

ELECTRICITY ACCESS ROLLOUT PROGAMME (EARP) SCALING -UP ENERGY ACCESS PROJECT (SEAP)





FINAL REPORT

ENVIRONMENTAL, HEALTH AND SAFETY PLAN

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September, 2016



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Acronyms & Abbreviations

COID: Compensation for Occupational Injuries and Diseases
CR: Construction Regulations
DOL: Provincial Department of Labour
GSR: General Safety Regulations
REMA: Rwanda Environmental Management Authority
OHSA: Occupational Health and Safety Act
ORHVS: Operating Regulations for High Voltage Systems
PPE: Personal Protective Equipment
SHE: Safety, Health and Environment
MV: Medium Voltage
HV: High Voltage
EDCL: Energy Development Corporation Limited
EHSP: Environmental Health and Safety Plan
GoR: Government of Rwanda
SEAP: Scale-Up Energy Access Project
EARP: Electricity Access Rollout Programme
HAZWOPER: Hazardous Waste Operations and Emergency Response
THA: Task Hazard Analysis
ENVs: Environmental Practices

SOW: Statement of Work



1.0 SCOPE AND SUMMARY OF TERMINOLOGIES AND MAIN RISKS AND

HAZARDS

This specification shall apply to the contractor acquiring Electrification works throughout Energy Development Corporation Limited (EDCL).

This specification covers the requirements for eliminating and mitigating incidents and injuries in all Electrification Projects. This document will promote legal compliance as well as an Environmental, health and safety culture and discipline amongst those conducting work and those affected by the activities taking place in and around them.

The purpose of this document is to provide clear and unambiguous Safety, Health and Environment (SHE) specifications to enable a Tenderer / Principal Contractor to make provision for, and comply with the required Health, Safety and Environmental and other risk requirements - both in terms of relevant legislation, as well as any additional or site-specific SHE requirements required by the Client. This document forms an integral part of the Contract and Principal Contractor required to make it an integral part of their contracts with Sub-Principal Contractor and suppliers

1.2. Definitions Terms

Agent: means any person or department that acts as a representative for the Client and has been formally appointed as such by the Client.

Client: means any EDCL appointed person, for whom construction work is performed on behalf of EDCL and who has formally entered into a contractual agreement with either an Agent or a Principal Contractor (internal or external).

Competent Person: means any person having the knowledge, training and experience specific to the work or task being performed: provided that where appropriate qualifications and training are registered in terms of the Rwandan Construction Regulations and Standards from Rwanda Housing Authority (RHA), these qualifications and training shall be deemed to be the required qualifications and training.

Construction Site: means a specific project site or the site where construction work is being carried out.

Contract means a written agreement intended to be enforceable by law or a formal legally binding agreement entered into by the Client and Principal contractor and/or Agent.

Method Statement or Safe Working Procedure: means a written document detailing the key activities to be performed in order to reduce the hazards identified in any risk assessment.

Principal Contractor: means an independent person or registered business with whom/which Angelique International Limited (AIL) enters into a commercial contract to provide a very specific service to the business. The Principal Contractor in this instance operates independently, and can at any point in time also render services to other companies.

The relationship between Energy Development Corporation Limited (EDCL) and the Principal Contractor (AIL) is managed in terms of the conditions stipulated in a contract via the applicable commercial and procurement process. The term does not include subcontractors.

The Principal Contractor is responsible for ensuring that all subcontractors adhere to contractual requirements and obligations.

Safety, Health and Environmental File: means a permanent record, containing the information on: the SHE management system during construction; and all information relating to the post-construction phase after the handover to Client, so that the Client here EDCL can maintain the works in a healthy and safe way.

Environmental, Health and Safety Plan: means a written plan that addresses hazards identified during a risk assessment as well as the identified impacts in the SHE specification. This would include safe work procedures to mitigate, reduce or control the hazards identified. It is specific to each construction project undertaken, and is compiled by a Principal Contractor (PC) or sub-contractor if any, and must be approved by the Client.

Safety, Health and Environmental (SHE) Specification: means a documented specification of significant residual SHE requirements for a construction site, which a competent and resourced Principal Contractor or sub-contractor would not have been aware of.

This is toensure the health and safety of persons, both workers and public, and duty of care for the environment. The Client compiles the SHE specification and these are specific to each construction project.



1.3 Project Details

Project Name: Scaling - up Energy Access project

1.3.1 Details of Proposed Project

The Government of Rwanda (GoR) is leading a nationwide initiative to extend access to electricity. This initiative involves coordinated effort across all power sector participants to connect new customers, commission new generation facilities to supply new and existing customers, reduce the cost of generation by switching to more efficient supply sources and to develop domestic industries to supply materials for electricity sector expansion.

The GoR's second medium-term Economic Development and Poverty Reduction Strategy (EDPRS-II) focuses on the following:

- increase of Rwanda's electricity generation capacity to 563 MW by 2018, by leveraging large scale private investments as the key means to achieving domestic interconnectivity and economic transformation of the economy;
- 2) Available-on-demand affordable energy for all the rural population and promotes twin strategies to connect 100% of the population through on-grid and off-grid solutions, by 2017–2018. The government has targeted to electrify 45% of households by 2017 from grid direct connections.

The Scaling-up Energy Access Project (SEAP)is one of various Projects operating under the Electricity Access Roll out Programme (EARP), which is designed to facilitate the implementation regardless of funding source. This project has four (4) main components:

(I) Component A: Upgrading and rehabilitation of substations. Under this component the existing 110/30kV Gifurwe substation will be rehabilitated from current 0MVA to 10 MVA capacity and a new 110/30kV substation will be constructed in Rulindo with 20MVA capacity. The existing 110/30kV, 3MVA Rulindo substation will be decommissioned upon the commissioning of this new substation.



Northern Zone Lots

(II) Component B: Access scale-up. Under this component, the existing MV national grid will be extended through the construction of 464 kms.vof MV (30kV) distribution lines and 710 Kms of LV (0.4 kV) network and connection of 25,438 household.

This component was divided into six (6) lots with targeted deliverables that will address the access of electricity in the Northern and Western provinces of Rwanda as shown in Table 1 and location maps as shown in Figures below:

Table 1: Three lots and its deliverables under Component B;

Lots	MV Line (km)	LV Line (km)	Number of Households to be connected	No.of Schools to be Connecte d	No. of Health Centers to be Connected	No. of Admin Offices to be Connected
Lot 2	70	93	4,166	21	3	4
Lot 7	71	158	5,809	25	6	3
Lot 16	95	101	3,455	33	8	5
TOTALS	236	352	13,430	79	17	12

Figure 1- Location Maps and General Information of Project intervention Areas





Lot 2: Located in Gicumbi District in Specifically Bwisige, Cyumba, Kaniga, Mukarange, Rubaya and Rushaki Sectors





Lot 7: Located in the Districts and Sectors as described in the title of this map





Lot 16: Located in the Districts and Sectors as described in the title of this map

(III-A) Component C1: Project Supervision and Management.

(III-B)Component C2: Technical assistance and capacity building.

(III-C) Component C3: Audit.

This aimed to conduct the Audit service for auditing the project account annually.

(IV)Component D: Implementation of ESMP/ARAP.

This component consists of:



- (i) Implementation of mitigation measures and compensation of people affected by the project through the Environmental and Social Management Plan (ESMP)
- (ii) Abbreviated Resettlement Action Plan (ARAP). SEAP/EARP will be responsible for compensation of people whose land, property, crops, and trees are affected by the project.

1.3.2 The Main high risk activities identified on Electrification (Distribution and transmission):sub-

Projects

- Excavation
- Electing poles
- Manual Loading and offloading of poles on site
- Installation of Transformers
- Working at Heights
- Stringing and tensioning
- Driving
- Stacking of Material
- Daily Environmental management struggles
- House Connections
- Compacting
- Tensioning
- Crane operating
- Use of Hydraulic Machine
- Testing and Commissioning
- Weather conditions
- Dismantling of reticulated Power lines.

1.4. Occupational health and safety requirements

1.4.1 Notification of work



The Principal Contractor shall, on receipt of the letter of appointment from the Client, before commencement on site, notify the Provincial Director of the Department of Labour of commencement of construction work as defined in National Construction Regulations of the Act (RHA).

A copy of the notification letter acknowledged by the section of Labour shall be forwarded to the Agent and Client on the same day as sent to the district division of Labour.

1.4.2 Compensation for Occupational Injuries and Diseases Act

The Principal Contractor shall submit a letter of good standing with the Compensation Commissioner or Insurer at the tender stage. The letter of good standing shall be valid. Throughout the project period.

1.4.3 Appointments

The Principal Contractor shall after consideration of the risks involved in the work, make relevant Occupational Health and Safety appointments as stipulated in the Regulations, before commencement of site operations and submit to the Client as part of the Health and Safety Plan.

1.4.4 Competency for Principal Contractor's responsible persons

The Principal Contractor (AIL) shall compile and maintain a current register/inventory of all supervisory and management personnel appointed to the Construction Site. The inventory shall include EHS and professional competencies for each person appointed. The inventory shall be submitted to the client for approval preferably at tender stage as part of the EHS plan. **Construction Supervisor must at least have 5** years working experience in the field of construction.

1.4.5 Organogram

A site Organogram clearly defining the reporting structure and legal appointment structure shall be drawn up and submitted by the Principal Contractor to the Client as part of the SHE plan.

1.4.6 Hazard Identification and Risk Assessment and Analysis (HIRA)Risk assessment

The Contractor shall cause a detailed HIRA to be performed by a competent person before commencement of construction work and it shall form part of this health and safety plan hereto to be submitted to the client for approval.



The HIRA is an ongoing process and a review shall be submitted whenever there are changes in scope and process. The Health and Safety Representative(s), the Health and Safety Committee members and Contractor's Representative shall be members of the HIRA team and shall ensure that all the identified hazards and risks are appropriately controlled and reviewed.

The Contractor shall be responsible for making sure that all employees under his control are conversant with the content of the HIRA and what appropriate measures have been put in place to either eliminate or reduce the risks.

Pre-task Risk assessments/ tailgate talk/On site risk assessments

A risk assessment shall be conducted in accordance with related National Regulations of the Construction Regulations and standards. An on-site toolbox talk including a risk assessment shall be conducted prior to the commencement of work. The supervisor/team leader, after conducting pre-task planning and after facilitating the on-site risk assessment shall share all the tasks at hand, the identified risks and control measures with all his team members before commencing a specific task. This shall be done to ensure common understanding of the tasks, risks and control measures required.

Safe working procedures (SWP)

The contractor shall develop safe working procedures for high risks tasks. The contractor shall make the employees to be conversant with SWP and ensure that tasks are carried out according to the SWP.

Planned task observations (PTO)The contractor shall conduct PTO's for high risk tasks. The contractor must submit four copies of PTO's per month to the client.

1.4.7 ES&H Management System Mechanisms

Introduction - This section identifies the set of core Integrated Safety Management System (ISMS) requirements applicable to all organizations, provides the foundation for Environment, Safety, and Health (ES&H) management, and includes the necessary detail required for implementation of ISMS directly and through other AIL documents, including division specific ISM Implementation Plans.



This ISM Management Plan, the ES&H Manual, the Division ISM Implementation Plans and the Environmental Management System (EMS) Plan are the principal mechanisms for implementing ISMS and EMS. These four facets, complemented by assessment and assurance, provide a structure to ensure work is performed safely and in compliance with applicable ES&H requirements consistent with the graded approach. The primary focus of the ISMS is to provide the worker with a safe work environment, ensure that necessary resources are made available to perform the work, and establish requirements for adequate procedures and controls to ensure that work is performed safely while minimizing environmental impacts. The ES&H roles, responsibilities, and authorities described in this section are developed and practiced to drive the integration of safety into all work activities. The objective of this effort is for the ES&H Management System to be completely integrated within the AIL's work and business processes. Planning the work activity is the starting point for analyzing and understanding hazards, identifying environmental impacts, and element of the EMS plan).

During the planning process, priorities are balanced with resources and constraints to maximize the likelihood of a successful outcome for the work activity envisioned. The results of the work process are analyzed for potential improvements throughout work planning and completion phases, and after the work is finished in an ongoing process. A work activity must satisfy requirements and constraints based on its defined work scope, hazard, and environmental impact analysis, and the applicable controls established by the institution and the facility where the activity is conducted. The institutional requirements presented in this Management Plan and the EH&S Manual are used to ensure Company-wide consistency. Similarly, a division or facility may establish a required practice, constraint, or limit to ensure consistency and compatibility of operations within a facility. Information gained from evaluations of the work—operational results, worker suggestions, self-assessments, audits, and so forth—is used as feedback to adjust and improve requirements and controls at the work activity, facility, and institutional levels.

1.4.8 Safety, Health and Environmental (SHE) Plan

The Principal Contractor shall develop, compile and issue a SHE Plan as per the Client's specifications. The SHE Plan shall be submitted for approval by the Client prior site establishment.



1.4.9 Safety, Health and Environmental Training

The Principal Contractor is conducting a training needs analysis on receipt of the letter of appointment from the Client. The training conducted on each project shall be three fold, namely:

Induction – the Principal Contractor shall ensure that all his employees undergo a SHE induction based on the legislative requirements, SHE Plan and HIRA before starting work onsite. **Awareness** –the Principal Contractor shall continuously conduct on site toolbox talks, display posters and discuss bulletins and case studies from the client.

Competency – the Principal Contractor shall, based on his HIRA and training needs analysis nominate relevant persons to be sent out on appropriate courses. The Principal Contractor shall make available at the Client's request copies if certificate of training. All records of training attendance, contents of training and training certificates shall be kept in the site SHE file. A training matrix shall be submitted to the client at every 3 months.

1.4.10 Health and safety representatives and committees

The Principal contractor shall appoint health and Safety representatives and they shall form part of health and safety committee. Where there is less than 2 health and safety representatives the safety meetings shall be conducted.

1.4.11Documentation

The Principal Contractor shall keep and maintain EHS records to demonstrate compliance to legal requirements and the SHE specification. All documents shall be available for inspection by the Client through THE Supervision farm (SMEC Ltd)

1.4.12 Monitoring and Evaluation

The Principal Contractor shall carry out inspections as prescribed by legislation, his EHS Plan and Client EHS specification. The Principal Contractor shall keep records of all inspections.



1.4.13 Reporting, Recording and Investigation of Accidents and Incidents

All accidents and incidents must be reported, recorded and investigated in accordance with OHS and other applicable environmental legislation.

The Principal Contractor shall report all accidents and incidents to the Client within 24 hours. The Principal Contractor shall allow the Client to participate in any investigation linked to any activity within the scope of the construction project. The Principal Contractor shall keep on site record of all incidents reported in the form of OHSA and submit copies to the client. In case of accidents/incidents, EDCL/EARP/SEAP may conduct an independent investigation.

1.4.14 Emergency Preparedness

The Principal Contractor must develop and submit to Client an emergency response plan from a review of potential emergency scenarios before commencement on site which will include, but not be limited to:

- Employee accounting systems after emergency
- Rescue and medical duties
- Means and procedures for reporting emergencies
- Emergency Contact list
- The emergency plan shall include training of employees to deal with such emergencies and
- Shall form part of the SHE plan. The Principal Contractor shall advise the Client or his agent
- Within 24 hours of any site emergency occurring together with the action taken.

1.4.15 Injury Statistics

The Principal Contractor shall report monthly injury statistics to the Client or his agent in thefollowing manner:

- ✤ Number of fatal injuries
- Number of lost time injuries
- Number of medical injuries
- Number of first aid injuries
- Number of occupational diseases



- Number of motor vehicle accidents
- Number of property damage incidents
- Number of environmental incidents
- Number of public incidents
- Number of electrical contacts
- Number of near misses
- ✤ Man hours worked

1.4.16 Client's audits

The Client will from time to time conduct audits as per the Risk audit system of the Principal Contractor's activities to ensure compliance with Funder and Client's requirements and specification.

1.4.17 Client's Incentive Program

The Client may develop and implement an incentive system from time to time to award, or acknowledge Principal Contractor's health and safety performance.

1.4.18 Public Health and Safety Information

The Principal Contractor shall ensure that each person visiting a site or the public, particularly the community residing in the surrounding area, shall be made aware of the dangers likely to arise from on site activities and the precautions to be observed to avoid or minimize those dangers. Appropriate health and safety signage shall be posted at all corners and times.

1.4.19 Facilities

Principal Contractors shall comply with the requirements of the EHS Plan.

4.20 Medical Surveillance Program

Where Principal Contractor employees are exposed to occupational health hazards and risks that may have adverse effects on their health and/or lead to occupational diseases e.g. Inhalation or breathing of dusts, exposure to noise, absorption through the skin etc., the Principal Contractor shall establish a medical



surveillance program. The Principal Contractor shall consult material safety data sheets and other resources for medical screening requirements.

The program shall include all high risk occupations as specified in the Construction regulations i.e. crane operators, construction vehicles, mobile plant operators, any person performing work at elevated areas.

1.4.21 Transport for Workers

The Principal Contractor shall refer and comply with the requirements of the National Road Transport Regulations, from Rwanda Transport Development Authority and concerned utility standards from RSB. The Principal Contractor shall ensure no persons are transported at the back of vehicles, unless the vehicle:

- An assessment has been carried out indicating a very low risk;
- Mitigating factors have been identified to control the risk;
- It has been discussed and agreed upon at a health and safety committee meeting;
- All vehicles are provided with a serviced portable fire extinguisher and a vehicle first aid kit at all times
- All vehicles and trucks to be fitted with safety and with a National vehicle inspection centre CERTIFICATE

1.4.22 Personal Protective Equipment (PPE)

The Principal Contractor shall, based on his HIRA, establish what type of PPE should be worn by his employees based on the nature of hazards and the type, range and performance of the protection required. The Principal Contractor shall ensure that all employees are trained in the correct use, maintenance, care and the limitations of PPE. The Principal Contractor shall ensure that the requisite PPE is worn at all times.

1.4.23Environmental restrictions

Contractor to comply with EMP provided by the client through the approved ESMP

1.4.24Non-compliance and Penalties

AIL will view the following at-risk behaviour in a very serious light:

a) Disregarding any requirements contained in OHSA, this document, site specifichealth and safety requirements and plan.



b) Performing an unsafe act or creating an unsafe condition that could pose a danger to themselves or to others.

c) A Principal Contractor allowing any of their employees or subcontractors' employees (including casual labourers, or labour broker employees) to work on any site without ensuring that each employee has received proper training.

1.4.25 Public Safety (Excavations)

Barricading of excavations is not allowed. Contractors are to dig and plant or backfill With soil and don't leave open holes at any given time.

2.0 DETAILED ENVIRONMENTAL, HEALTH AND SAFETY PLAN (EHSP)

BACKGROUND

This Health and Safety Plan (HSP) provides a general description of the levels of personal protection and safe operating guidelines expected of each employee or subcontractor associated with the environmental services being conducted at the EPC North sites, located in North-Western Region of Rwanda. This HASP also identifies chemical and physical hazards known to be associated with the Earth Tech-managed activities addressed in this document.

Health and Safety Plan Supplements will be generated as necessary to address any additional activities or changes in site conditions which may occur during field operations. Once generated, each Supplement will be inserted in

Attachment D and reviewed/acknowledged by field personnel prior to the start of applicable work activities.

1.1 GENERAL CONSIDERATIONS

The provisions of this EHSP are mandatory for all AIL LTD personnel engaged in fieldwork associated with the environmental services being conducted at the subject site. A copy of this EHSP, any applicable EHSP Supplements and the AIL Environmental, Health and Safety Manual for Environmental Practices (ENVs)shall be maintained on site and available for review at all times. Record keeping will be maintained in accordance with this EHSP and the applicable Environmental Practices.



In the event of a conflict between this EHSP, the ENV sand national considerations, local regulations and workers shall follow the most rigorous/protective requirements.

1.2 POLICY STATEMENT

"It is the policy of AIL to provide a safe and healthy work environment for all of its employees. AIL considers no phase of operations or administration is of greater importance than injury and illness prevention. Safety takes precedence over expediency or shortcuts. Every accident and every injury is avoidable." <u>At AIL</u>, we believe every accident and every injury is avoidable." We will take every reasonable step to reduce the possibility of injury, illness, or accident. This policy is detailed in AIL Corporate Policy EHS003, *Safety, Health and Environmental Policy Statement*.

The practices and procedures presented in this EASP and any supplemental documents associated with this EHSP are binding on all AIL employees while engaged in the subject work. In addition, all site visitors shall abide by these procedures as the minimum acceptable standard for the work site. Operational changes to this EHSP and supplements that could affect the health or safety of personnel, the community, or the environment will not be made without prior approval of the AIL Project Manager (PM) and the assigned AIL Safety Professional."

2.0 SITE INFORMATION AND SCOPE OF WORK

AIL will conduct environmental services and monthly report the implementation at the all North EPC sites. Work will be performed in accordance with the applicable Statement of Work (SOW) and associated Work Plans developed for Northern EPC. Deviations from the listed SOW will require that a Safety Professional review any changes made to this HASP, to ensure adequate protection of personnel and other property. The following is a summary of relevant data concerning the Northern EPC Sites, and the work procedures to be performed.

The Work Plan prepared by AIL as a companion document to this EHSP provides significantly greater details concerning both site history and planned work operations.



2.1 SITE INFORMATION

This section provides a general description and historical information associated with the site.

General Description

The Northern EPC sites consists of 236 Kms of Medium Voltage, 352 Kms of Low Voltage Lines 13,430 Number of Households to be connected, 79Number of Schools to be Connected, 17Number of Health Centers to be Connected, 12Number of Admin Offices to be Connected. These figures are situated and located in Four Districts which are GICUMBI, RULINDO of Northern Province and NYABIHU and NGORORERO Districts of Western Province, all arranged and called Northern ZONE EPC as per the client nomination.

The transmission lines will be constructed over private and people owned lands and trees and crops on those lands. The subjected properties to be destroyed will be valuated by AIL through a hired registered property valuer and be paid by the GoR through EDCL.

2.2 SCOPE OF WORK

The likely scope of work at this time will include the **pre-construction activities** including studies, surveying , drawings and designs, valuation of properties subjected to be destroyed prior for approval, **Construction stage activities** including excavations, pole election cables and conductors stringing, transformers installation, service connections ; then the **post-construction activities and commissioning** prior to the operationalisation of the line.

3.0 PROJECT HEALTHAND SAFETY ORGANIZATION (STRUCTURE)

3.1 PROJECT MANAGER

The Project Manager (PM) has overall management authority and responsibility for all site operations, including safety. The specific safety responsibilities for the PM are listed in Section 4.0 of ENV 001, General EH&S Responsibilities for Environmental Practices. The PM will provide the site supervisor with work plans, staff and budgetary resources which are appropriate to meet the safety needs of the project operations.



3.2 SAFETY PROFESSIONAL

The Safety Professional is the member of the AIL Safety, Health and Environmental Department assigned to oversee health and safety requirements for the project and provide any needed technical support. The Safety Professional will be the first point-of-contact for all of the project's health and safety matters. Duties include the following:

- Approving this EHSP and any required changes.
- Approving of the designated Site Safety Officer (SSO).
- Reviewing all personal exposure monitoring results
- Investigating any reported unsafe acts or conditions.
- Advocate for quality and standardization

3.3 SITE SUPERVISOR

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

3.3.1 Responsibilities

The Site Supervisor is responsible to:

- Discuss changes and challenges from the work plan with the SSO and PM.
- Discuss safety issues with the PM, SSO, and field personnel.
- Assist the SSO with the development and implementation of corrective actions and measures for site safety efficiencies.
- Assist the SSO with the implementation of this EHSP and ensuring compliance.
- Assist the SSO with inspections of the site for compliance with this EHSP and applicable Environmental practices.

3.3.2 Authority

The Site Supervisor has authority to:



- Verify that all operations are in compliance with the requirements of this HASP, and halt any activity which poses a potential hazard to personnel, property or the environment.
- Temporarily suspend individuals from field activities for infractions against the HASP pending consideration by the SSO, the Safety Professional, and the PM.

3.3.3 Qualifications

In addition to being Hazardous Waste Operations and Emergency Response (HAZWOPER)-qualified (see Section 4.1), the Site Supervisor is required to have completed the 8-hour HAZWOPER Supervisor training Course.

3.4 SITE SAFETY OFFICER (SSO)

3.4.1 Responsibilities

The SSO is responsible to:

- Update the site-specific HaSP to reflect changes in site conditions or the scope of work. HaSP updates must be reviewed and approved by the Safety Professional.
- Be aware of changes in AIL Safety Policy. Changes are posted on the AIL Safety Website(see Section 1.3 of this HASP).
- > Monitor the lost time incidence rate for this project and work toward improving it.
- Inspect the site for compliance with this HaSP and the ENVs using the appropriate audit inspection checklist provided by an AIL Safety Professional.
- Work with the Site Supervisor and PM 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 Safety Professional for technical advice regarding safety issues.
- Provide a means for employees to communicate safety issues to management in a discreet manner (i.e., suggestion box, etc.).
- Determine emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation



- Ensure 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 HSP or other safety documentation)
- > Present tailgate safety meetings and maintain attendance logs and records
- Discuss potential health and safety hazards with the Site Supervisor, the Safety Professional, and the PM
- Select an alternate SSO by name and inform him/her of their duties, in the event that the SSO must leave or is absent from the site.

3.4.2 Authority

The SSO has authority to:

- Verify that all operations are in compliance with the requirements of this HaSP.
- Issue a "Stop Work Order" under the conditions set forth in Section 4.7 of this HaSP.
- Temporarily suspend individuals from field activities for infractions against the HaSP pending consideration by the Safety Professional and the PM.

3.4.3 Qualifications

In addition to being Hazardous Waste Operations and Emergency Response -HAZWOPER-qualified (see Section 4.1), the SSO is required to have completed the 8-hourHAZWOPER Supervisor Training Course at least.

3.5 EMPLOYEES

3.5.1 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 EHASP 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 EHASP or other safety policies.
- Notifying the SSO, in writing, of unsafe conditions and acts.

3.5.2 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 EHaSP or other safety policies are not being followed.
- > The right to contact the SSO or the Safety Professional at any time to discuss potential concerns.

3.6 SUB-CONTRACTORS

The requirements for subcontractor selection and subcontractor safety responsibilities are outlined in ENV 104, *Subcontractor Selection*. Each 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 Personnel Protective Equipment (PPE).

Each subcontractor is considered to be an expert in all aspects of the work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services. Each subcontractor is expected to perform its operations in accordance with the Lead contractor's unique safety policies and procedures, in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided too, for review prior to the start of onsite activities, if required. Hazards not listed in this EHaSP but known to any subcontractor, or known to be associated with subcontractor's services, must be identified and addressed to the PM or the Site Supervisor prior to beginning work operations.

The Site Supervisor or authorized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner.

3.7 VISITORS

Authorized visitors (e.g., client representatives, regulators/competent authorities, Lead Contractor's management staff, etc.) requiring entry to any work location on the site will be briefed by the PM on the



hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies. In addition, this EHASP specifies the minimum acceptable qualifications, training and personal protective equipment which are required for entry to any controlled work area; visitors must comply with these requirements at all times:

AVAIL THIS NOTICE AT WORKS AREA:

"Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas".

4.0 SAFETY PROGRAMS 4.1 HAZWOPER QUALIFICATIONS

Personnel performing work at the job site must be qualified as HAZWOPER workers (unless otherwise noted in specific THAs or by the SSO), and must meet the medical monitoring and training requirements specified in the following safety procedures:

- ENV 202, Safety Meetings
- o ENV 207, Hazard Communication Program
- ENV 209, Environmental Training Requirements
- ENV 301, Hazardous Waste Operations

As appropriate, personnel must also have completed periodic refresher, each person's most recent training course must have been completed within the previous 365 days. In some cases Personnel must also have completed a physical exam where the medical evaluation includes a judgment of the employee's ability to use respiratory protective equipment and to participate in hazardous waste site activities.

4.2 SITE-SPECIFIC SAFETY TRAINING

All personnel performing field activities at the site will be trained in accordance with ENV 209, *Environmental Training Requirements*. For this project, training will include the requirements specified in the following:

1. ENV 202, Safety Measures Meetings

2. ENV 206, Respiratory Protection Program



- 3. ENV 207, Hazard Communication Program
- 4. ENV 301, Hazardous Waste Operations

In addition to the general health and safety training programs, personnel will be:

- Instructed on the contents of applicable portions of this EHASP and any supplemental health and safety information developed for the tasks to be performed.
- Informed about the potential routes of exposure, protective clothing, precautionary measures, and symptoms or signs of chemical exposure and heat stress.
- Made aware of task-specific physical hazards and other hazards that may be encountered during site work. This includes any client-specific required training for health and safety.
- **4** Made aware of fire prevention measures, fire extinguishing methods, and evacuation procedures.

The site-specific training will be performed prior to the worker performing the subject task or handling the impacted materials and on an as-needed basis thereafter. Training will be conducted by the SSO (or his/her designee) and will be documented on the form attached to ENV 202, *Safety Meetings*.

Competent-Person Training Requirements

In order to complete the planned scope of work, an OSHA-designated competent person must be onsite to perform the required daily inspections of equipment and/or operations. The competent person may be Lead contractor or subcontractor employee. The designated template of competent person(s) for this project are shown in Table 4-1:

Table 4-1. Task-Specific Competent Persons

Employee Name	Organization	Area of Competency
To Be Determined (TBD)	Subcontractor (TBD)	Excavation



To Be Determined (TBD)Lead contractorHazardous Waste Operations	S
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4.3 HAZARDOUS, SOLID, OR MUNICIPAL WASTE

If hazardous, solid and/or municipal wastes are generated during any phase of the project, the waste shall be accumulated, labeled, and disposed of in accordance with applicable Federal local regulations.

4.6 GENERAL SAFETY RULES

All site personnel shall adhere to ENV 201, *General Safety Rules*, during site operations. In addition, the housekeeping and personal hygiene requirements listed below will also be observed.

4.4 HOUSEKEEPING AND STORES

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

4.4.2 SMOKING, EATING, OR DRINKING

Smoking, will not be permitted inside any controlled work area at any time. Eating and drinking will be permitted upon controlled conditions respecting safety rules related to hygiene and sanitation 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 AIL site.

4.4.3 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. Potable water containers will be properly identified in order to distinguish them from nonpotable water sources. *Non-Potable Water*- Non-potable water may be used for hand washing and cleaning activities. Non potable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating:

NON-POTABLE WATER

NOT INTENDED FOR DRINKING WATER CONSUMPTION

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 5 total personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities on-site facilities are not required.

Washing Facilities: Employees will be provided washing facilities (e.g., buckets with water and Alcohol) ateach work location. The use of water and hand soap (or similar substance) will required by all employees following exit from the stores especially, prior to breaks, and at the end of daily work activities for site operators.

4.4.4 Buddy and partner System

All field personnel will use the buddy and partner system when working within any controlled work area. Personnel belonging to another organization on site can serve as "buddies" for AIL personnel. Under no Circumstances will any employee be present alone in a controlled work area.

4.4.5.1 Responding to Heat-Related Illness

The guidance below will be used in identifying and treating heat-related illness.

Type of Heat-	Description	Fi	rst Aid
Related Illness			
Mild Heat	The mildest form of heat-related	0	Provide the victim with a work break during
Strain	illness. Victims exhibit irritability,		which he/she may relax, remove any excess
	lethargy, and significant sweating.		protective clothing, and drink cool fluids,
	The victim may complain of	0	If an air-conditioned spot is available, this is an
	headache or nausea. This is the		ideal break location.

Table 4-2. Identification and Treatment of Heat-Related Illness



	initial stage of overheating, and prompt action at this point may prevent more severe heat-related	0	Once the victim shows improvement, he/she may resume working; however, the work place should be moderated to prevent recurrence of
	illness from occurring.		the symptoms.
<i>Heat</i> <i>Exhaustion</i>	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.	0 0 0 0	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 or her cool by loosening all clothing). If the victim is conscious, it may be helpful to give him or her sips of water. Transport victim to a medical facility as soon as possible.
Heat Stroke	The most serious of heat illness, heatstroke represents the collapse of the body's cooling mechanisms. As a result, body temperature may rise to 104degrees 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	0 0 0 0	Immediately evacuate the victim to a cool and shady area. Remove all protective outerwear and as much personal clothing as decency permits. Lay the victim on his or her back with 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 or rubbing alcohol, if available. The main objective is to cool without chilling the victim.



impringent if annagement	acationaca	-	Circo no stimulante ou hat duinke Singe heat
imminent if exposure	continues.	0	Give no stimulants or not drinks. Since neat
Heat stroke can occur su	ddenly.		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.

4.4.5.2 Solar Protection

To protect against exposure to solar radiation, workers will observe the following requirements:

- 1. All workers will wear sunglass-type safety glasses at all times when working outdoors during daylight hours.
- 2. Workers will utilize a commercial sun block with a minimum solar protection factor (SPF) of 15.

4.5 STOP WORK AUTHORITY

All employees have the right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions. Whenever the SSO determines that workplace conditions present an uncontrolled risk of injury or illness to employees, immediate resolution with the appropriate supervisor shall be sought. Should the supervisor be unable or unwilling to correct the unsafe conditions, the SSO is authorized and required to stop work, which shall be immediately binding on all affected AIL employees and subcontractors. Upon issuing the stop work order, the SSO shall implement corrective actions so that operations may be safely resumed. Resumption of safe operations is the primary objective; however, operations shall not resume until the Safety Professional has concurred that workplace conditions meet acceptable safety standards.

4.6 CLIENT SPECIFIC SAFETY REQUIREMENTS

The contract requires that the individuals receive Contractor safety training and Right-of-Way training. Personnel must receive safety training before they can work at sites on the commuter handrail line. Similarly,



personnel must receive safety training before they can work in certain areas operated by the Client. All site activities must be performed in accordance with client-specific requirements and procedures.

5.0 HAZARD ASSESSMENT

5.1 Task Hazard Analysis

Task hazard analysis (THA) is a technique used to identify hazards and hazard controls associated with specific job function. THAs focus on the relationship between the workers, the task and 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 inacceptable risk level. Section 2.2 describes the work activities anticipated to be performed during this project. Individual Task Hazard Analyses (THAs) for the tasks associated with this work can be found in the appendix.

5.1.1 Unanticipated Work Activities/Conditions

Operations at the site may require additional tasks not identified in Section 2.2 or addressed in the attachments. Before performing any task not covered in this EHSP a Task hazard analysis (THA) must be prepared, and approved by the Safety Professional.

5.2 ENVIRONMENTAL CONTAMINANT EXPOSURE HAZARDS

The following is a discussion of the hazards presented to worker personnel during this project from on-site chemical and radiological hazards known or suspected to be present on site. Hazards associated with chemical products brought to the site during work operations are addressed separately, under the Hazard Communication process described in Section 4.3. Exposure symptoms and applicable first aid information for each suspected site contaminant listed in Section 2are located in the following subsections.

5.2.1 Lead

Lead is a heavy, yielding, soft, gray metal that is toxic to a number of organs and organ systems in the body including the liver, kidneys, blood-forming organs (primarily located in the bones), and the Central Nervous system (CNS). Acute exposure to heavy metals can produce symptoms such as stomach distress and



vomiting, mental confusion and sluggishness, heart palpitations, breathing difficulties, and renal (kidney) failure. Chronic exposures can be characterized by deterioration in function of the liver and kidneys, CNS degradation, and abnormal changes in blood cell counts (especially white blood cells).

The potential routes of exposure to lead during this project are the inhalation of airborne dusts containing lead particulates and contact with lead-impacted paint chips and debris. These materials may be generated during the demolition of walls, ventilation ducts, and other equipment painted with lead-based paint. Lead-contaminated materials can enter the body through the respiratory system, open wounds or contamination and ingestion of food. Preventing these routes of exposure necessitates the use of appropriate protective clothing (respirators, gloves, tyvek) and proper decontamination procedures.

5.2.2 Arsenic

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds. Inorganic arsenic compounds are mainly used to preserve wood. Organic arsenic compounds are used as pesticides, primarily on cotton plants.

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting high levels of inorganic arsenic can result in death. Lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet. Skin contact with inorganic arsenic may cause redness and swelling. Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization (WHO), the Department of Health and Human Services(DHHS), and the EPA have determined that inorganic arsenic is a human carcinogen. The CalOSHA PEL for lead trioxide (as as) is 0.01 mg/m3.

5.2.3 Polycyclic Aromatic Hydrocarbons (PAHs)

Polycyclic aromatic hydrocarbons (PAHs) are produced during combustion events due to inadequate oxidation of fuel. Consequently, they may be encountered when opening the cap over landfill burn areas.



PAHs in the pure state are yellowish crystalline solids. They are found in coal tar and in products of incomplete combustion.

These chemicals have varying degrees of potency for causing cancer, with Benzo(a)pyrene being among the most potent. The PAHs are evaluated collectively as COAL TAR PITCH VOLATILES. Coal tar pitch volatiles may cause photo-sensitization and a rash where sunlight strikes the skin. Exposure may also cause cancer of lungs, skin, bladder or kidneys. Benzo(b)fluoranthene, Benzo(j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, chrysene, and Indeno(1,2,3,c,d)pyrene have been identified as carcinogenic.

This information on PAH compounds is presented for site contaminant awareness. While, the potential for site personnel sustaining significant inhalation exposures to volatilized PAH compounds during the site activities of this project is minimal, there is the potential for inhalation of PAH-contaminated dust, and handling of contaminated soils presents skin exposure hazards. Use of dust suppression techniques (as appropriate) and the proper use of the PPE will adequately protect personnel. Some significant PAH compounds include:

Anthracene Benzo (a) pyrene Benzo (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (k) fluoranthene Fluorene Benzo(g,h,i)perylene Indeno(1,2,3,c,d)pyrene Benzo (d,e,f) phenanthrene

5.2.4 Petroleum Hydrocarbon

Hydrocarbon fuels (including gasoline, diesel fuel and jet fuel) are complex mixtures of hydrocarbons and additives. The constituents of hydrocarbon fuels possess a range of vapor pressures. For highly volatile components, chronic exposures or exposures to a high concentration may cause unconsciousness, coma, and possible death from respiratory failure.



Exposure to low concentrations of vapor may produce flushing of the face, slurred speech, and mental confusion. Fuels are also irritating to the skin, and may cause drying and dermatitis as a result of prolonged contact.

A variety of components and additives of the fuels can themselves present significant additional hazards. The aromatic compounds benzene, toluene, methylbenzene and xylene (BTEX) are of greatest concern in relation to site investigation activities, and are addressed separately below. However some additives used for performance enhancement (e.g., methyl tert-butyl ether - MTBE), oxygenation (e.g., alcohols and MTBE) and water scavenging (e.g., ethylene glycol methyl ether - EGME) can also present significant hazards as a result of expanded inhalation or skin exposure and introduction. In the past tetra-ethyl and tetra-methyl lead, both of which have been identified as carcinogens and present moderate skin contact hazards, were added to gasoline for anti-knock control.

The use of skin protection (i.e., chemically-protective gloves) is required when handling gasolinecontaminated materials.

5.2.5 Assessment of Exposure Hazards

Inhalation – Soil sampling and excavation activities have important potential for airborne release of contaminants. Appropriate dust and fugitive emission controls, as well as monitoring and the use of appropriate PPE will greatly minimize the potential for exposure.

Skin Contact – Direct contact to skin will be minimized through engineering controls inherent to the operation, use of administrative controls, hand tools, and dermal protective equipment. Specially, wear Nitrile gloves and wash hands thoroughly with cleaning agent before and after working in the exclusion zone.

Ingestion – Protection against exposure via ingestion can be accomplished by performance of proper decontamination procedures when exiting contaminated work areas.

5.3 PHYSICAL HAZARDS

General physical hazards concerning all tasks are slips, trips, falls, and heat/cold stress. Identified physical hazard during soil sampling are pinch points, sharp corner and restricted movement, concerning contaminated soil excavation, physical hazards are workers struck by equipment, collapse of excavation walls.



5.4 BIOLOGICAL HAZARDS

Contact with 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:

- 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.
- Insects such as mosquitoes, ticks, bees, and wasps. Mosquitoes can potentially carry and transmit the West Nile Virus or Eastern Equine Encephalitis (EEE). 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 (an extreme allergic reaction).

Whenever you will enter 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; field especially staff should be lodged in an open and clean place and premises. If bitten by insects, see a doctor at the nearest medical facility. Is any question of an allergic reaction?

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.

6.0 ACTIVITY SPECIFIC REQUIREMENTS

6.1 SUPPLEMENTAL SAFETY PROCEDURES

As discussed in Section 5.0, personnel may be exposed to a variety of chemical, physical, radiological and biological hazards. The requirements for the control of many of these hazards is discussed in Standard Operating Procedures found in the 500 Series of the ENV. Manual. Specific procedures applicable to this project include:



- Manual Hand Tools (ENV. 505)
- Excavation (ENV. 510)
- Heavy Equipment (ENV. 520)
- Climate variability Operations (ENV. 528)
 In addition, the following supplemental procedures have been developed to address requirements not covered within the established AIL procedures (ENV 500-series). ENV and supplemental procedures are specified on a task-specific basis.

6.2 EXPOSURE MONITORING PROCEDURES

Monitoring procedures will be employed during site characterization activities to assess employee exposure to chemical and physical hazards. Monitoring will consist primarily of onsite determination of various parameters(e.g., airborne contaminant concentrations and heat stress effects), but may be supplemented by more stylish monitoring techniques, if necessary.

6.2.1 Real-Time Exposure Measurement

Monitoring shall be performed within the work area on site in order to detect the presence and relative levels of toxic substances. The data collected throughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be conducted as specified in each THA (Attachment A) as work is performed. Table 6-1specifies the real-time monitoring equipment which will be used for this project.

INSTRUMENT	MANUFACTURER/MODEL*	SUBSTANCES	
		DETECTED	
Photo Ionization Detector (PID)	RAE Systems mini-RAE Photovac Microtip	Petroleum hydrocarbons Organic Solvents	
	HINU MODEL HILU (IIIII. 10.2 eV buib)		
Flame Ionization Detector (FID)	Foxboro	Petroleum hydrocarbons Organic Solvents	



Combustible Gas Indicator	TBD	
(CGI)		Explosivity
		1 ,
May be combined with		
individual or multi-gas		
detectors.		
Individual Gas Detectors	TBD	Oxygen (O2)
		Carbon Monoxide (CO)
		Hydrogen Sulfide (H2S)
		Cranida Cases (CN)
		Cyamor Gases (CIN-)
Particulate Monitor	MIE Model PDM-3	Aerosols, mist, dust, and fumes
	mini-RAM	
Colorimetric Detector	Sensidyne	Benzene 0.5–10 ppm
Tubes		* *
	Draeger	

6.2.1.1 Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone. If ambient levels are measured which exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and mitigative actions, etc.) must be implemented prior to commencing activities at the specific work area. Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of SSO or the Safety Professional.

Reasons to upgrade:



- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas, vapor, or dust emission.
- Change in work task that will increase the exposure or potential exposure to hazardous materials
- Reasons to downgrade:
 - New information indicating that the situation is less hazardous than was originally suspected.
 - Change in site conditions that decrease the potential hazard.
 - Change in work task that will reduce exposure to hazardous materials.

6.2.1.2 Monitoring Equipment Calibration

All instruments used will be calibrated at the beginning and end of each work shift, in accordance with the manufacturer's recommendations. If the owner's manual is not available, the personnel operating the equipment will contact the applicable office representative, rental agency or manufacturer for technical guidance for proper calibration. If equipment cannot be pre-calibrated to specifications, site operations requiring monitoring for worker exposure or off-site migration of contaminants will be postponed or temporarily ceased until this requirement is completed.

6.2.1.3 Personal Sampling

Should site activities warrant performing personal sampling to better assess chemical exposures experienced by AIL employees, the SSO, under the direction of a Certified Industrial Hygienist (CIH), will be responsible for specifying the monitoring required. Within five working days after the receipt of monitoring results, the CIH will notify each employee, in writing, of the results that represent that employee's exposure.

Copies of air sampling results will be maintained in the project files. Should the site activities warrant, the subcontractor will ensure its employees' exposures are quantified via the use of appropriate sampling techniques.

The subcontractor shall notify the employees sampled in accordance with health and safety regulations, and provide the results to the SSO for use in determining the potential for other employees' exposure.

6.2.2 Noise Exposure Monitoring

When heavy equipment is in operation, it will be necessary to ensure that each exclusion zone fully encompasses all areas where hazardous noise levels are present (85dBA or greater).



Once each work day, the SSO will use a sound level meter to survey the perimeter of each exclusion zone, while all onsite heavy equipment within the zone is being operated simultaneously.

If the sound pressure level exceeds 85 dBA at any location along the site perimeter, the SSO will exit the exclusion zone and use the meter to determine the 85 dBA limit. The exclusion zone boundary will then be adjusted to fully encompass this region.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 Personal Protective Equipment (PPE)

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. ENV 205, *Personal Protective Equipment*, lists the general requirements for selection and usage of PPE. Table 7-1lists 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 found in Attachment A. By signing this HASP you are agreeing that you have been properly trained in the use, limitations, care and maintenance of the protective equipment you will use at this project. If you have not received training on the proper use, care, and limitations of the PPE required for this project, please see the PM/SSO for the proper training prior to signing this HASP.

ТҮРЕ	MATERIAL	ADDITIONAL
		INFORMATION
Minimum PPE:		
Safety Vest	High-visibility	Must have reflective tape and be visible from all sides
Boots	Leather	ANSI approved safety toe
Safety Glasses		ANSI Approved
Hard Hat		ANSI Approved

Table 7-1. Personal Protective Equipments



Work Uniform		No shorts/cutoff jeans or sleeveless shirts		
Additional PPE:				
Hearing Protection	Ear plugs and/ or muffs	In hazardous noise areas		
Leather Gloves	Any	If working with sharp objects on powered equipment.		
Protective Chemical Gloves	Inner: Best Safety N-DEX Outer: Heavy duty Nitrile, PVC, Neoprene, and Viton Inner: Tyvek or equivalent	When handling contaminated augers or collecting environmental samples.		
Protective Chemical Overalls	Outer: Ychem BR or equivalent			
Protective Chemical Boots Rubber	Neoprene			
Level C Respiratory	MSA (Full Face or equivalent			
Protection	equipped with GMA/P100)			
Faceshield	Debris/splash shield			
Cold Weather Gear	Hard Hat liner, hand warmers, and insulated gloves			

7.2 DECONTAMINATION

All requirements for performing personal and equipment decontamination may be found in Earth Tech Environmental Practice Standard ENV 535, *Decontamination*.



7.3 PPE DOFFING AND DONNING 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. Recommend using 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 proceed by manually tearing 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/Partner" 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.

8.0 SITE CONTROL

8.1 GENERAL

The purpose of site control is to minimize potential contamination of workers, protect the public from site hazards, and prevent vandalism and damage. 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 sitemaps, 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. General examples of zone layouts have been developed for drilling and earth moving activities [(e.g., excavating, trenching, etc.) and are attached to this section.

8.2 CONTROLLED WORK AREAS

Each HAZWOPER controlled work area will consist of the following three zones:

- **4** Exclusion Zone: Contaminated work area.
- **4** Contamination Reduction Zone: Decontamination area.
- Support Zone: 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 HASP. The Exclusion Zone and the Contamination Reduction Zone are considered work areas. The Supporting Zone is accessible to the public (e.g., vendors, inspectors).

8.2.1 Exclusion Zone

The Exclusion Zone 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 Sections 4.1 and 4.2, will be allowed in an Exclusion Zone. 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.

To meet this requirement, the following minimum distances will be used:

- ✓ **Direct Push Drilling Activities**. A distance of 20 feet in all directions will be cleared from the rig.
- ✓ HSA Drilling. Determine the mast height of the drill rig. This height will be cleared, if practical, in all directions from the bore-hole location and designated as the exclusion zone. The cleared area will be sufficient to accommodate movement of necessary equipment and the stockpiling of spoils piles.
- ✓ Potholing Activities. A distance of 25 feet will be cleared in all directions from the backhoe and the location where the excavated soil is deposited.
- ✓ Slab Cutting. A distance of 10 feet in all directions from the cutting location will be cleared when using manual methods (i.e., chisel or equivalent) and 20 feet when using a concrete saw.



- ✓ Hand Augering. A distance of 10 feet will be cleared in all directions from the sampling location in order to accommodate additional sampling equipment.
- ✓ Concrete Bulk Sampling. A distance of 10 feet will be cleared in all directions from the bulk collection point. All personnel should be alert to prevent unauthorized, accidental entrance into controlled-access areas (the Exclusion Zone 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).

8.2.2 Contamination Reduction Zone

The Contamination Reduction Zone 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. Decontamination procedures are further explained in ENV 535.

8.2.3 Support Zone

The Support Zone is an uncontaminated zone where administrative and other support functions, such as first aid, equipment supply, emergency information, etc., are located. The Support Zone shall have minimal potential for significant exposure to contaminants (i.e., background levels). Employees will establish a Support Zone (if necessary) at the site before the commencement of site activities. The Support Zone would also serve as the entry point for controlling site access.

8.3 SITE ACCESS CREDENTIALS

If implemented by the PM, all personnel entering the site shall complete the "Site Entry/Exit Log" located at the site trailer or primary site support vehicle.

8.3.1 Visitor Access

Visitors to any HAZWOPER controlled-work area must comply with the health and safety requirements of this HASP, and demonstrate an acceptable need for entry into the work area. All visitors desiring to enter any controlled work area must observe the following procedures:



- i. A written confirmation must be received by AIL documenting that each of the visitors has received the proper training and medical monitoring required by this HASP. Verbal confirmation can be considered acceptable provided such confirmation is made by an officer or other authorized representative of the visitor's organization.
- ii. Each visitor will be briefed on the hazards associated with the site activities being performed and acknowledge receipt of this briefing by signing the appropriate tailgate safety briefing form.
- iii. All visitors must be escorted by an AIL employee. If the site visitor requires entry to any Exclusion Zone, but does not comply with the above requirements, all work activities within the Exclusion Zone must be suspended. Until these requirements have been met, entry will not be permitted.

8.4 SITE SECURITY

Site security is necessary to:

- **4** Prevent the exposure of unauthorized, unprotected people to site hazards.
- 4 Avoid the increased hazards from vandals or persons seeking to abandon other wastes on the site.
- Prevent theft.
- **4** Avoid interference with safe working procedures.

To maintain site security during working hours:

- i. Maintain security in the Support Zone and at access control points.
- ii. Establish an identification system to identify authorized persons and limitations to their approved activities. Assign responsibility for enforcing authority for entry and exit requirements.
- iii. When feasible, install fencing or other physical barrier around the site.
- iv. 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.
- v. Have the PM approve all visitors to the site. Make sure they have valid purpose for entering the site. Have trained site personnel accompany visitors at all times and provide them with the appropriate protective equipment.

To maintain site security during off-duty hours:



- 1. If possible, assign trained, in-house technicians for site surveillance. They will be familiar with the site, the nature of the work, the site's hazards, and respiratory protection techniques.
- If necessary, use security guards to patrol the site boundaries at mainly Stores. Such personnel may be less expensive than trained technicians, but will be more difficult to train in safety procedures and will be less confident in reacting to problems around hazardous substances.
- 3. Enlist public enforcement agencies, such as the local police department, if the site presents a significant risk to local health and safety.
- 4. Secure the equipment.

9.0 EMERGENCY RESPONSE PLANNING

9.1 Emergency Action Plan

Although the potential for an emergency to occur is remote, an emergency action plan has been prepared for this project should such critical situations arise. The only significant type of onsite emergency that may occur is physical injury or illness to a member of the AIL team. The emergency action plan will be reviewed by all personnel prior to the start of field activities.

Three major categories of emergencies could occur during site operations:

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

9.1.1 Emergency Response Coordinator

Prior to beginning site activities, the PM will complete Table 9-1 by filling in the names of the Emergency Coordinator (EC) and the alternate EC. The duties of the EC and the alternate EC have been specified in ENV102.

9.1.2 Site-Specific Emergency Procedures

Prior to the start of site operations, the EC shall fill in the following with any site-specific information regarding evacuations, muster points, communication, and other site-specific emergency procedures:



Table 9-1. Emergency Planning

Emergency	Evacuation Route	Muster Location		
Chemical Spill	Upwind			
Fire/Explosion				
Lightning		Vehicle		
	ADDITIONAL INFORMATION			
Communication Procedures	[Insert communication procedures, means of alerting personnel, etc.]			
CPR/First Aid Trained Personnel	 TBD Any ET employee out at the job site should be First Aid/CPR trained It is recommended that ET subcontractors should have one or two personnel from their group be First Aid/CPR trained. 			
Site-Specific Spill Response Procedures(if any)				

9.1.3 Spill Containment Procedure

Work activities may involve the use of hazardous materials (i.e. fuels, solvents) or work involving drums or other containers.

The following procedures will be used to prevent or contain spills:

- All hazardous material will be stored in appropriate containers
- Tops/lids will be placed back on containers after use. Containers of hazardous materials will be stored appropriately away from moving equipment. At least one spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e. speedy dri) shall be available at each work site (more as needed).
- All hazardous commodities in use (i.e. fuels) shall be properly labeled.



- Containers shall only be lifted using equipment specifically manufactured for that purpose.
- For drums/containers, follow the procedures in ENV 507, *Handling of Drums and Large Containers*, to minimize spillage.

9.1.4 Site-Specific Emergency Procedures

Prior to the start of site operations, the EC shall fill in the following with any site-specific information regarding evacuations, muster points, spill response, communication, and other site-specific emergency procedures.

9.1.5 Accident/Incident Reporting

All accidents and incidents that occur on-site during any field activity will be promptly reported to the SSO and the PM in accordance with AIL Safety Procedure EHS 101, *Injury, Illness, and Near-Miss Reporting.* If any AIL employee is injured and requires medical treatment, the PM will contact **AIL's Incident Reporting Line at (800) 348-5046 immediately**. The PM will initiate a written report, using the *Supervisor's Report of Incident form* (see EHS 101). The PM will complete the first two sections of this form and forward to the CTO Manager for completion of Section 3.

The report will then be provided to the H&SP 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 SSO within 24 hours after the accident has occurred.

Table 9-2. Emergency Contacts and Addresses

	Emergency Coordinators (ECs) / Key Personnel			
NO	Names	Phone contact		
	Client Representative /Focal point			



		Project Manager		
		Site Supervisor		
		Emergency Coordinator (EC)		
		Secondary/Alternate EC		
		Organization /		
		Site Safety Officer		
		Incident Reporting/Corporate Safety Administrator		
	LOCAL INTERVEN	TION AGENCIES		
	SERVICE		DIR	ECT CONTACTS/Toll free line
1	Police Department			
2	Fire Department			
3	First Aid Services			
4	Ambulance Service			
5	Breakdown Service			

10.0 PERSONNEL ACKNOWLEDGEMENT

By signing below, the undersigned acknowledges that he/she has read and reviewed the Health and Safety Plan for the Northern EPC sites. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work, and will comply with the provisions contained therein.

Table 9-3: Personnel Acknowledgement

NAME	ORGANIZATION	POSITION	DATE	SIGNATURE



11. TECHNICAL SUMMARY OF RISKS AND HASARDS AND SAFETY MEASURES

11.1 Potential Health Effects



Inhalation: Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.

Ingestion:

POISON!: The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.

Skin Contact!: Lead and lead compounds may be absorbed through the skin on prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain.

Eye Contact!: Absorption can occur through eye tissues but the more common hazards are local irritation or abrasion.

Chronic Exposure!:Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. The symptoms of chronic exposure are like those of ingestion poisoning; restlessness, irritability, visual disturbances, hypertension and gray facial color may also be noted.

Aggravation of Pre-existing Conditions!:Persons with pre-existing kidney, nerve or circulatory disorders or with skin or eye problems may be more susceptible to the effects of this substance.

11.2 FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.



Skin Contact:

Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

11.3 . FIRE FIGHTING MEASURES

Fire: Likely and measured to be suspecting fire hazard. Powder/dust is flammable when heated or exposed to flame.

Explosion: Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode. Can produce toxic lead fumes at elevated temperatures and also react with oxidizing materials.

11.4 ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

11.5 HANDLING AND STORAGE

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Areas in which exposure to lead metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized



persons. Containers of this material maybe hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

11.6 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area

11.7. PERSONAL RESPIRATORS

If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements.

11.8. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options.



State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

11.9. LABEL HAZARD WARNING:

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSESIRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN.AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSECANCER BASED ON ANIMAL DATA." Risk of cancer depends on duration and level of exposure".

11.10 LABEL PRECAUTIONS:DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.DO NOT BREATHE DUST.KEEP CONTAINER CLOSED.USE ONLY WITH ADEQUATE VENTILATION.WASH THOROUGHLY AFTER HANDLING.

11.11. LABEL FIRST AID:

IF SWALLOWED, INDUCE VOMITING IMMEDIATELY AS DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE

ANNEXES

ANNEXURE 1 Health and Safety Plan Contents

1. Reference documents



- 2. Responsibilities
- 3. Notification of construction work
- 4. Contractors responsible persons to supervise construction work
- 5. Risk Assessments
- 6. Health and Safety Reps and Committees
- 7. Objectives and Targets
- 8. Implementation of SHE Specification
- 9. COID Registration
- 10. Fall Protection Plan
- 11. Health and Safety Training
- 12. Record Keeping
- 13. Emergency Procedure
- 14. PPE
- 15. Safety Signage
- 16. Health and Safety in practice
- 17. Public Safety
- 18. Training Matrix
- 19. Medical Surveillance Plan
- 20. Incident Management
- 21. Inspection forms/checklists and schedules

ANNEXURE 2:

Health and Safety File contents

1. Risk Assessments (hazard identification)



- 2. Health & Safety Policy
- 3. Health and Safety Plan
- 4. Health & Safety Specifications
- 5. List of Safe Work Procedures (and where it is available)
- 6. In the case of modifications, the revised SHE Specifications and Risk Assessments
- 7. Appointments

8. Organogram indicating the relationships in terms of the 16.2 and person identified as the client if it is not the same person

- 9. List of Contractors / Mandatory's
- 10. Training Records on:
- a. General Induction
- b. Site / job specific induction based on the risk assessments outcomes / results
- c. Job specific based on task specific requirements (specialist training).
- 11. Medical Examination Records
- 12. Inspection Results Records.

ANNEXURE 3: REFERENCES



- 1. EWSA, 2013: Electricity reticulation standards.
- 2. RURA, Rwanda Grid Code(Pg 123- pg231),
- National Institute for Occupational Safety and Health (NIOSH)/OSHA/U.S. Coast Guard (USCG)/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, Publication No. 85-115, 1985.
- 4. Title 29, Part 1910 of the Code of Federal Regulations (29 CFR 1910), Occupational Safety and Health Standards (with special attention to Section 120, Hazardous Waste Operations and Emergency Response)
- 5. Title 29, Part 1926 of the Code of Federal Regulations (29 CFR 1926), *Safety and Health Regulations for Construction*.
- 6. WB environmental, Health and Safety Handbook, 2010

ANNEXURE 4:

Hazard and Risks Judgment Layout



Activity	Hazard	Risk(What	Scoring (Low/	Control	Accountable
	(How Can	Can	Medium/ High)	Measures	Person/Agent
	It Happen)	Happen)			