefit should be carefully evaluated in relation to its potential for increasing the risk of heat stress. Once PPE is selected, the safe duration of work/rest periods should be determined based on the following criteria and that of the recommendations of the ACGIH Threshold Limit Value (TLV) handbook:

- Anticipated work rate
- Ambient temperature and other environmental factors
- Type of protective ensemble
- Individual worker characteristics and fitness

Sweating does not cool the body unless moisture is removed from the body. The use of PPE reduces the body's ability to eliminate large quantities of heat because the evaporation of sweat is decreased. The body's effort to maintain an acceptable temperature may become impaired and this may cause heat stress. Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks.

Early Symptoms of Heat Related Illness

The following are the early symptoms of heat related problems that may be experienced by the field teams:

- Decline in task performance
- Lack of coordination
- Decline in alertness
- Unsteady walk
- Excessive fatigue
- Muscle cramps
- Dizziness

Heat Stress Disorders

This section outlines the major heat related illness that may result from exposure to high heat environments, which include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke. For the purpose of this program, reference to "liquids" will indicate the use of water or an electrolyte replacement solution, and not tea or coffee (unless it is decaffeinated) or carbonated soft drinks.

Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by wet chafing clothing. This condition can decrease a worker's ability to tolerate hot environments.

- Symptoms: Mild red rash, especially in areas of the body that sweat heavily.

- Treatment: Decrease amount of time in protective gear and provide powder such as cornstarch or baby powder to help absorb moisture and decrease chafing. Maintain good personal hygiene standards and change into dry clothes if needed.

Heat Cramps

Heat cramps are caused by a profuse rate of perspiration that is not balanced by adequate fluid and electrolyte intake. The occurrence of heat related cramps are often an indication that excessive water and electrolyte loss has occurred, which can further develop into heat exhaustion or heat stroke.

- Symptoms: Acute, painful spasms of voluntary muscles such as the back, abdomen, and extremities.

- Treatment**:** Remove victim to a cool area and loosen restrictive clothing. Stretch and massage affected muscles to increase blood flow to the area. Have patient drink one to two cups of liquids immediately, and every twenty minutes thereafter. Consult with physician if condition does not improve. If available, an electrolyte replacement solution should be taken along with liquids.

Heat Exhaustion

Heat exhaustion occurs due to the large fluid and salt loss from profuse sweating. It is a state of very definite weakness or exhaustion caused by increased stress on various organs to meet increased demands to cool the body due to excessive loss of fluids from the body. This condition leads to inadequate blood supply and cardiac insufficiency. Heat exhaustion is less dangerous than heat stroke, but nonetheless must be treated. If allowed to go untreated, heat exhaustion can quickly develop into heat stroke.

- Symptoms: Pale or flushed, clammy, moist skin, profuse perspiration, and extreme weakness. Body temperature is basically normal or slightly elevated, the pulse is weak and rapid, and breathing is shallow. The individual may have a headache, be dizzy or nauseated.

- Treatment: Remove the individual to a cool, air-conditioned place, loosen clothing, elevate feet, and allow individual to rest. Consult physician, especially in severe cases. Have patient drink one to two cups of liquids slowly and immediately, and every twenty minutes thereafter. Total liquid consumption should be about one to two gallons per day. If the signs and symptoms of heat exhaustion do not subside, or become more severe, immediate medical attention will be required.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by failure of the heat regulating mechanisms of the body. Heat stroke occurs when the body's system of temperature regulation fails and the body temperature rises to critical levels. When this occurs, the body core temperature rises very rapidly to a point (>105.8°F) where brain damage and death may result if the person is not cooled quickly.

- Symptoms: The victim's skin is hot, and may or may not be red, dry, and/or spotted, due to the fact that the individual may still be wet from having sweat while wearing protective clothing earlier; nausea; dizziness; confusion; extremely high body temperature; rapid respiratory and pulse rate; delirium; convulsions; unconsciousness or coma.

- Treatment: Cool the victim immediately. If the body temperature is not brought down quickly, permanent brain damage or death may result. The victim should be moved to a shady area; he should lie down and keep feet elevated. Cool the victim by either sponging or immersing the victim in very cool (not cold) water to reduce the core temperature to a

safe level (<102°F). If conscious, give the victim cool liquids to drink. Observe the victim and obtain immediate medical help. Do not give the victim energy, caffeinated or alcoholic beverages. Heat stroke is considered a medical emergency. Medical help should be summoned immediately. EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.

Preventive Measures

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat exhaustion, that person may become predisposed to additional heat injuries. In order to avoid heat related illnesses, proper preventive measures will be implemented whenever environmental conditions dictate the need, normally whenever the temperature reaches at least 70°F. These preventive measures represent the minimal steps to be taken and will include the following procedures.

The SSHO or other authorized person will observe each site worker prior to the start of daily operations, and periodically throughout the day, to determine the individuals susceptible to heat induced stress. Evidence of extreme dehydration, illness, or drug or alcohol use may require the SSHO to restrict the worker's activities until such time as the worker is fit for duty. Personnel identified as being at high risk for heat stress who are allowed to participate in site operations will be monitored frequently by the SSHO.

Site workers will be trained to recognize and treat heat-related illnesses. This training will include the signs, symptoms, and treatment of heat stress disorders. In order to maintain workers' body fluids at normal levels, workers will be encouraged to drink, as a minimum, approximately sixteen ounces of liquids prior to start of work in the morning, after lunch, and prior to leaving the site at the conclusion of the day's activities. Disposable four to twelve ounce cups and liquids will be provided onsite. Liquids to be provided will be water. Liquids containing caffeine should be avoided.

When ambient conditions and site workload requirements dictate, as determined by the SSHO, workers will be required to drink a minimum of 16 to 32 ounces of liquids during each rest cycle. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat. When heavy sweating occurs, workers shall be encouraged to drink even though they may not be thirsty. A shelter or shaded area may be provided where workers can be protected from direct sunlight during rest periods.

Monitoring of ambient or physiological heat stress indices will be conducted to allow prevention and/or early detection of heat-induced stress. Monitoring will be conducted in accordance with applicable paragraphs of this APP.

Site workers will be given time to acclimatize to site work conditions, temperature, protective equipment, and workload. Acclimatization is the adaptive process that usually takes two to six days of continued work in hot environments, resulting in a decrease of the physiological strain and allowing the worker's body to become adjusted to the level and type of work required by the application of a constant environmental stress. This process involves a gradual increase in the individual's workload over the required period, the length of which depends upon the nature of the work performed, ambient temperatures, and the individual's susceptibility to heat stress.

Work schedules will be adjusted as follows:

- Modify work/rest schedules according to monitoring requirements
- Mandate work slowdowns as needed
- Rotate personnel: alternate job functions to minimize over-stress or overexertion at one task
- Add additional personnel to work teams
- Perform work during cooler hours of the day if possible

Workers will be encouraged to achieve and maintain an optimum level of physical fitness. Increased physical fitness will allow workers to better tolerate and respond to hot environments and heavy workloads. In comparison to an unfit person, a fit person will have less physiological strain, a lower heart rate and body temperature, and a more efficient sweating mechanism.

Alcohol should not be consumed in a hot environment because the loss of body fluids increases the risk of heat stress.

Heat Stress Monitoring

Because the incidence of heat stress depends on a variety of factors, all workers shall be monitored. Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and the level of physical work. The length of the work cycle will be governed by the frequency of the required physiological monitoring.

Monitoring of personnel wearing PPE should begin when the ambient temperature is 72°F or above. Table 9-1 presents the suggested frequency for such monitoring. Monitoring frequency should increase as the ambient temperature increases or as slow recovery rates are observed.

A person with a current first aid certification who is trained to recognize heat stress symptoms should perform heat stress monitoring. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature (WBGT) index from ACGIH TLV booklet or portable heat stress monitoring instrumentation can be used.

Table 9-1
Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers

Adjusted Temperature[1,2]	Normal Work Ensemble[3]	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 min. of work	After each 15 min. of work
87.5°-90°F(30.8°-32.2°C)	After each 60 min. of work	After each 30 min. of work
82.5°-87.5°F (28.1°-28.1°C)	After each 90 min. of work	After each 60 min. of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 min. of work	After each 90 min. of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 min. of work	After each 120 min. of work

Notes:

1 For work levels of 250 kilocalories/hour

2 Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

3 A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

When workers are wearing permeable clothing (i.e., standard cotton work clothes), follow recommendations for monitoring requirements, and suggested work/rest schedules in the current ACGIH TLVs for Heat Stress.

When monitoring the worker physically, measure:

- Heart rate:
  - Count the radial pulse during a 30-second period as early as possible in the rest period
  - If the working heart rate (while in PPE and performing tasks) exceeds 180 beats per minute minus the workers age, the work cycle should be discontinued and an appropriate rest/recovery period should begin.

— If the heart rate exceeds 110 beats per minute at the beginning of the rest period (after one minute of rest), shorten the next work cycle by one-third and keep the rest period the same

— If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third

- Oral temperature:

  — Use a clinical thermometer (three minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking)

  — If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period

  — If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third

  — Do not permit a worker to wear a semi-impermeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C)

For site conditions where personnel are working in Level D PPE, and the ambient temperature is greater than 72°F, the SSHO may conduct WBGT monitoring to assist in controlling the potential for site workers experiencing heat related adverse health effects. The SSHO may take readings on a WBGT monitor throughout the day to determine the work/rest schedule to be implemented (see Table 9-2).

Table 9-2
Permissible WBGT Heat Exposure Threshold Limit Values (TLV)

Work — Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous work	86 (30.0)	80 (26.7)	77 (25.0)
75% Work — 25% Rest, each hour	87 (30.6)	82 (28.0)	78 (25.9)
50% Work — 50% Rest, each hour	89 (31.4)	85 (29.4)	82 (27.9)
25% Work — 75% Rest, each hour	90 (32.2)	88 (31.1)	86 (30.0)

Note:

* Consult the ACGIH TLV booklet for definitions of Light, Moderate, and Heavy workloads. Values are given in F and (C) WBGT, and are intended for workers wearing single layer summer type clothing. Use of semi or totally impermeable clothing requires monitoring in accordance with the Heat Stress Prevention Program. As workload increases, the heat stress impact on a non-acclimated worker is exacerbated. For non-acclimated workers performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5°C.

The values outlined in Tables 9-1 and 9-2 are designed such that nearly all acclimatized, fully clothed workers with adequate water and electrolyte replacement liquids intake will be able to function without the body temperature exceeding 100.4°F (38°C).

Heat Stress Documentation

The SSHO will be responsible for recording all heat stress related information. This will include training sessions and monitoring data. Training sessions will be documented on the Safety Meeting and Training Form, and WBGT data and other information will be recorded on a heat stress monitor log.

9.o. Crystalline Silica Monitoring Plan

This section is not applicable to this project.

9.p. Night Operations Lighting Plan

This section is not applicable to this project.

9.q. Fire Prevention Plan

All project personnel will be responsible for observing and reporting fires and conditions that could lead to fires. During all onsite activities, the following practices will be used for fire prevention and protection:

- Smoking on site is prohibited in designated work areas, contamination reduction zones, and other areas where smoking may create a fire hazard (e.g., dry fields or forested areas)
- A designated smoking area will be established (if allowed by base regulations) as necessary by the SSHO or Site Supervisors when operations on site begin
- Accumulations of combustible scrap and debris onsite will be promptly removed and properly disposed
- Care will be taken with all equipment to reduce the possibility of sparks or open flames
- Inspect all electrical cords and plugs prior to use; keep cords away from water and moisture

- Fire extinguishers (minimum 2 A:B:C, 10-lb) will be available at the work area and support area

- A fire extinguisher will be available on all pieces of heavy equipment

Requirements for storage of flammable and combustible liquids will include:

- A suitable portable fire extinguisher will be available at the location where flammable or combustible liquids are stored

- "No Smoking" signs will be posted in the storage area

- Flammable liquids will be stored in closed containers. Type I or Type II metal safety cans (not greater than 5 gallons capacity) will be used for small quantities. Plastic storage containers are not allowed

- Not more than 60 gallons of Class I or Class II liquids, nor more than 120 gallons of Class III liquids may be stored in a storage cabinet

- Containers of flammable and combustible liquids shall be stored properly when not in use

- The grounds around the storage area will be kept free of weeds, trash, and other unnecessary combustible materials

- Spills will be cleaned up promptly

- Proper bonding and grounding principles will be observed when transferring flammable liquids from one container to another

Fire Extinguishers

Fire extinguishers are divided into categories, based on different types of fires. Each fire extinguisher also has a numerical rating that serves as a guide for the size of fire the extinguisher can handle. The higher the number rating, the more firefighting power of the extinguisher. The following is a quick guide to project management to help choose the right type of extinguisher:

- Class A extinguishers are for ordinary combustible materials such as paper, wood, cardboard, and most plastics. The numerical rating on these types of extinguishers indicates the amount of water it holds and the amount of fire it can extinguish.

- Class B fires involve flammable or combustible liquids such as gasoline, kerosene, grease and oil. The numerical rating for class B extinguishers indicates the approximate number of square feet of fire it can extinguish.

Class C fires involve electrical equipment, such as appliances, wiring, circuit breakers, and outlets. Never use water to extinguish class C fires – the risk of electrical shock is far too great! Class C extinguishers do not have a numerical rating. The C classification means the extinguishing agent is non-conductive.

9.r. Wild Land Fire Management Plan

This section is not applicable to this project.

9.s. Hazardous Energy Control Plan

This section is not applicable to this project.

9.t. Critical Lift Plan

This section is not applicable to this project.

9.u. Contingency Plan for Severe Weather

Daily weather conditions will be a part of the daily briefing. During severe weather, project personnel will seek shelter in an appropriate location (i.e., building or vehicle). The individual is ultimately responsible for his/her personal safety and has the right to take appropriate action when threatened by severe weather.

Safe Locations during Severe Weather and Locations to Avoid

No place is absolutely safe from severe weather; however, some places are safer than others:

- Large enclosed structures (substantially constructed buildings) tend to be much safer than smaller or open structures

- The risk for lightning injury depends on whether the structure incorporates lightning protection, construction materials used, and the size of the structure

- In general, fully enclosed metal vehicles such as cars, trucks, buses, vans, etc. with the windows rolled up provide good shelter from many weather conditions

AVOID being in or near: High places and open fields, isolated trees, rain or picnic shelters, communications towers, flagpoles, light poles, bleachers (metal or wood), metal fences, water (lakes, streams, rivers, etc.).

When inside a building AVOID: Use of the telephone, washing your hands, or any contact with conductive surfaces with exposure to the outside such as metal door or window frames, electrical wiring, telephone wiring, cable TV wiring, plumbing, etc., if lightning is a factor. Generally speaking, identify and seek shelter that is appropriate for the type of severe weather you are encountering. Proper shelter will always include sound structure and remove you from the elements. When available, pay attention to weather warning devices such as National Oceanic and Atmospheric Administration weather radio and/or credible weather detection systems, however, do not let this information override good common sense.

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. Additionally, lightning strikes during electrical storms could also be a potential hazard. The following procedures will be implemented once thunder is heard or lightning spotted:

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

- If lightning is observed, the Site Supervisor or SSHO 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.

- The following action guidelines shall be implemented once the “second” count is □30 seconds:

  — “second” count > 30, the Site Supervisor or SSHO will continually observe the storm front. If the front is moving away, work will continue. If the front is moving

towards the site, the Site Supervisor will initially place workers on alert for potential evacuation.

— "second" count □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.

- 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.

9.v. Float Plan

This section is not applicable to this project.

9.w. Site-Specific Fall Protection & Prevention Plan

This section is not applicable to this project.

9.x. Demolition Plan

This section is not applicable to this project.

9.y. Excavation/Trenching Plan

This section is not applicable to this project.

9.z. Emergency Rescue

This section is not applicable to this project.

9.aa. Underground Construction Fire Prevention and Protection Plan

This section is not applicable to this project.

9.bb. Compressed Air Plan

This section is not applicable to this project.

9.cc. Formwork and Shoring Erection and Removal Plans

This section is not applicable to this project.

9.dd. Precast Concrete Plan

This section is not applicable to this project.

9.ee. Lift Slab Plans

This section is not applicable to this project.

9.ff. Steel Erection Plan

This section is not applicable to this project.

9.gg. Site Safety and Health Plan for Hazardous Toxic Radiological Waste Work

See the site-specific SSHP, Appendix H to this APP.

9.hh. Blasting Safety Plan

This section is not applicable to this project.

9.ii. Diving Plan

This section is not applicable to this project.

9.jj. Confined Space Program

This section is not applicable to this project.

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10. RISK MANAGEMENT PROCESSES

Risk management processes are implemented to insure all project hazards have been identified by the management team and safety professionals, and that procedures are in place to control the exposure to these hazards.

The following are the major types of hazards that are anticipated for tasks at the NAS Key West Site 22, Geiger Key Hawk Missile Site:

- Physical
- Chemical
- Biological

Each task or activity will have a THA developed to define the activity to be performed. The THA will reflect the work sequences, site conditions, anticipated hazards, control methods, equipment requirements, and training to be implemented to eliminate or reduce the hazards.

Operations at the site may require additional tasks not identified or addressed in the SSHP. Before performing any task not covered in this APP or associated SSHP, an THA must be prepared, and approved by the Project SH&E Manager.

The specific THAs identifying the project-specific task hazards and controls are presented in the SSHP, Appendix H to this APP. The following text discusses the major types of hazards.

Chemical Hazards

Chemical hazards include the materials that are found on site during field tasks and those chemicals brought on the site to support the project. Resolution Consultants has effective Hazard Communication, PPE, and Environmental Monitoring Programs to control chemical hazards.

General Rules and Procedures

Occupational Exposure Limits: The Permissible Exposure Limits of OSHA and the TLVs of the ACGIH will be monitored and appropriate controls will be implemented to maintain our personnel exposure below these limits. Occupational exposure limits for the chemicals in use or anticipated at this project are listed in the SDS's for each chemical. To avoid incidental exposure to hazardous chemicals please follow these criteria:

- Develop and practice safe chemical hazard recognition habits
- Avoid unnecessary exposure to chemicals by any route
- Do not smell or taste chemicals
- Wear and inspect gloves before handling chemical containers or contaminated debris

Eating, smoking, etc.:

- Do not eat, drink, smoke, chew gum, or apply cosmetics in areas where chemicals are present

- Wash hands, face, arms and neck before conducting these activities

- Storage, handling, or consumption of food or beverages from refrigerators used for samples holding is prohibited

Personal housekeeping:

- Keep the work area clean and uncluttered
- Properly label and store chemicals and equipment
- Clean up the work area on completion of an operation or at the end of each shift

Personal protection:

- Ensure that appropriate eye protection (ANSI approved Safety Glasses with side shields) is worn by all persons, including visitors, where chemicals are stored or handled

- Wear appropriate gloves when the potential for contact with toxic materials exists, inspecting them before each use, washing them before removal, and replacing them periodically

- Use any other protective and emergency apparel and equipment as appropriate

- Use of contact lenses in areas where chemicals may be encountered is not permitted

- Remove PPE immediately on discovering significant contamination

Biological Hazards

Biological hazards, which may be found on jobsites, include insects, arachnids, such as spiders, ticks, mites, and plants. Several varieties of snakes and other wildlife are also common hazards on jobsites. Employee awareness and the safe work practices outlined in the following paragraphs should reduce the risk associated with these hazards to acceptable levels.

The common biological hazards and controls that may be applicable to this project are indigenous hazards that will be discussed during the site orientation training and daily briefings, and where necessary, PPE and first aid treatment protocols will be established during site operations.

Generally speaking, employee exposure to biological hazards is anticipated to be low, however; specific tasks may increase the likelihood of exposure to biological hazards. In an effort to mitigate any potential hazards to employees, the SSHO will assess the work areas during site activities in an effort to delineate the presence of poisonous plants (poison ivy/oak) or other biological hazards. These areas will be adequately delineated and the location of material fully disclosed to all onsite personnel.

Biological Hazard Injury and Illness Prevention

Contact with bodies of water, animals, insects, and plants can cause injury and illness to personnel. Care must be taken to ensure that these types of injuries are avoided. Some examples of biological hazards include:

1. Natural and artificial bodies of water (e.g., lakes, rivers, ponds, lagoons, etc.), may contain a variety of microorganisms. Microorganisms, in particular, present a significant hazard to personnel who may come into contact with water bodies. Contact with microorganisms in water may result in dermatitis, infection (i.e., in cuts/lacerations), digestive distress, and other diseases.

   Always be aware of areas that may contain excessive amounts of microorganisms. Such areas may include areas of standing water, areas of warm water (i.e., cooling tower effluents, etc.), and areas downstream of municipal wastewater treatment. To prevent exposure to microorganisms in water, always adhere to the following:

- Wear protective gloves (i.e., nitrile, etc.) and other appropriate PPE to prevent skin contact with water

- Never drink from natural or artificial bodies of water; such water is considered non-potable and is not safe for drinking

2. Wild animals, such as snakes, raccoons, squirrels, and rats. These animals not only can bite and scratch, but can carry transmittable diseases (e.g., rabies). Avoid the animals whenever possible. If bitten, go to the nearest medical facility.

3. Insects such as mosquitoes, ticks, bees, and wasps. Mosquitoes can potentially carry and transmit the West Nile Virus. Ticks can transmit Lyme disease or Rocky Mountain Spotted Fever. Bees and wasps can sting by injecting venom, which causes some individuals to experience anaphylactic shock (extreme allergic reaction). Whenever entering areas that provide a habitat for insects (e.g., grass areas, woods), wear light-colored clothing, long pants and shirt, and spray exposed skin areas with a DEET-containing repellent. Keep away from high grass wherever possible. Keep your eyes and ears open for bee and wasp nests. If bitten by insects, see a doctor if there is any question of an allergic reaction.

4. Plants such as poison ivy and poison oak can cause severe rashes on exposed skin. Be careful where you walk, wear long pants, and minimize touching exposed skin with your hands after walking through thickly vegetated areas until after you have thoroughly washed your hands with soap and water. Remember, poisonous vegetation is poisonous year round, not just during the foliage seasons. Examples of common poisonous or irritating plant species, common to the United States, are shown in Figure 10-1.

Poison Ivy • Grows in East, West, Midwest, Texas • Several forms — vine, trailing shrub, or shrub • Three leaflets (can vary 3-9) • Leaves green in summer, red in fall • Yellow or green flowers • White berries	
Poison Oak • Grows in the East (NJ to Texas), Pacific Coast • 6-foot tall shrubs or long vines • Oak-like leaves, clusters of three • Yellow berries	
Poison Sumac • Grows in boggy areas, especially in the Southwest and Northern states • Shrub up to 15 feet tall • Seven to 13 smooth-edged leaflets • Glossy pale yellow or cream-colored berries	

Figure 10-1 Hazardous Plant Identification Guide

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Response Measures for Contact with Hazardous Plants

If you have been exposed to poison ivy, oak, or sumac, act quickly because the toxin in the plants penetrates the skin within minutes. If possible, stay outdoors until you complete the first two steps:

1. Cleanse the exposed skin with generous amounts of a surfactant/emulsifying agent and wipe the area clean (Technu, Ivy-X wipes, etc.)

2. Wash the skin with water

3. Take a regular shower with soap and cool water. Do not use soap until this point because it will pick up the toxin from the surface and move it around.

4. Wash clothes, tools, and anything else that may have been in contact with the toxin, with alcohol and water. Be sure to wear hand protection during that process.

Signs and symptoms of exposure include redness and swelling that appears 12 to 48 hours after exposure. Blistering and itching will follow. If you have had a severe reaction in the past, you should see an occupational physician right away. Otherwise, according to the Federal Drug Administration, there are quite a few effective over-the-counter products to help with symptoms, including Cortaid and Lanacort, baking soda, Aveeno oatmeal bath, and calamine lotion. Additional information on the avoidance and protective measures to be implemented from field biological hazards can be found in SH&E SOP *5-313 Wildlife, Plants and Insects*.

Physical Hazards

Resolution Consultants has published safe work practice procedures that will provide general guidelines that are to implement when executing work in the field. These procedures apply to all activities, and personnel working on field projects and operations.

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials. Additional information on the requirements of housekeeping can be found in SH&E SOP 5-307-*Housekeeping Worksite*.

Manual Lifting

Most materials associated with investigation and remedial activities are moved by hand. The human body is subject to severe damage in the forms of back injury, muscle strains, and hernia if caution is not observed in the handling process. Whenever possible, use mechanical assistance to lift or move materials and at a minimum, use at least two people to lift, or roll/lift with your arms as close to the body as possible. For additional requirements, refer to SH&E SOP 5-308-*Manual Lifting Field.*

Appendix A
Resolution Consultants OSHA 300 Form

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OSHA's Form 300A
Summary of Work-Related Injuries and Illnesses

Year 2014

U.S. Department of Labor
Occupational Safety and Health Administration
Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its e[illegible] They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 190[illegible] OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	1
(G)	(H)	(I)	(J)

Number of Days

Total number of days of job transfer or restriction	Total number of days away from work
0	0
(K)	(L)

Injury and Illness Types

Tot[illegible]mber of... (M)

(1) Injury	0	(4) Poisoning	0
(2) Skin Disorder	0	(5) All other illnesses	1 JK
(3) Respiratory Condition	0		

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave. NW, Washington, DC 20210. Do not send the completed forms to this

Establishment information

Your establishment name EnSafe, Inc. (Corporate)

Street 5724 Summer Trees Drive

City Memphis State TN Zip 38134

Industry description (e.g., Manufacture of motor truck trailers)
Environmental and Safety Consultants

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)
8 7 4 4

Employment information

Annual average number of employees 345

Total hours worked by all employees last year 530,268

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Michael A. Wood, CPA Company executive	CFO Title
(901) 372-7962 Phone	1/27/2015 Date

OSHA's Form 300
Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 2014

U.S. Department of Labor
Occupational Safety and Health Administration

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Form approved OMB no. 1218-0176

Establishment name EnSafe, Inc. (Corporate)

City Memphis State Tennessee

Identify the person				Describe the case		Classify the case										
						Using these categories, check ONLY the most serious result for each case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:				
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	Death	Days away from work	Remained at work		On job transfer or restriction (days)	Away from work (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	All other illnesses
								Job transfer or restriction	Other record-able cases							
						(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)
M-1	Chad Pope	Technician	06/19	Former Parts Inc. 633 East St.	Heat Stress Syndrome				x							
					Page totals	0	0	0	1	0	0	0	0	0	0	0

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

	Injury	Skin Disorder	Respiratory Condition	Poisoning	All other illnesses
	(1)	(2)	(3)	(4)	(5)

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Appendix B
Resolution Consultants Safety and Health Policy Statement

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Safety, Health, and Environmental Policy Statement

PURPOSE

The purpose of this policy is to:

- Establish and maintain a framework for a safe and healthy workplace for all Resolution Consultants and partners' employees and minimize our impact on the environment.
- Outline expectations relative to compliance with governing occupational safety, health and environmental legislation.

COMMITMENT

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. We will actively seek to conserve energy, water and natural resources and to recycle and reduce waste where appropriate during the execution of our business activities. We and our partners will be good corporate citizens by striving to ensure that our facilities and operations do not pose unreasonable safety or environmental risks, and by participating in community-related activities that promote excellence in safety, health and environmental practices. In all of our activities we will develop and implement appropriate systems and procedures designed to comply with applicable laws, legislation, licensing requirements and stakeholder expectations. Resolution Consultants will plan and design its processes, facilities and projects in a manner that reduces risks and impacts during their entire life cycle, consistent with the direction and objectives of our clients.

OBJECTIVES

Our ultimate goals are simple:

- Prevent work-related injuries or illnesses
- Prevent damage to property and/or equipment from our activities
- Prevent adverse impacts to the environment from our ongoing projects or operations

IMPLEMENTATION

To guide the Implementation efforts required by this policy, the Management Committee will collaborate to establish Safety, Health and Environmental (SH&E) programs that reflect the following expectations and beliefs:

- SH&E performance will not be compromised for the sake of other business or client demands.
- All accidents are preventable.
- Compliance with all applicable safety, health and environmental rules and regulations at the local, state, provincial and national level is a minimal expectation; we will not be satisfied to simply meet SH&E compliance standards. Where no specific regulation exists, we will comply with our standards and appropriate industry practices.
- We will meet client requirements.
- Concern for employee health and safety will be evident and embedded into all phases of our work by design and through the business decisions that we make.
- We will report on performance using SH&E metrics designed to help achieve established goals.
- We will communicate to all affected employees their Individual SH&E obligations.
- We will incorporate input from employees, customers and partners to continuously improve our SH&E performance. We will periodically review and continually improve our processes to reflect feedback and experience, and ensure they remain relevant and appropriate to the organization.
- We will recognize those who contribute to their improved SH&E performance.

EMPLOYEE RESPONSIBILITIES

All employees will be responsible for:

- Conducting themselves in accordance with directives, standards and procedures established by the applicable SH&E program.
- Helping ensure their fellow employees and stakeholders have the knowledge, skills, and equipment necessary to protect themselves and others.
- Temporarily suspending their personal work activities and requesting guidance from their supervisor before continuing a task when they identify a condition or practice that creates a serious safety, health or environmental risk.
- Immediately reporting safety, health and/or environmental incidents to their supervisor.

Resolution Consultants Management Committee:

Paul Banks

Steve Scott

Ginny Gray-Davis

Michael Wood

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Appendix C
Resolution Consultants SH&E Standard Operating Procedures

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5-001-Safe Work Standards and Rules

1.0 Purpose and Scope

1.1 Demonstrates Resolution's commitment to the establishment and maintenance of workplaces free from recognized hazards.

1.2 This procedure applies to all Resolution based employees and operations.

2.0 Terms and Definitions

2.1 **Safety Violation:** Not following verbal or written safety policies, rules and procedures (e.g., guidelines, rules, horse play, failure to wear selected PPE, abuse of selected PPE, etc.).

2.2 **Safe Work Practices:** The do's and don'ts about carrying out a task or use of equipment, informing the worker about the hazards present and providing direction on how to safeguard against the hazard. Safe Work Practices are generally guidelines only.

2.3 **Safe Job Procedures:** Written step-by-step set of instructions about completing a specific task safely including control measures and responding to emergency situations.

3.0 References

3.1 Resolution Employee Handbook

4.0 Procedure

4.1 Standard Operating Procedures (SOPs)

4.1.1 Safe Work Practices and Safe Job Procedures are embodied in the SH&E Standard Operating Procedures and are available on Resolution's SH&E website.

4.1.2 Specific Safe Work Practices and Safe Job Procedures have been developed in conjunction with employees and with particular input from those who have significant experience.

4.1.3 Standard Operating Procedures have been developed to provide clear instruction regarding the safety and reporting requirements of staff and operations.

4.2 Inspections and Audits

4.2.1 **Project Managers,** supervisors and **Regional SH&E Managers** shall conduct project audits and office inspections to identify safe work practices and potential safety violations.

4.3 Roles and Responsibilities

4.3.1 All managers and mupervisors are responsible for compliance with all SOP's and governmental requirements, and will be held responsible to prevent or bring any violations to the attention of the appropriate level of Management for corrective actions as per employing JV partner policies.

4.3.2 **Project Managers** (Including field task managers, supervisors) have overall responsibility for implementation of, and compliance with, this procedure.

4.3.3 **Regional SH&E Managers** provide guidance as to safe work standards, rules, requirements and guidelines.

4.3.4 **Human Resource Managers** (from employing JV partner) provide guidance and direction to managers and supervisors implementing the disciplinary process for safety violations (as defined in the Employee Handbook).

4.3.5 **Employees** are responsible for adhering to all Resolution safe work standards, rules, requirements and instructions and to provide input as appropriate.

4.4 Any employee who willfully disregards Resolution or client safety standards, rules or requirements is subject to disciplinary action.

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5.0 Records

None.

6.0 Attachments

5-001 Safety Rules

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5-002-Stop Work Authority for Unsafe Work

1.0 Purpose and Scope

1.1 This procedure establishes the requirements for Resolution personnel to stop work if they believe there is an imminent safety, health, or environmental risk as described below that will affect them, their co-workers, the public, or the environment.

1.2 This procedure applies to all Resolution-based employees and operations.

2.0 Terms and Definitions

2.1 **Discrepancy/Deficiency**: An omission or commission, a condition, or a situation that is in conflict with the procedures and requirements of Resolution's SH&E standards.

2.2 **Imminent Danger**: An impending or threatening situation that, if left uncorrected, is likely to result in serious injury, property damage, or environmental impairment.

2.3 **Potentially Dangerous**: Minor violations that present a low potential for serious injury, property damage, or environmental impairment.

2.4 **Stop Work Order**: A directive to cease Resolution-controlled work issued for failure to follow procedures, imminent danger situations/conditions, accumulation of safety violations, etc. The Stop Work Order will apply to Resolution and its direct subcontractors placed at risk by the situations or conditions.

3.0 References

None.

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Employees** are responsible for stopping all Resolution-directed work and for bringing it to the attention of the appropriate manager, Site Safety Officer, Project Manager, and/or Contractor representative any time an employee identifies a discrepancy, deficiency, or potentially dangerous condition or act that is likely to cause an unsafe or unhealthy situation or an imminent danger situation.

4.1.2 **Employees** may report unsafe working conditions anonymously, but they must provide sufficient detail and promptness to allow Resolution management and the SH&E staff to initiate corrective action.

4.1.3 **The Site Safety Officer** or **Local SH&E Representative** must initiate the development and implementation of corrective actions to eliminate the condition causing the Stop Work Order for Resolution employees and other personnel under Resolution's direct control affected by such condition. Report the details of the Stop Work Order and any corrective actions implemented to the **Project Manager** and the appropriate **Regional SH&E Manager**

4.1.4 **Project managers (field task managers, supervisors)**

- Verify that corrective actions taken appropriately address the conditions leading to the Stop Work Order.
- If Resolution has control over the circumstance that led to the condition, initiate additional corrective actions necessary to correct the conditions leading to the Stop Work Order. Otherwise, remain in communication with the persons or entities that are taking the corrective measures.
- Communicate such corrective actions and the effects of such corrective actions on the project/office to the client and/or Region Management.

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- Ensure that documentation related to the Stop Work Order and corrective actions is placed in the project/office file.

4.1.5 **Regional Business line Managers (regional, district and office managers)**

- Provide support, in accordance with our contractual responsibilities for the project, for the implementation of corrective actions and communications with clients.
- Ensure that no reprimand or reprisal is associated with the initiation of a Stop Work Order.

4.1.6 **Regional SH&E Managers**

- Provide technical guidance for the development and implementation of corrective actions.
- Communicate with the SH&E group and assist with the development of Shared Learning and Safety Alert notices.
- Report all instances when Stop Work Authority has been implemented to the Resolution Consultants SH&E Manager.

4.2 Commitment

4.2.1 It is Resolution's policy and firm commitment that employees are expected to stop their work to prevent unacceptable exposure to workplace hazards, including unsafe conditions or worker behaviors, without fear of reprimand or reprisal.

4.2.2 Cases involving reprisal, reprimand, or any attempt to discourage the initiation of Stop Work Orders or reporting of unsafe or unhealthy conditions or situations within Resolution should be immediately reported to the employee's **Manager, Human Resources Representative**, and **Regional SH&E Manager, Resolution Consultants SH&E Manager**.

4.3 Authority

4.3.1 Resolution's stop work authority applies to all work controlled by Resolution, its employees, and Resolution -controlled subcontractor work activities. All Resolution personnel are authorized to stop work in the event of an identified unsafe condition. If the responsible organization fails to provide resolution, or if at any time their acts or failure to act cause substantial harm or imminent danger to the health and safety of project employees, the public, or the environment, Resolution may issue an order stopping work in whole or in part. In the event that Resolution issues a Stop Work Order, an order issued by Resolution Consultants SH&E Manager (or his designee) authorizing the resumption of work must be in place prior to restarting work.

4.3.2 In most cases, a Stop Work Order affects only those areas immediately involved in the hazardous situation. Resolution may issue a Stop Work Order for a portion of the work area(s) or for an entire work area when unacceptable risks exist that cannot be mitigated by reasonable engineering controls, administrative actions, or personal protective equipment. The Stop Work Order will remain in effect until the responsible organization resolves the problem(s) and brings the work area(s) to satisfactory conformance with established SH&E requirements. Work will not resume until appropriate corrective actions have been completed, ensuring that the condition has been rectified. The Stop Work Order will apply to Resolution and its direct subcontractors placed at risk by the situations or conditions.

4.4 Severity of Hazards

4.4.1 Imminent Danger Situations

- Upon becoming aware of an imminently dangerous situation that Resolution does not control, the employee should immediately inform the persons or entities in control of such imminently dangerous activities and his or her project manager about the situation. If the activities pertain to work that is controlled by Resolution, then the employee may stop the work upon discovering an imminently dangerous situation and then immediately notify his project manager, who may determine the appropriate further action to be taken (including the issuance of a formal Stop Work Order).

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- "Stopping work" for Resolution -controlled work includes stabilizing an imminent danger situation to the extent that it can be left unattended for a prolonged period of time until the issue is resolved.
- The person requesting the work stoppage will notify the organization responsible for the work.
- The responsible organization will notify Resolution project/office management immediately of any stop work action(s) taken to rectify the situation.
- An Resolution's failure to comply with any Stop Work Order in whole or in part may result in disciplinary action. An Resolution subcontractor employee's failure to comply with any Stop Work Order may result in immediate removal from the project and/or office location.

4.4.2 Potentially Dangerous Situations

- Informal stop work interventions to correct minor conditions (e.g., to remind workers to put on their hard hats, safety glasses, etc.) do not require formal notification.
- If the minor condition cannot be corrected, a formal Stop Work Order must be issued and work must not be resumed until the situation has been eliminated.

4.5 Management-issued Stop Work Orders

4.5.1 **Project Managers** and/or **SH&E Managers** may issue a formal Stop Work Order for Resolution-controlled work in the following situations:

- Imminent danger exists involving the public or employee's safety and health or damage to the environment, facilities, or property.
- Continuing work or equipment usage will result in significant repair, rework, or removal.
- A project, or any segment of the project, is executed improperly or is out of compliance with applicable regulations or standards.

4.6 Resuming Work

4.6.1 Work associated with the affected area or operation will not resume unless all corrective actions identified in the applicable Stop Work Order have been completed and closed.

4.6.2 All personnel affected by the Stop Work Order will be instructed on the corrective actions and preventative measures taken.

5.0 Records

5.1 The completed Stop Work Order and any corrective action reports generated will be maintained at the project site for the duration of the project and placed in the closed project file.

6.0 Attachments

5-002 Stop Work Order

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5-003-SH&E Training Sign-In Sheet

Course Name:					
Region:		**District:**			
Business Line:		**Dept #:**			
Office:		**Address:**			
Date:		**Start Time:**		**Stop Time:**	
Certification Level (Check One):	**Awareness** ☐	**Performance** ☐	**Competent Person** ☐		
Lead Instructor:		**Instructor 1:**		**Instructor 2:**	

	Employee Name: (PRINT LEGIBLY)	**Region/Office Company (if not Resolution)**	**Employee ID #:**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
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05-004-Incident Reporting

1.0 Purpose and Scope

1.1 To document and report all SH&E incidents in a timely and accurate manner. Additionally, to gather that appropriate Lessons-Learned from all SH&E incidents and that all information required for regulatory reports is generated and filed as required for compliance.

1.2 This procedure applies to all Resolution Consultants based employees and operations.

2.0 Terms and Definitions

2.1 SH&E Incidents: The following events or situations as applied to Resolution Consultants employees and/or Resolution Consultants-controlled operations are considered SH&E Incidents:

2.1.1 Any injury or illness(including pain and soreness) to an Resolution Consultants employee, that could be potentially work related or become aggravated by the work environment. This includes Resolution Consultants subcontractor, temporary employee or third party contractor, performing work under the control of an Resolution Consultants operation.

2.1.2 Fire, explosion, or flash that is not an intended result of a remediation process, laboratory procedure, or other planned event.

2.1.3 Any accidents involving company-owned, rented, or leased vehicles (including personal vehicles used for company business).

2.1.4 Any breach of a numeric limit attached to a governmental permit or consent.

2.1.5 Any failure to perform the requirements of a non-numeric requirement contained in a government permit or consent.

2.1.6 Any failure to obtain a government permit or consent when required (including failure to obtain revisions before an existing permit or consent expires).

2.1.7 Any notice of violation or notice of non-compliance received from a regulatory authority with enforcement powers.

2.1.8 Property damage resulting from any Resolution Consultants or subcontractor activity.

2.1.9 Unexpected release or imminent release of a hazardous material.

2.1.10 Unexpected chemical exposures to workers or the public.

2.1.11 A safety, health or environmental related complaint from the public regarding Resolution Consultants activities.

2.1.12 SH&E-related incidents that could result in adverse public media interest concerning Resolution Consultants or an Resolution Consultants project.

2.1.13 Any inspection by a federal, provincial, or local safety, health, & environmental enforcement agency.

2.1.14 Any boating incident that includes the following:

2.1.15 Fatality.

2.1.16 A person disappeared from the vessel under circumstances that indicated death or injury.

2.1.17 A person was injured and required medical treatment beyond first aid.

2.1.18 Damage to vessels and other property totaled $2000 or more.

2.1.19 The boat was destroyed (physically destroyed or sinks).

2.2 Near-Miss Incidents: This is defined as an incident having the potential to cause injury, health effects, environmental impairment, or property damage as described in the above categories – but did not. For example:

2.2.1 A crane drops a 454 kilogram (1,000 pound) beam during a lift – and nobody is hurt, no equipment is damaged.

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2.2.2 A work crew is conducting a survey along the highway. A vehicle leaves the roadway and the vehicle enters the survey area at 80 kph (50 mph). The vehicle misses an employee by 1 meter (3 feet), the driver recovers control of the vehicle and leaves the area.

2.2.3 Awareness of an equipment recall or incident that occurs at another similar worksite.

2.2.4 Unsafe condition that could have caused an incident if not corrected.

2.2.5 Awareness of an equipment recall or incident that occurs at another similar worksite.

2.2.6 Unsafe condition that could have caused an incident if not corrected.

2.3 Significant Learning Experience: Defined as a near-miss incident that the affected group (i.e. project team, office staff, etc.) believes could have wide-ranging impacts throughout Resolution Consultants.

2.4 Serious SH&E Incident: Any SH&E Incident that meets/involves the following criteria:

2.4.1 Any amputation.

2.4.2 Hospitalization for treatment (admission).

2.4.3 Absence from work for more than 30 calendar days due to work-related injury/illness.

2.4.4 Any single event resulting in more than one employee requiring medical treatment.

2.4.5 Any SH&E-related Consent Agreement/Order/Lawsuit or enforcement action seeking more than $10,000 or alleging criminal activity.

2.4.6 Any spill or release of a hazardous material that is reportable to a government agency.

2.4.7 Any Notices of Violation.

2.4.8 Near miss incidents that, in the opinion of the SH&E Manager, Project Manager, or Contract Task Order Manager, may have otherwise resulted in any of the above.

2.5 **Fatality:** Loss of life of any Resolution Consultants employee, Resolution Consultants subcontractor personnel, client personnel or member of the general public that can be perceived to be related to work performed or controlled by Resolution Consultants.

2.6 **General Liability:** Incidents where Resolution Consultants could potentially be held liable.

2.7 **Resolution Consultants Recordable Injury: See *05-601 Recordkeeping* for definitions.**

2.8 **H&W:** Health and Welfare Human Resource office which manages all injury and illness claims.

2.9 **HR:** Human Resource office which manages all injury and illness claims.

2.10 **Lost Time Days:** The total number of days the injured person accumulates before returning back to regular duties.

2.11 **Lost Time Injury or Disease:** A work-related injury or disease that has caused a worker to be absent from his or her regular work following the day that the injury or awareness of the disease occurred.

2.12 **Restricted Work (also called "Modified Work"):** Where an injury is medically treated, but the person is not able to return to regular duties. The restricted duties are done within the limitation of the injured person's abilities. (documentation may be required per regulatory requirements).

2.13 **Restricted Work Days:** The total number of restricted work days the injured person accumulates before being able to return to regular duties.

2.14 **Supervisor's Report of Incident (SRI):** Form used to document incidents which shall be completed within 24 hours.

2.15 **Support Services:** Resolution Consultants entities of Legal, Human Resources, Communications, SH&E Department, etc.

2.16 **WCB:** Workers Compensation Board

2.17 **WC Carrier:** Workers Compensation Insurance Carrier (US).

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3.0 References

3.1 05-606 Modified Duty Program

3.2 05-603 Incident Investigation and Review

3.3 05-601 Recordkeeping

4.0 Procedure

4.1 All incidents, regardless of type or severity, shall be reported to the on-site supervisor immediately.

4.2 All incidents, regardless of type or severity, shall be reported to the employer company safety representative by the supervisor as soon as possible but no later than the end of the current work shift.

4.3 Completed Supervisor's Report of Incident shall be submitted the supervisor, Regional SH&E Manager and the Resolution Consultants SH&E Manager within 24 hours.

4.4 Fatalities and serious SH&E incidents shall be reported to the Regional SH&E Manager and Resolution Consultants SH&E Manager as soon as reasonably possible but no more than 2 hours after the incident.

4.5 Where there is potential for criminal, civil or regulatory action against Resolution Consultants or any of its employees or subcontractors, Resolution Consultants' Contracts Task Order Manager shall be contacted prior to any external communication, correspondence, or meeting concerning any incident, governmental investigation, or environment impact. Resolution Consultants' Contracts Task Order Manager, or the Program Manager, may supplement this Policy or require additional measures to protect the best interests of Resolution Consultants and its employees.

4.6 **Roles and Responsibilities**

4.6.1 Employees. Each employee involved in an SH&E incident will:

4.6.1.1 Notify his/her supervisor immediately that an incident (including a near-miss) has occurred, the circumstances involved, the nature and extent of the injuries/illness, and whether medical treatment may be required. Except for emergency situations, affected employees are required to discuss their injury/illness status with their supervisor and Regional SH&E Manager or project SH&E Professional prior to obtaining medical treatment.

4.6.1.2 Assist supervisor in completing appropriate reporting and investigation forms. If issues are raised regarding the content prepared in the SRI, contact the Regional SH&E Manager for guidance.

4.6.2 Supervisors. In an emergency/life-threatening situation, supervisors will:

4.6.2.1 Use the appropriate local emergency phone numbers and seek immediate medical care for the employee.

4.6.2.2 Address any immediate corrective actions needed. Consult with the Regional SH&E Manager if guidance is required.

4.6.2.3 Call the Regional SH&E Manager and Resolution Consultants SH&E Manager as soon as the situation is stabilized, but not later than the end of the current work shift.

4.6.2.4 Complete the applicable forms and email to the supervisor and the Regional SH&E Manager within 24 hours of the incident.

4.6.2.5 Supervisor's Report of Incident or Near Miss/Observation Report (completed with assistance and acknowledgment from affected employees).

4.6.2.6 Federal/State/Province Specific Forms, if required (contact applicable Support Services for guidance).

4.6.2.7 Notify the appropriate line or lead manager (i.e. manager responsible for personnel involved/project oversight/business line, etc.).

4.6.2.8 As appropriate, initiate an Incident Investigation and Review per the requirements of 5-603 Incident Investigation and Review.

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4.6.2.9 Completion of any external reporting requirements. For example, the U.S. Coast Guard CG-3865, Recreational Boating Accident Report may be required if the incident involved a boat (contact the SH&E Manager for clarification). See 5-004 Form 4 Incident Response and Reporting for further instruction.

4.6.2.10 Report all fatalities and/or serious SH&E incidents to the Resolution Consultants SH&E Manager and Program Manager as soon as reasonably possible but no more than 2 hours after the incident.

4.6.3 Resolution Consultants SH&E Manager or Designee:

4.6.3.1 Coordinate with the appropriate SH&E Incident Reporting Support Staff

4.6.3.2 Upon receipt of an Incident Notification, contact the supervisor to discuss the incident as well as short term and long term corrective actions.

4.6.3.3 Engage Resolution Consultants Medical Provider for non urgent medical guidance, if needed.

4.6.3.4 Notify appropriate Manager of the incident

4.6.3.5 As appropriate, initiate or assist an Incident Investigation and Review.

4.6.3.6 Report all fatalities and/or serious SH&E incidents to the Contracts Task Order Manager and Program Manager as soon as reasonably possible but no more than 2 hours after the incident.

4.6.4 Incident Reporting Support Staff:

4.6.4.1 Inform appropriate personnel that have not already been notified of incidents.

4.6.4.2 Audit data of incident reporting system.

4.6.4.3 Coordinate with Regional SH&E Manager or designee for management of medical support.

4.6.4.4 Forward incident data to support agencies for insurance claims.

5.0 Records

5.1 Incident reports and supporting documentation are maintained in a secure file by the incident reporting support staff.

5.2 The completed Supervisor Report of Incident and supporting documents must be retained by the appropriate Resolution Consultants parent company. Records relating to occupational injury and accidents must be kept for up to 30 years, plus the length of employment.

6.0 Attachments

6.1 05-004-Form 1 Supervisor’s Report of Incident

6.2 05-004-Form 2 Near-Miss Observation Report

6.3 05-004-Form 3 Supervisor’s Incident Reporting Flowchart

6.4 05-004-Form 4 Incident Response and Reporting Instructions

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5-202-Competent Person Designation

1.0 Purpose and Scope

1.1 Outlines the process and minimum requirements necessary for classifying an Resolution employee as a "Competent Person" in one or more activity areas.

1.2 This procedure applies to all Resolution based employees and operations where Resolution is self-performing the identified activities and where Resolution controls projects performing the activities requiring a Competent Person. Client-mandated requirements may apply on a project-specific basis and shall be addressed in supplemental documents (e.g., Task Hazard Analysis or Health and Safety Plan).

1.3 It is recognized that regulations and legislation may contain alternate definitions for Competent Person and it will be the responsibility of the **Project Manager** to determine if conflicts exist between Resolution and applicable regulatory/legislative definitions and resolve the conflict.

1.4 When a qualified employee within Resolution is not available to be designated as the Resolution Competent Person, the **Project Manager** in coordination with their **Regional SH&E Manager** may designate an appropriately qualified and trained Contractor employee as the Competent Person for the project.

2.0 Terms and Definitions

2.1 **Competent Person:** One who is capable of identifying existing and predictable hazards in surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization and resources to take prompt corrective measures to eliminate them.

2.2 **HASP:** Project Health and Safety Plan.

3.0 References

None.

4.0 Procedure

4.1 The following activities require an individual to be designated as a competent person:

4.1.1 Asbestos

4.1.2 Blasting & Explosives

4.1.3 Concrete & Masonry Construction

4.1.4 Confined Spaces

4.1.5 Control of Hazardous Energy (Lockout-Tagout)

4.1.6 Cranes & Derricks

4.1.7 Demolition

4.1.8 Electrical Wiring Design & Protections

4.1.9 Fall Protection

4.1.10 Hearing Protection

4.1.11 Heavy Equipment

4.1.12 Ionizing Radiation

4.1.13 Lead

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4.1.14 Material Hoists & Personnel Hoists

4.1.15 Stairways & Ladders

4.1.16 Respiratory Protection

4.1.17 Rigging Equipment

4.1.18 Scaffolds

4.1.19 Steel Erection

4.1.20 Trench & Excavations

4.1.21 Underground Construction

4.1.22 Welding & Cutting

4.2 The Resolution competent person field functions are dependent on the project activities and Resolution's field function. Refer to each SH&E Standard Operating Procedure (SOP) for the activities listed above and the associated legislative (e.g., OSHA) standard to determine the details of responsibility. Generally, it is the Competent Person's responsibility to be onsite at all times when Resolution staff are performing work governed by this SOP, make daily inspections of the conditions and work activities, and take actions to control any hazards associated with those activities.

4.3 The *5-202-Competent Person Designation* shall be used on all projects for documenting Competent Person designations. It must be filled out completely and updated as necessary by the contractor.

4.4 **Roles and Responsibilities**

4.4.1 A Competent Person in Resolution is an employee who functions in a technical role when either Resolution self-performs associated field work (above) or oversees and directs the work of subcontractors. For operations where Resolution is providing oversight of subcontractors (ex. drilling services), it is the subcontractors employee who is the Competent Person on-site for that phase of operation.

4.4.1.1 Any Resolution employee considered for designation as a "Competent Person" shall:

- Complete a Training Needs Assessment (TNA) with their Supervisor under the guidance of the **Regional SH&E Manager**, regarding competent person's requirements;
- Obtain approval from their supervisor prior to enrolling in any Resolution-sponsored safety competent person training program.
- Track his or her own training anniversary dates and arrange for appropriate refresher training at least 30 days prior to expiration of certification

4.4.1.2 Contractor Competent Persons

- Unless Resolution is self-performing, the Contractor is responsible for determining the safe means and methods of its work activities.
- The Contractor is responsible for designating its Competent Person(s) for each category of work it undertakes as required above.
- The Contractor's Competent Person is responsible for technically supporting the Contractor's site operations for the safe execution of its activities.
- The Contractor's Competent Person should be knowledgeable about the work activities, compliance with the associated safety and health regulations, identifying and removing any attendant field hazards and the Contractor's work practices and procedures.
- For work on Resolution controlled sites, the **Project Manager** confirms that the Contractor designates a Competent Person(s) for its activities. *5-202-Competent Person Designation* or the equivalent may be use for this purpose.

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4.4.2 **Project Manager**/Field Task Manager/Supervisor are responsible for ensuring that all assigned personnel, including personnel utilized from other offices to support their operations, comply with the requirements of this procedure. The **Project Manager** shall:

- Designate the Competent Person based on the work activity using *5-202- Competent Person Designation***;**
- Implement corrective actions when employees fail to meet training requirements;
- Identify supplemental employee training needs based on local/client requirements;
- Verify competent person training requirements are reviewed with each employee, based upon current and anticipated job functions and past performance on a routine basis;
- Identify additional employees requiring competent person training based on this procedure;
- For projects controlled by Resolution, when these activities are contracted to another party, secure the identity of the Contractor's Competent Person(s), provide them with a copy of this SOP to verify the Contractor's capability to comply with the requirements within, and obtain documentation to support the designation of the Contractor employee as a Competent Person for Resolution;
- Verify the designation of the Competent Person for a specific activity is effectively communicated to field personnel on site during daily tailgate safety meetings.

4.4.3 The **Regional SH&E Manager** or designee will work with operations to assess the competency of all designated persons based on specific requirements outlined in this procedure. With the **Project Manager** or designee determining the work-specific Competent Person, the **Regional SH&E Manager** provides guidance as needed. The SH&E Department (i.e., **Regional SH&E Manager**) with operations is responsible for:

- Establishing competent person training/experience requirements and communicating these requirements to line management.
- Monitoring the overall implementation of this SOP.
- Monitoring field compliance of this procedure.
- Providing technical assistance/support as requested by **Regional and District Managers**.
- Performing internal safety training classes as requested by **Regional and District Managers**.
- Supporting the **Project Manager** in establishing minimum competent person requirements for regulated job activities based on individual job descriptions, applicable regulatory requirements, operational considerations, and management directives.
- Reviewing and approving as requested by designated operations representatives the Competent Person's qualifications for Resolution employees.
- Develop and maintain a process to track employee training compliance and anniversary dates.

5.0 Records

5.1 Resolution Competent Person Designation forms shall be maintained in the project file.

5.2 Documentation as to daily inspections and corrective measures by the Resolution Competent Person shall be maintained in the project file.

6.0 Attachments

6.1 5-202-Competent Person Designation Form

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5-208-Personal Protective Equipment Program

1.0 Purpose and Scope

1.1 Provide an effective Personal Protective Equipment (PPE) Program to protect Resolution employees from potential workplace safety and health hazards.

1.2 This procedure applies to all Resolution employees and operations.

1.3 The proper use of appropriate PPE, in combination with effective engineering and administrative controls, can provide Resolution employees with protection against potential workplace hazards and can reduce the potential for workplace injury and illness.

2.0 Terms and Definitions

2.1 **PPE**: Personal Protective Equipment

2.2 **ANSI:** American National Standards Institute

3.0 References

3.1 Occupational Safety and Health Administration (OSHA) PPE standard (29 CFR 1910.132) requires Resolution to assess workplace(s) to determine if hazards that necessitate the use of PPE exist in the workplace, and, if such hazards are present, to

3.1.1 Select the appropriate types of PPE and

3.1.2 Provide employees with training about the use and care of the selected PPE.

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Regional SH&E Professional**

- Provide guidance to Project Managers, Field Task Managers, Supervisors, and field staff on the assessment of hazards and the selection of PPE.
- Provide training materials to Project Managers, Field Task Managers and Supervisors for employee training.

4.1.2 **Project Managers (Field Task Managers, Supervisors)**

- Conduct Hazard Assessments to identify hazards present and to specify PPE appropriate for those hazards.
- Determine which of your staff members will require employee-issued PPE.
- Approve the purchase of company-issued PPE.
- Verify that appropriate PPE is utilized by your employees when required or necessary.

4.1.3 **Employee**

- In accordance with your training and instructions, utilize appropriate PPE that has been issued to them when required or necessary.
- Inspect your PPE prior to use to confirm that it is functional, and maintain your PPE in a clean and functional condition.
- Follow instructions and manufacturers' guidance on the care, use, and storage of your PPE.
- Prior to using any type of PPE, confirm that it is in good shape, free of dirt and debris, and that you are familiar with its correct use. Always make sure PPE fits adequately to perform the use intended.
- Refrain from wearing PPE outside of the work area for which it is required if doing so would constitute a hazard.

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4.2 Hazard Assessment for Office Locations

Office Hazard Analysis will be completed for applicable tasks as required in 29 CFR 1910.132 following the guidelines as specified in OSHA Pamphlet 3151-12R 2003 (Personal Protective Equipment),

4.3 Hazard Assessment for Off-Site Locations

4.3.1 HAZWOPER Locations

- Each Health and Safety Plan (HASP) that is prepared for waste site investigations/remediation includes a hazard assessment for each proposed field activity. Task-specific PPE requirements are listed in the HASP. Therefore, the HASP will serve as the certificate of hazard assessment for each project that involves off-site work activities that require the use of PPE.

4.3.2 All Other Off-Site Locations

- The Task Hazard Analysis will serve as the certificate of hazard assessment for projects that involves offsite work activities that require the use of PPE. The checklist will be reviewed with the entire field team prior to arriving at the site.

4.4 Training

4.4.1 Staff will receive adequate instruction on the correct use, limitations, and assigned maintenance duties for the equipment to be used. The following information, at a minimum, will be covered during PPE training:

- What PPE is required.
- When it is required.
- Why it is required.
- How to properly don, doff, adjust, and wear the PPE described.
- The limitations of the PPE, including its expected useful life.
- How to properly care for, maintain, and dispose of the PPE.

4.4.2 Field staff are responsible for confirming that they have reviewed the operation manual for the PPE before work commences.

4.4.3 All staff will receive an orientation to the hazards on the job site as well as initial Field Safety orientation that outlines appropriate PPE requirements.

4.4.4 Resolution Consultants employees who have participated in the 40-hour HAZWOPER training course are considered to have met the employee training requirements of the PPE standard. The training certificates that are issued as documentation of successful completion of the 40-hour HAZWOPER course will also serve as documentation of training as required by the PPE standard. Employees who have not participated in the HAZWOPER training will be provided PPE training specific to your assignment and/or location. The PPE Facts Sheets (attached) can serve as the basis for training.

4.5 Determining the Need for PPE

4.5.1 Using the Task Hazard Assessment or HASP, the need for the following types of PPE will be evaluated.

4.5.2 PPE will:

- Be selected and used in accordance with recognized standards and provide effective protection.
- Not in itself create a hazard to the wearer.
- Be compatible, so that one item of PPE does not make another item ineffective.
- Be maintained in good working order and in a sanitary condition.

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4.5.3 Prior to entering any regulated work area, confirm that you have access to or are equipped with the following CSA-approved PPE, appropriate to the site hazards:

- Head Protection
- Eye & Face Protection
- Foot Protection
- Hi-Visibility Vests
- Hearing Protection

4.5.4 After the hazard assessments have been completed, the Project Manager will select the appropriate PPE for each job category or task, as necessary. The selected equipment will be indicated on the hazard assessment. PPE will be provided to each employee appropriate for the hazards present. All PPE selected and purchased by Resolution will meet or exceed the American National Standards Institute (ANSI) standards, Canadian Standards Association (CSA) standards, or other standards as dictated by provincial, territorial, or state legislation.

4.6 Eye and Face Protection

4.6.1 The OSHA standard requires that Resolution employees use appropriate eye and face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acid and caustic liquids, chemical gases or vapors, and injurious light radiation. The standard further requires that eye protection provide side protection when there is a hazard from flying objects.

4.7 Head Protection

4.7.1 Protective helmets (hard hats) are required when employees are working in areas where there is a potential for falling objects to cause injury to the head. When working near exposed electrical conductors that could contact the head, helmets designed to reduce electrical shock will be worn.

4.8 Foot Protection

4.8.1 Protective footwear is required when employees are working in areas where there is a danger of foot injuries from falling and rolling objects or from objects piercing the sole and where an employee's feet are exposed to electrical hazards.

4.9 Hand Protection

4.9.1 Appropriate hand protection is required when employee's hands are exposed to hazards such as those from skin absorption of harmful substances, severe cuts and lacerations, severe abrasions, punctures, chemical burns, thermal burns, or harmful temperature extremes.

4.9.2 Chemically Resistant Clothing

4.9.3 Chemically resistant clothing is required when there is significant potential for the employee to come in direct contact with the chemicals he/she is handling. Tasks that involve chemical handling will be evaluated for the potential of splashing or spilling.

4.9.4 High-Visibility Apparel

4.9.5 High-visibility apparel with reflective banding (ANSI Class II and III garment) is required for all field activities in close proximity to moving traffic and other modes of transportation (transit, airlines, marine, etc.), in proximity to heavy equipment operations, or whenever otherwise specified in a project HASP. Color of apparel (orange or lime) may be client/project-specific.

4.10 Personal Clothing

4.10.1 For personal safety on the job site, do not wear

- Loose or unsecured clothing or loose fitting cuffs.
- Greasy or oily clothing, gloves, or boots.
- Torn or ragged clothing.

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4.10.2 Neck chains are hazardous and will be worn under clothing so that they do not hang out. Long hair will be tied back or otherwise confined.

4.10.3 Clothing made of synthetic fibres can be readily ignited and melted by electric flash or extreme heat sources. Cotton or wool fabrics are recommended for general use.

4.11 Specialized PPE

4.11.1 In addition to basic PPE, additional specialized PPE may be required to provide appropriate protection to the employee. Refer to applicable OH&S legislation and related Standard Operating Procedures for additional information on PPE requirements.

- Fall Protection: Only full body harnesses with shock-absorbing lanyards will be used for personal fall arrest.
- Respiratory Protection: Respiratory protection shall be selected based on the contaminant and concentration to which the employee will be exposed. Refer to*5-519 Repiratory Protection Program* and the task- or project-specific Baseline Hazard Assessments for specific requirements.
- Fire Resistant Clothing: Approved fire resistant outer clothing may be required at work locations with flammable or explosive materials or environments.
- Other Head Protection: Operators and passengers (if permitted) of all terrain vehicles and snowmobiles will wear approved helmets.
- Chemical Protective Clothing: Approved chemical protection appropriate to the hazard will be worn. Review applicable Material Safety Data Sheets (MSDSs) for appropriate PPE.
- Protection from Drowning: Employees being transported by boat are required to wear life jackets. Employees exposed to any other drowning hazards are required to wear personal flotation devices. Life jackets and personal flotation devices will have the proper regulatory approval.

4.12 PPE Supplies

4.12.1 Each Resolution office will maintain a supply of safety equipment including safety glasses, gloves, and chemically resistant clothing based on the nature of their field activities. The Office Manager or designee will be responsible for maintaining this inventory. PPE that is required for large field efforts will be ordered by the Project Manager or their designee.

4.12.2 At a minimum, the office will review its PPE program annually.

4.13 Obtaining Personalized Safety Gear

4.13.1 The OSHA standard in 29 CFR 1910 - Subpart I / 29 CFR 1926 requires that protective equipment, including PPE for eyes, face, head, and extremities, protective clothing, and respiratory devices, be provided to employees wherever necessary by reason of hazards.

4.13.2 Employees are not expected to provide their own general PPE. Although each Resolution office stocks and issues various general issue safety gear such as hard hats, plan safety glasses, disposable gloves and coveralls, fall protection, and hearing protection, certain personalized safety gear such as prescription safety glasses, safety-toed (capped) boots, and cotton coveralls will be ordered and sized specifically for the user.

4.13.3 Most PPE will be provided to the employee at no charge, with the exception of the above personalized safety equipment (safety glasses, safety toed boots, washable coveralls). A partial cost reimbursement to the employee may be made based on legacy company practice or project stipulations.

4.13.4 Prescription Safety Glasses

- As with all hazards, staff will be notified of their potential for injury and will be provided with the appropriate PPE. If wearing contact lenses poses a hazard to the worker's eyes during work, the worker will be advised of the hazards and the alternatives to wearing contact lenses.
- Eligibility

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- Employees will wear safety glasses during activities that involve exposure to eye hazards such as flying particles, chemical splash, or certain types of radiation such as ultraviolet light from welding operations. Typically, the following types of field activities will require the use of safety glasses:
  - Site investigation or remediation and construction activities.
  - Stack monitoring and other types of air emissions monitoring.
  - Audits and assessments in industrial or manufacturing facilities.
  - Activities conducted within laboratories.
  - Activities at client facilities where safety glasses are required.
- Eligibility to obtain prescription safety glasses will be determined by the employee's supervisor based upon the guidance above.

- Procurement of Prescription Safety Glasses
  - Except for eye examinations, associated prescription eyewear costs will be paid by Resolution. The employee may be asked to pay an optician's dispensing fee, which may be submitted on an expense report for reimbursement. Because eye examinations are not covered, employees who have had recent eye examinations should contact the eye care professional in advance to determine their procedure for handling a current prescription.
  - Employees who are eligible will be allowed to order one pair of prescription safety glasses every other year from the selection of glasses offered by the program.
  - Contact the Regional SH&E Professional for guidance on the procurement of prescription safety glasses.

4.13.5 Safety Toed Boots/Shoes

- Eligibility
  - Employees will wear safety boots/shoes during activities that pose the potential for foot injury from dropped objects or penetrations through the sole. Typically, safety toed boots/shoes will be required for the same type of activities, with the exception of laboratory activities, for which safety glasses are required. In addition, work around all types of heavy equipment will typically require the use of safety shoes.
  - Eligibility to obtain safety shoes will be determined by the employee's supervisor based upon the guidance above.
- Procurement of Safety Shoes
  - Eligible employees will be allowed to purchase one pair of safety shoes every other year.
  - Employees who have been authorized to purchase safety shoes by their supervisor should consult the Regional SH&E Manager for obtaining for detailed instructions on how and where to purchase the equipment. The style chosen (i.e., boot or shoe) should be determined based upon the application. For example, low cut shoes may be appropriate for audits and assessments in light industry applications, while safety boots will be more appropriate for environmental remediation, construction, and heavy industry work with significant foot hazards. Before purchasing, the employee is required to verify that the safety boots or shoes meet the specifications above.
  - After the purchase, an employee expense report, including a dated receipt for the shoes, should be submitted for approval and reimbursement. Resolution will reimburse the employee up to a amount that is specified by the SH&E Department or Regional Operations management.

4.13.6 Reusable Coveralls

- Eligibility

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- Reusable cotton (or some other washable fabric) coveralls may be made available to employees who regularly perform field work based on conditions. Coveralls can be worn over personal clothing to help protect and keep them clean.
- Eligibility to obtain washable coveralls will be determined by the employee's supervisor based upon the guidance above.

5.0 Records

None.

6.0 Attachments

None.

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05-209-Project Hazard Assessment and Planning

1.0 Purpose and Scope

1.1 Resolution Consultants and its employees must assess all projects and sites for anticipated hazards and plan to mitigate those hazards through a series of controls. This procedure establishes the requirements and provides the tools for this process of pre-work planning and risk assessment.

1.2 The objective is to enhance SH&E performance, to reduce losses due to injury, illness, property damage, or environmental impairment incident, and maintain regulatory compliance.

1.3 This procedure applies to all Resolution Consultants employees and operations.

2.0 Terms and Definitions

2.1 **Task Hazard Analysis (THA):** A THA *(05-209-Form 1 Task Hazard Analysis)* is a technique for evaluating the component parts of any work method or procedure for the purpose of:

- Identifying the SH&E hazards and risks connected with the work;
- Identifying and implementing control methods to eliminate, nullify, or reduce to a minimum the consequences of such hazards and risks; and,
- Evaluating the effectiveness of risk control measures and making modifications as needed.

2.2 **Plan:** A comprehensive document which outlines at length, in a report-style format, all of the operational controls necessary to mitigate the anticipated hazards for a project's sites and activities. Resolution Consultants will use two established planning templates:

- **Health and Safety Plan (HASP**) for work involving environmental contaminants (e.g., HAZWOPER), or
- **Safe Work Plan (SWP)** for all other SH&E planning documentation.

2.3 **High Risk Classification:** Any task where the identified hazard, if further controls are not implemented, has a combined severity and probability that is either catastrophic or very likely, or some combination thereof (but where the result is not minor or rare). (Refer to 0*5-209-Form 2 Hazard Identification, Classification and Controls* for further details.) The following may be classified as High Risk; consult the SH&E Department for clarification:

- Confined space,
- HAZWOPER,
- Contaminated sites,
- Radiation,
- Lead,
- Asbestos,
- Resolution Consultants camp or construction sites,
- Competent person requirements,
- Sites with potential for client system failures,
- Significant physical hazards (e.g., fall, water, equipment, etc.),
- Munitions and Explosives of Concern / Unexploded Ordnance (MEC-UXO) Ops
- Potential for significant environmental incident, or
- Sites with medical surveillance requirements.

3.0 References

None.

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4.0 Procedure

4.1 All projects must have a completed Task Hazard Analysis at a minimum. In addition, all field projects must have an Emergency Response Plan. These two documents may be all a project needs for administrative safety requirements, depending on the hazards identified.

4.2 The table below helps illustrate the further planning documentation which may be required, depending on the hazards identified in the THA.

Task Hazard Analysis	• Most basic requirement • All sites and tasks including walk-through site visits	• Prepared by employees/supervisors • Confirmed by **Project Manager** or designee
Safe Work Plan (SWP)	• High risk activities • Complex projects with multiple stakeholders, long-duration • Non-HAZWOPER	• SH&E Department review and guidance required
Health & Safety Plan (HASP)	• HAZWOPER regulated sites and all other sites with potential chemical exposures • Client directed	• Only for sites with potential chemical exposures and Hazardous Waste Operations and Emergency Response (HAZWOPER) • SH&E Department review and guidance required

4.3 Task Hazard Analysis (THA)

4.3.1 A THA must be completed for all (routine and non-routine) tasks and sites.

4.3.2 A THA must be completed prior to the commencement of work so that all controls can be planned, equipment purchased/inspected, and staff adequately trained for the hazards.

4.3.3 The THA must identify all known and potential physical hazards as well as potential occupational exposures for noise, biological, or chemical contaminants, and environmental issues.

4.3.4 The assessment must include the identification and implementation of control measures to prevent worker injury, exposure and contamination.

4.3.5 Hazard identification and risk assessment must be ongoing. This requires the project team to consider the timing and frequency of the THA reviews, as affected by the following types of issues:

- The need to determine whether existing risk controls are effective and adequate,
- The need to respond to new hazards,
- The need to respond to changes that Resolution Consultants itself has made,
- The need to respond to feedback from monitoring activities, incident investigation, emergency situations or the results of testing of emergency procedures,
- Changes in legislation,
- External factors, e.g. emerging occupational health issues,
- Advances in control technologies,
- Changing diversity in the workforce, including contractors, or
- Changes proposed by corrective and preventive action.

4.3.6 THAs will be prepared by the supervisor and employee(s) directly responsible for the work.

4.3.7 Final drafts shall be submitted for review and approved by the **Project Manager** prior to commencing work activities.

4.3.8 Resolution Consultants subcontractors will prepare their own THA and submit them to the **Project Manager** for review and acceptance prior to the start of subcontracted work activities. These reviews are not approvals, and do not relieve the subcontractor for being responsible for their own safety on the project site.

4.3.9 The **Project Manager** shall maintain all approved/signed THA copies (including revisions) in the project files and make them available during project audits and for use during the training of new project personnel.

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4.3.10 THAs shall be used to facilitate project SH&E tailgate meetings. Comments and suggestions relative to the completed THA shall be encouraged from attendees and incorporated into revised documents. Any modifications must be reviewed as corrective measures to confirm that no new hazards are created.

4.3.11 THAs that have been found to be inadequate or incomplete should be suitably annotated by the project management team to be used as lessons learned.

4.3.12 The THA will be reviewed by all personnel involved in the task, as well as any visitors or additional or new crews brought on to perform the work. This is a minimum of a one-time review and signature with supplement reviews conducted on a pre-determined basis by the **Project Manager** or their designee.

4.4 Planning Documents

4.4.1 An SH&E plan (in addition to the THA) may be required in the following circumstances:

- Tasks with high risk classification designations,
- Tasks with medium risk classification designations, where circumstances warrant, and/or
- Complex projects where it is necessary to communicate to numerous stakeholders and clearly define all controls including emergency response, incident reporting, inspections, security requirements, or other details.

4.4.2 The planning document shall be titled a **Safe Work Plan** UNLESS it involves Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements, then it will be called a **Health and Safety Plan (HASP)** and will clearly address the specific requirements associated with the hazardous waste exposures.

4.4.3 Specific plan needs will vary for each project. In some cases it may be acceptable to utilize general (non-site/non-project-specific) SH&E procedural documentation prepared for the type of work activities being performed, while in others project/site/activity-specific documentation is required to be developed as part of the project planning process. The specific operational needs of individual projects will be determined as part of the initial coordination between the **Project Manager** and the SH&E Department.

4.4.4 The following requirements apply to all Resolution Consultants SH&E planning documentation:

- Preparation of the SH&E documentation can be performed by a member of the project team or the SH&E Department.
- All SH&E documentation (including draft versions of documents) will be approved by the SH&E Department prior to release for outside agency review (e.g., clients, regulatory agencies, etc) and prior to its field implementation.
- All changes to approved SH&E documentation require concurrence from a designated member of the SH&E Department. This includes those made in response to changing field conditions or operational requirements and those made in response to regulator/client comments. Any written responses made to regulator/client comments also must be reviewed and approved by the SH&E Department.
- The SH&E documentation for any project lasting twelve (12) months or longer will be reviewed at periodic intervals determined by the SH&E Department, but at least annually. The **SH&E Representative** will review the changes and determine whether modifications are required to the existing SH&E planning documentation. This confirms that the documentation continues to reflect the current project scope and knowledge of site conditions, and that any revised regulatory requirements are properly addressed. The **Project Manager** will provide a master copy of the SH&E documentation to be maintained on site for reference by personnel, together with copies of any required SH&E-related records or operational documentation. The master copy must be current in all respects, and will include any changes or modifications made as work progresses.
- **Project Managers** will confirm that ALL plans and THAs have been reviewed with project personnel prior to implementation of field work. Sign-off and concurrence is mandatory and to be kept in the project records.

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4.5 Roles & Responsibilities

4.5.1 **SH&E Department** responsibilities include the following:

- Assisting project management personnel to identify any necessary project-specific SH&E planning documentation required for all new and ongoing projects.
- Assisting in the preparation of necessary SH&E planning documentation.
- Reviewing and approving all SH&E planning documentation prior to its implementation for field activities.

4.5.2 **Project Manager (or their designee)** responsibilities include the following**:**

- Confirming the completion of SH&E planning documentation (THA, SWP or HASP), as required, that addresses the full range of project activities, safety risks and that all requirements and procedures are implemented and enforced during the field activities.
- Confirming SH&E requirements and Standard Operating Procedures are implemented successfully, including but not limited to:
  - Subcontractor evaluations
  - SH&E Training
  - Personal Protective Equipment
  - First aid and emergency response
  - Client requirements
- Contacting the SH&E Department to discuss SH&E planning documentation needs/ requirements at the start of each new project involving Resolution Consultants and at designated intervals (not to exceed one year) or when changes occur to the work operations or work location/ conditions, when work activities are modified/ changed, or when additional tasks are added to the work scope.
- Confirming that all SH&E planning documentation (draft or final) has been reviewed and approved by the SH&E Department prior to its use by Resolution Consultants personnel, or prior to release to outside agencies or organizations.
- Making appropriate resources available to protect the health and safety of Resolution Consultants employees, the environment and to comply with occupational health and safety, and environmental legislation and for the effective implementation of this procedure.

4.5.3 **Employee** responsibilities include the following**:**

- Participating in hazard identification training at the commencement of their employment with Resolution Consultants or prior to commencing field preparations.
- Reviewing and understanding the potential hazards and controls of the project before work commences.
- Complying with all required controls as identified in the THA and/or associated safety plans.

5.0 Records

5.1 Completed THAs, SWPs, and HASPs will be filed in their appropriate project file.

6.0 Attachments

6.1 05-209-Form 1 Task Hazard Analysis

6.2 05-209-Form 2 Hazard Identification, Classification and Controls

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05-209-Form 1 Task Hazard Analysis

This THA (worksheets 1 & 2) must be completed for all field work.

HAZARDS 1
- Identify hazards
- Classify hazards
- Identify controls

CONTROLS 2
- Summarize controls
- Acknowledgement / Sign off

EMERGENCY RESPONSE 3
- Emergency contacts
- Emergency procedures
- Emergency equipment

Required for all projects/sites which do not have an existing emergency response plan

Hazard Identification

- **Natural (biological)** – bacteria, viruses, insects, plants, birds, and animals
- **Chemical** – exposure to chemical toxins, acute or chronic, by way of inhalation, ingestion or absorption
- **Physical** – slipping/tripping, being struck by moving objects, repetitive movement, strains from lifting
- **Environmental** – extreme heat or cold, noise, vibrations, magnetic fields, pressure extremes and air quality
- **Psychosocial** – stress, violence

Hazard Classification

- Considers the potential severity of the outcome
- Considers the likelihood of the occurrence
- Used to prioritize and determine extent of required controls

Controls

- **Elimination (first)** – choose a different process; modify an existing process; substitute with less hazardous substance
- **Engineering Controls (second)** – physically alter the plant or equipment design in order to circumvent possible hazards; place guards on machinery
- **Administrative Controls (third)** – change the job procedure and/or process; limit the amount of time an individual is in a hazardous environment through job rotation
- **Personal Protective Equipment (last option)** – provide employees with direct physical protection while working in a hazardous environment

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Project Name:	Project Number:	Client:	
Supervisor:	Project Manager:	Location:	
THA Developed By:		Date:	
Task Name:		Regularity of Task: One-time ☐	Routine ☐

TASK HAZARD ANALYSIS

	Job Event Sequence *(List the major steps of the individual task)*	Hazards *(List primary hazards)*	Hazard Classification *(before controls)* Severity	Likelihood	Risk Level	Hazard Classification	Controls *(List controls that Resolution Consultants will implement)*
1					0		
2					0		
3					0		
4					0		
5					0		
6					0		
7					0		
8					0		
9					0		
10					0		

Hazard Classification Guidelines

Severity

1 Remote potential for injury, property damage/$ loss, or env damage

2 Potential for minor first aid injury, property damage/$ loss, or environmental damage

3 Potential for moderate personnel injuries, including medical treatment, property damage/$ loss, environmental damage, or negative public impact

4 Potential for a serious injury, major property damage/$ loss, serious impact to the environment, and public health

5 Catastrophic damage to people, property/equipment, environment, or public health

Likelihood of Occurrence

1 Very unlikely

2 Unlikely

3 Likely

4 Very likely

5 Certain

Hazard Classification Matrix

Likelihood \ Severity	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Risk Level
Low
Medium
High

Risk Level = Likelihood x Severity

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Project Name:	Project Number:	Client:
Supervisor:	Project Manager:	Location:
THA Developed By:		Date:
Task Name:		

SUMMARY OF CONTROLS

Personal Protective Equipment (*check all that apply*)

- CSA/ANSI Safety-Toed Boots (Leather or Rubber)
- CSA/ANSI Safety Glasses or Goggles
- CSA/ANSI-approved Hard Hat
- CSA/ANSI Type II/III Reflective Traffic Safety Vest

Air Monitoring (reference HASP monitoring plan)

☐ No air monitoring required ☐ Air monitoring required (*see procedures below*)

Parameter	Location/Monitoring Interval	Response/Action Levels	Response Activity

Required Training (associated with this THA)	Key SOPs (associated with this THA)		Client & Other Requirements
1			
2			
3			
4			
5			
6			

Acknowledgement / Signatures

Project Manager / Supervisor (signature): Date:

Name	Signature	Company	Date	Name	Signature	Company	Date

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	Project Name:	Project Number:	Client:
	Supervisor:	Project Manager:	Location:
	THA Developed By:		Date:
EMERGENCY RESPONSE PLAN	Task Name:	Regularity of Task: ☐ One-time	☐ Routine

Check-in Procedures			
Check-in Times	Check-in Person	Phone Number	Cell Phone Number
Alternate:			

Emergency Coordinators / Key Personnel			
Name	Title	Phone Number	Cell Phone Number
	On-site First Aid Attendant		
	Project Manager		
	Site Supervisor		
	Regional SH&E Manager		
	Incident Reporting Line		
	Client Contact		

Emergency Agencies / Public Utilities			
Name	Type	Details	Phone Number
	Police		
	Fire		
	Ambulance		
	Nearest Hospital / Clinic		
	Poison Control Center		
	Pollution / Environmental		

Emergency Equipment & Supplies		Other Emergency Plan Details
☐ First Aid Kit - Type:	☐ Eye Wash	
☐ Blankets / Survival:	☐ Spill Kit	
☐ Fire Extinguishers Type:	☐ Other:	
☐ Communication Device		
☐ Vehicle Safety Equipment		

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05-209 Form 2 Hazard Identification, Classification & Controls

The following information is intended to guide staff in completing the Task Hazard Analysis.

1.0 Hazard Identification

1.1 Hazards occurring in the workplace may be:

- Natural (biological) – bacteria, viruses, insects, plants, birds, and animals
- Chemical – exposure to chemical toxins, acute or chronic, by way of inhalation, ingestion or absorption
- Physical – slipping/tripping, being struck by moving objects, repetitive movement, strains from lifting
- Environmental – extreme heat or cold, noise, vibrations, magnetic fields, pressure extremes and air quality
- Psychosocial – stress, violence

1.2 When identifying hazards, remember to consider the following:

- Routine and non-routine activities;
- Activities of all persons having access to the workplace (including contractors and visitors);
- Human behavior, capabilities and other human factors;
- Identified hazards originating outside the workplace capable of adversely affecting the health and safety of persons under the control of Resolution Consultants;
- Hazards created in the vicinity of the workplace by work-related activities under the control of Resolution Consultants;
- Infrastructure, equipment and materials at the workplace, whether provided by Resolution Consultants or others;
- Changes or proposed changes within Resolution Consultants;
- Modifications to the OH&S management system, including temporary changes, and their impacts on operations, processes, and activities;
- Any applicable legal obligations relating to risk assessment and implementation of necessary controls;
- The design of work areas, processes, installations, machinery/equipment, operating procedures and work organization, including their adaptation to human capabilities.

1.3 It is often useful to break the job or task down into a sequence of steps ("Job Event Sequence") to help identify the primary hazards which may be encountered when you complete a job task. The "events" identified should be only as detailed as required to identify the primary hazards (e.g., drive to worksite; inspect bridge decking; take water samples, etc.)

2.0 Hazard Classification

Once identified, all hazards should be classified based on both their potential outcome and the probability of its occurrence as follows:

2.1 **Severity**

- Insignificant – no injuries, low environmental/financial impact = 1
- Minor – first aid required, some environmental/financial impact = 2
- Moderate – medical treatment required, contained environmental impact, high cost = 3
- Major – serious injury, severe environmental damage, major cost = 4

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- Catastrophic – death, environmental disaster, extensive damage, extended downtime for company or site, huge cost = 5

2.2 **Probability**

- Unlikely – Incident will probably not occur during the work activity = 1
- Rarely – Incident will rarely occur during the work activity = 2
- Possibly – Possibility of incident occurring sometime during the work activity = 3
- Likely – Likelihood of incident occurring sometime during the work activity = 4
- Very Likely – Likelihood of incident happening often during course of the work activity = 5

2.3 High Hazard – Practice or condition whose sum of severity and probability is greater than or equal to 8.

2.4 Medium Hazard – Practice or condition whose sum of severity and probability is equal to either 6 or 7.

2.5 Low Hazard – Practice or condition whose sum of severity and probability is less than or equal to 5.

2.6 Inputs to the hazard classification can include, but are not be limited to, information or data on the following:

- Details of location(s) where work is carried out,
- The proximity and scope for hazardous interaction between activities in the workplace,
- Security arrangements,
- The human capabilities, behavior, competence, training and experience of those who normally and/or occasionally carry out hazardous tasks,
- Toxicological data, epidemiological data and other health related information,
- The proximity of other personnel (e.g. cleaners, visitors, contractors, the public) who might be affected by hazardous work,
- Details of any work instructions, systems of work and/or permit-to-work procedures, prepared for hazardous tasks,
- Manufacturers' or suppliers' instructions for operation and maintenance of equipment and facilities,
- The availability and use of control measures (e.g. for ventilation, guarding, personal protective equipment (PPE), etc.),
- Abnormal conditions (e.g. the potential interruption of utility services such as electricity and water, or other process failures),
- Environmental conditions affecting the workplace,
- The potential for failure of plant and machinery components and safety devices or for their degradation from exposure to the elements or process materials,
- Details of access to, and adequacy/condition of emergency procedures, emergency escape plans, emergency equipment, emergency escape routes (including signage), emergency communication facilities, and external emergency support, etc.,
- Monitoring data related to incidents associated with specific work activities,
- The findings of any existing assessments relating to hazardous work activity,
- Details of previous unsafe acts either by the individuals performing the activity or by others (e.g. adjacent personnel, visitors, contractors, etc.),
- The potential for a failure to induce associated failures or disabling of control measures,
- The duration and frequency at which tasks are carried out,
- The accuracy and reliability of the data available for the risk assessment,

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- Any legal and other requirements which prescribe how the risk assessment has to be performed or what constitutes an acceptable risk, e.g. sampling methods to determine exposure,
- Use of specific risk assessment methods, or permissible exposure levels.

2.7 Considering all of the hazards associated with the job task (and using the Hazard Matrix), provide an overall classification for the job/task in the Task Hazard Analysis. This classification can be used as a guideline for prioritizing and determining the level and number of controls required.

Hazard classification matrix

Severity		Probability				
		Very Likely	Likely	Possibly	Rarely	Unlikely
		5	4	3	2	1
Catastrophic (death, environmental disaster, extensive damage, extended downtime for company or site, huge cost)	5	10	9	8	7	6
Major (serious injury, severe environmental damage, major cost)	4	9	8	7	6	5
Moderate (medical treatment required, contained environmental impact, high cost)	3	8	7	6	5	4
Minor (First aid required, some environmental/financial impact)	2	7	6	5	4	3
Insignificant (no injuries, low environmental/financial impact)	1	6	5	4	3	2

Probability: How likely is it to happen?

Very Likely	Likelihood of incident happening often during course of the work activity
Likely	Likelihood of incident occurring sometime during the work activity
Possibly	Possibility of incident occurring sometime during the work activity
Rarely	Incident will rarely occur during the work activity
Unlikely	Incident will probably not occur during the work activity

Hazard Classification:

- **HIGH**
- **MED**
- **LOW**

3.0 Hazard Control

Once identified and classified, all hazards must have an effective means of control which can be accomplished by using one or more of the following means of control:

3.1 Elimination (first)

- Choose a different process
- Modify an existing process
- Substitute with less hazardous substance

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3.2 Engineering Controls (second)

- Physically alter the plant or equipment design in order to circumvent possible hazards
- Place guards on machinery
- Construct catwalks to divert traffic from hazardous areas

3.3 Administrative Controls (third)

- Affect the job procedure and/or process in order to reduce hazards
- Implement rules to change unsafe behaviors
- Limit the amount of time an individual is in a hazardous environment through job rotation

3.4 Personal Protective Equipment (fourth)

- Provide employees with direct physical protection while working in a hazardous environment

All identified hazards must have an effective means of control to minimize the potential for an incident; however, hazards with higher classifications should be addressed first and will undoubtedly require a variety of the types of controls mentioned above.

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05-210-Project Safety Meetings

1.0 Purpose and Scope

1.1 Establishes the requirements for conducting and documenting meetings on topics that are designed to promote Safety, Health & Environmental (SH&E) awareness and facilitate discussion regarding hazards and risks.

1.2 This procedure applies to all Resolution Consultants employees and operations in the performance of services directed and controlled by Resolution Consultants.

2.0 Terms and Definitions

None.

3.0 References

None.

4.0 Procedure

4.1 Project Initiation/Kick-off meeting

4.1.1 A project initiation/kick-off safety meeting will be conducted prior to the start of field operations. Discussion points for this meeting will come from the project-specific SH&E documentation (e.g., Health and Safety Plan (HASP), Safe Work Plan, Task Hazard Analysis, etc.). The meeting will involve representatives from all organizations with a direct contractual relationship with Resolution Consultants on the job site. Topics for this meeting will include:

- Communication to all participants regarding on site SH&E responsibilities and authority.
- Establishing safety points of contact for each organization and phase of work.
- Communication of organizational SH&E performance expectations.
- Identification of significant project SH&E issues, risks, and solutions.
- Coordination of organizational SH&E conflicts and interactions.

4.2 Timing of Meetings

4.2.1 Change in Scope/Activity– Conducted for all Resolution Consultants staff and site personnel with a direct contractual relationship with Resolution Consultants to discuss changes to scope or a new phase of work.

4.2.2 Periodic – Conducted at a regular, recurring frequency of not less than biweekly, but preferably once per week.

4.2.3 Daily – Daily safety discussions as part of daily routine project coordination meetings. Daily meetings are required for HAZWOPER activities and other activities as identified in the safety plan. Daily safety discussions will involve representatives from all organizations with a direct contractual relationship with Resolution Consultants on the job site.

4.2.4 Significant Personnel Turn-over – Conducted at the start of any workday where a new organization begins work on site or when more than 25 percent of the day's work force is new to the site.

4.2.5 Post-Incident – Conducted at the start of the work day following the occurrence of a significant incident as defined in *5-004 Incident Reporting*. All project initiation/kick-off safety meetings will be documented using the *5-210 Form 1 Tailgate Safety Meeting Log*.

4.2.6 All special situation safety meetings listed above will include review of applicable Task Hazard Analyses for the scope of services to be performed and be documented using the *5-210 Form 1 Tailgate Safety Meeting Log* or equivalent.

4.2.7 Daily safety discussions not otherwise required by HAZWOPER or the project safety plan will be documented.

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4.3 **Supplemental Training Meetings**

4.3.1 The PM, Site Supervisor or Site Safety Officer (SSO) will implement worker training on general safety topics as part of routine on-site training activities. Where such training is conducted it will be documented on the *5-210 Form 1 Tailgate Safety Meeting Log*.

4.4 Safety Orientation

4.4.1 All project employees will attend a project-specific safety orientation and training session prior to the start of any project and/or task.

4.4.2 The PM, site supervisor, or SSO will conduct the meeting based on project specifics (e.g., location, unique hazards and risks, client requirements, etc.) and any mandatory topics required by *5-003 SH&E Training*. The Regional SH&E Manager can provide examples of project safety orientation material for reference.

4.4.3 The depth/level of training will be commensurate with the job function(s) to be performed. Site visitors will receive general orientation and task-specific training.

4.4.4 At a minimum, employee orientation and training will consist of the items listed below:

- Identification of hazards associated with the individual's job function and responsibilities.
- Specific safety procedural instruction needed to perform his or her required job function or task.
- Content of the HASP and any Task Hazard Analyses (THA) in accordance with *5-209 Project Hazard Assessment and Planning*.

4.5 Periodic Safety Training Meetings

4.5.1 Sit-down safety training meetings will be scheduled and conducted throughout the duration of the project.

4.5.2 Meetings shall give project personnel an opportunity to maintain a high degree of safety awareness through timely and quality safety education. Meeting time will be used to discuss specific safety topics and obtain employee feedback.

4.5.3 Safety meetings will be conducted by the PM, Site Supervisor or SSO and supplemented by lead persons of the various crafts represented at the site (e.g., electrician, heavy equipment operator, foreman, inspector, resident engineer, etc.).

4.5.4 Topics for discussion will include SH&E hazards noted during routine and non-routine work situations and an explanation of job safety procedures unique to the project.

4.5.5 The PM and SSO will monitor safety meetings to ensure that subject matter is properly presented.

4.5.6 All periodic safety meetings will be documented using the Safety Training Log (Attachment 3). Sign-in of every meeting participant is required to ensure proper accountability and to meet Resolution Consultants project recordkeeping requirements.

4.5.7 Safety, Health and Environmental considerations will be discussed at every project meeting. Once on-site:

- All on-site personnel must review and acknowledge the form or plan at a “tailgate” or “toolbox” meeting.
- Any new or previously unidentified hazards must be documented on the form or plan as a Revision and acknowledged with initials by all on-site staff.
- The Project Safety Plan must be reviewed regularly as required and documented on the plan.

4.5.8 All signed copies of the field forms and project plans must be placed in the appropriate project folder.

4.6 Roles and Responsibilities

4.6.1 **SH&E manager** shall provide assistance to Project Managers (PM) as required to carry out the requirements of this Standard Operating Procedure (SOP), particularly in the area of making training materials available and providing spot-checks of proper documentation.

4.6.2 **Task Order Managers** shall ensure that PMs of projects within their areas of responsibility are conducting and properly documenting safety meetings in accordance with requirements of this SOP.

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4.6.3 **Project Managers (field task managers, supervisors)** shall ensure that all employees and personnel under the control of Resolution Consultants (e.g., subcontractors, temporary agency employees) assigned to projects within their areas of responsibility participate in project initiation/kick-off meetings, special situation meetings, task hazard analyses, on-site safety inspections, and supplemental training meetings.

5.0 Records

None.

6.0 Attachments

6.1 5-210 Form 1 Tailgate Safety Meeting Log

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5-307 Housekeeping, Worksite

1.0 Purpose and Scope

1.1 This procedure provides Resolution Consultants' work practices as well as personal hygiene and work site sanitation standards for housekeeping.

1.2 Applies to all Resolution Consultants staff and field worksites.

2.0 Terms and Definitions

None.

3.0 References

None.

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Project Manager (Field Task Manager, Supervisor)** is responsible for the procedure's implementation and the details of addressing housekeeping policy within the construction/demolition worksite.

4.1.2 **SH&E Professionals** will monitor, assess, and report on project housekeeping when visiting locations.

4.1.3 Employees are responsible for reporting any areas of concern to the Site Supervisor for prompt resolution as well as for maintaining worksites that are free from debris, clutter, and slipping or tripping hazards.

4.2 Smoking, Eating, and Drinking

4.2.1 Eating and drinking will be permitted in designated areas at Resolution Consultant project sites and as specified on client sites. Smoking will be permitted only in areas designated in compliance with applicable local laws, regulations, legislation, and ordinances, by the Field Supervisior and situated in locations that are not in the immediate vicinity of activities associated with work site activities. Additionally, Field Supervisior will designate each smoking area giving primary consideration to those personnel who do not smoke.

4.2.2 Personnel involved in the performance of certain activities will not be permitted to smoke, eat, drink, or use smokeless tobacco, except during breaks (e.g., HAZWOPER-controlled work areas).

4.2.3 Site personnel will first wash hands and face after completing work activities and prior to eating or drinking.

4.3 Water Supply

4.3.1 Water supplies will be available for use on site and will comply with the following requirements:

4.3.2 Potable Water: An adequate supply of drinking water will be available for site personnel consumption. Potable water can be provided in the form of approved well or city water, bottled water, 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 and tape sealed in order to distinguish them from nonpotable water sources and protect the potable water integrity.

4.3.3 Nonpotable Water: Nonpotable water will not be used for drinking purposes. Nonpotable water may not be used for hand washing or other personal hygiene activities but may be used for other types of cleaning activities. All containers/supplies of nonpotable water used will be properly identified and labeled as such.

4.4 Toilet Facilities

4.4.1 Toilet facilities will be available for site personnel and visitors. Should subcontractor personnel be located on-site for extended periods, it may become necessary to obtain temporary toilet facilities.

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Exceptions to this requirement will apply to mobile crews where work activities and locations permit transportation to nearby toilet facilities.

4.4.2 A minimum of one toilet will be provided for every 20 site personnel, with separate toilets maintained for each sex, except where there are less than five total personnel on site. For mobile crews where work activities and locations permit use of nearby toilet facilities (e.g., gas station, or rest stop), on-site facilities are not required.

4.4.3 Washing Facilities

4.4.4 Hand and Face: Site personnel will wash hands and face after completing work activities and prior to breaks, lunch, or completion of workday.

4.4.5 Personal Cleaning Supplies: Cleaning supplies at Resolution Consultant project sites will consist of soap, water, and disposable paper towels or items of equal use/application (e.g., anti-bacterial gels, wipes, etc.).

4.5 Clothing and Personal Protective Equipment (PPE)

4.5.1 All PPE will be kept clean at all times and maintained in accordance with the manufacturer's, Resolution Consultant's. and applicable regulatory, legislative, or provincial requirements.

4.5.2 General Work Areas

4.5.3 At all times work areas will be kept free of dirt and debris that may impact the safety of site personnel and visitors. All trash receptacles will be emptied regularly.

4.5.4 Break Areas and Lunchrooms

Site personnel will observe the following requirements when using break areas and lunchrooms at Resolution Consultant project sites:

4.5.5 All food and drink items will be properly stored when not in use.

4.5.6 Food items will not be stored in personal lockers for extended periods in order to prevent the potential for vermin infestation.

4.5.7 Perishable foods will be refrigerated whenever possible.

4.5.8 All waste food containers will be discarded in trash receptacles.

4.5.9 All tables, chairs, counters, sinks, and similar surfaces will be kept clean and free of dirt, waste food, and food containers at all times.

4.5.10 Refrigerators used to store food items will be maintained at 45 degrees Fahrenheit and emptied of all unclaimed food items weekly. Refrigerators used to store food will be labeled as such so that only food and drinks are stored within the refrigerator.

4.5.11 Routine cleaning of refrigerators will also be performed on a regular basis.

4.6 Vermin Control

4.6.1 Every enclosed workplace shall be constructed, equipped, and maintained, so far as reasonably practicable, to prevent the entrance or harborage of rodents, insects, and other vermin.

4.6.2 A continuing and effective extermination program shall be instituted where the presence of rodents, insects, or other vermin is detected.

4.7 General Housekeeping

4.7.1 All work areas shall be kept clean to the extent that the nature of the work allows.

4.7.2 Every work area shall be maintained, so far as practicable, in a dry condition. Where wet processes are used, drainage shall be maintained and platforms, mats, or other dry standing places shall be provided, where practicable, or appropriate waterproof footgear shall be provided.

4.7.3 Protruding objects or placement of materials on paths or foot traffic areas present a problem with regard to slips, trips, falls, and puncture wounds. Personnel will use a reasonable amount of effort to keep slip, trip, and fall hazards to a minimum.

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4.7.4 Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal.

4.7.5 At no time will debris or trash be intermingled with waste PPE or contaminated materials.

4.7.6 Material and equipment must be placed, stacked, or stored in a stable and secure manner. Stacked material or containers must be stabilized as necessary by interlocking, strapping, or other effective means of restraint to protect the safety of workers.

4.7.7 An area in which material may be dropped, dumped, or spilled must be guarded to prevent inadvertent entry by workers or protected by adequate covers and guarding.

4.7.8 Floors, platforms, ramps, stairs, and walkways available for use by workers must be maintained in a state of good repair and kept free of slipping and tripping hazards. If such areas are taken out of service, the employer must take reasonable means for preventing entry or use.

4.7.9 Hazardous areas not intended to be accessible to workers must be secured by locked doors or equivalent means of security and must not be entered unless safe work procedures are developed and followed.

4.8 Worksite Offices and Trailers

Worksite offices and trailers will be maintained in accordance with *RC-103-Housekeeping, Office.*

5.0 Records

None.

6.0 Attachments

None.

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5-308-Manual Lifting, Field

1.0 Purpose and Scope

1.1 This procedure provides the requirements for use when performing manual materials handling activities (e.g., lifting/handling of items or materials).

1.2 This procedure applies to all field staff for Resolution Consultants operations.

2.0 Terms and Definitions

2.1 **Manual Materials Handling:** Moving or handling things by lifting, lowering, pushing, pulling, carrying, holding, or restraining.

2.2 **Team Handling:** Team handling occurs when more than one person is involved during the lift.

3.0 References

3.1 OSHA Technical Manual: http://www.osha.gov/dts/osta/otm/otm_vii/otm_vii_1.html

3.3 National Safety Council: www.nsc.org

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 The **Project Manager** will effectively implement the procedure, providing resources as required, and providing direction on proper lifting/handling techniques.

4.1.2 The **Resolution Consultants Health and Safety Manager** will assist in identifying activities with a high potential for lifting/handling strains/injuries as well as the associated mitigation strategies and training on proper lifting/manual materials handling techniques.

4.1.3 **Employees** are responsible for reviewing and following *5-308- Manual Lifting Safe Work Practices*.

4.2 Mechanical Controls

4.2.1 Mechanical equipment or assistance such as dollies, carts, come-alongs, or rollers are preferable to be used whenever possible rather than the employee physically moving materials.

4.2.2 Mechanical assistance will be of proper size, have wheels sized for the terrain, and be designed to prevent pinching or undue stress on wrists.

4.2.3 Objects to be moved will be secured to prevent falling and properly balanced to prevent tipping.

4.3 Administrative Controls

4.4 When significant, sustained lifting work is required, it is desirable to rotate employees to spread the work load among several people and thereby avoid fatigue.

4.5 Rotation is not simply performing a different job but instead is performing a job that utilizes a completely different muscle group from the ones that have been overexerted.

5.0 Records

None.

6.0 Attachments

None.

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5-313-Alligators

1.0 Hazard

1.1 Your chance of encountering an alligator is greatest during the animal's courtship and mating season, which takes place from March through September. This is when male alligators become most dominant and aggressive as they try to intimidate rival males and attract females by their show of power. Some males end up having to travel to find a mate. July through September is when mother alligators are guarding nests.

1.2 Mating season takes up much of the warmer months - a very popular time in the southeastern USA for outdoor activities - and alligators are solar-powered, so-to-speak. The warmth from the sun fires up their metabolism, giving them renewed energy; and renewed energy means great potential for conflict.

2.0 Encounter

2.1 The alligator is naturally wary of humans, and will flee quickly if you get too close to it, or it may utter a very audible and compelling warning hiss. In some cases; however, alligators may charge or attack. Here are some examples of such cases:

2.1.1 An alligator that is accustomed to being fed by humans may not be so shy.

2.1.2 An alligator that is surprised and alarmed by your approach may attack, thinking that it is being attacked itself.

2.1.3 A mother alligator caring for her nest or for live babies. If you see alligator babies, or if you encounter a nest (usually a mound of vegetation mixed with mud), remove yourself to a safe distance, the mother alligator is sure to be close by. If you get close, the mother may sound a very audible and intimidating warning hiss. Such a nest may be difficult to identify for a non-expert, but it is likely the mother will issue you a warning.

2.1.4 Alligator mothers are well-known to be practically fearless when defending their offspring, whether the little ones have hatched or not. A mother alligator was observed leaping, jaws agape, to attack a helicopter as it approached the nest area to land! (The helicopter carried biologists studying alligator nests.)

2.2 Also be careful near heavy vegetation in or near the water's edge. This is where an alligator likes to enjoy privacy and peace during the daylight hours. If you trudge through there and surprise it, the outcome may not be positive.

2.3 Generally, a good minimum distance to keep between you and an alligator or nest is 15 feet/ 4.6 meters.

2.4 When trying to get past an alligator, make sure not to walk between the alligator and the water, because if it's spooked, it's going to run to the water.

2.5 If an alligator does approach in a threatening manner, make as much noise and movement as possible. This should show the alligator that he has taken on more than he can handle and he'll back away.

3.0 Alligator Charge

3.1 The alligator is not a natural runner. Those short legs obviously don't serve it like a horse's legs do, and the alligator can actually tire out in a relatively short time. When it charges after a human or animal, it is either trying to scare it away or seize it. It has a fast and furious burst of energy which

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serves it well for stealth hunting -- grabbing prey when it doesn't expect it. Furthermore, the reptile is opportunistic, which means, quite simply, it doesn't like to work very hard to get its food if it doesn't have to.

3.2 In the very rare event you are charged or chased by an alligator, move in as straight a line as possible away from it as fast as you reasonably can. In many cases, the vegetation features of the wild will serve to protect you by slowing the alligator down, like trees, bumps, bushes, etc. -- your comparatively long legs usually make it easier for you to maneuver through the trees and brush than an alligator's short legs do.

3.3 Most adult humans can outrun even a fast crocodilian, which has been clocked at a maximum of about 10 mph/17 kilometers per hour (kph), compared to a human speed of 15-17 mph/24-27 kph. But this doesn't matter much; an alligator will often give up the chase because it sees that the runner is moving away too quickly, and realizes that too much effort will be required to continue pursuit.

3.4 You may have heard somewhere that the zigzag run (running in a "z" pattern, side-to-side) is a good idea, but this is not only an unnecessary maneuver but probably a very unwise one. Here's why:

3.4.1 Unless you're an Olympic athlete, running zigzag over natural topography increases your risk of tripping and falling over rocks, plants, roots, and the like. And it goes without saying that falling while being pursued by an alligator is not good.

3.4.2 Furthermore, an alligator doesn't have the degree of stereoscopic vision we have. It actually has a small 'blind spot' directly in front of it. Hence, the alligator's vision is most effective in the 'sides' of its field of view. So, running zigzag not only slows your rate of distance from your pursuer, it may clearly indicate to the animal exactly where you are; even this point hardly matters since in many cases the alligator may keep its eyes shut while pursuing so as not to get them hit by twigs, grass stalks and branches in its path.

3.4.3 Finally, an alligator bites very effectively in a side-swiping motion, so if you are trying to run zigzag and are slowed down by plants, rocks, or other obstacles, the backwards flying leg of a running human is an optimal target for side-swiping, chomping jaws (the operative word here is "side").

3.5 Simply put, when faced with an attack, move directly away from the alligator as quickly as possible, navigating the terrain as carefully as possible. The zigzag idea will likely not serve you well.

4.0 Alligator Attack

4.1 If it seizes prey, and the prey fights back hard, the alligator may release it, depending on factors such as its own size relative to that of the victim, its own level of aggression, and its measure of hunger. Merely struggling to break free may not be enough counter-aggression to stop an alligator, and may actually prompt a devastating "death roll" response, in which the reptile furiously spins on its central axis to tear muscle and bone free of the victim's body.

4.2 These armored saurian are among the toughest beasts in the animal kingdom, so an attack victim should channel his or her nervous energy and will to survive and take the offensive by fighting hard. Not struggling...fighting very, very, very hard. Others on hand during such an event may be able to help by fighting the reptile, too. This should include punching the snout, poking the eyes, and even jabbing the ears, which are seen as small slits behind the eyes.

5.0 Additional Resources

5.1 Additional resources can be found at:

5.1.1 http://www.tpwd.state.tx.us/huntwild/wild/species/alligator/index.phtml

5.1.2 http://corkscrew.audubon.org/Wildlife/Alligators.html

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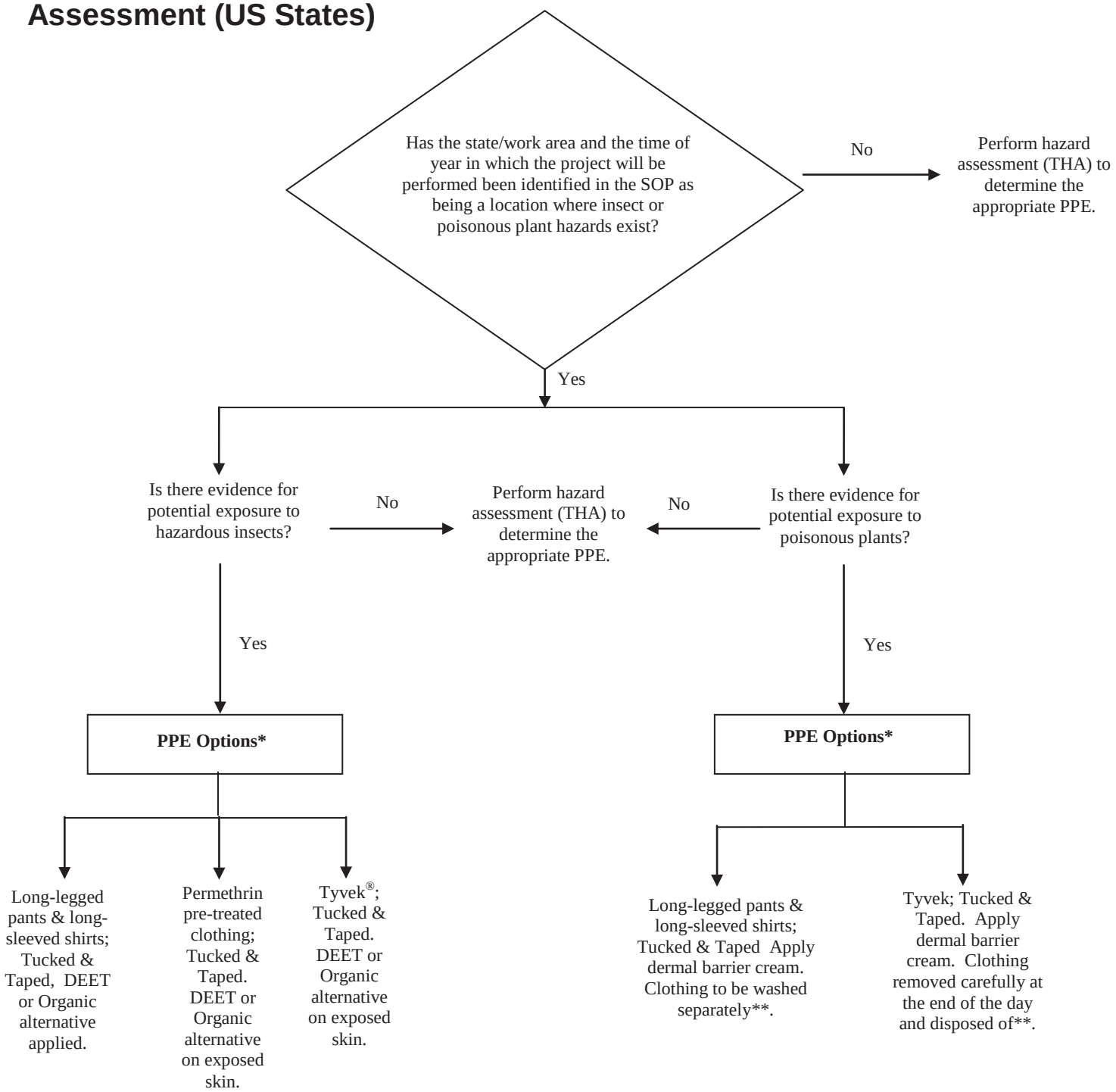
5-313-Biological Hazard Assessment Decision Flow Chart Hazard Assessment (US States)



* indicates that when both insect and poisonous plant hazards are recognized hazards at a project site, the most conservative combination of the available PPE choices will be selected.

** indicates that clothing that has been known or suspected to have come in contact with poisonous plants must be washed before it can be worn again. Similarly, Tyvek® that has been known or suspected to have come in contact with poisonous plants will be disposed of rather than reused during a subsequent day or project.

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State by State Guideline for Exposure

States	Tick-Borne Diseases	Mosquito-Borne Diseases	Poisonous Plants
Alabama	Year Round Low Risk	Year Round	Year round
Alaska	No Risk	No Risk	No Risk
Arizona	No Risk	March - July	March - November
Arkansas	March - November	March - November	March - November
California	Low Risk	March - November	Year Round
Colorado	Low Risk	March - November	No Risk
Connecticut	March - November	Low Risk March - November	March - November
Delaware	March - November	Low Risk March - November	March - November
Florida	Year Round Low Risk	Year Round	Year round
Georgia	Year Round Low Risk	Year Round	Year round
Hawaii	No Risk	No Risk	No Risk
Idaho	No Risk	Low Risk March - November	No Risk
Illinois	March - November	March - November	March - November
Indiana	March - November	March - November	March - November
Iowa	March - November	March - November	March - November
Kansas	Low Risk	March - November	March - November
Kentucky	March - November	March - November	March - November
Louisiana	Year Round Low Risk	Year Round	Year round
Maine	March - November	March - November	March - November
Maryland	March - November	Low Risk	March - November
Massachusetts	March - November	March - November	March - November
Michigan	March - November	March - November	March - November
Minnesota	March - November	March - November	March - November
Mississippi	Year Round	Year Round	Year round
Missouri	March - November	March - November	March - November
Montana	Low Risk March - July	Low Risk March - July	No Risk
Nebraska	Low Risk	Low Risk	Low Risk
Nevada	Low Risk March - July	Low Risk March - July	Low Risk March - November
New Hampshire	March - November	March - November	March - November
New Jersey	March - November	March - November	March - November
New Mexico	No Risk	Low Risk March - July	No Risk
New York	March - November	March - November	March - November
North Carolina	March - November	March - November	March - November
North Dakota	No Risk	March - November	No Risk
Ohio	Low Risk March - November	March - November	March - November
Oklahoma	March - November	Low Risk March - November	March - November
Oregon	Low Risk March - November	Low Risk March - November	March - November
Pennsylvania	March - November	March - November	March - November
Puerto Rico	???	Low Risk March - November	Year round

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States	Tick-Borne Diseases	Mosquito-Borne Diseases	Poisonous Plants
Rhode Island	March - November	Low Risk March - November	March - November
South Carolina	March - November	Low Risk March - November	March - November
South Dakota	Low Risk March - November	March - November	March - November
Tennessee	March - November	March - November	March - November
Texas	Year Round Low Risk	Year Round	Year round
Utah	Low Risk March - July	Low Risk March - July	No Risk
Vermont	March - November	Low Risk March - November	March - November
Virginia	Low Risk March - November	March - November	March - November
Washington	Low Risk March - November	Low Risk March - November	March - November
West Virginia	Low Risk March - November	March - November	March - November
Wisconsin	March - November	March - November	March – November
Wyoming	No Risk March - July	Low Risk March - July	No Risk

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5-313-Configuration Clothing for Protection Against Ticks and Insects

1.0 Configuration of Clothing

1.1 Loose-cuff trousers must be tucked into socks, wrapped with duct tape (or equivalent) completely around the cuff of the sock up on to the surface of the pant leg to prevent entry of insects between the sock and pants, and preferably reverse-wrapped with “sticky” side out (see figure below). Once the clothing is configured , insect repellent containing DEET (or acceptable alternative) should be applied to the clothing.

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5-313-Insect Repellent Active Ingredient Product Information

1.0 Application of Insect Repellent

1.1 Immediately prior to the commencement of work in the field, an Resolution Consults -approved insect repellent shall be applied to exposed skin, and to the outer surface of pant leg cuffs tucked into socks, shirt tails tucked into pants at the waist, and shirt cuffs.

1.2 Table 1 provides a list of Resolution Consults-approved insect repellent active ingredients; employees may utilize any brand containing the minimum concentration of active ingredients as listed.

1.3 All products are registered with the EPA and recommended by the CDC.

1.4 Employees should select the Resolution Consults approved repellent which is best for them based on skin sensitivity/allergies, and personal preference, but be aware that reapplication frequency will be greater for Picaridin and lemon eucalyptus products.

1.5 Employees shall carefully read and comply with manufacturer recommendations and instructions on product labels prior to application. Repellent shall not be applied beneath clothing to minimize the potential for irritation and/or allergic reaction.

1.6 The chemical N,N-diethyl-*m*-toluamide (DEET) shall not be applied to Nomex™ fire retardant clothing as it reduces the effectiveness of the fabric.

Table 1
Approved Insect Repellents

Active ingredient and minimum concentration	Products Available	Approximate Duration of Effectiveness	Notes and Web Link to Product Safety Information
Permethrin (0.5%)	-Repel® Permanone -Coulston's Duranon™	2 weeks[1]	-Application to clothing and equipment only
DEET (23.8%)	-Deep Woods Off! ® -Repel® Sportsmen Formula®	5 hours[2]	-Cannot be applied to Nomex™ fabric
Picaridin (7%)	-Cutter Advanced™	4 hours[3]	-Protection equivalent to approximately 10% DEET
Oil of Lemon Eucalyptus (30%)	-Repel® Lemon Eucalyptus	2 hours[2]	-Protection equivalent to approximately 7% DEET -Natural, plant based product

[1] – New York State Department of Health, 2007
[2] – Fradin and Day, 2002
[3] – Spectrum Brands, 2007

1.7 Repellent shall be reapplied multiple times daily over the course of the day at a frequency identified during the hazard assessment based on manufacturers' recommendations, the approximate effective period provided in Table 1, and other factors such as perspiration, precipitation, etc.

1.8 All approved repellents are available at most department or sporting goods stores.

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Product Safety Information

Facts about the repellants recommended by Resolution Consults are available by clicking on the embedded link.

National Pesticide Telecommunications Network Fact Sheet: Permethrin and Picaridin

Picaridin

Picaridin Fact Sheet.pdf

Permethrin

Permethrin Fact Sheet.pdf

DEET

DEET Fact Sheet.pdf

Lemon Eucalyptus

Lemon Eucalyptus fact sheet.pdf

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5-313-Mosquito-Borne Diseases

1.0 Background

1.1 CDC data indicates that mosquito-borne illnesses, including encephalitis, are a health risk to employees working in outdoor environments.

1.2 Mosquitoes pose a risk of causing infection with various forms of encephalitis and other diseases in Resolution Consultants employees. This section will focus on the transmission of encephalitis. West Nile encephalitis is an infection of the brain that is caused by a virus known as the West Nile virus.

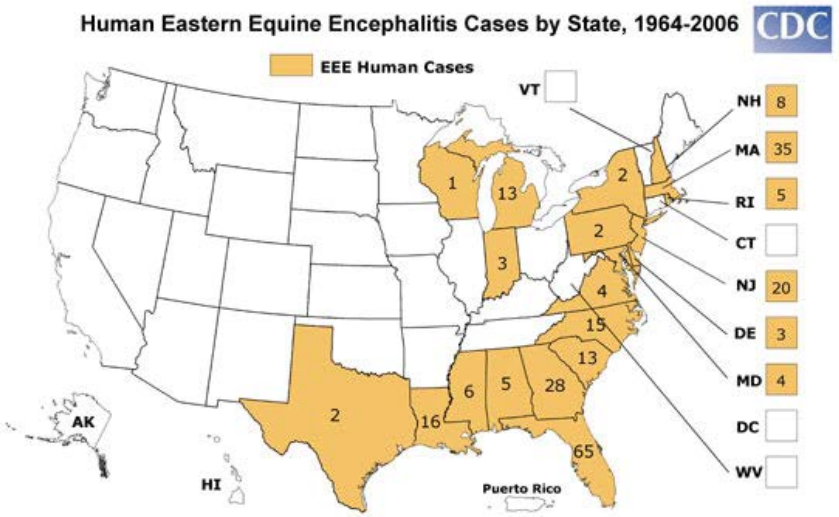
1.3 If other mosquito-borne diseases are identified in the project area, the local Public Health Department and CDC should be consulted to determine what diseases are present and exposure prevention recommendation.

1.4 According to the CDC, arboviral encephalitis is a virus that is "maintained in nature through biological transmission between susceptible vertebrate hosts by blood feeding arthropods", e.g., mosquitoes. It exists in various forms in global distribution, and in four primary forms in the U.S.: 1) eastern equine encephalitis (EEE), 2) western equine encephalitis (WEE), 3) St. Louis encephalitis (SLE), and 4) La Crosse (LAC) encephalitis; all of which are transmitted by mosquitoes.

1.5 Mosquitoes are known to breed in standing water; therefore, when standing water is found at a job site, actions should be taken to drain the water. Typically, mosquitoes will fly only a quarter of a mile (400 meters) from their breeding location.

2.0 Distribution

Figure 1
Distribution Map for EEE Cases



Source: http://www.cdc.gov/ncidod/dvbid/arbor/images/EEE_Map.jpg

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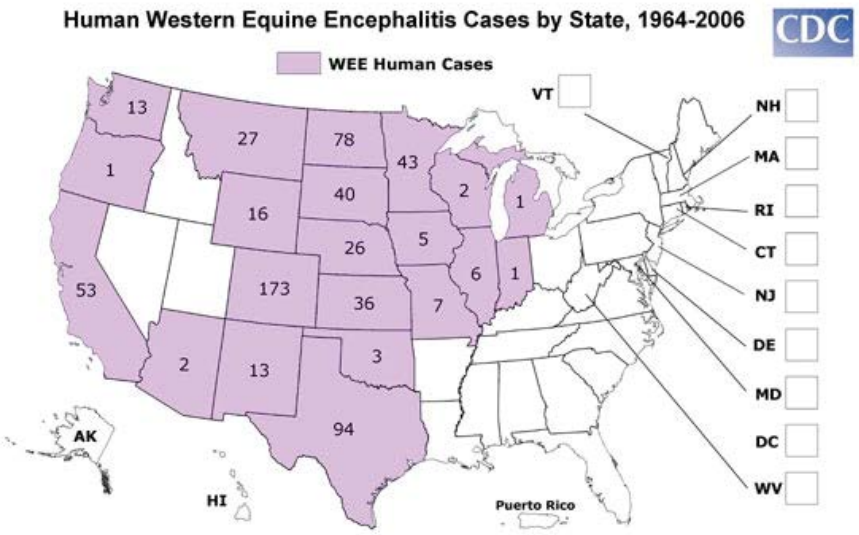
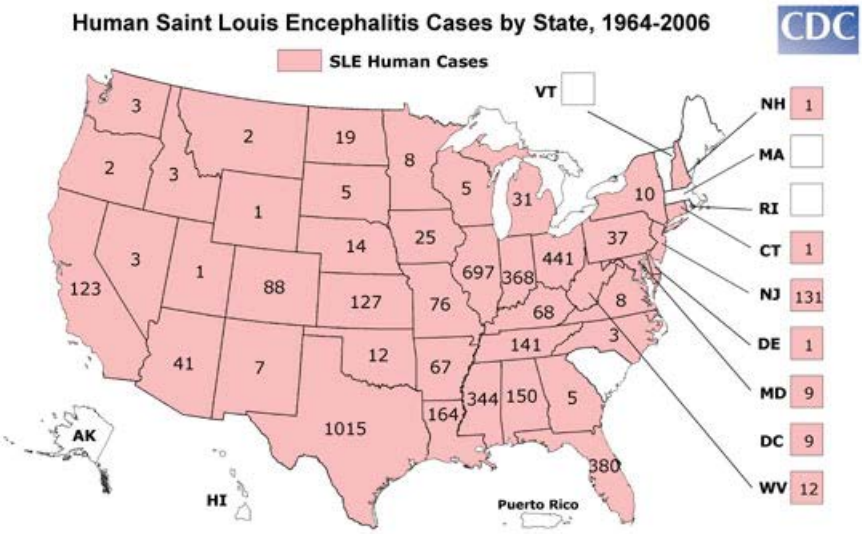
Figure 2

Distribution Map for WEE Cases



Source: http://www.cdc.gov/ncidod/dvbid/arbor/images/WEE_Map.jpg

Figure 3
Distribution Map for SLE Cases



Source: http://www.cdc.gov/ncidod/dvbid/arbor/images/SLE_Map.jpg

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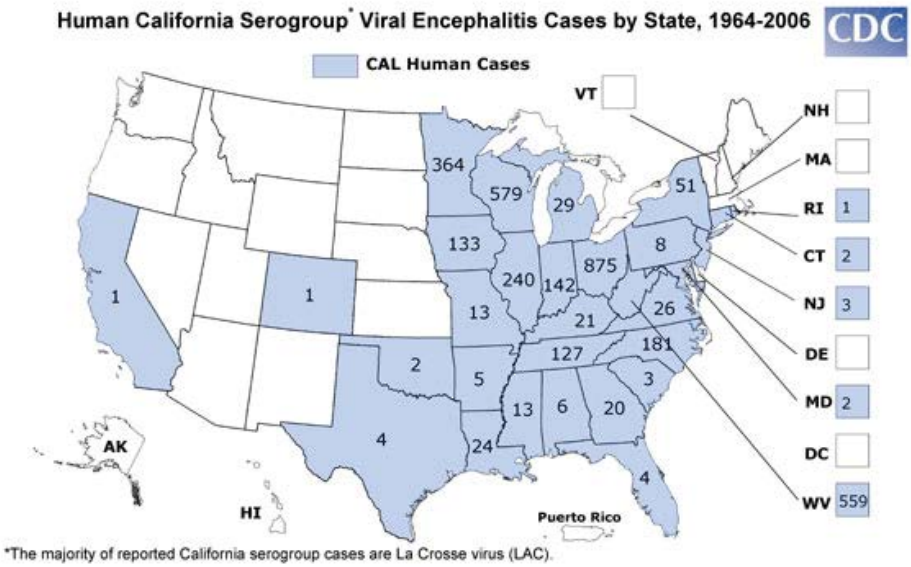
Figure 4
Distribution Map for LAC Cases



Source: http://www.cdc.gov/ncidod/dvbid/arbor/images/LAC_Map.jpg

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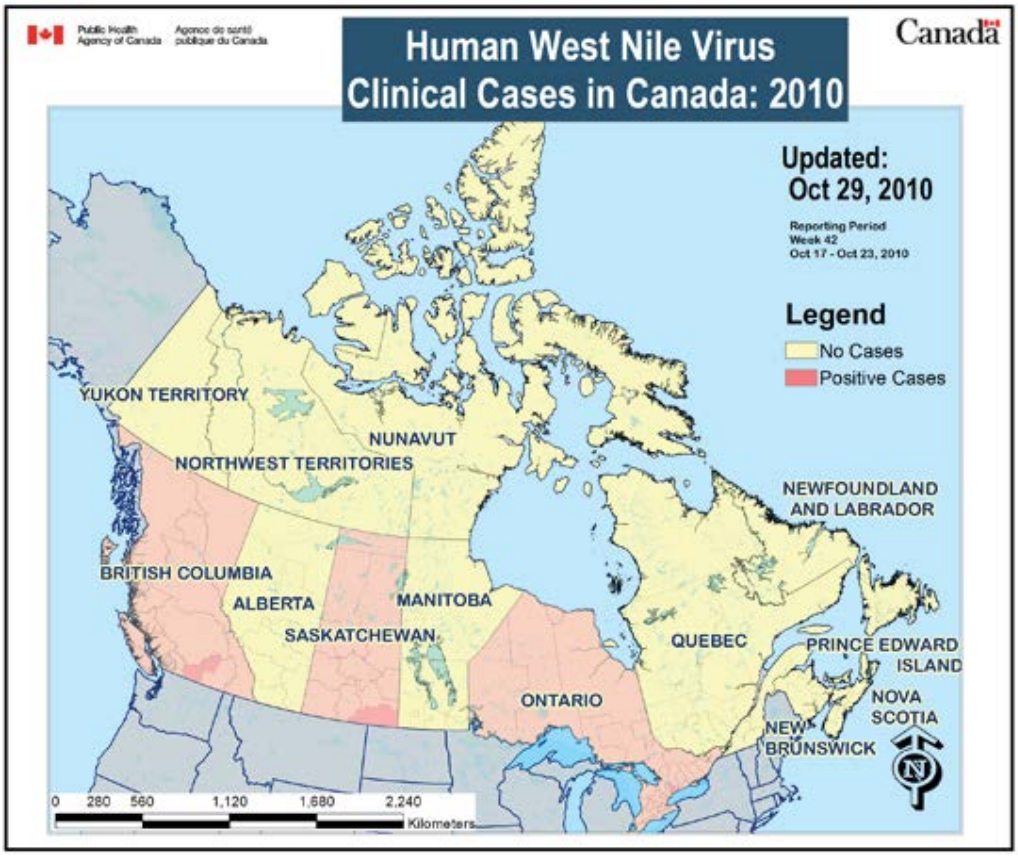
Canadian Mosquito Borne Diseases



Source: http://www.eidgis.com/wnvmonitorca/

Disease	Distribution
California encephalitis	Canada-wide
Western equine encephalitis	Western Canada
Eastern equine encephalitis	Quebec, Ontario
St Louis encephalitis	Ontario, Quebec, Manitoba, Saskatchewan
Cache Valley	Ontario, Manitoba, Saskatchewan, Alberta

Source: Paediatr Child Health. 2000 May–Jun; 5(4): 206–212.

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5-313-Plants of Concern

1.0 Background

1.1 Poison ivy, oak and sumac (poisonous plants) pose a significant threat to Resolution Consultants employees due to the dermatitis that results from exposure to the oil on these plants, called urushiol.

1.2 Exposure to urushiol produces a rash that can be irritating and cause the exposed employee to scratch the infected area, increasing susceptibility for an infection to result from the rash.

1.3 It should be noted that each time an employee is exposed to urushiol, it increases the severity of the reaction they will have in subsequent exposures.

2.0 Treatment

2.1 In cases that involve severe rashes, medical treatment may be necessary to control the rash.

2.2 Employees that develop a rash as a result of exposure to poison ivy, oak or sumac should report the exposure immediately to their Supervisor, Project Manager and RSHEM.

Figure 1

Distribution Map for Poison Ivy

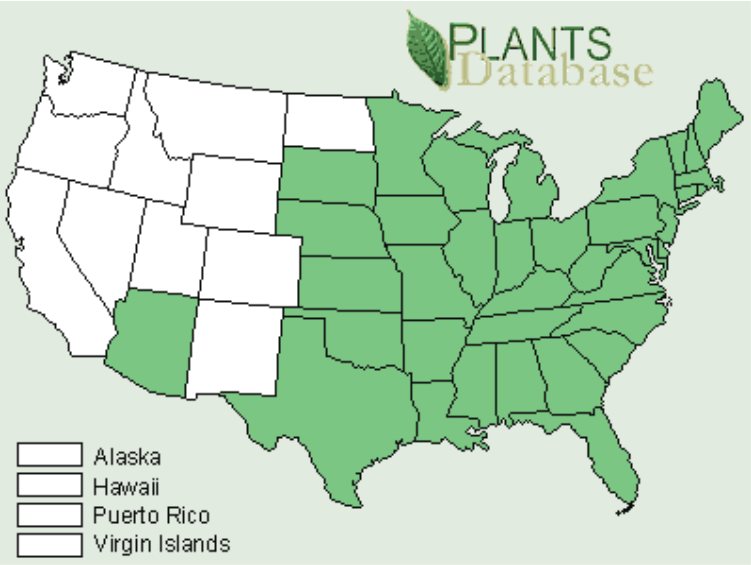

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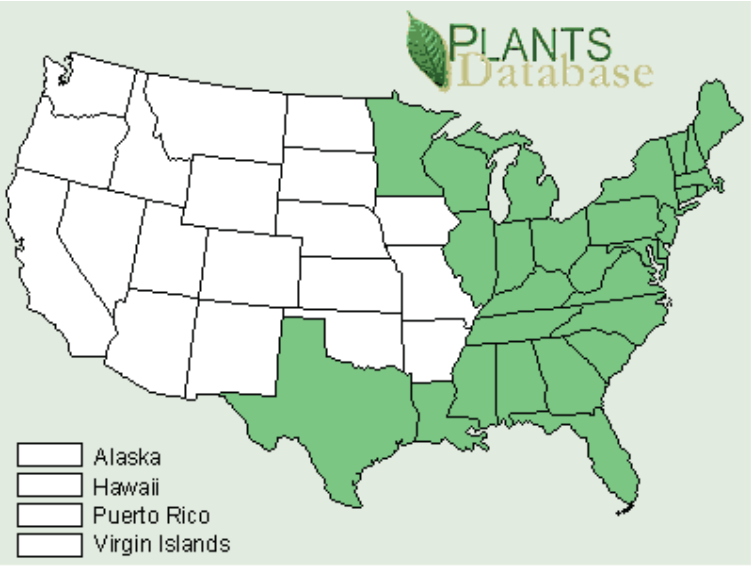
Figure 2
Distribution Map for Poison Oak

Figure 3
Distribution Map for Poison Sumac



Source for Figures 1, 2, and 3: http://www.tecnuextreme.com/plant-map.htm

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5-313-Poisonous Spider Identification

Black Widow Spider

- ☐ Abdomen usually shows hourglass marking.
- ☐ The female is 3-4 centimeters in diameter.
- ☐ Have been found in well casings and flush-mount covers.
- ☐ Not aggressive, but more likely to bite if guarding eggs.
- ☐ Light, local swelling and reddening of the bite are early signs of a bite, followed by intense muscular pain, rigidity of the abdomen and legs, difficulty breathing, and nausea.
- ☐ If bitten, see physician as soon as possible.

Brown Spiders (Recluse)

- ☐ Central and South U.S., although in some other areas, as well.
- ☐ ¼-to-½-inch-long body and the size of silver dollar.
- ☐ Hides in decaying wood, baseboards, ceilings, cracks, and undisturbed piles of material.
- ☐ Bite either may go unnoticed or may be followed by a severe localized reaction, including scabbing, necrosis of affected tissue, and very slow healing.
- ☐ If bitten, see physician as soon as possible.

Exercise care when collecting samples and avoid reaching into areas where visibility is limited. If bitten by a spider, attempt to identify the spider, 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.

Additional USA Spider Identification charts are available at http://www.termite.com/spider-identification.html

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5-313-Snakes

1.0 Hazard

1.1 **Snakes have the ability to inject venom.** 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.

2.0 Personal Protective Equipment

2.1 Long pants and shirts.

2.2 Heavy gloves if staff will be handling debris or be close to the ground.

2.3 Rubber boots, or boots that fully cover the foot (not sandals!) and preferably are at least 10” high.

2.4 Snake Chaps that cover at least the shin.

2.5 Personal first aid kit.

3.0 Restrictions

3.1 Staff must not work alone in areas where the risk of a snake encounter is high.

4.0 Training

4.1 Staff must be notified of the hazard before work commences.

5.0 Safe Work Practice

5.1 Staff working in areas known to be inhabited by venomous snakes should take extra precautions, be able to identify the local snake species, and understand the best practices for administering first aid.

5.2 Most snakes in Canada are non-venomous; and most snake bites are not fatal, only painful. Learning to identify snake species will assist you in responding appropriately to an encounter, and will assist medical professionals in determining if antivenin needs to be administered if anyone is bit.

5.3 Most snakes are non-aggressive and will only attack if immediately threatened.

5.4 **Prevention**

5.4.1 Before venturing out into the wilderness, familiarize yourself with the snakes in your area, both venomous and non-venomous species.

5.4.2 Learn which habitats the venomous species in your region are likely to be encountered in, and use caution when in those habitats.

5.4.3 Try as much as possible not to take a snake by surprise.

5.4.4 Stay on trails where possible, and watch where you place your hands and feet, especially when climbing or stepping over fences, large rocks, and logs, or when collecting firewood. Take care when overturning any objects on the ground when in snake country.

5.4.5 If you see a snake, give it as much room as possible. Most snakes have a strike distance that is only half the length of their body.

5.4.6 If you get very close to a rattlesnake, hold very still until it calms down and starts to move away. Then slowly move backwards until you are at least one snake-body length away.

5.5 **Treatment**

5.5.1 Venomous snakebites are rare, and they are rarely fatal to humans. Of the 8,000 snakebite victims in the United States each year, only about 10 to 15 die. In Canada the number of snake bites each year is very small. However, for any snakebite the best course of action is to get medical care as soon as possible.

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5.5.2 Try to keep the snakebite victim still, as movement helps the venom spread through the body.

5.5.3 Keep the injured body part motionless and just below heart level.

5.5.4 Keep the victim warm, calm, and at rest, and transport him or her immediately to medical care.

5.5.5 Do not allow him to eat or drink anything.

5.5.6 If medical care is more than half an hour away, wrap a bandage a few inches above the bite, keeping it loose enough to enable blood flow (you should be able to fit a finger beneath it). Do not cut off blood flow with a tight tourniquet. Leave the bandage in place until reaching medical care.

5.5.7 If you have a snakebite kit, wash the bite, and place the kit's suction device over the bite. (Do not suck the poison out with your mouth.) Do not remove the suction device until you reach a medical facility.

5.5.8 Identify the snake that caused the bite to determine if it is venomous, and if antivenin needs to be administered. Do not waste time or endanger yourself trying to capture or kill it. Note the shape & color of the snake's head.

5.5.9 If you are alone and on foot, start walking slowly toward help, exerting the injured area as little as possible.

- ☐ Note that there are several species of snakes that superficially resemble rattlesnakes. Several species, including Bull, Milk, Fox, and Rat Snakes will even rattle their tails when startled.
- ☐ Massasauga Rattlesnake is recognized as a Threatened Species in Ontario and it is an offence to harass, , or destroy the habitat of this species.
- ☐ One scorpion species, the Northern Scorpion (*Paruroctonus boreus*) occurs in semi-arid areas of southern British Columbia, Alberta, and Saskatchewan. It carries a stinger on the end of its tail. The sting is painful but not life threatening unless there is an allergic reaction.

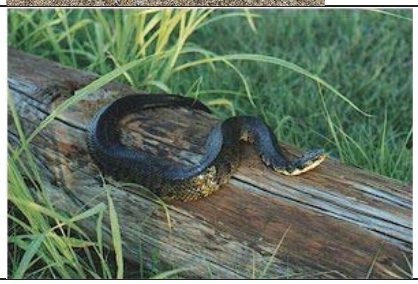
6.0 Species

6.1 Venomous Snakes in Canada

Eastern Massasauga Rattlesnake (*Sistrurus catenatus*) found around Wainfleet, Windsor, Bruce Penninsula and eastern Georgian Bay in Ontario.	Eastern Massasauga Rattlesnake picture by Michael Redmer/Courtesy Lincoln Park Zoo
Northern Pacific Rattlesnake (*Crotalus viridis*) found primarily in Okanagan and Thompson River valleys of southern British Columbia.	

Prairie Rattlesnake (*Crotalus viridis*) found in south eastern Alberta, and south western Saskatchewan.	

6.2 Venomous snakes in the U.S.

Rattlesnake(*Crotalus cerastes)* found mostly concentrated in the southwestern United States, they extend north, east and south in diminishing numbers and varieties. Every contiguous state has one or more varieties of rattlesnake. The rattlesnake is found in many different biomes ranging from along the coast at sea level, the inland prairies and desert areas to the mountains at elevations of more than 10,000 feet. Species include: Sidewinder, Santa Catalina, Western, Mojave, Red Diamond, Western Diamond, Ridge Nosed, Eastern Diamondback, and Pigmy.	Western Rattlesnake Eastern Diamondback
Copperhead (*Agkistrodon contortrix*) is the most common venomous snake found in the eastern US. It can be found in the states of Texas, Oklahoma, Kansas, Missouri, Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Tennessee, Kentucky, Virginia, Illinois, Indiana, Ohio, Iowa, Pennsylvania, Maryland, New Jersey, Delaware, New York, Connecticut, and Massachusetts.	
Cottonmouths (water moccasins) (*Agkistrodon piscivorus)* found in the eastern United States from Virginia, south through the Florida peninsula and west to Arkansas, eastern and southern Oklahoma, and east and central Texas..	

Coral Snake (*Micrurus sp.)* found in the southern range of many temperate US states including North Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Arkansas, Kentucky, Arizona, and New Mexico.	Eastern Coral Snake, *Micrurus fulvius*

7.0 References

7.1 *The Eastern Massasauga Rattlesnake Stewardship Guide. A resource and field guide for living with rattlesnakes in Ontario.* Sponsored by the Government of Canada, and distributed on behalf of the Toronto Zoo and the Eastern Massasauga Rattlesnake Recover Team.

7.2 http://www.rattlesnakes.us/

7.3 **http://drdavidson.ucsd.edu/Portals/0/snake/Crotalus.htm**

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5-313-Ticks

1.0 Background

1.1 The Public Health Agency of Canada (PHAC) works with the provinces, health authorities and other experts on research to define and monitor the occurrence of the ticks that carry *Borrelia burgdorferi*, the bacterium that causes Lyme disease. In Canada, the blacklegged tick (*Ixodes scapularis*; often referred to as a deer tick) and the western blacklegged tick (*Ixodes pacificus*) are the species known to transmit this disease-causing agent, as well as other less common agents.

1.2 In Quebec, blacklegged tick populations are becoming established in parts of the Monteregie and Estrie regions in the southeast of the province. In Ontario, populations can be found in Long Point; Point Pelee National Park; Rondeau Provincial Park; Turkey Point; Prince Edward Point National Wildlife Area and St. Lawrence Islands National Park in the Thousand Islands region of eastern Ontario. In Nova Scotia, blacklegged tick populations are found in the Lunenburg, Bedford and Shelburne areas. An established population has also been found in the southeastern corner of Manitoba. Western blacklegged ticks, on the other hand, are found in British Columbia; they are fairly widely distributed but populations are largest in the lower mainland, on Vancouver Island, and in the Fraser Valley.

1.3 Although the distribution of blacklegged ticks in Canada appears to be limited, surveillance indicates that some of the established populations are spreading within certain areas of southern Canada. The potential expansion of localized tick populations makes it difficult to precisely define the geographic limits of any given population; however, people living in or visiting areas adjacent to established tick populations may have a greater chance of contact with blacklegged ticks. Although current evidence does not suggest a widespread distribution of blacklegged tick populations in Canada, the establishment of new populations appears to be an ongoing process. Hence, it is desirable to continue surveillance and to take precautions to reduce tick contact.

1.4 The rate of infection of ticks with the bacterium that causes Lyme disease varies. Infection rates are typically higher in adult ticks compared to the other stages (nymphs and larvae). Despite the lower rates of infection, people are most likely to acquire Lyme disease from a nymph because this stage is so small (see Figure 2) and thus more likely to go unnoticed and feed for a sufficient amount of time for the Lyme disease bacterium to be transmitted (24-36 hours). Infection rates are often greater in tick populations that have been established for long periods of time (such as Long Point) compared to newly established ones. As many as 60 percent of the adult ticks at Long Point are infected; however, infection rates in adults are more often between 10 and 25 percent at the other localities where ticks are established. Partly because of differences in the types of hosts that they feed upon, infection rates of the Lyme disease agent in *Ixodes pacificus* are much lower (1-3 percent) than *Ixodes scapularis*.

1.5 While there is a higher risk of coming in contact with infected blacklegged ticks in areas where populations are established, there is also a low risk of Lyme disease being contracted almost anywhere in Canada because migratory birds transport infected ticks over large geographic distances. Surveillance data indicates that about 12 percent of the ticks detected outside of areas where tick populations are established, and likely transported there on migratory birds, are infected with the agent of Lyme disease.

1.6 Source: http://www.phac-aspc.gc.ca/id-mi/tickinfo-eng.php

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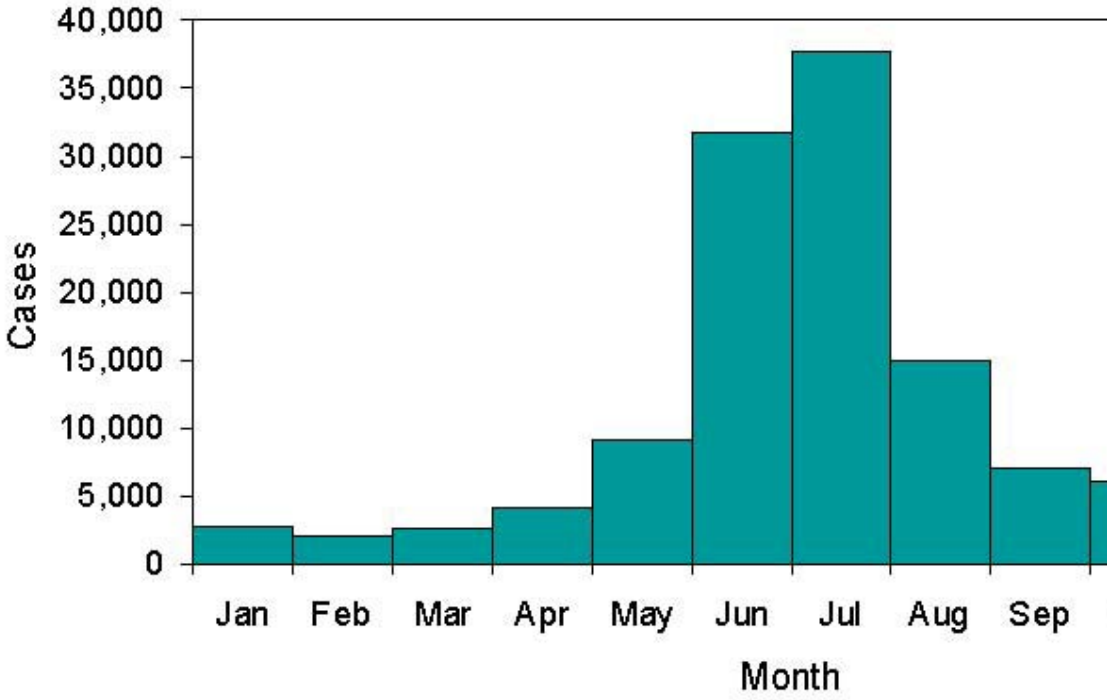
Figure 1

Reported Cases of Lyme Disease by Month of Illness Onset United States, 1992-2004



Lyme disease patients are most likely to have illness onset in June, July, or August and less likely to have illness onset from December through March.

Lyme disease likelihood = April through November http://www.cdc.gov/ncidod/dvbid/lyme/ld_rptmthofill.htm

2.0 Tick removal tips from CDC

http://www.cdc.gov/ncidod/dvrd/ehrlichia/Q&A/Q&A.htm

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3.0 To Remove Attached Ticks

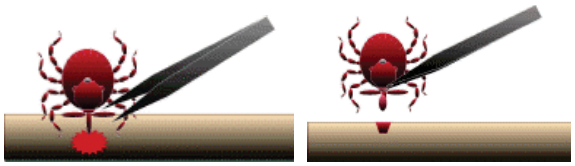
3.1 Use fine-tipped tweezers or notched tick extractor, and protect your fingers with a tissue, paper towel, or latex gloves (see figure). Persons should avoid removing ticks with bare hands.

3.2 Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. (If this happens, remove mouthparts with tweezers. Consult your health care provider if illness occurs.)

3.3 After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.

3.4 Do not squeeze, crush, or puncture the body of the tick because its fluids may contain infectious organisms. Skin accidentally exposed to tick fluids can be disinfected with iodine scrub, rubbing alcohol, or water containing detergents.

3.5 Save the tick for identification in case you become ill. This may help your doctor make an accurate diagnosis of potential diseases by determining what type of tick it is. Place the tick in a sealable plastic bag and put it in your freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.



4.0 Devices Designed for Removing Ticks

4.1 **The Tick Tool - http://www.ticktool.com/index.html**

5.0 Folklore Remedies Don't Work

5.1 Folklore remedies, such as the use of petroleum jelly or hot matches, do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva or regurgitate gut contents, increasing the chances of transmitting the pathogen. These methods of tick removal should be avoided.

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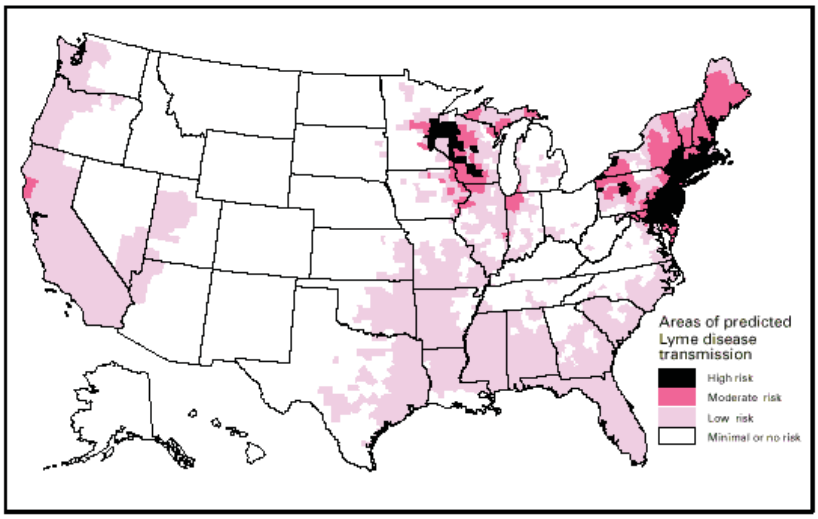
Information Regarding Common Tick-Borne Diseases and Tick Removal Procedures

Table 1
Common Tick-Borne Diseases in the U.S. and Information Resources

Disease	Tick Species	CDC Informational Web Pages
Lyme disease	☐Black-legged or deer tick ☐Western black legged tick	http://www.cdc.gov/ncidod/dvbid/lyme/
Ehrlichiosis	☐Lone star tick ☐Black-legged or deer tick ☐Western black legged tick	http://www.cdc.gov/Ncidod/dvrd/ehrlichia/Index.htm
Rocky Mountain spotted fever	☐American dog tick ☐Rocky Mountain wood tick ☐Brown dog tick	http://www.cdc.gov/ncidod/dvrd/rmsf/index.htm

6.0 Distribution

Figure 2
Distribution Map for Lyme Disease Risk, U.S.



Note: This map demonstrates an approximate distribution of predicted Lyme disease risk in the United States. The true relative risk in any given county compared with other counties might differ from that shown here and might change from year to year. Risk categories are defined in the accompanying text. Information on risk distribution within states and counties is best obtained from state and local public health authorities.

Source: CDC, http://www.cdc.gov/ncidod/dvbid/lyme/riskmap.htm

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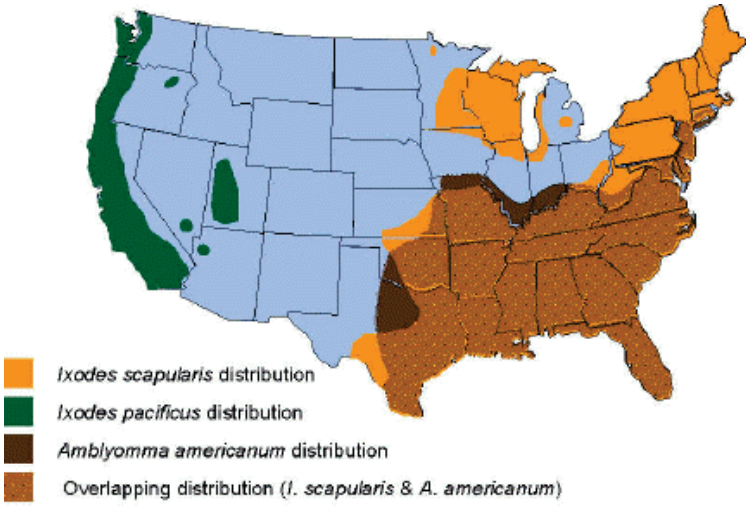
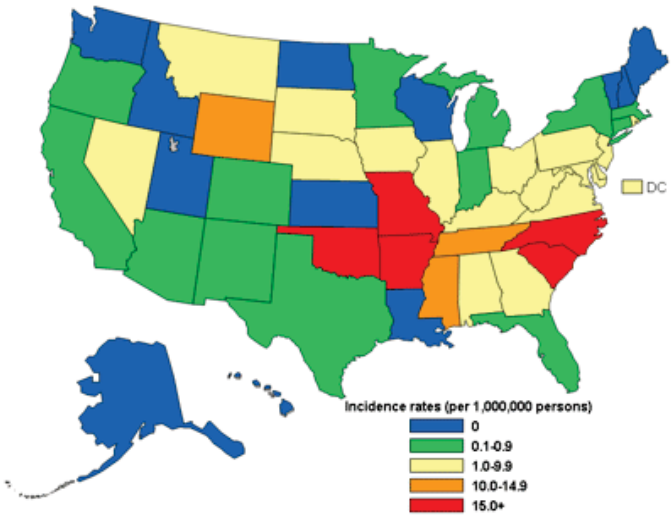
Figure 3
Distribution Map of Vector

Tick Species for Human Ehrlichiosis, U.S.



Source: CDC, http://www.cdc.gov/ncidod/dvrd/ehrlichia/Q&A/Q&A.htm

Figure 4
Distribution Map of Annual Incidence
of Rocky Mountain Spotted Fever, U.S



Data for calendar year 2002

Source: CDC, http://www.cdc.gov/ncidod/dvrd/rmsf/Epidemiology.htm

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5-313-Tick Test Request Form

IGeneX, Inc.
795 San Antonio Road
Palo Alto, CA 94303
800/832-3200
www.igenex.com

TICK TEST REQUEST FORM

Revised: JUNE 2008

TO SEND A TICK:

- Place ticks (up to 20) in a small tube or plastic baggy with a small piece of moist cotton.
- Place container in a sealed plastic bag.
- Fill out lower portion of this form.
- Place form, check and sealed plastic bag in padded envelope or box.
- Send to IGeneX, Inc. and mark front of envelope or box with "TT".
- IGeneX does not "TYPE" or determine the species of the ticks. If you want to "TYPE" your tick, please contact your local Vector Control Center.
- Once your tick(s) have been processed, the tick can not be returned to you.
- For Multiple Ticks: up to 20 ticks will be tested together at one time unless indicated otherwise.
  If ticks are tested separately, the charge is per tick. Please test my ticks separately. Yes ☐

Please test the tick by PCR for:

☐	Test 140	Lyme Disease (B. burgdorferi)	$65.00
☐	Test 689	Babesiosis (B microti and/or B duncani)	$65.00
☐	Test 148	Ehrlichiosis (Ehrlichia)	$65.00
☐	Test 290	Bartonella henselae	$65.00
☐	Test 975	Rickettsia	$65.00

Name and Address of Sender:

_____

_____

_____

Phone: (_____) _____

If you would like results faxed or called, please indicate below. Otherwise, results will be mailed by USPS.

_____Please fax my completed results to:
(_____)_____-_____

_____Please call me with my results at:
(_____)_____-_____

☐ Check enclosed payable to IGeneX, Inc.

☐ Please charge my credit card for the above tests:

☐ Visa ☐ Mastercard ☐ Discover

Card Number: _____

Exp. Date_____

Signature_____

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5-313 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

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

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/opprd001/factsheets/picaridin.pdf

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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 *5-511 Heat Stress Prevention.*

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 *5-313-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 *5-208 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.

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4.6.4 Epi-pens[1] 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 *5-313-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.

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[1] *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.*

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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). 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). 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 *5-313-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 *5-313-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

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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 *5-313-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..

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[2] (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 *5-313-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

[2] *Phytodermatisi producer: keep skin covered and wash well after exposure*

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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:

- ☐ *5-313-Snakes*
- ☐ *5-313-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.

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 repellentrepellent should be available if exposure to spiders, flying insects, or other biological hazards is encountered.

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- ☐ 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 repellentrepellent 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 *5-313-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.

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- ☐ 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 *5-313-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 *5-208 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. 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

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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 *5-313-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 RCSHEM for follow up.

5.0 Records

None.

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05-505-Cold Stress Prevention

1.0 Purpose and Scope

1.1 To protect workers from the severest effects of cold stress (hypothermia) and cold injury and to identify exposures to cold working conditions under which it is believed nearly all workers can be repeatedly exposed without adverse health effects.

1.2 This procedure applies to all Resolution Consultants employees and operations.

2.0 Terms and Definitions

2.1 **Cold Stress:** The production of physiological effects due to cold temperatures and\or wind chill.

2.2 **Frostbite:** Freezing of tissue, often resulting in tissue death.

2.3 **Hypothermia:** Condition of reduced core body temperature resulting in loss of dexterity, loss of mental alertness, collapse, and possible death.

2.4 **Wind Chill:** The effect of air movement on apparent temperature in a cold environment.

3.0 References

None.

4.0 Procedure

4.1 Restrictions

4.1.1 Staff working in extreme cold or snow for extended periods of time away from a shelter or vehicle shall not work alone.

4.1.2 All staff working in extreme cold or snow conditions should understand the following guidelines for preventing and detecting hypothermia and frost bite.

4.1.3 If you experience frost bite or hypothermia, find shelter and warmth and contact a medical practitioner if symptoms persist.

4.1.4 Take frequent short breaks in warm dry shelters to allow your body to warm up. Limit time of exposure.

4.1.5 Try to schedule work for the warmest part of the day or when the wind is most calm.

4.1.6 Avoid exhaustion or fatigue because energy is needed to keep muscles warm.

4.1.7 Because prolonged exposure to cold air or to immersion in cold water at temperatures even well above freezing can lead to dangerous hypothermia, whole-body protection shall be used.

4.2 Roles and Responsibilities

4.2.1 Project Managers/Field Task Managers:

- Implement cold stress prevention measures as applicable at each work site.
- Develop/coordinate a work-warning regimen, as applicable.
- Confirm cold stress hazard assessments/evaluations were completed for the planned activities.
- Assign personnel physically capable of performing the assigned tasks.
- Confirm personnel are properly trained to recognize the symptoms of cold stress.

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4.2.2 Regional SH&E Managers:

- Conduct/support cold stress assessments/evaluations.
- Conduct/support incident investigations related to potential cold stress-related illnesses.
- Assist project teams develop appropriate work-warming regimens.
- Provide cold stress awareness training.

4.2.3 Supervisors:

- Identify the tasks that may be most impacted by cold stress and communicate the hazard to the assigned employees.
- Confirm that employees have been trained on the recognition of cold stress-related illnesses.
- Confirm that adequate supplies of warm fluids/drinks are readily available to employees.
- Confirm that a warm/sheltered rest area is available, as applicable.
- Conduct cold stress monitoring, as applicable.
- Implement the work-warming regimen.
- Confirm that first aid measures are implemented once cold stress symptoms are identified.
- Confirm that personnel are physically capable of performing the assigned tasks and are not in a physically compromised condition.

4.2.4 Employees:

- Observe each other for the early symptoms of cold stress-related illnesses.
- Maintain an adequate intake of available fluids.
- Report to work in a properly vested condition.
- Report all suspected cold stress-related illnesses.

4.3 Training

4.3.1 Before they begin work, project staff who may be exposed to cold stress will be informed of the potential for cold stress and how to prevent cold stress.

4.3.2 Personnel potentially exposed to cold stress will receive training including, but not limited to:

- Sources of cold stress, the influence of protective clothing, and the importance of acclimatization
- How the body loses heat.
- Recognition of cold-related illness symptoms.
- Preventative/corrective measures.
  - Employees will be informed of the harmful effects of excessive alcohol consumption in a cold stress environment.
- First aid procedures for symptoms related to cold stress.

4.4 Personal Protective Equipment

4.4.1 Wear multiple layers of clothing to maintain immobile layers of warm air next to the body.

4.4.2 Avoid cotton, especially blue jeans.

4.4.3 Wear proper clothing, including head coverings and gloves or mittens for cold, wet, and windy conditions.

4.4.4 Use insulated footwear with adequate traction to prevent slips and falls.

4.4.5 Confirm extra blankets or sleeping bags are on-site.

4.4.6 Sunglasses and sunscreen should be used when there is a persistent combination of snow and direct sun.

4.4.7 If shelter is not readily available, confirm that staff carry fire starter materials (see the Safe Work Practice for Wilderness Isolation).

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4.4.8 Pack warm, sweet drinks, and high-calorie food for snacks.

4.5 General Cold Stress Prevention Measures

4.5.1 In order to prevent hypothermia:

- Wear multiple layers of clothing to maintain immobile layers of warm air next to the body. Avoid cotton, especially blue jeans.
- When active, ventilate excess heat by opening or removing outer layers of clothing to avoid sweating.
- Start with the mitten or gloves, unless protection from ice, snow, or cold metal surfaces is needed.
- Next remove head gear and neck wrappings.
- Then coats/parkas should be opened at the waist and sleeves.
    - Finally, layers of clothing should be taken off.
    - When resting or tired, or colder conditions are encountered, add additional layers of clothing/ close outer layers in the reverse of the above order, or get out of the cold. Have a sweet drink but do not indulge in heavy eating.
    - Garments worn to keep out rain and spray should also allow water vapor to escape.
    - Take advantage of heat from the sun and stay out of the wind as much as possible.
    - Have available emergency shelter providing protection from wind and rain and insulation from the ground.
    - Replace wet clothing. If wet clothing cannot be replaced, then cover it with a layer of non-breathing material to prevent evaporation. Place an insulation layer over this non-breathing material.
    - Get adequate rest; conserve energy.
    - Get adequate nutrition to replenish energy stores; rest after meals.
    - Drink adequate fluids to avoid dehydration.
    - If any project staff member shows signs of hypothermia, stop and treat him/her.

4.5.2 In order to prevent frostbite:

- Dress to prevent hypothermia and protect the feet and hands.
- Avoid obstruction of circulation by, for example, tight boots or tightly fitting clothing.
- Avoid nicotine, particularly cigarettes, and alcohol.
- Keep ears and nose covered and out of the wind.
- Frostbite of the corneas of the eyes can be prevented by protective goggles.
- Adopt a “buddy system” of constantly watching the faces of others in the party for white skin tissue, which is evidence of frostbite (frostnip).
- Practice constant personal vigilance for signs of trouble in one’s own fingers and toes; when in doubt, investigate thoroughly before it is too late.

4.5.3 Adequate, insulating dry clothing that will help maintain core temperatures above 96.8^{o}F (37°C) shall be provided to workers if work is performed in air temperatures below 40°F (5°C). Wind chill cooling rate and the cooling power of air are critical factors. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.

4.5.4 An Equivalent Chill Temperature (ECT) chart relating the actual dry bulb air temperature and the wind velocity is presented in *05-505-Temperature Thresholds.* Unless unusual or extenuating circumstances exist, cold injury to other than hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia. Superficial or deep local tissue freezing will occur only at temperatures below 32°F (0° C) regardless of wind speed. However, older workers or workers with circulatory problems require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions that should be considered.

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4.5.5 Continuous exposure of skin should not be permitted when the air speed and temperature results in an ECT of –25°F (-32° C) or below.

4.5.6 At air temperatures of 40°F (5°C) or less, it is imperative that workers who become immersed in water or whose clothing becomes wet be immediately removed from the cold environment, provided a change of clothing, and be treated for hypothermia.

4.5.7 If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.

4.5.8 Adequate protection, such as general ventilation, shall be incorporated into any warming shelter design to prevent carbon monoxide poisoning.

4.5.9 Operation of internal combustion or similar devices within warming shelters is prohibited.

4.5.10 If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.

4.6 Cold Stress Prevention Measures for the Hands

4.6.1 Special protection of the hands is required to maintain manual dexterity for the prevention of accidents including, but not limited to the following:

- If fine work is to be performed with bare hands for more than 10 to 20 minutes in an environment below 60oF (15o C), special provisions should be established for keeping the workers' hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized. Metal handles of tools and control bars should be covered by thermal insulating material at temperatures below 30oF (-1o C).
- If the air temperature falls below 60oF (15o C) for sedentary work, 40oF (5o C) for light work, or 20oF (-6o C) for moderate work, and fine manual dexterity is not required, workers should use gloves.

4.6.2 To prevent contact frostbite, workers should wear anti-contact gloves:

- When cold surfaces below 20°F (-6° C) are within reach, each worker should be warned to prevent inadvertent contact by bare skin.
- If the air temperature is 0°F (-18° C) or less, workers should protect their hands with mittens. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.

4.6.3 Provisions for additional total body protection are required if work is performed in an environment at or below 40°F (5° C). The workers should wear cold protective clothing appropriate for the level of cold and physical activity.

4.6.4 Additional Cold Stress Prevention Measures. For work practices at or below 10°F (-12° C) ECT, the following will apply:

- The worker should be under constant protective observation (buddy system or supervision).
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work is being performed, rest periods should be taken in heated shelters and opportunities to change into dry clothing should be provided.
- New employees should not be required to work full time in the cold during the first days of employment until they become acclimated to the working conditions and required protective clothing.
- The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the worker.
- The work should be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats should not be used. The worker should be protected from drafts to the greatest extent possible.
- Workers should be instructed in safety and health procedures, which should address:
  - Proper rewarming procedures and appropriate first aid treatment.

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- Proper clothing practices.
- Proper eating and drinking habits.
- Recognition of impending frostbite.
- Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
- Safe work practices.

4.6.5 Eye protection for workers employed outdoors in a snow and/or ice-covered terrain should be supplied. Special safety goggles to protect against blowing ice crystals and ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) should be required when there is an expanse of snow coverage causing a potential eye exposure hazard.

4.6.6 Workers handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of “cryogenic fluids” or those liquids with a boiling point that is just above ambient temperature.

4.6.7 Trauma sustained in freezing or subzero conditions requires special attention, because an injured worker is predisposed to cold injury. Special provisions should be made to prevent hypothermia and freezing of damaged tissue in addition to providing for first aid treatment.

4.7 Work-Warming Regimen

4.7.1 If work is performed continuously in the cold at an equivalent chill temperature (ECT) at or below -15°F (–26°C), heated warming shelters (tents, cabins, rest rooms, etc.) should be made available nearby. The workers should be encouraged to use these shelters at regular intervals; the frequency will depend on the severity of the environmental exposure.

4.7.2 The onset of heavy shivering, minor frostbite (frostnip), the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter.

4.7.3 When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing should be loosened to permit sweat evaporation or a change of dry work clothing provided.

4.8 A change of dry work clothing should be provided as necessary to prevent workers from returning to the cold environment with wet clothing.

5.0 Records

None.

6.0 Attachments

6.1 05-505-Temperature Thresholds

6.2 05-505-Symptoms and Treatment

6.3 05-505-Cold Exposure

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05-505-Temperature Thresholds

1.0 Purpose and Scope

1.1 The following table gives apparent temperatures (wind chill) for various combinations of wind and air temperature, as well as guidelines to the danger of skin exposure.

Table 1. Wind Chill Chart (C)

Actual Temp (°C)	Wind Speed in km/hour									
	8	**16**	**24**	**32**	**40**	**48**	**56**	**64**	**72**	**80**
	Ambient Temperature (°C)									
0	-2	-8	-11	-14	-16	-17	-18	-19	-19	-20
-5	-7	-14	-18	-21	-23	-25	-26	-27	-28	-28
-10	-12	-20	-25	-28	-31	-33	-34	-35	-36	-36
-15	-18	-26	-32	-35	-38	-40	-42	-43	-43	-44
-20	-23	-32	-38	-43	-46	-48	-50	-51	-52	-52
-25	-28	-38	-45	-50	-53	-56	-57	-59	-59	-60
-30	-33	-45	-52	-57	-61	-63	-65	-67	-67	-68
-35	-39	-51	-59	-64	-68	-71	-73	-75	-75	-76
-40	-44	-57	-65	-71	-75	-79	-81	-83	-83	-84
-45	-49	-63	-72	-78	-83	-86	-89	-90	-91	-92
-50	-54	-69	-79	-85	-90	-94	-96	-98	-99	-100

Note: A. Little Danger: if less than one hour of exposure to dry skin.
B. Danger: Exposed flesh freezes within one minute.
C. Great Danger: Flesh may freeze with in 30 seconds.

*Source: *Threshold Limit Values (TLV™) and Biological Exposure Indices (BEI™) booklet; published by ACGIH, Cincinnati, Ohio.*

Table 2. Equivalent Chill Temperature Chart (F)

Estimated Wind Speed (mph)	Actual Temperature Reading (°F)									
	50	**40**	**30**	**20**	**10**	**0**	**-10**	**-20**	**-30**	**-40**
	Equivalent Chill Temperature (°F)									
Calm	50	40	30	20	10	0	-10	-20	-30	-20
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-24	-33	-46	-58	-70
15	36	22	9	-5	18	-32	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-75	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	35	-51	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Wind speeds >40 mph have little additional effect	**LITTLE DANGER**				**INCREASING DANGER**			**GREAT DANGER**		
	Trenchfoot and immersion foot may occur at any point on this chart.									

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Table 3. Work-Warming Schedule Guidelines

Air Temp. (Sunny Sky) °F	No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind		25 mph Wind		Air Temp. (Sunny Sky) °C
	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	
above 5°	Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		above -15°
5° to –1°											100 min	2	-15° to -17°
0° to –4°									100 min	2	75 min	2	-18° to -20°
-5° to –9°							100 min	2	75 min	2	55 min	3	-21° to -22°
-10° to –14°					100 min	2	75 min	2	55 min	3	40 min	4	-23° to -25°
-15° to –19°			100 min	2	75 min	2	55 min	3	40 min	4	30 min	5	-26° to -28°
-20° to –24°	100 min	2	75 min	2	55 min	3	40 min	4	30 min	5	Cease Work		-29° to -31°
-25° to –29°	75 min	2	55 min	3	40 min	4	30 min	5	Cease Work				-32° to -34°
-30° to –34°	55 min	3	40 min	4	30 min	5	Cease Work						-35° to -37°
-35° to –39°	40 min	4	30 min	5	Cease Work								-38° to -39°
-40° to –44°	30 min	5	Cease Work										-40° to -42°
-44° & below	Cease Work												-43° & below

Modified from ACGIH 2002 Threshold Limit Values for Chemical Substances and Physical Agents.

Note 1: Schedule describes the maximum continuous duration of work and number of 10-15 minute breaks to be observed during any 4-hour work period and assumes that period will be followed by an extended warm-up period (e.g., lunch). Allowed breaks should be taken in a warm environment.

Note 2: Schedule applies to moderate to heavy work performed by acclimated workers wearing appropriate layered clothing. For light to moderate work apply the schedule for conditions one step lower. For unacclimated workers apply the schedule for conditions two steps lower. These modifications are additive.

Note 3: For work under 25%–50% overcast/clouds, apply the schedule for conditions one step lower. For work at night or under greater then 50% overcast/clouds, apply the schedule for conditions two steps lower. These modifications are additive with any applicable modifications from Note 2.

Note 4: For wind speeds in excess of 25 mph, cease all nonemergency work when temperatures fall below 5°F.

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05-505-Symptoms and Treatment

1.0 Cold Stress-related Illnesses

1.1 Frostbite

1.1.1 Frostbite is a localized cold injury characterized by freezing of the tissues with ice crystal formation.

1.1.2 This injury is almost always limited to the upper and lower extremities or to such appendages as the ears or nose.

1.1.3 Conditions conducive to frostbite include sub-zero temperatures, hypothermia (most important predisposing factor), dehydration, obstruction of the blood supply to the extremities (by constricting clothing, especially on the feet or at the wrists or ankles), contact with cold metal, contact with organic liquids (such as gasoline or solvents that have been left outdoors in sub-zero temperatures), use of substances that cause vasoconstriction (such as smoking tobacco), or other injury or shock.

1.1.4 Symptoms of frostbite include:

- Pain in the involved tissue is the earliest symptom.
- Sudden and complete cessation of cold or discomfort in affected fingers or toes, often followed by a pleasant feeling of warmth.
- Subsequently the only symptom may be the absence of any sensation in the frozen part.
- Paleness in the affected tissues.
- Firm or hard tissues.
- Purple tissue, if a large area, such as an entire hand or food, is frostbitten.

1.1.5 If exposure occurs in temperatures that are below freezing (32ºF or below), frostbite or trench foot (immersion foot) may accompany or complicate the symptoms of hypothermia. Frostbite is the freezing of living tissues with a resultant breakdown of cell structure. Symptoms due to frostbite may include, but is not limited to:

- Superficial redness of the skin
- Slight numbness
- Blisters
- Obstruction of blood flow (ischemia)
- Blood clots (thrombosis)
- Skin discoloration due to insufficient oxygen in the blood (cyanosis)

1.1.6 Frostbite may occur if the skin comes into contact with objects with a surface temperature below freezing, such as metal tool handles. Trench foot is caused by continuous exposure to cold combined with persistent dampness or immersion in water. Injuries in this case include permanent tissue damage due to oxygen deficiency, damage to capillary walls, severe pain, blistering, tissue death, and ulceration.

1.1.7 Additionally, cold exposures may either induce or intensify vascular abnormalities. These include chilblain (a swelling or sore), Raynaud's disease, acrocyanosis (blueness of hands and feet) and thromboangiitis (inflammation of the innermost walls of blood vessels with accompanying clot formation). Workers suffering from these ailments should take particular precautions to avoid chilling.

1.2 Hypothermia

1.2.1 Hypothermia is a lower than normal body temperature that occurs when outer cold cools the body faster than the body can produce heat to stay warm.

1.2.2 Hypothermia can be caused by exposure to wind, cold, and/or moisture. The combination of wind, cold, and moisture can be deadly.

1.2.3 Early warning signs of hypothermia:

- Feeling of being cold and tired.
- Heavier breathing and increased pulse rate.
- Tendency to keep moving (e.g., stamping feet, rubbing hands, continued walking/pacing).
- Goose bumps, holding arms tightly wrapped around the body, hunching of shoulders.

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- Shivering.

1.2.4 Hypothermia damages both the body's internal temperature mechanisms (hypothalamus) and the peripheral mechanisms to prevent heat loss (vasoconstriction and perspiration.) These effects may last up to three years after the initial hypothermia episode. Symptoms of hypothermia may include, but are not limited to:

- Pain in the extremities.
- Severe shivering and numbness.
- Low core body temperature.
- Drowsiness and muscular weakness.
- Apathy.
- Mental confusion.
- Loss of consciousness.
- Shock.
- Decreasing pulse and breathing rate.

2.0 Recommended Treatment for Cold Stress-related Illnesses

2.1 Frostbite

2.1.1 Wrap the victim in woolen blanket and keep dry until he or she can be brought inside.

2.1.2 Remove the victim from the cold environment.

2.1.3 Do not rub, chafe, or manipulate frozen parts.

2.1.4 Place the victim in warm water (102ºF to 105ºF) and make sure the water remains warm. Test the water by pouring it on the inner surface of your forearm. Never thaw affected body parts if the victim has to go back out into the cold; refreezing can cause significant tissue damage.

2.1.5 Do not use hot water bottles or a heat lamp, and do not place the victim near a hot stove.

2.1.6 Do not allow the victim to walk if his or her feet are affected.

2.1.7 Have the victim gently exercise the affected parts once they are thawed.

2.1.8 Seek immediate medical attention for thawing of serious frostbite.

2.2 Hypothermia

2.2.1 Bring the victim into a warm room or shelter as quickly as possible.

2.2.2 Give artificial respiration and stop any bleeding, if necessary.

2.2.3 If the victim cannot be moved (spinal injury, etc.), carefully place newspapers, blankets, or some other insulation between the victim and the ground.

2.2.4 Remove all wet clothing.

2.2.5 Provide an external heat source, because the body cannot generate its own heat. Wrap the victim in prewarmed blankets, place him or her in the liner of a portable hypothermia treatment unit, put the torso (not the extremities) into a tub of warm water, or use body-to-body contact to rewarm the body core. These measures will slowly reopen the peripheral circulation, minimizing the possibility of after-shock or after-drop (the flowing of cooled, stagnated blood from the limbs to the heart), which may cause ventricular fibrillation, cardiac arrest, or death.

2.2.6 Do not allow the victim to sleep.

2.2.7 Give warm, sweet drinks. Do not give alcohol or pain relievers.

2.2.8 Keep the victim still. Do not try to walk.

2.2.9 Do not rub numb skin.

2.2.10 Get medical attention as soon as possible.

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05-505-Cold Exposure

The following Occupational Health and Safety regulations apply directly to cold and snow hazards:

Jurisdiction	Regulation
United States	
OSHA	Title 29, Code of Federal Regulations, Sections 1910.1027 and 1926.1127
Canada	
Alberta	n/a
British Columbia	OHS Regulation (1997) Sect 7.33 – 7.38
Manitoba	Workplace Health and Safety Regulation (217/2006) Sect 4.12, 4.14
New Brunswick	OHS Regulation (91-191) Sect 44
Newfoundland/Labrador	OHS Regulation (C.N.L.R. 1165/96) Sect 10
Nova Scotia	n/a
NWT/NU Territories	n/a
Ontario	O. Reg. 851 Sect 39, 129
Prince Edward Island	OHS Regulations (EC180/87) Sect 42.1
Quebec	OHS Regulation (R.R.Q., c. S-2.1, r.19.01 O.C. 885-2001) Schedule 4
Saskatchewan	OHS Regulation (R.R.S., c. O-1, r. 1) Sect 70 Cold Conditions Guidelines for Outside Workers
Yukon Territory	Occupational Health Regulations (O.I.C. 1986/164) Sect 9

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5-507-Hazardous Materials Communication / WHMIS

1.0 Purpose and Scope

1.1 Provides a Hazard Communication Program so that Resolution employees are informed of the hazards of the chemicals to which they may be exposed in the course of their work by way of container labeling and other forms of warning, material safety data sheets (MSDS), and employee training.

1.2 This procedure applies to all Resolution JV Partner employees and operations.

1.3 The program applies to the use of any hazardous substances which are known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

2.0 Terms and Definitions

A complete list of definitions can be found in their entirety in the HMR, the TDG Regulations, and the IATA DGR.

2.1 **Acute Effect:** An adverse effect on the human body with immediate onset of symptoms.

2.2 **Article:** A manufactured item: (1) which is formed to a specific shape or design during manufacture; (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and, (3) which does not release or otherwise result in exposure to, a hazardous chemical, under normal conditions of use.

2.3 **Carcinogen:** Those chemicals appearing in any of the following reference sources are established as carcinogens for hazard communication purposes:

- National Toxicology Program (NTP) Annual Report on Carcinogens.
- International Agency for Research on Cancer (IARC) Monographs, Volumes 1-34. Note: The Registry of Toxic Effects of Chemical Substances published by NIOSH indicates whether a substance has been found by NTP or IARC to be a potential carcinogen.

2.4 **Chemical Name:** The scientific designation of a substance in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry or the system developed by the Chemical Abstracts Service.

2.5 **Chronic Effect:** An adverse effect on the human body with symptoms which develop slowly over a long period of time or which frequently recur.

2.6 **Combustible Liquid:** Any liquid having a flash point at or above 100°F (37.8°C) but below 200°F (93.3°C), except any mixture having components with flash points of 200°F (93.3°C), or higher, the total volume of which makes up 99% or more of the total volume of the mixture.

2.7 **Common Name:** Any designation or identification such as code name, code number, trade name or brand name used to identify a substance other than by its chemical name.

2.8 **Container:** Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank or the like that contains a hazardous chemical. For purposes of this Safety Operating Procedure (SOP) and Occupational Safety and Health Administration (OSHA) standard, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle are not considered to be containers.

2.9 **Establishment:** Any separate and distinct Resolution office, laboratory or other company facility.

2.10 **Exposure:** Any situation arising from work operations where an employee may ingest, inhale, absorb through the skin or eyes or otherwise come into contact with a hazardous substance.

2.11 **Flammable:** A substance that falls into one of the following categories:

- **Flammable Aerosol**: An aerosol that when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening or flashback (a flame extending back to the valve) at any degree of valve opening;
- **Flammable Gas**: A gas that at ambient temperature and pressure:

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- Forms a flammable mixture with air at a concentration of 13% of volume or less; or
- Forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.

- **Flammable Liquid**: Any liquid having a flash point below 100°F (37.8°C), except any mixture having components with flash points of 100°F (37.8°C) or higher, the total of which make up 99% or more of the total volume of the mixture.
- **Flammable Solid**: A solid, other than a blasting agent or explosive as defined in 8 CCR 5237(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change or retained heat from manufacturing or processing or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.
  - A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

2.12 **Flash Point:** Minimum temperature of a liquid at which it gives off sufficient vapors to form an ignitable mixture with the air near the surface of the liquid or within the container used.

2.13 **Hazardous Chemical:** Those chemicals appearing in any of the following reference sources are established as hazardous chemicals for hazard communication purposes.

- 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, OSHA.
- Hazardous Products Act, R.C.S. 1985, c. H-3, section 2, Canada
- For operations within the state of California, the list of hazardous substances prepared by the California Director of Industrial Relations pursuant to Labor Code Section 6382. The concentrations and footnotes, which are applicable to the list, shall be understood to modify the same substance on all other source lists or hazard determinations set forth in § 8 CCR 5194(d)(3)(B) and (d)(5)(D).

2.14 **Hazardous Substance:** A hazardous chemical or carcinogen, or a product or mixture containing a hazardous chemical or carcinogen provided that:

- The hazardous chemical is 1% or more of the mixture or product or 2% if the hazardous chemical exists as an impurity in the mixture; or
- The carcinogen is 0.1%or more of the mixture or product.
- Manufacturers, importers and distributors will be relied upon to perform the appropriate hazard determination for the substances they produce or sell.

2.15 The following materials are not covered by the Hazard Communication Standard:

- Any hazardous waste as defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC 6901 et seq.) when subject to regulations issued under that act by the Environmental Protection Agency.
- Tobacco or tobacco products
- Wood or wood products. Note: Wood dust is not exempt since the hazards of wood dust are not “self-evident” as are the hazards of wood or wood products
- Consumer products (including pensm, pencils, adhesive tape) used in the work place under typical consumer usage
- Articles (i.e. plastic chairs)
- Foods, drugs, or cosmetics intended for personal consumption by employees while in the work place
- Foods, drugs, cosmetics in retail store packaged for retail sale
- Any drug in solid form used for direct administration to the patient (i.e., tablets or pills)

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2.16 **Hazardous Substance Inventory (HSI):** A listing of all chemicals stored or used at an office or project site. Note that the HSI may be imbedded in a project Health and Safety Plan.

2.17 **Immediate Use:** Means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

2.18 **MSDS:** A material safety data sheet prepared pursuant to state and federal regulations, OSHA Form 174 and Canada regulations (Controlled Products regulations, schedule 1).

2.19 **MSDS Administrator:** The individual designated by the Office Manager to maintain the additional establishment-specific HSI and the MSDS binder required if that establishment uses or stores hazardous substances.

2.20 **NFPA:** A system of categories, colors and numbers was created to provide basic hazard information. It enables firefighters and other emergency personnel to easily decide whether or not to evacuate an area or proceed with emergency control operations. The three principal categories of identification are Health, Flammability and Instability. A numerical range of “0 to 4” indicates the severity of the hazard. A “4” indicates the most severe and a “0” indicates a minimal hazard.

2.21 **Mixture:** Any solution or intimate admixture of two or more substances which do not react chemically with each other**.**

2.22 **Reactivity:** A measure of the tendency of a substance to undergo chemical reaction with the release of energy.

2.23 **Solubility:** The ability of substance to blend and mix uniformly with another.

2.24 **Specific Gravity (density):** Ratio of the weight of a substance to the weight of the same volume of another substance. As used in this directive, specific gravity or density refers to the weight of substance as compared to the weight of an equal volume of water.

2.25 **Vapor Density:** The weight of a vapor-air mixture resulting from the vaporization of a volatile liquid at equilibrium temperature and pressure conditions, as compared with the weight of an equal volume of air under the same conditions.

2.26 **WHMIS:** The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are cautionary labelling of containers of WHMIS "controlled products", the provision of material safety data sheets (MSDSs) and worker education and training programs.

3.0 References

None.

4.0 Procedure

4.1 All employees have a right to, and should, know the properties and potential hazards of substances to which they may be exposed.

4.2 Should Resolution assign employees that do not read and speak English to tasks with chemical exposures, communications will be provided in the language understood by that employee.

4.3 Hazardous Waste Exemption

4.3.1 In the U.S., hazardous wastes are excluded from the state and federal Hazard Communication standards. However, Resolution employees who handle or are otherwise exposed to hazardous wastes are covered by the requirements of the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 CFR 1910.120 – Hazardous Waste Operations And Emergency Response. This standard requires that:

- Employees receive 40-hour initial and 8-hour annual SH&E training; and that
- Information on the hazards of hazardous wastes be documented in a site-specific Health and Safety Plan (HASP) and communicated to all employees in site-specific briefing on-site training required by the standard.

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4.3.2 Therefore, Resolution HAZWOPER projects are not required to comply with the requirements of this SOP as they relate to the hazardous wastes that are present at those project sites.

4.3.3 A Resolution's HASP requirements are specified in *5-509-Hazardous Waste Operations and Emergency Response.*

4.4 Hazardous Substance Inventory

4.4.1 Establishment-Specific HSI

- If an Resolution establishment uses or stores additional hazardous substances, an establishment-specific HSI must be maintained at that establishment.
- If it is determined that an office-specific HSI is needed, the Resolution **Office Manager** shall assure that one is developed and maintained by someone appointed as the establishment's MSDS Administrator.
- The content of the office-specific written inventory shall be updated as new hazardous substances are procured for, or removed from, the establishment and shall be verified by the **Regional SH&E Manager** through regular inspections of the establishment.
- In order to meet the 30-years-after-employment-termination record retention requirement, the office-specific HSIs shall be treated as a permanent record.

4.5 Material SAFETY Data Sheets

4.5.1 Establishment-Specific MSDS Inventory

- If it is determined that an Resolution establishment is required to maintain an establishment-specific HSI ,MSDSs for those specific hazardous substances must be maintained on file at that establishment.
- The **Regional SH&E Manager** shall audit the local office program for MSDS request and maintenance and report deficiencies to the appropriate management level, as necessary, to assure compliance with this SOP.

4.5.2 Field Project Sites and Client Facilities

- The **Project Manager** and/or the **Site Safety Officer** shall access or obtain, and maintain copies of MSDS from:
  - All Resolution subcontractors bringing chemicals onto the project site; and
  - The client, for all of the client's chemicals to which Resolution or Resolution subcontract employees are potentially exposed.

4.5.3 Employee Access to MSDSs

- MSDSs should be maintained at the local establishment that uses that hazardous substance. Copies of the MSDS should be made available to the employee upon request to the office's MSDS Administrator.

4.5.4 Field Access to MSDSs

- When hazardous substances are brought into the field, the user must assure that a copy of the MSDS for that substance accompanies it and is available at the field location where it is to be used.

4.5.5 MSDSs for Resolution Products

- It is unlikely that Resolution activities would create a chemical for which a new MSDS were needed. If such a chemical were created, the Corporate SH&E Department shall work with the appropriate operations groups to draft, review, and publish the new MSDS.

4.5.6 Content of the Material Safety Data Sheet

- As a minimum, the MSDS must contain the following information:
  - The name, address, and telephone number of the source of the product or material, preferably those of the manufacturer
  - The trade name and synonyms of the product or material

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- Chemical names of hazardous ingredients, including, but not limited to, those in mixtures
- An indication of the percentage, by weight or volume, which each ingredient of a mixture bears to the whole mixture
- Physical data pertaining to the product or material, including boiling point (in °F); vapor pressure (in mm of mercury); vapor density of gas or vapor (air = 1); solubility in water (in percent by weight); specific gravity of material (water = 1); percentage volatile by volume (at 70 °F); evaporation rate for liquids (either butyl acetate or ether may be taken as 1); and appearance and odor
- Fire and explosion hazard data pertaining to the product or material, including flash point (in °F); flammable limits (in percent by volume in air); suitable extinguishing media or agents; special fire fighting procedures; and unusual fire and explosion hazard information
- Health hazard data pertaining to the product or material, including exposure limits, effects of overexposure and medical conditions aggravated by exposure, and emergency and first-aid procedures
- Reactivity data, including stability, incompatibility, hazardous decomposition products, and hazardous polymerization
- Procedures to be followed and precautions to be taken in cleaning up and disposing of materials leaked or spilled
- Special protection information, including use of personal protective equipment, such as respirators, eye protection, and protective clothing, and ventilation or other control measures
- Special precautionary information about handling and strong
- Any other general precautionary information

- MSDSs that do not contain this information shall be returned to the distributor or manufacturer to be updated.

4.5.7 Trade Secrets

- Some hazardous substance suppliers may claim the information requested on MSDSs is proprietary and not provide the information to Resolution.
- When MSDSs supplied to the Resolution Regional SH&E Manager indicate that proprietary information has been withheld, the Regional SH&E Manager will either obtain the necessary information to make a hazard assessment or reject the material for use within Resolution.

4.6 Labeling

4.6.1 Containers of hazardous substances used or stored in each Resolution establishment must be labeled, tagged or marked with the following information:

- Identification of the hazardous substance(s)
- Appropriate hazard warnings
- Name and address of the manufacturer, importer or other responsible parties
- Safe Handling Instructions
- Statement that an MSDS is available for the product

4.6.2 Labels on containers shall not be removed or defaced. Labels or other forms of warning shall be legible, in English and French (Canada), and prominently displayed on the container.

4.6.3 Any failure to have the appropriate labeling information on a container at any time will be cause to suspend use of the product until the container is properly labeled.

4.6.4 Carcinogen Labeling

- Chemicals which have been indicated as positive or suspect carcinogens by either OSHA, ACGIH, the International Agency for Research on Cancer (IARC) (World Health Organization), or the National Toxicology Program (NTP) will be considered to be carcinogenic for purpose of the HCS. Those chemicals identified as being “known to be carcinogenic” by NTP must have carcinogen warnings on the label and information on the MSDSs.

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4.6.5 Stationary Process Containers

- If there is stationary process equipment within a work area, signs, placards, process sheets, batch tickets, operating procedures, or other such written materials may be used in lieu of fixed labels on the containers, as long as the alternative method conveys the appropriate hazard information. The written materials shall be readily accessible to the employees in the work area.

4.6.6 Portable Containers

- Portable containers of hazardous substances need not be labeled when the substance is transferred from labeled containers and is intended for immediate use of the employee who performs the transfer.
- Containers of hazardous substances transferred from labeled containers and not intended for the immediate use of the employee performing the transfer shall be labeled with the chemical name and a hazard warning label in accordance with the National Fire Protection Association's (NFPA) 704M Hazard Identification System shall be attached.

4.7 Chemical Storage

4.7.1 Hazardous chemicals are to be stored in their original, labeled containers with the lids securely closed and taped if possible. Flammable and combustible materials must be stored in fire impervious cabinets in designated stockroom areas. Chemicals must be stored in compliance with instructions provided on their labels, MSDS, or the manufacturer's specifications.

4.7.2 All hazardous chemicals must be stored in a manner that prevents spillage and leakage from exposing people or the environment to the chemical.

4.7.3 Hazardous chemicals shall not be stored with foods or beverages. Food and beverages shall not be consumed in areas where hazardous chemicals are used or stored.

4.8 Chemical Use in Offices

4.8.1 In general, hazardous substances should not be taken into office areas, conference rooms, or break areas. If this general requirement is infeasible, contact the SH&E Department for guidance.

4.8.2 General exceptions to this rule are the following:

- Liquid paper
- Toner
- Cleaners
- Isobutylene calibration gas
- pH calibration solutions for instruments

4.9 Employee Information and Training

4.9.1 Each Resolution employee who handles or is exposed to hazardous substances must be provided information and training on hazardous substances in their work area.

- At the time of their initial assignment
- Whenever a new hazard is introduced into their work area

4.9.2 As a minimum, the training requirements apply to Resolution personnel in the following job categories:

- All personnel who perform field work that involves the use of, or potential exposure to, hazardous substances
- Laboratory Employees

4.10 Initial Training Content

4.10.1 The Initial Training will provide instruction in the following:

- Methods and observations that may be used to detect the presence or release of a hazardous substance in the work area (such as personal monitoring, visual appearance or odor of hazardous substances being released, etc.);

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- The physical and health hazards of substances in the work area and measures and procedures Resolution has implemented to protect employees; and
- The details of this hazard communication program (SOP), including an explanation of the labeling system and the MSDS, and how he/she can obtain and use appropriate hazard information.

4.10.2 The Initial Training will also inform the employee of the following:

- Any operations in their work area in which hazardous substances are present
- Location and availability of this written hazard communications program (SOP)
- Their right to personally receive information regarding hazardous substances to which they may be exposed
- Their right to have their physician receive information regarding hazardous substances to which they may be exposed
- Their right against discharge or other discrimination (in California) due to the employee's exercise of rights afforded pursuant to provisions of the California Hazardous Substances Information and Training Act

4.11 Periodic Training and Training for Non-Routine Tasks

4.11.1 Additional training will be provided to employees who have received initial training whenever:

- A new hazardous substance is introduced into their work area
- A new or revised MSDS is received, which indicates significantly increased risks to employee health as compared to those stated on the previous MSDS
- Non-routine tasks are performed, which will potentially result in exposure to hazardous substances, or exposure under circumstances, which were not addressed during initial training

4.11.2 Supervisors, in coordination with their **Regional SH&E Manager**, shall provide such training through an explanation of the information on the contents of the MSDS for that substance.

4.11.3 When training their employees, supervisors shall explain:

- Any health hazards associated with use of the substance or mixture
- Proper precautions for handling
- Necessary personal protective equipment or other safety precautions to prevent or minimize exposure
- Emergency procedures for spills, fire, disposal, and first aid

4.11.4 For most projects involving field work, this periodic training requirement will be facilitated through the implementation of the site specific HASP that has been developed for the project.

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4.12 Documentation of Initial and Periodic Training

4.12.1 All training required by this SOP shall be documented at the time it is performed by having the employee sign a copy of a training attendance sheet.

4.13 Chemical Usage

4.13.1 Prior to using any chemical, a Task Hazard Analysis (THA) shall be completed by the employees assigned to use the chemical. The analysis will identify the hazards associated with the tasks to be performed and prescribe the Personal Protective Equipment (PPE) to be used.

4.14 Office Specific Written Program

4.14.1 Each office or location using or storing hazardous materials will develop a written office/ location-specific Hazard Communication/WHMIS Program. If the local office decides to implement the requirements of the standard in any way that differs from this procedure, they shall verify the changes with the SH&E department, document the changes, and communicate the differences to all affected employees.

4.14.2 For Canadian operations, all relevant MSDS must be current (no more than 3 years) and readily available (in French and English) for all hazardous materials.

4.15 Canada-specific

4.15.1 Consumer products are exempt from supplier labels and MSDS requirements. Some cleaning solvents may be packaged as consumer products and these must be labelled in accordance with the Consumer Product Act requirements.

4.15.2 In addition to the labelling of storage containers in the workplace, the contents of process piping (including valves), process vessels and reaction vessels are required to be identified through the use of colour coding, labels, placards or other modes of identifications that must be communicated to workers through training programs. It is very important for employees to be aware of and understand Client labelling requirements for these types of process systems.

4.16 Roles and Responsibilities

4.16.1 **Regional SH&E Managers** will:

- Audit their regional offices to assure that they maintain an establishment-specific Hazardous Substance Inventory (HSI).
- Audit their regional offices to assure that if an establishment-specific HSI is required, that MSDSs are available for each substance listed on the HSI.
- Provide interpretation of MSDSs and hazard information for HMIS labels/NFPA labels and other information to assist in training employees.
- Provide hazard communication training to Resolution employees and file documents of this training in the Corporate SH&E office.
- Review MSDS for adequacy of completion to meet the OSHA and Canadian standard and returning them to supplier, if necessary.

4.16.2 **Office Managers** will:

- Have an operations-specific, written hazard communication program which at least describes how the requirements of this Procedure and the US OSHA and Canadian Hazard Communication requirements for labels and other forms of warning, material safety data sheets, and employee information and training will be met.
- Appoint an MSDS administrator for their establishment if they store or use hazardous substances.
- Confirm, if required, that the MSDS Administrator maintains an HSI for their establishment.
- Confirm that MSDS are available for all substances listed on their establishment's HSI.
- Confirm that a copy of this Procedure and the site-specific MSDS are available to all employees. Employees shall be instructed in the location of this Procedure and the MSDS.
- Confirm that all employees in their office affected by the HAZCOM standard are provided with the appropriate training, including new employees.

4.16.3 **Project Managers (field task managers, supervisors)** will:

- Confirm that all employees under their supervision have received the initial and periodic training required by this SOP prior to assigning employees to tasks involve the use of, or potential exposure to, hazardous substances.
- Notify employees of hazardous substances covered by this SOP that are used in their work area.
- Determine the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling or utilization of a hazardous substance and will communicate this information to their affected employees, before any are permitted to work with it.
- Confirm that an MSDS is available for each hazardous substance used, or potentially encountered, in the work areas or on the projects that are under their supervision.
- Notify subcontractors (working for Resolution) of any hazardous substances that are used or stored by Resolution to which the subcontractor's employees may be exposed.
- Notify clients or property owner/operators of chemicals brought onto their property by Resolution or Resolution's subcontractors.
- Request MSDSs from all subcontractor organization for the relevant chemicals they bring onto an Resolution controlled site.

4.16.4 **Employees** will:

- Confirm that they have received appropriate hazard communication training prior to working with materials that fall under the standard.
- Only work with materials for which they have been instructed on how to find an MSDS and how to work with that material safely.
- Provide a copy of all MSDSs received to the MSDS Administrator at their facility.
- Verify that an MSDS is available in their work area for each hazardous substance that they use.
- Confirm that containers of hazardous substances that they use are properly labeled.

5.0 Records

None.

6.0 Attachments

None.

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5-511 Heat Stress Prevention

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 Resolution Consultants 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 5-003-SH&E Training

3.2 5-208-Personal Protective Equipment

3.3 5-314-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:

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- 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 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 devises, 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.

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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.

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- 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^{o}F, shorten the next work cycle by one-third without changing the rest period.
- If the oral temperature still exceeds 99.6^{o}F (36.6^{o}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 *5-511-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

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- 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 5-511-FM Heat/Cold Stress Monitoring Log

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5-511 Form 1 Heat Stress Monitoring Log

The purpose of this form is to track entry into hot zones wearing chemically protective clothing and monitor employees for heat stress-related illness. It is the responsibility of the foreman or supervisor-in-charge to ensure that each person entering the hot zone completes the required information. Vital signs must be taken by a competent person.

Project Name:			**Foreman/Supervisor:**											**Work/Rest Schedule1:** IN *(min)* OUT *(min)*		
Date:	**Water Provided[2]**		**Acclimated[3]**		**Initial Vitals[3]**	**Vital Signs and Time In/Out[4]**										
Employee Name	Yes	No	Yes	No	**Vitals**	In	Out	**Vitals**	In	Out	**Vitals**	In	Out	**Vitals**	In	Out
					P			**P**			**P**			**P**		
					BP			**BP**			**BP**			**BP**		
					Temp			**Temp**			**Temp**			**Temp**		
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1. Please refer to 5-511 Heat Stress. Section 6.3 provides specific details on how to develop a work-rest schedule.
2. Each employee should be provided a sufficient amount of water or sports drink before entering the hot zone. Drinks such as coffee and cola should be discouraged.
3. A worker is "acclimated" if he/she has worked in a hot environment for at least 7 to 10 consecutive days. If a worker is acclimated, check "Yes." If a worker is not acclimated, check "No" and reduce the "Min In" by 50 percent for that employee until the 7- to 10-day period is reached.
4. "Vitals" refers to employee vital signs (e.g., pulse [P], blood pressure [BP], body temperature [Temp], etc.). Initial vitals must be taken and recorded before the start of work operations in the hot zone. Each time the employee exits the hot zone, vitals must be taken and evaluated for heat stress criteria. Section 6.4 of 5-511 Heat Stress provides specific instructions for taking and evaluating employee vital signs.
5. Body temperature vital signs will be recorded in °F.

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5-603-Incident Investigation and Review

1.0 Purpose and Scope

1.1 Provide that all SH&E incidents are investigated in a timely and thorough manner. For all recordable, serious and fatalities, provide a formal incident investigation process.

1.2 Additionally, ensure that appropriate Lessons Learned are gathered from all SH&E incidents and that information is shared regarding lessons learned throughout the organization.

1.3 This procedure applies to all Resolution Consultants employees and operations.

2.0 Terms and Definitions

2.1 **Responsible Lead Investigator (RLI):** Manager responsible for the incident investigation.

2.2 **SRI:** Supervisor's Report of Incident .

2.3 **SH&E Incidents**: A potientially work-related event which is unplanned, possibly harmful or damaging, and which may result in personal injury, environmental impact, or loss or may impact the reputation of Resolution Consultants or its clients or may result in an investigation by a regulatory agency or insurer.

3.0 References

3.1 5-004-Incident Reporting

4.0 Procedure

4.1 Initial post-incident response procedure by office/project team as it relates to an incident investigation and review

4.1.1 Immediate steps to be taken by local field/office personnel:

- Confirm corrective actions that have been put in place to eliminate or control identified hazards at the scene.

4.1.2 Secure the area. Do not disturb the scene until relevant facts are obtained unless an immediate hazard exists.

4.1.3 Prepare appropriate sketches and or obtain photographs of the incident scene and gather relevant information from the scene (Who, What, Where, When and other "environmental factors" that may have had an influence on the incident).

4.1.4 Interview witnesses and document responses as soon as possible at the scene of the incident.

4.2 Follow–up Investigation

4.2.1 **Identify Responsible Lead Investigator and Formation of Team.**

- The **Responsible Lead Investigator (RLI)** An appropriate team member will be designated to be the RLI for any investigation covered by this procedure. That determination will be made based off of technical capabilities, relevant work experience, and the ability to demonstrate critical thinking skills.
- The **RLI** shall contact Resolution Consultants SH&E Manager to ask if legal counsel will be needed in the investigation. If so, the incident investigation report will be marked as "Attorney Privileged Communication."

The RLI will appoint an appropriate team to conduct and document the required investigation.

4.2.2 **Investigation Team Procedures**

- The team will follow an appropriate investigation technique (as agreed to by the **RLI, Resolution Consultants SH&E Manager** and Resolution Consultants in-house counsel) to determine the following:
  - Sequence of events leading up to the incident and steps followed immediately following the incident that may have had an impact on the final outcome.
  - Identification of the People, Parts/Equipment, Position and Paper/Documentation factors involved in the incident.
  - Determination of direct cause(s) and root causes using techniques agreed to by the **RLI** and **Resolution Consultants SH&E Manager.** (Note: Example root cause investigation tools include "5 Why's", TapRoot, Fishbone Diagram, etc.).
- The Investigation Team will prepare a preliminary report, signed by the **RLI**, documenting all findings and recommended corrective actions within 10 business days following the incident. If necessary, the report shall be prepared at the direction of in-house counsel and shall be marked "Attorney Privileged Communication".
- An Investigation Review Call will be held to review the preliminary investigation report. Required participants for the call will include:
  - **Responsible Lead Investigator**.
  - Responsible Supervisor or **Project Manager** of the injured/involved employee.
  - Resolution Consultants **SH&E Manager**.
  - Resolution Consultants **Legal Counsel**, when required.
  - Additional personnel as deemed necessary by the Resolution Consultants Management Committee.
- Note: Incident Review Calls are designed to summarize the preliminary investigation findings and come to agreement on contributing factors, root causes and appropriate corrective actions.
- The **RLI** will extend an invitation to the **Program Manager** at least 5 days prior to the scheduled review date. The **Program Manager** will extend an invitation to other senior and executive management members based on a preliminary assessment of the incident:
  - Final investigation reports (following incident review call where required) are to be forwarded to the **Resolution Consultants SH&E Manager** for inclusion in the permanent incident files.

4.2.3 **Communication of Investigation Results**

- **Any and all written investigation reports must first be reviewed by** Program Manager**, or the Chief Counsel's designee. All drafts shall include "Attorney-Client Work-Product Privilege" at the top of such reports.**
- Where appropriate based on the type, severity and/or scope of the incident, a formal Alert will be prepared by the **RLI** and **Resolution Consultants SH&E Manager**. The Alert will be communicated to the most appropriate audience (i.e. regional, national, business line only, etc.).
- Action items and corrective actions identified by the **RLI** and investigation teams will be tracked to completion by the **Resolution Consultants SH&E Manager**. Additionally, the results will be utilized by the SH&E department to develop appropriate regional, national and business line level reports and to improve existing procedures.

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4.3 Roles and Responsibilities

4.3.1 **Office Managers, Project Managers, Field Task Managers** are responsible to:

- Lead/participate in the formal Incident Investigation process as required by this procedure. Managers should consult with the appropriate Resolution Consultants in-house counsel before conducting any formal investigation of a serious SH&E incident or engaging in any discussion outside of Resolution Consultants.
- Schedule and conduct Incident Review calls as required by this procedure.

4.3.2 **Supervisors** are responsible for the following:

- Lead/Participate in formal Incident Investigation as required by this procedure.

4.3.3 **Resolution Consultants SH&E Manager** is responsible for the following:

- Provide training on incident investigation techniques and tools to selected investigation teams.
- Initiate an investigation for all incidents by contacting the **RLI** and establishing the team, report format, and deadlines.
- Participate (following consultation with Resolution Consultants in-house counsel) on investigation teams and Incident Review Calls when requested by the **Responsible Lead Investigator.**
- Track and report on the status of all action items identified within final Incident Investigation Reports.
- Provide final Incident Investigation Report to the Program Manager prior to inclusion in permanent incident files.

4.3.4 **Employees** involved in an SH&E incident must assist supervisor in completing/ conducting appropriate incident investigations.

5.0 Records

None.

6.0 Attachments

None.

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Appendix D
Site Safety and Health Officer Resume

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Frank E Burwell

Engineer

Professional History

Education

B.S., Biosystems Engineering, Clemson University, 2008

Professional Registrations

Engineer in Training, South Carolina 2008

Training and Certifications

40-hour Health and Safety Training: OSHA (29 CFR 1910.120)
8 Hour Supervisor Training
CPR / First Aid

Mr. Burwell has 5 years of environmental experience managing environmental investigation and restoration projects for the Department of Defense in the south east. As a Technical Manager for the Formerly Used Defense Site (FUDS) program he was responsible for scoping the project work plan, budgeting, subcontractor and regulator interface, and meeting project deadlines. As a Site Manager for Redstone Arsenal Installation Restoration Program he was responsible for ensuring the project work plan met Army standards, contractors conducted project work correctly and efficiently and project deadlines were met.

Experience

Redstone Arsenal, Army Environmental Command (2011-2013): Huntsville, AL

Role: Site Manager

Mr. Burwell was the Site Manager for over 25 environmental sites on Redstone Arsenal. Sites at Redstone Arsenal are required by permit to undergo investigation and evaluation to determine the need, if any, for remedial action. Sites on Redstone range from underground storage tanks and oil water separators to military munitions and chemical warfare material. Coordinated communication efforts and negotiations between the Army and the Alabama state regulators.

Formerly Used Defense Sites Program, Army (2011-2013): Southeast U.S

Role: Technical Manager

Mr. Burwell was the Technical Manager for 10 formerly used defense sites in the south east. Duties consisted of providing technical oversight for projects. This includes developing scopes and budgets coordinating work at the facilities, providing oversight and technical support during completion of the project and providing technical review of documents submitted by subcontractors.

Environmental Protection Agency, Five Year Reviews (2010-2012); Southeast

Role: Technical Manager

Conduct EPA required five year reviews at Monsanto Corporation in Augusta GA, Para-Chem Corporation in Greenville SC, and Sydney Mines in Tampa, FL. Responsible for field site visits, gathering historical information, analyzing current remedy in place, and determining whether remediation efforts are still protective of human health and the environment.

Army Environmental Command, Periodic Reviews (2010-2012); Southeast

Role: Technical Manager

Conduct voluntary five year reviews for Ft. Belvoir in Fairfax, VA, Ft. Stewart in Hinesville, GA, and Hunter Army Airfield in Savannah, GA. Responsible for field site visits, gathering historical information, analyzing current remedy in place, and determining whether remediation efforts are still protective of human health and the environment.

Other Experience

Role: Environmental Engineer
Dates: June 2008 to September 2013
Company: U.S Army Corps of Engineers, Savannah District

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Appendix E
Competent / Qualified Persons Proof of Competency

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Appendix F
HAZWOPER Training and Medical Monitoring Documentation

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Appendix F.1
8-Hour Certificates

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ENSAFE

Certificate of Training

Hazardous Waste Operations Emergency Response

8 Hour Update
29 CFR 1910.120(e)(8)
EnSafe Inc.

This is to certify that

Frank Burwell

Has successfully completed the above course title and all appropriate provisions within as described in 29 Code of Federal Regulations 1910.120. This certification is valid for one year after the date listed below.

Trainer Signature _____ *Date* February 04, 2015

John Knopf, CSP

EnSafe Inc. 5724 Summer Trees Drive – Memphis, TN

ENSAFE

Certificate of Training

Hazardous Waste Operations Emergency Response

8 Hour Update
29 CFR 1910.120(e)(8)
EnSafe Inc.

This is to certify that

Thomas Deck

Has successfully completed the above course title and all appropriate provisions within as described in 29 Code of Federal Regulations 1910.120. This certification is valid for one year after the date listed below.

Trainer Signature _____ *Date* February 04, 2015

John Knopf, CSP

EnSafe Inc. 5724 Summer Trees Drive – Memphis, TN

Appendix F.2
40-Hour Certificates

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ALL-PRO

Occupational Trainers

Certify to all that

Frank Burwell

Has successfully completed the requirements of

40 HOUR HAZWOPER

In accordance with 29CFR1910.120(e)(3)

Instructor: Daniel E. Buechner

Date: July 17, 2008
City or Metropolitan Area of class attended: Norcross, GA
Certification Number: 080717330

ALL-PRO Occupational Trainers, Inc.

ALL-PRO

Occupational Trainers

Certify to all that

Thomas Deck

Has successfully completed the requirements of

40 HOUR HAZWOPER

In accordance with 29CFR1910.120(e)(3)

Instructor: Daniel E. Buechner

Date: October 05, 2001
City or Metropolitan Area of class attended: Tampa, FL
Certification Number: 011005633

President: ALL-PRO Occupational Trainers, Inc.

Appendix F.3
Medical Monitoring

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Concentra Medical Centers (FL)
1584 Normandy Village PkwySte 32 Jacksonville, FL 32221
Phone: (904) 482-1400 Fax: (904) 482-1407

Service Date: 07/18/2014

Physical Exam

Name: Deck, Thomas A.

SSN: XXX-XX-7107

Date: 07/18/2014

Examination Results

✓ Able to perform essential functions as listed.

_____ Unable to perform all essential functions as listed. Please list failed essential function(s):

_____

_____

✓ No medical restrictions are indicated.

_____ The following medical restrictions are indicated:

_____

_____

_____ Recommend further evaluation.

Remarks: _____

_____

_____

_____

William Y. Finlig
Provider Print Name Here

Provider Signature

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Appendix F.4
Supervisor Certificates

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HAZWOPER Management and Supervisor Training

EnSafe Inc. certifies that Frank Burwell has received his/her additional 8 hours management and supervisor training in accordance with OSHA 29 CFR 1910.120(e)(4). This training plus the previous 40 Hour HAZWOPER classroom training and 3 days supervised field experience or equivalent as evaluated by EnSafe Inc. qualifies the above named employee as a Hazardous Material / Hazardous Waste manager or supervisor.

	March 23, 2015
EnSafe Corp. H&S Manager	Date

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Appendix G
First Aid and CPR Trained Individuals

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HEARTSAVER FIRST AID CPR AED

Heartsaver®
First Aid CPR AED

American Heart Association®

Thomas Deck

This card certifies that the above individual has successfully completed the objectives and skills evaluations in accordance with the curriculum of the AHA Heartsaver First Aid CPR AED Program. Optional completed modules are those **NOT** marked out:

Child CPR AED Infant CPR Written test

10/22/2014
Issue Date

10/2016
Recommended Renewal Date

American Heart Association®
GUIDELINES CPR ECC 2010

Certificate

Frank Burwell

has successfully completed Part 1 of the Heartsaver® First Aid CPR AED Online Course

This certificate does not constitute a successful completion of the full Heartsaver First Aid CPR AED Online Course. A skills practice and testing session, conducted by an American Heart Association Instructor is required in order to receive an American Heart Association Heartsaver First Aid CPR AED Course Completion Card. Skills practice and testing must be completed within 60 days from the date below. Please take this certificate with you.

Sections Completed

Start Here
How This Course Works

First Aid Basics
First Aid Basics: Introduction
Rescuer Duties
Victim and Rescuer Safety
Phoning for Help
Finding the Problem
After the Emergency
Review Questions: First Aid Basics

Medical Emergencies
Medical Emergencies: Introduction
Breathing Problems
Choking in an Adult
Allergic Reactions
Heart Attack
Fainting
Diabetes and Low Blood Sugar
Stroke
Seizure
Shock
Review Questions: Medical Emergencies

Injury Emergencies
Injury Emergencies: Introduction
Bleeding You Can See
Wounds
Bleeding You Can't See
Head, Neck, and Spine Injuries
Broken Bones and Sprains
Burns and Electrical Injuries
Review Questions: Injury Emergencies

Environmental Emergencies
Environmental Emergencies: Introduction
Bites and Stings
Heat-Related Emergencies
Cold-Related Emergencies
Poison Emergencies
Review Questions: Environmental Emergencies

CPR and AED
CPR and AED for Adults

December 8, 2013
Date Completed

SCIa8b37bf2d694
Certificate Number

11:10:33 GMT-0500 (EST)

DS-4485 R7/11 © 2011, American Heart Association

HEARTSAVER FIRST AID CPR AED

Heartsaver®
First Aid CPR AED

PEEL HERE

Frank Burwell

This card certifies that the above individual has successfully completed the objectives and skills evaluations in accordance with the curriculum of the AHA Heartsaver First Aid CPR AED Program. Optional completed modules are those **NOT** marked out:

Child CPR AED Infant CPR Written test

12/09/2013
Issue Date

12/2015
Recommended Renewal Date

HEARTSAVER FIRST AID CPR AED

Training Center Name: Code One Charleston TC ID #

TC Info: 1595 Savannah Hwy, Charleston, SC
www.code1web.com/charleston

Course Location: Code One, Charleston Training Center
(843) 375-6601

Instructor Name: Richard Shok 10070556472 Inst. ID #

Holder's Signature

© 2011 American Heart Association *Tampering with this card will alter its appearance.* 90-1820

Frank Burwell
313 Wingo way
Mt pleasant, SC 29464

Peel the wallet card off the sheet and fold it over.

Strike through the modules ***NOT*** completed.

This card contains unique security features to protect against forgery.

This card can be inserted into either a number 10 window or regular envelope.

If using a number 10 regular envelope, peel off the address label and apply it to the outside of the envelope.

90-1820 3/11

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Appendix H
Site Safety and Health Plan

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APPENDIX H — SITE SAFETY AND HEALTH PLAN

SITE 22 — GEIGER KEY HAWK MISSILE SITE
NAVAL AIR STATION KEY WEST, FLORIDA

Revision: 0

Prepared for:

Department of the Navy
Naval Facilities Engineering Command Southeast
Bldg. 135 N, P.O. Box 30
Jacksonville, Florida 32212-0030

Prepared By:

Resolution Consultants
A Joint Venture of AECOM & EnSafe
1500 Wells Fargo Building
440 Monticello Avenue
Norfolk, Virginia 23510

Contract Number: N62470-11-D-8013
Delivery Order Number: JM85

April 2015

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List of Acronyms

APP	Accident Prevention Plan
AST	Aboveground Storage Tank
BB&L	Blasland, Bouck and Lee, Inc.
CRZ	Contaminant Reduction Zone
DPT	Direct Push Technology
EAP	Emergency Action Plan
EC	Emergency Coordinator
EZ	Exclusion Zone
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Levels
HAZWOPER	Hazardous Waste Operations and Emergency Response
SDS	Safety Data Sheet
NAS	Naval Air Station
PID	Photo-ionization detector
PPE	Personal Protective Equipment
SAR	Site Assessment Report
SCTL	Soil Cleanup Target Level
SDS	Safety Data Sheet
SH&E	Safety, Health, and Environmental
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
SSHO	Site Safety Health Officer
SZ	Support Zone
THA	Task Hazard Analysis
TOM	Task Order Manager
TRPH	Total Recoverable Petroleum Hydrocarbon

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SIGNATURE SHEET

This Site Safety and Health Plan (SSHP) was prepared for employees performing field activities at Naval Air Station Key West, Florida. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present at the project sites. While it is not possible to discover, evaluate, and protect in advance against of all possible hazards that may be encountered during the completion of the project, adherence to the safety and health program requirements of this SSHP will significantly reduce the potential for occupational injury.

By signing below, I acknowledge that I have reviewed and hereby approve this SSHP for the field activities at Naval Air Station Key West, Florida. This SSHP has been written for exclusive use by Resolution Consultants employees and its subcontractors. This SSHP was written for specified site conditions, dates, and personnel, and must be amended if these conditions change.

Plan Preparer:

_____ Date: _____

1.a Eric Allen, CSP, CHST
Safety, Health, & Environmental Representative
Resolution Consultants

Plan Review:

_____ Date: _____

1.b Todd Haverkost
Task Order Manager
Resolution Consultants

Plan Concurrence:

_____ Date: _____

1.c John Knopf, CSP
Safety, Health, & Environmental Manager
Resolution Consultants

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1.0 INTRODUCTION

The provisions of this Site Safety and Health Plan (SSHP) are mandatory for all Resolution Consultants personnel (including both AECOM and EnSafe employees, as applicable) engaged in fieldwork associated with the environmental services being conducted at the subject site. For the purposes of this SSHP, the term "Resolution Consultants" means an employee of either of the two firms. A copy of this SSHP and any applicable SSHP supplements shall be accessible onsite and available for review at all times. Recordkeeping will be maintained in accordance with this SSHP and the applicable Standard Operating Procedures (SOPs) referenced throughout this document and the Accident Prevention Plan (APP). In the event of a conflict between this SSHP, the SOPs and federal, provincial, state, and local regulations, workers shall follow the most stringent/protective requirements. Concurrence with the provisions of this SSHP is mandatory for all personnel covered by this SSHP and personnel must sign the acknowledgement page in Attachment 1 to indicate they have read and understand the SSHP. All changes to this SSHP must be documented using the form in Attachment 2.

2.0 SITE DESCRIPTION AND CONTAMINANT CHARACTERIZATION

2.1 General Description

Naval Air Station (NAS) Key West is located in the Florida Keys, between the Gulf of Mexico and the Atlantic Ocean in Monroe County, Florida. Naval Air Station (NAS) Key West is approximately five miles east/northeast of the city of Key West on Boca Chica Key. The present-day mission of NAS Key West is to provide pilot training facilities and services, as well as access to airspace and training ranges for tactical aviation squadrons.

2.2 Site Background and History

Site 22 is located on Geiger Key south of State Road S-941 on the southwest end of Geiger Key. Site 22 is bordered to the south by Atlantic Ocean. Tamarac Park, a residential area that consists of several manmade canals, borders Site 22 to the east. Wetlands border the property to the west. The site is approximately 12 acres.

Site 22 was completed by the United States Army as a link in the defensive perimeter around the Florida Keys during the confrontation between the United States, the Soviet Union, and Cuba, known as the Cuban Missile Crisis. The site utilized the Hawk missile, which was initially designed to destroy aircraft and later adapted to destroy other missiles in flight. During operations, work in support of the Site's mission was focused on keeping the missiles, radar towers, and equipment clean and ready for use at all times. Maintenance of the individual components for the

Hawk system included, but was not limited to, generator maintenance and repair; radar coolant service, electronic component replacement, and anti-corrosion repairs; missile component replacement; anti-corrosion and contamination maintenance; and replacement of vital air-conditioning for electronics (Osato and Straup, 1968). The site was decommissioned in April 1979 and continues to be maintained by the NAS Key West. Site 22 is currently abandoned and overgrown with vegetation. There are signs of frequent trespassing at the site.

2.3 Previous Investigations

The first investigation at Site 22 was a Closure Report completed in 1996 by Blasland, Bouck and Lee, Inc. (BB&L). According to the Closure Report, a 2,000 gallon and a 300 gallon aboveground storage tank (AST) were closed in place on 27 April 1996. Petroleum hydrocarbons were measured in the vicinity of the 2,000 gallon AST in soil and groundwater above the Florida Department of Environmental Protection (FDEP) regulatory criteria in place at the time of closure (BB&L 2002). The Closure Report recommended that a Contamination Assessment be performed.

A Contamination Assessment was performed by BB&L in October 2001 and reported in a Site Assessment Report (SAR) in 2002. Soil and groundwater were collected from locations adjacent to the 2,000 gallon AST and east of the Generator Building. Although no free product was detected in any soil boring or monitoring well, exceedance of FDEP cleanup target levels were measured. Total Recoverable Petroleum Hydrocarbon (TRPH) was measured greater than the FDEP Soil Cleanup Target Level (SCTL) at a soil sample location less than 20 feet south of the closed 2,000 gallon AST. No other analytes were detected in soil samples at concentrations greater than SCTLs. Several petroleum hydrocarbons were detected in two monitoring wells at concentrations greater than the FDEP Groundwater Cleanup Target Levels (GCTLs). The SAR recommended monitored natural attenuation at Site 22.

Between November 2003 and May 2004, a Supplemental Site Assessment was conducted to assess the horizontal nature and extent of petroleum contamination at Site 22 (Tetra Tech 2004). Soil from 52 direct-push technology (DPT) borings was screened using a photo-ionization detector (PID). Based on elevated PID readings, three soil samples were sent to an analytical laboratory for analysis. No exceedances of FDEP SCTLs were measured in soil. TRPH and several polynuclear aromatic hydrocarbons were measured in exceedance of FDEP GCTLs in groundwater collected from DPT borings adjacent to the Generator Building.

Based on the results of the SAR, five shallow monitoring wells (completed 12 feet below ground surface) and one deep monitoring (completed 25 feet below ground surface) were installed in February 2004. Groundwater samples from the newly installed and existing wells were collected in February and May 2004. During the February event, benzene, 1-methylnaphthalene, 2-methylnapthlane, naphthalene, acenaphthene, and TRPH were measured at concentrations exceeding the FDEP GCTLs. During the May 2004 sampling event, benzene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, acenaphthene, and benzo(b)fluoranthene were detected at concentrations that exceeded the FDEP GCTLs. Free product was measured during both events (0.06 feet and 0.05 feet, respectively) in monitoring well G01-MW-06. The amount of free product measured at the site excluded monitored natural attenuation as a potential remedy.

In September 2006, a Treatability Study was conducted to evaluate the effectiveness of passive free product recovery at Site 22. During the study, increased free product volumes excluded passive recovery as a potential remedial option (Tetra Tech 2006).

In December 2010, a Site Inspection was conducted at Site 22 to further evaluate the presence and absence of contamination in soil and groundwater. Groundwater collected from existing wells (excluding GKHMS-MW11 because of free product) and 31 shallow DPT wells. Soil was collected from 34 DPT borings and screened with a PID. Twenty soil samples were sent to an offsite laboratory based on elevated PID readings. FDEP GCTL exceedances of arsenic, cadmium, iron, lead, alpha-benzene hexachloride (alpha-BHC), and TRPH were measured in groundwater. No FDEP SCTL exceedances were measured in soil.

In May 2013, groundwater from nine existing permanent monitoring wells was collected to determine water quality of the surficial aquifer and confirm exceedances of FDEP GCTLs measured during the Site Inspection. Alpha-BHC in monitoring well GKHMS-MW12 and arsenic in GKHMS-MW03 exceeded FDEP GCTLs. Free product persisted in monitoring well GKHMS-MW11.

2.4 Potential Chemical Exposure

Chemicals of concern are arsenic, alpha-benzene hexachloride, and total recoverable petroleum hydrocarbon.

Safety Data Sheets (SDS) will be included for all chemicals that are brought onto the site. SDS are included in Attachment 3.

2.5 Biological Hazards

Poisonous Snakes of South Florida

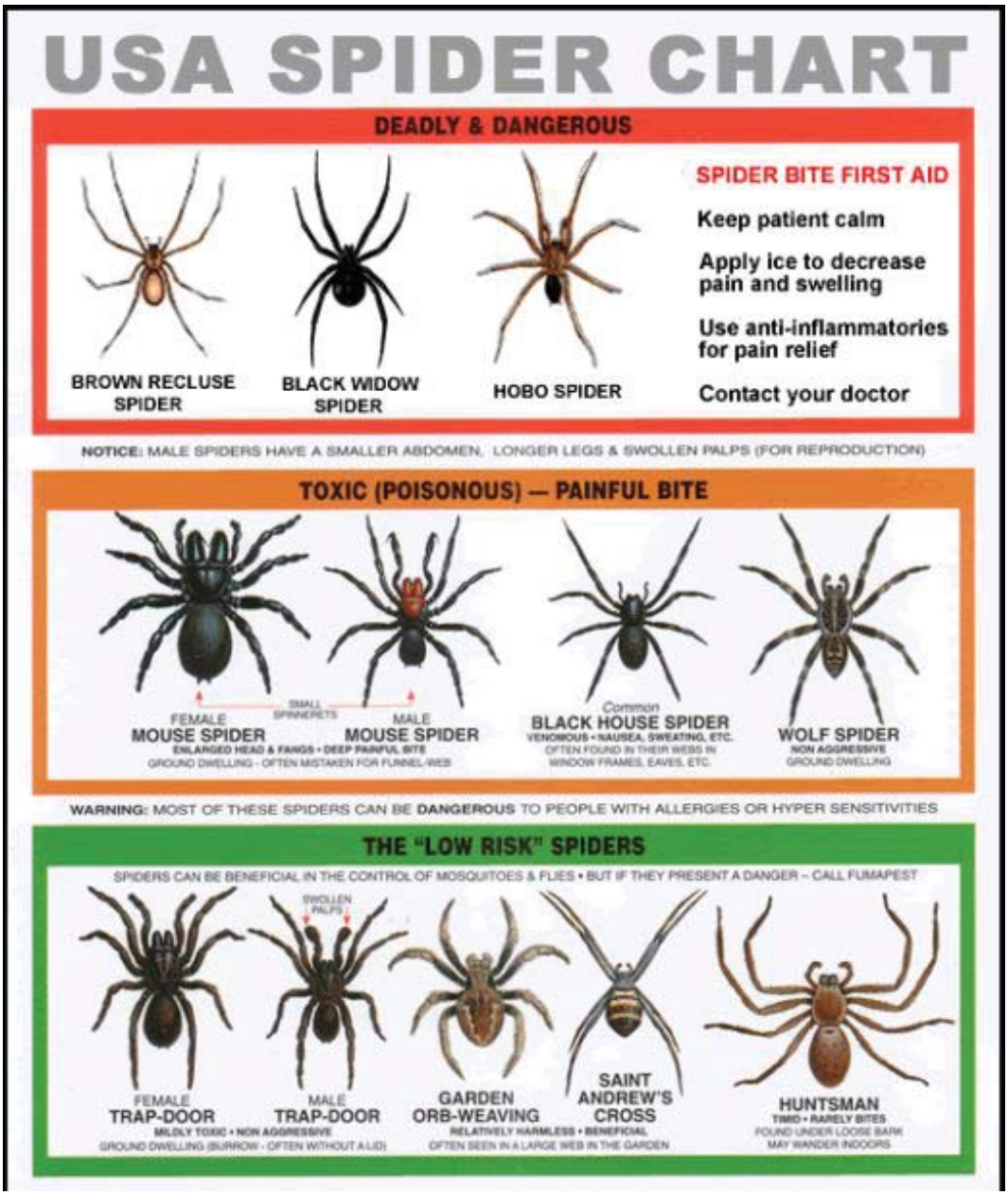
Coral Snake

- There are 3 different species of coral snakes in North America.
- They range in size at adulthood from 1 foot to 3 feet in length.
- Remember the jingle, “Red and black, friend of Jack; red and yellow kill a fellow.”

Eastern Diamondback and Pygmy Rattle Snake

- There are 9 different species of rattle snakes in North America.
- Found in all 48 lower states.
- They range in size at adulthood from 1 foot to 8 feet in length. The majority of rattle snakes are between 2 and 3 feet in length.
- All have the signature rattle snake design as a defense mechanism to keep predators away.

Poisonous Spiders of The United States



Note: The Poisonous Spiders are at the top of the chart

Red Widow Spider

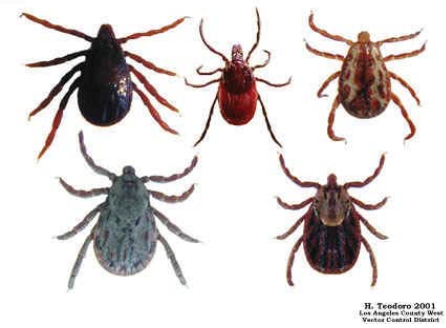
The red widow spider is much less common than the black widow. However, this spider is very toxic and its venom is 10-25% more potent than that of the diamondback rattle snake. Fatalities are extremely rare with the application of proper anti-venoms.

Brown Widow Spider

The brown widow spider is the most poisonous of all widow spiders. However, it is the smallest of the family as well. The brown widow spider usually has less reactive bites due to its size and the amount of venom that can be transferred.

Other Biological Hazards

Ticks



- Ticks are blood-feeding parasites that are often found in tall grass and shrubs, where they will wait to attach to a passing host.
- Ticks pass a number of diseases including Lyme disease.
- Daily inspection of your body will reveal any ticks that can easily be removed.
- First Aid-Antiseptic ointment and observation of bite area.
- If bite area turns red or swells after a few days, seek medical attention.

Rodents

- **Rats**
- **Mice**
- **Squirrels**
- **Chipmunks**
- **Muskrats**
- **Beavers**
- **Prairie Dogs**

Rodents are disease carriers who can carry over 20 different diseases that are dangerous to humans. These diseases can be transmitted either through direct or indirect contact. While a rodent may seem like a small animal, you cannot underestimate their potential for harm. The best course of action is to avoid contact with them at all times. Should you become bitten or scratched by these disease carrying animals, seek medical attention immediately.

Poison Ivy

The most common and well-known irritating plant in this area is poison ivy. It can grow as a groundcover or as a "hairy" vine climbing up the bark of trees. Skin contact with any part of the plant can result in an allergic response that causes itching red spots and blistering. Washing thoroughly with warm, soapy water can reduce the likeliness of a reaction if you have touched the plant.

Poison Oak

The Poison Oak of the southeastern United States has its leaves divided into three leaflets; the leaflets are densely haired and generally have three to seven distinct lobes. The white, berry-like fruit are also somewhat hairy. Both species contain poisonous substances that are believed to be identical or closely related to that found in poison ivy.

Poison Sumac

Poison Sumac is a small tree or large shrub with large attractive leaves and white fruit that could be used as an ornamental if it didn't cause severe skin irritation in most people. Its smaller relatives with 3-parted leaves, Poison Ivy and Poison Oak, have similar irritating properties.

Key features to identify it include are alternate leaves usually with 9-13 entire (not toothed) leaflets and a red rachis (the stem connecting the leaflets). The leaflets are smooth and may be shiny above.

Brazilian Pepper

The family Anacardiaceae contains poison ivy, poison oak, poison sumac, and *Schinus terebinthifolius*, or Brazilian pepper-tree. People sensitive to poison ivy, oak or sumac may also be allergic to Brazilian pepper tree because it also has the potential to cause dermatitis to those with sensitive skin. Some people have also expressed respiratory problems associated with the bloom period of pepper tree.

3.0 TASK HAZARD ANALYSIS

Tasks that require a Task Hazard Analysis (THA) include:

- Mobilization/demobilization
- Groundwater extraction well installation
- Groundwater sampling
- Investigation Derived Waste handling

THAs for all work tasks that will be conducted during this phase of work are included in Attachment 4.

4.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

4.1 Program Manager — Mr. Ken Vinson

The Resolution Consultants Program Manager is responsible for supporting the establishment and oversight of the overall health and safety program presented in the APP.

4.2 Resolution Consultants Safety, Health, and Environmental Manager — John Knopf, CSP

The Site, Health, and Environmental (SH&E) Manager is assigned to provide guidance and technical support for the project. Duties include the following:

- Approving this SSHP and any required changes
- Approving the designated Site Safety Health Officer (SSHO)
- Reviewing all personal exposure monitoring results
- Investigating any reported unsafe acts or conditions

The SH&E 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 SSHP in lieu of the designee.

4.3 Task Order Manager — Mr. Todd Haverkost

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.

4.4 Site Supervisor — Mr. Frank Burwell

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.

4.4.1 Responsibilities

The Site Supervisor is responsible to:

- Discuss deviations from the work plan with the SSHO and TOM

- Discuss safety issues with the TOM, SSHO, and field personnel

- Assist the SSHO with the development and implementation of corrective actions for site safety deficiencies

- Assist the SSHO with the implementation of this SSHP and ensuring compliance

- Assist the SSHO with inspections of the site for compliance with this SSHP and applicable SOPs

4.4.2 Authority

The Site Supervisor has authority to:

- Verify that all operations are in compliance with the requirements of this SSHP, 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 SSHP pending consideration by the SSHO, the SH&E Manager or designee, and the TOM

4.4.3 Qualifications

In addition to being Hazardous Waste Operations and Emergency Response (HAZWOPER)-qualified, the Site Supervisor is required to have completed the 8-hour HAZWOPER Supervisor Training Course in accordance with 29 Code of Federal Regulation 1910.120 (e)(4).

4.5 Site Safety Health Officer — Mr. Frank Burwell

4.5.1 Responsibilities

The SSHO is responsible to:

- Update the site-specific SSHP to reflect changes in site conditions or the scope of work. SSHP updates must be reviewed and approved by the SH&E Manager or designee. Updates must be documented using the Revision History in Attachment 2.

- Be aware of changes in Resolution Consultants Safety Policies, Programmatic Health and Safety Plan, or SOPs.

- Monitor the lost time incidence rate for this project and work toward improving it.

- Inspect the site for compliance with this SSHP and the SOPs using the appropriate audit inspection checklist provided by the SH&E 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 SH&E Manager or designee for technical advice regarding safety issues.

- Provide a means for employees to communicate safety issues to management in a discreet manner (e.g., suggestion box, etc.).

- 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 SSHP or other safety documentation).

- Present tailgate safety meetings and maintain attendance logs and records in accordance with SH&E SOP *5-210-Tailgate Safety Meeting Log* (Attachment 5).

- Discuss potential health and safety hazards with the Site Supervisor, the SH&E Manager or designee, and the TOM.

- Select an alternate SSHO by name and inform him/her of their duties, in the event that the SSHO must leave or is absent from the site. The alternate SSHO must be approved by the TOM.

4.5.2 Authority

The SSHO has authority to:

- Verify that all operations are in compliance with the requirements of this SSHP

- Issue a “Stop Work Order” under the conditions set forth in this SSHP

- Temporarily suspend individuals from field activities for infractions against the SSHP pending consideration by the SH&E Manager or designee and the TOM

4.5.3 Qualifications

In addition to being HAZWOPER-qualified, the SSHO is required to have completed the 8-hour HAZWOPER Supervisor Training Course in accordance with 29 Code of Federal Regulation 1910.120 (e)(4).

4.6 Employees

4.6.1 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 SSHP 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 SSHP or other safety policies
- Notifying the SSHO, in writing, of unsafe conditions and acts

4.6.2 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 SSHP or other safety policies are not being followed
- The right to contact the SSHO or the SH&E 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

5.0 TRAINING, GENERAL AND PROJECT SPECIFIC

5.1 HAZWOPER Qualifications

Personnel performing work at the job site must be qualified as HAZWOPER workers (unless otherwise noted in specific THAs or by the SSHO), and must meet the medical monitoring and training requirements specified in the Resolution Consultants SH&E SOPs.

If site monitoring procedures indicate that a possible hazardous material exposure has occurred above the Occupational Safety and Health Administration permissible exposure limit, employees may be required to receive supplemental medical testing to document any symptoms that may be specific to the particular materials present.

5.2 Site-Specific Safety Training

All Resolution Consultants personnel performing activities at the site will be trained in accordance with SH&E SOP *5-003-SH&E Training* (Attachment 5). All 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 task specific training developed for the tasks to be performed. Administration and compliance with the requirements for additional task-specific training will be the responsibility of the project or lead manager. Any additional required training that is completed will be documented and tracked in the project files.

5.2.1 Competent Person Training Requirements

Work requiring a task specific competent person may be required on this site. If competent person tasks are identified, the SSHO/Site Supervisor will be responsible for identifying the appropriate employee/subcontractor and area of competency. Table 1 contains the required information for task-specific competencies on this jobsite.

Table 1
Task-Specific Competent Persons

Employee Name	Organization	Area of Competency (Task)
TBD	TBD	Drilling

Notes:

TBD = To be determined

The training requirements for competent persons are specified in the indicated SOPs and/or SH&E SOP 5-202-Competent Person Designation (refer to Appendix C of the APP). By identifying an employee as a "competent person," that person has now been authorized to take prompt corrective measures to eliminate hazards.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of personal protective equipment (PPE) is to provide a barrier, which will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. SH&E SOP *5-208-Personal Protective Equipment Program* (Attachment 5) lists the general requirements for selection and usage of PPE. Table 2 lists the minimum PPE required during site operations and additional PPE that may be necessary. The specific PPE requirements for each work task are specified in the individual THAs. By signing this SSHP, the employee agrees having been trained in the use, limitations, care, and maintenance of the protective equipment to be used by the employee at this project. If training has not been provided, request same of the TOM/SSHO for the proper training before signing.

Table 2
Personal Protective Equipment

PPE	Type	Additional Information
Minimum PPE		
Boots	Leather	ANSI approved safety toe. Do not use steel-toe during geophysical instrument usage
Safety Glasses	ANSI Z87.1	ANSI Approved; ≥98% UV protection
Hard Hat	ANSI Z89.1	ANSI Approved; recommended wide-brim, not to be used during anomaly avoidance unless overhead hazard present
Work Uniform		No shorts/cutoff jeans or sleeveless shirts
Additional PPE		
Leather Gloves		If working with sharp objects or powered equipment.
Protective Chemical Gloves	Inner: Chemical resistant	Use during handling of all potentially impacted media.
Level C Respiratory Protection	Upgrade to Half Face based on SSHO recommendations	Upgrade based on air monitoring requirements established in Section 8

Notes:
PPE = Personal protective equipment
SSHO = Site Safety and Health Office

6.1 PPE Doffing and Donning (Utilization) Information

The following information is to provide field personnel with helpful hints that, when applied, make donning and doffing of PPE a more safe and manageable task:

- Never cut disposable booties from your feet with basic utility knives. This has resulted in workers cutting through the booty and the underlying sturdy leather work boot, resulting in significant cuts to the legs/ankles. Use a pair of scissors or a package/letter opener (cut above and parallel with the work boot) to start a cut in the edge of the booty, then manually tear the material down to the sole of the booty for easy removal.

- When applying duct tape to PPE interfaces (wrist, lower leg, around respirator, etc.) and zippers, leave approximately one inch at the end of the tape to fold over onto itself. This will make it much easier to remove the tape by providing a small handle to grab while still wearing gloves. Without this fold, trying to pull up the tape end with multiple gloves on may be difficult and result in premature tearing of the PPE.

- Have a "buddy" check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure situation.

Never perform personal decontamination with a pressure washer.

7.0 MEDICAL SURVEILLANCE

Medical Records for Resolutions Consultants employees working on the NAS Key West Site 22 are included in Appendix F.3 of the APP.

8.0 EXPOSURE MONITORING AND AIR SAMPLING PROGRAM

Monitoring is performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices, and PPE.

Air monitoring is not planned during the sampling at Site 22 due to the previous site investigations and the contaminants of concern being contained in groundwater. Wells should be allowed to vent to off gas any potential buildup of airborne concentrations prior to any sampling.

9.0 HEAT STRESS

Heat stress may vary based upon work activities, PPE/clothing selection, geographical locations, and weather conditions. To reduce the potential of developing heat stress, be aware of the signs and symptoms of heat stress and watch fellow employees for signs of heat stress.

9.1 Responding to Heat-Related Illness

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 SH&E SOP *511-Heat Stress Prevention* (Attachment 5). The guidance presented in Table 3 will be used in identifying and treating heat-related illness.

Table 3
Identification and Treatment of Heat-Related Illness

Type of Heat-Related Illness	Description	First Aid
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.	• Provide the victim with a work break during which he/she may relax, remove any excess protective clothing, and drink cool fluids. • If an air-conditioned spot is available, this is an ideal break location. • Once the victim shows improvement, he/she may resume working; however, the work pace should be moderated to prevent recurrence of the symptoms.
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.	• Immediately remove the victim from the work area to a shady or cool area with good air circulation (*avoid drafts or sudden chilling*). • Remove all protective outerwear. • Call a physician. • Treat the victim for shock. (*Make the victim lie down, raise his or her feet 6–12 inches, and keep him/her cool by loosening all clothing*). • If the victim is conscious, it may be helpful to give him/her sips of water. • Transport victim to a medical facility as soon as possible.
Heat Stroke	The most serious of heat illness, heat stroke represents the collapse of the body's cooling mechanisms. 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.	• Immediately evacuate the victim to a cool/shady area. • Remove all protective outerwear and as much personal clothing as decency permits. • Lay the victim on his/her back w/the feet slightly elevated. • Apply cold wet towels or ice bags to the head, armpits, and thighs. • Sponge off the bare skin with cool water. • The main objective is to cool without chilling the victim. • Give no stimulants or hot drinks. • 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.

10.0 STANDARD OPERATING PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

10.1 Site Rules and Prohibitions

All site personnel shall conduct themselves in a safe manner and maintain a working environment that is free of additional hazards, in adherence to SH&E SOPs *5-001-Safe Work Standards and Rules* and *5-307-Housekeeping, Worksite* (Attachment 5).

10.1.1 Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials.

10.1.2 Smoking, Eating, or Drinking

Smoking, eating, and drinking will not be permitted inside any controlled work area at any time. Field workers will first 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 site. Smoking, eating, or drinking must be in an approved area.

10.1.3 Personal Hygiene

The following personal hygiene requirements will be observed:

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. Staff sharing a potables cooler shall not introduce individually opened containers into the team cooler in an effort to minimize concerns for indirect contamination. Additionally, each potable cooler will be sealed to protect the water quality.

Potable water containers will be properly identified in order to distinguish them from non-potable water sources. All containers of potable water will be marked with a label stating:

Potable Water ONLY
Not Intended for Sample Storage

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

Toilet Facilities: A minimum of one toilet will be provided for every 20 personnel on site, with separate toilets maintained for each sex except where there are less than five total personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities, onsite facilities are not required.

Washing Facilities: Employees will be provided washing facilities (e.g., buckets with water and Alconox, waterless hand sanitizers) at each work location. The use of water and hand soap (or similar substance) will be required by all employees following exit from the exclusion zone (EZ), prior to breaks, and at the end of daily work activities.

10.1.4 Buddy System

All field personnel will use the buddy system when working within any controlled work area. Personnel belonging to another organization on site can serve as "buddies" for Resolution Consultants personnel. Under no circumstances will any employee be present alone in a controlled work area.

10.1.5 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 SH&E SOP *5-002-Stop Work Authority* (refer to Appendix C in the APP). Whenever the SSHO 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 SSHO is authorized and required to stop work, which shall be immediately binding on all affected Resolution Consultants employees and subcontractors.

Upon issuing the stop work order, the SSHO 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 SH&E Manager or designee has concurred that workplace conditions meet acceptable safety standards.

10.1.6 Client Specific Safety Requirements

No client specific requirements are applicable during this phase of work.

10.2 Work Permit Requirements

No permits are required during this phase of work.

10.3 Material Handling Procedures

Manual Material Handling Procedures are included in *SH&E SOP 5-308-Manual Lifting Field* (Attachment 5) Standard Operating Procedures.

10.4 Drum, Container, Tank Handling

Drums containing investigation derived waste will be handled in accordance with NAS Key West procedures.

10.5 Comprehensive THA of Treatment Technologies

This section is not applicable to this project.

11.0 SITE CONTROL MEASURES

11.1 General

The purpose of site control is to minimize potential contamination of workers, protect the public from site hazards, and prevent vandalism. The degree of site control necessary depends on the site characteristics, site size, and the surrounding community.

Controlled work areas will be established at each work location, and if required, will be established directly prior to the work being conducted. Diagrams designating specific controlled work areas will be drawn on site maps, posted in the support vehicle or trailer, and discussed during the daily safety meetings. If the site layout changes, the new areas and their potential hazards will be discussed immediately after the changes are made.

11.2 Controlled Work Areas

The scope of this project may require the implementation of HAZWOPER work zones. The SSHO shall determine the applicability and breadth of this requirement.

Each HAZWOPER controlled work area will consist of the following three zones:

- *EZ:* Contaminated work area
- Contamination Reduction Zone (CRZ): Decontamination area
- *Support Zone (SZ):* Uncontaminated or "clean area" where personnel should not be exposed to hazardous conditions

Each zone will be periodically monitored in accordance with the air monitoring requirements established in this SSHP. The EZ and the CRZ are considered work areas. The SZ is accessible to the public (e.g., visitors, vendors, and inspectors).

11.2.1 Exclusion Zone

The EZ is the area where primary activities occur, such as sampling, remediation operations, installation of wells, cleanup work, etc. This area must be clearly marked with hazard tape, barricades or cones, or enclosed by fences or ropes. Only personnel involved in work activities, and meeting the requirements specified in the applicable THA and this SSHP will be allowed in an EZ. The extent of each area will be sufficient to ensure that personnel located at/beyond its boundaries will not be affected in any substantial way by hazards associated with sample collection activities.

All personnel should be alert to prevent unauthorized, accidental entrance into controlled-access areas (the EZ and CRZ). If such an entry should occur, the trespasser should be immediately escorted outside the area, or all HAZWOPER-related work must cease. All personnel, equipment, and supplies that enter controlled-access areas must be decontaminated or containerized as waste prior to leaving (through the CRZ only).

11.2.2 Contamination Reduction Zone

The CRZ is the transition area between the contaminated area and the clean area. Decontamination is the main focus in this area. The decontamination of workers and equipment limits the physical transfer of hazardous substances into the clean area. This area must also be clearly marked with hazard tape and access limited to personnel involved in decontamination. This area will clearly show the entrance and exit lanes for access to the EZ.

11.2.3 Support Zone

The SZ is an uncontaminated zone where administrative and other support functions, such as first aid, equipment supply, emergency information, etc., are located. The SZ shall have minimal potential for significant exposure to contaminants (i.e., background levels).

Employees will establish a SZ (if necessary) at the site before the commencement of site activities. The SZ would also serve as the entry point for controlling site access.

11.3 Site Access Documentation

If implemented by the TOM or SSHO, all personnel entering the site shall complete the "Site Entry/Exit Log" located at the site trailer or primary site support vehicle.

11.4 Site Security

Depending upon the jobsite location and the proximity to unauthorized pedestrian traffic and other areas of interest site security may be necessary. The TOM or SSHO shall determine if site security is necessary for the jobsite.

Site security is necessary to:

- Prevent the exposure of unauthorized, unprotected people to site hazards
- Avoid the increased hazards from vandals or persons seeking to abandon other wastes on the site
- Prevent theft
- Avoid interference with safe working procedures

To maintain site security during working hours:

1. Maintain security in the SZ and at ECPs.
2. Establish an identification system to identify authorized persons and limitations to their approved activities.
3. Assign responsibility for enforcing authority for entry and exit requirements.
4. When feasible, install fencing or other physical barrier around the site.

5. If the site is not fenced, post signs around the perimeter and whenever possible, use guards to patrol the perimeter. Guards must be fully apprised of the hazards involved and trained in emergency procedures.

6. Have the TOM approve all visitors to the site. Make sure they have a valid purpose for entering the site. Have trained site personnel accompany visitors at all times and require them to wear the appropriate protective equipment.

12.0 EQUIPMENT DECONTAMINATION

12.1 General Requirements

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment through or over, tracking, or splashing potential or known contaminated/impacted materials, etc.)

All personal decontamination activities shall be performed with an attendant (buddy) to provide assistance to personnel that are performing decontamination activities. Depending on specific site hazards, attendants may be required to wear a level of protection that is equal to the required level in the EZ but shall be no lower than one step below the EZ PPE ensemble (e.g., EZ is Level B, Decon is Level C).

All persons and equipment entering the EZ shall be considered contaminated, and thus, must be properly decontaminated prior to entering the SZ.

Decontamination procedures may vary based on site conditions and nature of the contaminant(s). If chemicals or decontamination solutions are used, care should be taken to minimize reactions between the solutions and contaminated materials. In addition, personnel must assess the potential exposures created by the decontamination chemical(s) or solutions. The applicable SDSs must be reviewed, implemented, and filed by personnel contacting the chemicals/solutions.

All contaminated PPE and decontamination materials shall be contained, stored, and disposed of in accordance with site-specific requirements determined by site management.

12.2 Decontamination Equipment

The equipment required to perform decontamination may vary based on site-specific conditions and the nature of the contaminant(s). The following equipment is commonly used for decontamination purposes:

- Soft-bristle scrub brushes or long-handled brushes to remove contaminants
- Hoses, buckets of water, or garden sprayers for rinsing
- Large plastic/galvanized wash tubs or children's wading pools for washing and rinsing solutions
- Large plastic garbage cans or similar containers lined with plastic bags for the storage of contaminated clothing and equipment
- Metal or plastic cans or drums for the temporary storage of contaminated liquids
- Paper or cloth towels for drying protective clothing and equipment

12.3 Personal/Equipment Decontamination

All equipment leaving the EZ shall be considered contaminated and must be properly decontaminated to minimize the potential for exposure and offsite migration of impacted materials. Such equipment may include, but is not limited to, sampling tools, heavy equipment, vehicles, PPE, support devices (e.g., hoses, cylinders, etc.), and various handheld tools.

All employees performing equipment decontamination shall wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of PPE required in the EZ. Other PPE may include splash protection, such as face-shields, splash suits, and knee protectors. Following equipment decontamination, employees may be required to follow the proper personal decontamination procedures above.

PPE used onsite may be considered disposable and if so, can be removed and containerized in the CRZ during decontamination activities. Suits and booties will be removed first, and gloves last.

For Glove removal:

- Grasp the cuff of the dominant hand and pull glove over the bulk of the hand, leaving the fingers inside the glove.
- Use the dominant hand to grasp the cuff of the non-dominant hand and pull the glove completely off (inside-out) and place inside of the dominant hand glove.
- Once removed, employee should only touch the inside material of the dominant hand glove.
- Thoroughly wash hands.

For larger equipment (not personnel), a high-pressure washer may need to be used. Some contaminants require the use of a detergent or chemical solution and scrub brushes to ensure proper decontamination. Before heavy equipment and trucks are taken offsite, the site supervisor and/or SSHO will visually inspect them for signs of contamination. If contamination is present, the equipment must be returned to the decontamination process.

For equipment, use the following steps for decontamination:

1. Remove majority of visible gross contamination in EZ (use shovels, scrapers, brooms, etc.).
2. Wash equipment in decontamination solution with a scrub brush and/or power wash heavy equipment.
3. Rinse equipment.
4. Visually inspect for remaining contamination.
5. Follow appropriate personal decontamination steps outlined above.

All decontaminated equipment shall be visually inspected for contamination prior to leaving the CRZ. Signs of visible contamination may include an oily sheen, residue or contaminated soils left on the equipment. All equipment with visible signs of contamination shall be discarded or re-decontaminated until clean. Depending on the nature of the contaminant, equipment may have to be analyzed using a wipe method or other means.

13.0 EMERGENCY EQUIPMENT AND FIRST AID

A first aid kit will be available at all times while work is being conducted at the site.

14.0 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES (ERP)

14.1 Pre-Emergency Planning

Prior to the start of site operations, the Emergency Coordinator* will complete Table 4 with any site-specific information regarding evacuations, muster points, communication, and other site-specific emergency procedures.

Table 4
Emergency Planning

Emergency	Evacuation Route	Muster Location
Chemical Spill	• Upwind	• Site vehicles
Fire/Explosion	• Upwind	• Site vehicles
Tornado/Severe Weather	• Closest available tornado shelter	• Building # (TBD by SSHO)
Lightning	• Closest available shelter	• Vehicle/Site Trailer
Additional Information		
Communication Procedures	Direct verbal communications. Must be supplemented when voices cannot be clearly perceived above ambient noise levels and when a clear line-of-sight cannot be maintained by personnel. Personnel will bring a mobile phone to the site to ensure that communications with local emergency responders is maintained, when necessary.	
CPR/First Aid Trained Personnel	Frank Burwell	
Site-Specific Spill Response Procedures	Chemicals brought onsite will be limited to fuel for vehicles and small quantities of laboratory preservatives. In the event of a minor spill, sorbent material will be placed on the spill and then transferred to a container for disposal. Field personnel will immediately notify the TOM who in turn will notify the account manager and the Department project representative.	

Notes:
TBD = To be decided
SSHO = Site Safety and Health Officer
TOM = Task Order Manager

Figure 1 contains the project organization chart showing lines of communication and authority if an emergency situations arises during the project.

The duties of the Emergency Coordinator include:

- Implement the Emergency Action Plan (EAP) based on the identified emergency condition.
- Notify the appropriate project and SH&E Department personnel of the emergency (Table 5).

- Verify emergency evacuation routes and muster points are accessible.

- Conduct routine EAP drills and evaluate compliance with the EAP.

14.2 Criteria and Procedures for Emergency Recognition and Site Evacuation

Although the potential for an emergency to occur is remote, an EAP has been prepared for this project should such critical situations arise. The EAP will be reviewed by all personnel prior to the start of field activities. On long term sites, a test of the EAP will be performed within the first three days of the project field operations. This test will be evaluated and documented in the project records.

Four 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, i.e., bomb threat
4. Safety equipment problems

14.3 Decontamination and Medical Treatment of Injured Personnel

Personnel who may become injured onsite will require an appropriate level of decontamination to ensure that medical personnel or emergency service workers are not exposed to chemical hazards posed onsite. We expect our employees to encounter very low levels of chemical contaminants that should not pose a hazard to medical or emergency response personnel; however, we will still provide personal hygiene supplies and appropriate levels of emergency decontamination. If clothing is heavily soiled and/or exhibits chemical odors, personnel shall have their clothing removed and provided temporary covering. Personnel will practice acceptable hygienic steps before being transported for medical treatment. If an injured employee is incapacitated, site personnel will perform this task for them.

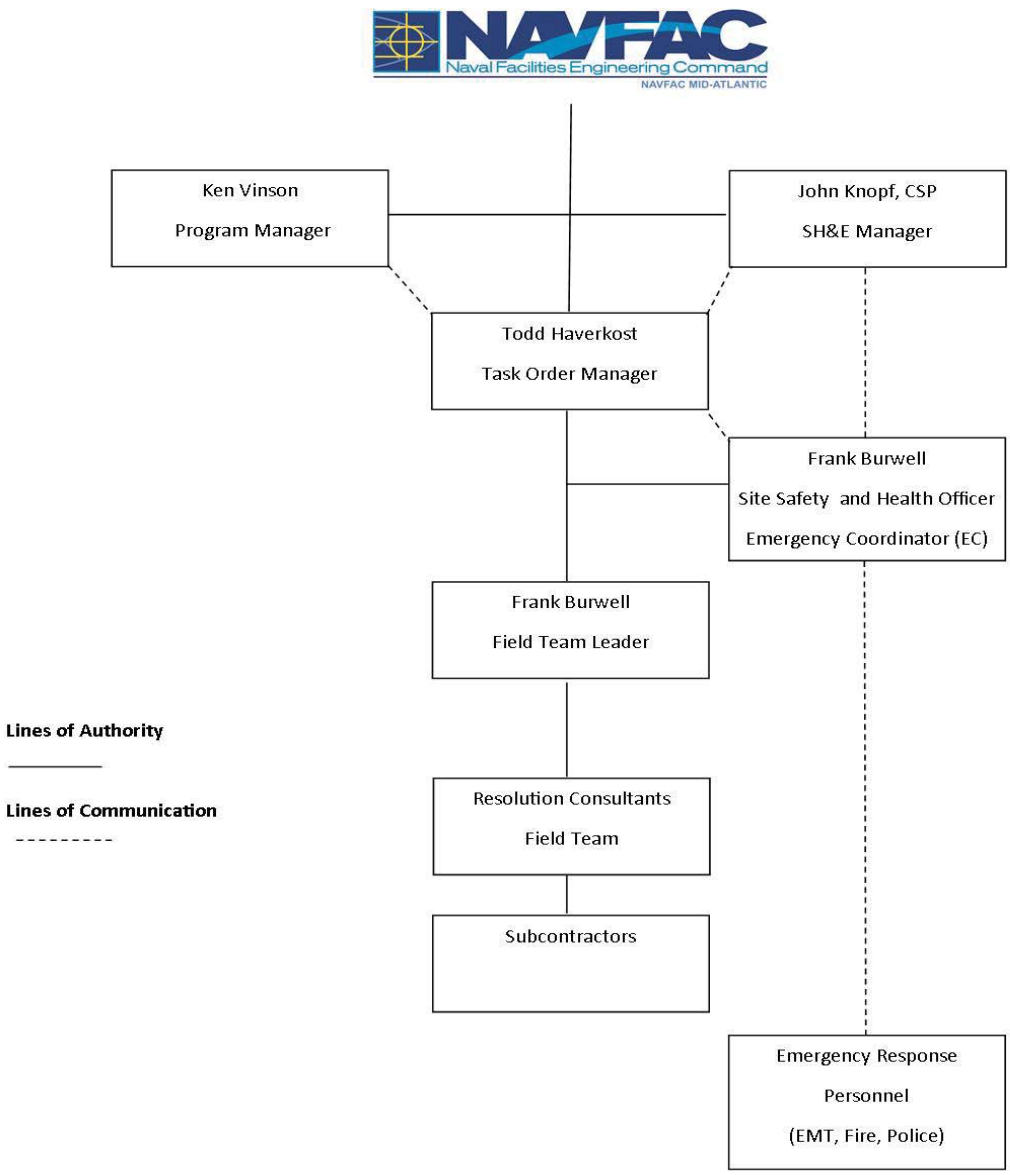


Figure 1 Personnel and Lines of Authority for Emergency Situations

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14.4 Route Map to Emergency Medical Facilities and Phone Numbers for Emergency Responders

The route map to the nearest emergency medical facility is included as Attachment 6. Table 5 lists the emergency contacts and their phone numbers.

14.5 Criteria for Alerting the Local Community Responders

Base emergency alerting phone numbers are expressed in the Table 5 and should be followed in the event of an emergency.

Table 5
Emergency Contacts

Emergency Coordinators/Key Personnel			
Name	**Title/Workstation**	**Telephone Number**	**Mobile Phone**
Brian Syme	Navy RPM/NAVFAC SE	904-542-6151	256-651-2531
Todd Haverkost	Task Order Manager	901-372-7962	901-490-7283
John Knopf, CSP	Resolution Consultants SH&E Manager	901-372-7962	901-451-1464
Eric Allen, CSP	EnSafe CLEAN H&S contact	901-372-7962	901-359-6698
Incident Reporting	**AECOM Personnel**	**800-348-5046 and John Knopf**	
	EnSafe Personnel	**Call John Knopf**	
Ann-Alyssa Hill	AECOM TDG/IATA Shipping Expert	804-515-8506	804-640-4815
Kevin Arick	EnSafe TDG/IATA Shipping Expert	901-372-7962	901-356-3525
Organization/Agency			
Name			**Telephone Number**
Police Department (Base Security)			911
Fire Department (Base Fire)			911
Ambulance Service ***(EMT will determine appropriate hospital for treatment)***			911
Emergency Hospital ***(Use by site personnel is only for emergency cases)***			
Lower Keys Medical Center, 5900 College Road, Key West, FL 33040			304-294-5531
See Attachment 6 for Emergency Hospital Route			
Poison Control Center			800-222-1222
Pollution Emergency			800-292-4706
National Response Center			800-424-8802
Title 3 Hotline			800-424-9346
Public Utilities			
Name			**Telephone Number**
Call Before You Dig			811

Notes:

H&S = Health and Safety
SH&E = Safety, health, & environmental
CSP = Certified Safety Professional
RPM = Remedial project manager
NAVFAC = Naval Facilities Engineering Command

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Attachment 1

SSHP Acknowledgement Form

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SSHP Acknowledgement Form
CTO JM85
Site 22, Geiger Key Hawk Missile Site , Key West, Florida

Print Name	Signature	Organization	Date

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Attachment 2

SSHP Revision Table

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Site Health and Safety Plan
Revision History
NAS Key West; Site 22, Geiger Key Hawk Missile Site — Key West, Florida

Revision No.	Revision Date	Approved By (Initials)	Changes, Discussion
0			

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Attachment 3
Safety Data Sheets

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Attachment 4
Task Hazard Analyses

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Attachment 5
Resolution Consultants Safety
Standard Operating Procedures
(See *Appendix C* of the APP)

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Attachment 6
Route Map to Emergency Medical Facility

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Attachment 1

SSHP Acknowledgement Form

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SSHP Acknowledgement Form
CTO JM85
Site 22, Geiger Key Hawk Missile Site , Key West, Florida

Print Name	Signature	Organization	Date

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Attachment 2

SSHP Revision Table

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Site Health and Safety Plan
Revision History
NAS Key West; Site 22, Geiger Key Hawk Missile Site — Key West, Florida

Revision No.	Revision Date	Approved By (Initials)	Changes, Discussion
0			

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Attachment 3

Safety Data Sheets

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Attachment 4

Task Hazard Analyses

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Activity Hazard Analysis (AHA)

Activity/Work Task: **Mobilization/ Demobilization**	Overall Risk Assessment Code (RAC) (Use highest code) **L**
Project Location: NAS Key West	
Project Number: JM 85	
Date Prepared: 3/24/2015	
Prepared by (Name/Title): Eric Allen/ H&S Specialist	
Reviewed by (Name/Title): Tom Deck/ TOM	

Notes: (Field Notes, Review Comments, etc.)
Seat Belts are to be worn at all times while traveling in vehicles.

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

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.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

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.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
General Physical Hazards	• Slip/Trip/Fall • Cold/Heat Stress • Biological Hazards • Cuts/Scrapes/Bruises • Manual lifting	• Level D PPE required. • Maintain a clean and organized work area. • Watch your step and ensure proper footing. • Provide drinking water and first aid kit. • Wear appropriate clothing for weather conditions. • Assess work area for poisonous plants and animals and communicate observations to avoid them. • Wear appropriate work gloves for task • Maintain 3 points of contact when climbing into vehicle • 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)	L
	• Adverse Weather	• Be aware of changing weather condition and provide appropriate weather gear. • When work is halted due to inclement weather, personnel are to seek shelter in vehicles or building designated Shelter in Place (SIP)	
Driving	• Communication • Accident Prevention	• Do not use cellular phones while operating vehicles of any kind. • Always wear seatbelt when traveling in the vehicle to and from the site	L

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. 8. Wear nitrile gloves when collecting samples in soil to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.

Additional Operational Safety Procedures	PPE
05-308, Manual Lifting 05-313, Wildlife, Plants, Insects 05-607, Manual Lifting	LEVEL D • ANSI approved hard hat • ANSI approved safety glasses • Shirts with sleeves and full-length pants. • ANSI approved steel safety-toe boots or approved equivalent. • High visibility reflective traffic vest if near moving vehicles • Nitrile Gloves • Leather work gloves • First aid kit (located in vehicle). • Fire extinguisher (located in vehicle). Modified LEVEL D (biohazard avoidance) • Tyvek suit

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

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Task Hazard Analysis (THA)

Activity/Work Task: **Groundwater Sampling, Monitoring Wells**	Overall Risk Assessment Code (RAC) (Use highest code) **L**
Project Location: NAS Key West	**Risk Assessment Code (RAC) Matrix**
Project Number: JM 85	
Date Prepared: 3/24/2015	
Prepared by (Name/Title): Eric Allen/ H&S Specialist	
Reviewed by (Name/Title): Tom Deck/ TOM	
Notes: (Field Notes, Review Comments, etc.)	

Severity	Probability: Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

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.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

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.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
General Physical Hazards	• Slip/Trip/Fall • Cold/Heat Stress • Biological Hazards • Cuts/Scrapes/Bruises • Manual lifting	• Level D PPE required. • Maintain a clean and organized work area. • Watch your step and ensure proper footing. • Provide drinking water and first aid kit. • Wear appropriate clothing for weather conditions. • Assess work area for poisonous plants and animals and communicate observations to avoid them. • Wear appropriate work gloves for task • Maintain 3 points of contact wen climbing into vehicle • 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)	L
	• Adverse Weather	• Be aware of changing weather condition and provide appropriate weather gear. • When work is halted due to inclement weather, personnel are to seek shelter in vehicles or building designated Shelter in Place (SIP)	
Establish work area around well and unload/set-up equipment	• Traffic in roadways and parking lots	• Use combination of vehicles, cones, traffic barriers and caution tape. • A traffic plan may be necessary depending on location.	L
	• Cuts/scrapes	• Wear leather gloves.	

Job Steps	Hazards	Controls	RAC
	• Stacking heights	• Avoid stacking equipment and boxes.	
Open well and take water level measurement.	• Cuts/scrapes • Biological Hazards • Exposure potential	• Wear leather gloves when un-bolting well lid • Look for spiders, scorpions, etc. in the well head. • Use ventilation procedures on each well, monitoring at well head and breathing zone. • Use respiratory protection, depending on measurements. • Wear nitrile gloves to remove plug and taking measurement.	**L**
Sample/develop purge using a bailer or pump Well will be purged prior to sampling.	• Exposure potential • Cuts/scrapes • Electrical • Manual lifting	• Wear nitrile gloves while taking flow rates • Monitor breathing zone continuously during sampling event. • Use respiratory protection, depending on measurements. • Ensure employees are properly trained in the use of the compressors, e.g., use correct contacts for 12 volt batteries and avoid arcing situations • Use proper lifting techniques and ergonomics awareness. • Use appropriate cutting devices for tubing boxes and proper tools for pump repairs/maintenance.	**L**
IDW handling	• Chemical Exposure • Manual lifting • Splash Hazard • Spills	• Wear modified level D PPE when necessary (Tyvek and face shields or dust masks) • Use respiratory protection, depending on measurements. • Have portable eyewash on site • Inspect Drums/Containers prior to use for integrity and contaminants • Pour water from buckets into drums/containers as soon as practicable. • Place used PPE and disposable sampling equipment in garbage bags to be disposed of properly.	**L**
Sample collection and packaging	• Chemical exposure potential	• Follow proper decontamination procedures	**L**
	• Cuts/Scrapes	• Inspect glassware for breakage and avoid sharp edges and wear gloves (nitrile and cut resistant leather or Kevlar)	
	• Manual lifting of equipment	• Use proper lifting techniques and do not over-extend	
Decontamination	• Chemical exposure potential • Cuts/Scrapes • Manual lifting of equipment	• Wear modified level D PPE when necessary (Tyvek and face shields or dust masks) • Have portable eyewash on site • Pour water from buckets into drums/containers as soon as practicable and lifting with legs.	**L**

Chemical Hazards and Monitoring Procedures	
Chemical Hazard(s) (list):	**Arsenic, alpha-benzene hexachloride**
Applicable SSHP Section(s):	**2.4**
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. 8. Wear nitrile gloves when collecting samples in soil to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.

Additional Operational Safety Procedures	PPE
05-305, Hand & Power Tools 05-308, Manual Lifting 05-313, Wildlife, Plants, Insects 05-508, Hazardous Materials and Sample Shipping 50-511, Heat Stress	LEVEL D • ANSI approved hard hat • ANSI approved safety glasses • Shirts with sleeves and full-length pants. • ANSI approved steel safety-toe boots or approved equivalent. • High visibility reflective traffic vest if near moving vehicles • Nitrile Gloves • Leather work gloves • First aid kit (located in vehicle). • Fire extinguisher (located in vehicle). Modified LEVEL D (biohazard avoidance) • Tyvek suit

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
TBD	TBD	TBD

Acknowledgement

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

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- 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

Task Hazard Analysis (THA)

Activity/Work Task: **Well Installation Oversight**	Overall Risk Assessment Code (RAC) (Use highest code)	**M**
Project Location: NAS Key West	**Risk Assessment Code (RAC) Matrix**	
Project Number: JM85		
Date Prepared: 3/24/2015		
Prepared by (Name/Title): Eric Allen/ H&S Specialist		
Reviewed by (Name/Title): Tom Deck/ TOM		

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Notes: (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.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

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.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Recommended PPE:
_X_ Safety Glasses With Sideshields _X_ Steel-Toed Boots _X_ Hard Hat _X_ Nitrile Gloves ___ Leather Gloves _X_ Hearing Protection ___ Flame Retardant Clothing

Job Steps	Hazards	Controls	RAC
General Physical Hazards	• Slip/Trip/Fall • Cold/Heat Stress • Biological Hazards • Cuts/Scrapes/Bruises • Manual lifting	• Level D PPE required. • Maintain a clean and organized work area. • Watch your step and ensure proper footing. • Provide drinking water and first aid kit. • Wear appropriate clothing for weather conditions. • Assess work area for poisonous plants and animals and communicate observations to avoid them. • Wear appropriate work gloves for task • 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)	**L**
	• Adverse Weather	• Be aware of changing weather condition and provide appropriate weather gear. • When work is halted due to inclement weather, personnel are to seek shelter in vehicles or building designated Shelter in Place (SIP)	

Job Steps	Hazards	Controls	RAC
Mobilization / Site Set Up	• Slips, Trips, Falls	• Clear trees, roots, weeds, limbs and other ground hazards from the drilling location. Practice good housekeeping to keep the ground around the drilling site clear of obstructions, equipment, and other tripping hazards. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces.	L

	• General equipment hazards
	  • Overhead and underground utilities
	  • Noise Hazard
	  • Pinch points/swing radius
	  • Chemical exposure potential
	  • Eye Injury
	  • Fire
		• All equipment will be properly secured during transport.
		• All vehicles and equipment will comply with DOT requirements.
		• Never move the DPT rig with the mast upright. Ensure the sampling site foundation is stable and as level as possible.
		• Use a ground guide along with a functioning back-up alarm during equipment backing.
		• Confirm Utility Locations
		• Inspect vehicles and equipment daily (Checklists provided in HASP)
		• Maintain clean and organized work area.
		• Wear appropriate clothing and PPE, (no loose clothing or jewelry)
		• Earplugs and/or ear muffs required in EZ
		• Position the drill rig and personnel up wind of drilling location
		• Monitoring breathing zone with PID and upgrade PPE as required.
		• Avoid creating splash hazards while drilling.
		• Keep a safe distance from drill rig.
		• Use hand signals, keep clear of moving equipment, and ensure eye contact with operator prior to approaching.
		• Have fire extinguisher on site.	

	• Contact with utilities	• Inspect for buried and overhead utilities in the vicinity of the drilling location. Clearance will be required, as stipulated in the HASP.	
	• Traffic in adjacent roadway	• Use combination of vehicles, cones, traffic barriers, and caution tape	
Boring Process	• Cuts	• Wear appropriate work gloves to prevent cuts, lacerations	M
	• Dermal Contact	• Wear appropriate protective clothing to avoid dermal or personal clothing contact with sampled material.	

Job Steps	Hazards	Controls	RAC
	• Slips, Trips, Falls	• Clear trees, roots, weeds, limbs and other ground hazards from the drilling location. Practice good housekeeping to keep the ground around the drilling site clear of obstructions, equipment and other tripping hazards. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces.	
	• Volatile Organic Compounds (VOCs)	• If the results of previous surveys indicate the presence of VOCs in hazardous levels, rig operators should be prepared to protect both personnel and equipment from VOC inhalation and flammable atmospheres.	
Sample collection and packaging	• Chemical exposure potential	• Follow proper decontamination procedures	**L**
	• Cuts/Scrapes	• Inspect glassware for breakage and avoid sharp edges and wear gloves (nitrile and cut resistant leather or Kevlar)	
	• Manual lifting of equipment	• Use proper lifting techniques and do not over-extend	
Rig decontamination	• Dry Decontamination	• Rig decontamination will be conducted by the subcontracted driller.	**L**

Chemical Hazards and Monitoring Procedures	
Chemical Hazard(s) (list):	**Arsenic, alpha-benzene hexachloride**
Applicable SSHP Section(s):	**2.4**
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). Ensure equipment has a working kill switch and back-up alarms, and follow equipment inspection procedures.
3. Ensure underground utilities are verified with facility, marked, markings maintained, and operator aware of location
4. All equipment operators must be Competent Persons for the task/equipment being performed/operated.
5. All ground personnel must stay clear of equipment and make eye contact (and receive confirmation) with operator prior to approaching. Wear high visibility reflective vests and stay out of travel lanes and swing radius of heavy equipment.
6. Dust hazard are expected to be minimal due to saturated state of soils and regular precipitation. If visible emissions of dust observed, then dust suppression techniques will be implemented.
7. 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.
8. Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate THAs or SOPs.
9. 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.
10. 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.
11. Conduct equipment inspection of all hoses and switches. Stay clear of running equipment.

Additional Safety Considerations
12. 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. 13. Stay clear of moving rig, do not move rig with mast raised, do not drive on slopes greater than 30 degrees, avoid soft areas when moving rig and setting up, chock wheels. Use spotter when moving rig, check for overhead obstructions. 14. Wear nitrile gloves when collecting samples in soil to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc. 15. For equipment decontamination, triple rinse using distilled or deionized water and alconox for first rinse and distilled or deionized water for second and third rinses. Always clean materials between locations and at the site. Do not bring equipment back to the office without proper decontamination.

Additional Operational Safety Procedures	PPE
SH&E 305, Hand & Power Tools SH&E 308, Manual Lifting SH&E 313, Wildlife, Plants, Insects SH&E 405, Drilling and Boring SH&E 406, Overhead Electrical Lines SH&E 417, Identifying Underground Utilities SH&E 508, Hazardous Materials and Sample Shipping SH&E 511, Heat Stress	LEVEL D • ANSI approved hard hat • ANSI approved safety glasses • Shirts with sleeves and full-length pants. • ANSI approved steel safety-toe boots or approved equivalent. • High visibility reflective traffic vest • Nitrile Gloves • Leather work gloves • Hearing protection required when around operating machines (85 dBA). • First aid kit (located in vehicle). • Fire extinguisher (located in vehicle). Modified LEVEL D (biohazard avoidance) • Tyvek suit

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Drill Rig	Drilling to be performed by competent person as certified by employer.	Equipment will be inspected daily by drill rig operator. Any safety deficiencies detected will require cessation of sampling activities until appropriate repairs have been made.

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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

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Attachment 5
Resolution Consultants Safety
Standard Operating Procedures
(See *Appendix C* of the APP)

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Attachment 6
Route Map to Emergency Medical Facility

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Driving directions

via Boca Chica Rd and U.S. 1 S — 19 min

18 min without traffic · Show traffic — 9.8 miles

13-17 Geiger Rd
Key West, FL 33040

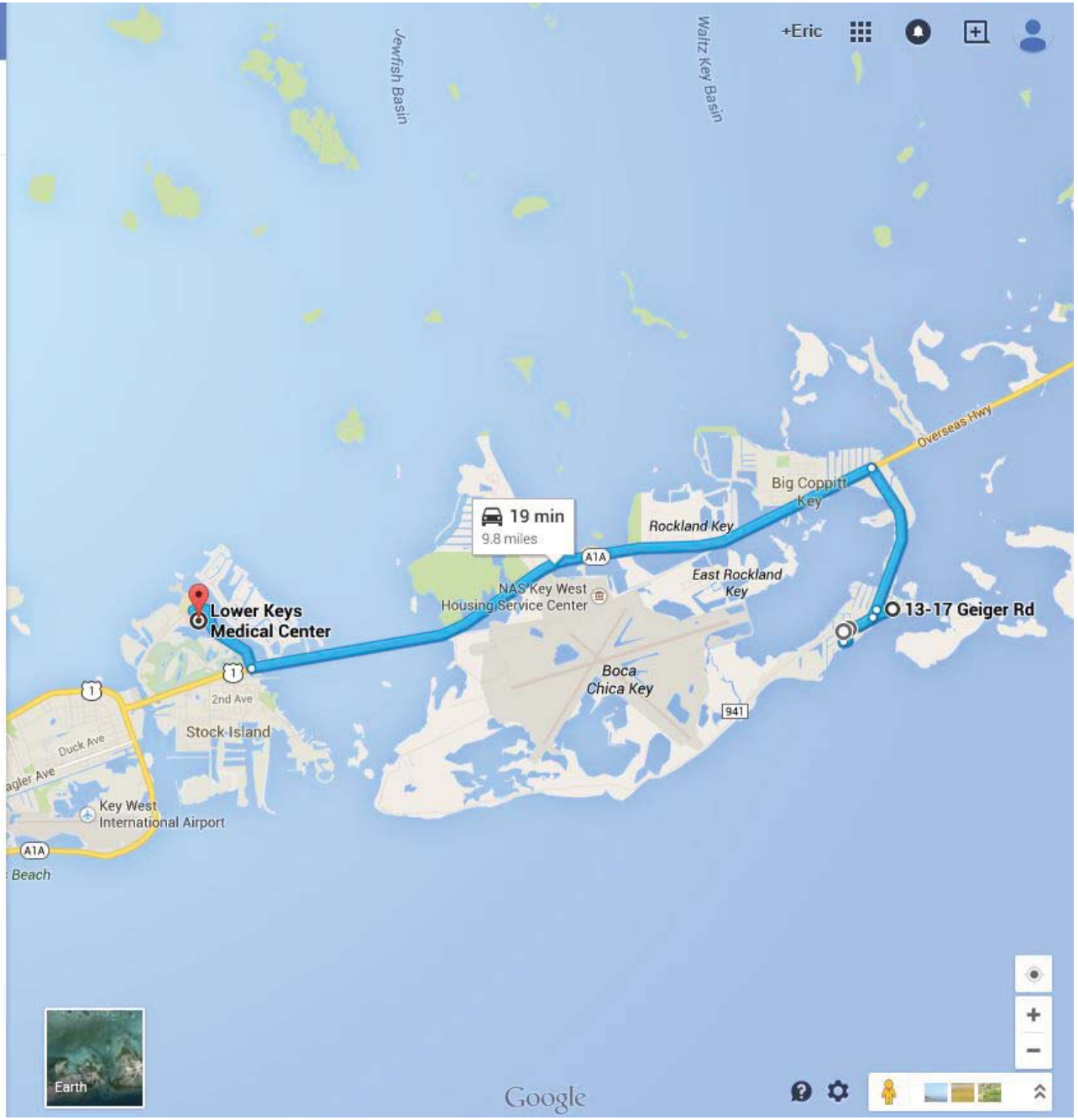
Take Boca Chica Rd to U.S. 1 S
10 min (3.4 mi)

Turn left onto U.S. 1 S

Turn right onto College Rd
Destination will be on the left

Lower Keys Medical Center
5900 College Road, Key West, FL 33040

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



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Appendix I
Subcontractor Health and Safety Plan

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