



**HEALTH AND SAFETY PLAN  
ROBINSON TERMINAL SOUTH  
DUKE STREET AND SOUTH  
UNION STREET  
ALEXANDRIA, VIRGINIA**

**ECS PROJECT NO. 21983-E**

**FOR**

**EYA**

**NOVEMBER 20, 2015**

**HEALTH AND SAFETY PLAN  
ROBINSON TERMINAL SOUTH  
DUKE STREET AND SOUTH UNION STREET  
ALEXANDRIA, VIRGINIA**

**ECS PROJECT NO. 21983-E**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
<b>1.0 INTRODUCTION</b>	1
<b>2.0 PROJECT TASKS</b>	2
<b>3.0 HAZARD/RISK ASSESSMENT</b>	3
<b>3.1 Chemical Hazards</b>	3
<b>3.2 Physical Hazards</b>	4
<b>4.0 SITE CONTROL</b>	6
<b>5.0 DECONTAMINATION</b>	7
<b>6.0 PERSONNEL PROTECTION</b>	8
6.1 Personal Protective Equipment	8
6.1.1 Level D Protection	8
6.1.2 Modified Level D Protection	8
6.1.3 Level C Protection	9
<b>7.0 EXPOSURE MONITORING</b>	10
<b>8.0 GENERAL SAFETY RULES</b>	11
<b>9.0 EMERGENCY PROCEDURES</b>	12
9.1 First Aid	12
9.2 Emergency Assistance	13
9.3 Directions to the Hospital	13
<b>10.0 TRAINING</b>	15
<b>APPENDICES</b>	
I Air Monitoring Data Sheet	
II Hazard Awareness Orientation Log	

## **1.0 INTRODUCTION**

This Health and Safety Plan (HASP) has been prepared to address health and safety procedures for archaeological, construction, demolition or other activities where subsurface soil or groundwater contamination may be encountered during the course of the these activities at the Robinson Terminal South site, located at 2 Duke Street in Alexandria, Virginia (Site). A Soil and Groundwater Management Plan (SGWMP) has been prepared separately regarding the handling of impacted soil and groundwater during redevelopment activities. Included in the SGWMP is the provision to obtain a VPDES permit. This HASP is intended to generally comply with requirements under 29 CFR 1910.120 and the U.S. Environmental Protection Agency (EPA) Standard Operating Safety Guidelines for Hazardous Waste Operations. This document is not meant to be a substitute for or replace an over-all site safety and health program (SSHP) which ensures compliance with other OSHA regulations related to hazard communication, confined space, excavation, first aid etc. It shall be the contractor's responsibility independent of this HASP to comply with all other related OSHA regulations outside of those covered under this plan under 29 CFR 1910.120.

All site activities should be performed in accordance with the documents listed above. At the discretion of the SSO, certain individuals performing work activities that are included in this HASP may be required to complete the required training programs and maintain qualification through annual refresher training. However, it is recommended that general awareness training be provided to all individuals performing work on the Site in accordance with HAZCOM under OSHA 29 CFR 1926.59..

It is the responsibility of the contractor performing the work to implement this HASP and ensure that all requirements are met and procedures are followed.

This HASP was prepared using the available information regarding specific site conditions identified in the *Site Characterization Report*, dated June 3, 2015 and the *Risk Assessment*, dated June 1, 2015 that were prepared by ECS. The health and safety specifications included in this HASP are based on publicly available data for contaminants present on the site.

## **2.0 PROJECT TASKS**

The General Contractor is responsible for implementing this plan and ensuring that work on this project is performed in accordance with the provisions contained in this HASP and any other federal, state, and local safety and health regulations as they apply to the work they are performing. The General Contractor's Site Superintendent will designate a competent person as defined under Occupational Safety and Health Administration (OSHA), in their employment, as a Site Safety Officer (SSO). The SSO has full responsibility and authority to implement this Plan and to verify compliance with applicable OSHA, EPA, and other environmental, health, and safety guidance and regulations at the site. The SSO will report to the Site Superintendent and will be onsite or readily available to the site during all work operations and will have the authority to halt site work if unsafe conditions are observed.

The SSO will be responsible for monitoring worker entries into the work area for safe conditions in compliance with the General Contractor's SSHP. This includes adequate shoring, safe ingress/egress and the absence of confined space hazards such as explosive, toxic and/or oxygen-depleted atmospheres.

The SSO is also responsible for the following:

- Maintaining a copy of this HASP on-site.
- Providing subordinate personnel a copy of this HASP, and briefing them on its content.
- Giving Hazard Awareness Orientation to all persons entering areas of known or suspected contamination, including visitors.
- Enforcing the applicable provisions of this HASP and preparing an inspection log
- Inspecting and maintaining equipment in compliance with applicable federal, state or local safety regulations.
- Enforcement of corrective actions.
- Investigation of accidents or injuries.

During the archaeological, construction, demolition activities or any other activity where subsurface soil or groundwater may be encountered, site workers are responsible for complying with this HASP, using the proper personal protective equipment (PPE), reporting unsafe acts and conditions, and following the work and safety and health instructions of the site superintendent and SSO.

### **3.0 HAZARD/RISK ASSESSMENT**

This section describes potential chemical, physical and environmental hazards that may be encountered at the site and the control measures that should be implemented to minimize or eliminate each hazard.

At the start of each work day, before work begins, a safety meeting should be held to discuss potential chemical, physical and environmental hazards and preventative safety measures. Attendance should be mandatory for all personnel who will perform work activities covered under this HASP and attendance should be documented in the *Daily Safety Meeting Form* included in Appendix I.

#### **3.1 Chemical Hazards**

The primary contaminants of potential concern (COPCs) at the Site, as identified by the *Risk Assessment*, dated June 1, 2015, are petroleum hydrocarbons, semi-volatile organic compounds and metals. Table 1 lists the specific compounds where concentrations exceeded their respective Virginia Department of Environmental Quality (VDEQ) Voluntary Remediation Program (VRP) Tier III Screening Levels. Table 1 also includes the permissible exposure limits (PELs) as defined by OSHA.

**Table 1. Contaminant Exposure Limits**

<b>Contaminant</b>	<b>OSHA PEL</b>
Arsenic	0.5 mg/m <sup>3</sup>
Lead	0.050 mg/m <sup>3</sup>
Benzo (a) Anthracene	not established
Benzo (a) Pyrene	not established
Benzo (b) Fluoranthene	not established
Indeno (1,2,3-cd) Pyrene	not established
Naphthalene	50 mg/m <sup>3</sup>

Petroleum hydrocarbons, such as gasoline range organics and diesel range organics, are generally considered to be of low toxicity. Recommended airborne exposure limits have been established for some of these vapors. Inhalation of low concentrations of the vapor may

cause mucous membrane irritation. Inhalation of high concentrations of the vapor may cause pulmonary edema. Repeated or prolonged direct skin contact with these petroleum substances may produce skin irritation as a result of defatting. Protective measures, such as the wearing of chemically resistant gloves to minimize contact are addressed elsewhere in this plan. Because of the relatively low vapor pressures associated with these petroleum hydrocarbons (specifically fuel oils, naphthalene related compounds), an inhalation hazard in the outdoor environment is not likely. As good practice, exposure levels to these contaminants should be kept as low as feasibly possible.

With respect to metals exposure, dust suppression methods will be used at the site to reduce exposure. Hand washing facilities will also be available; Strict policies will be maintained at the site with regard to no eating, smoking or drinking in work areas.

### 3.2 Physical Hazards

General physical hazards that may be associated with site activities include slips, trips, falls, contact and crushing-type injuries, eye abrasions, noise, contusions, lacerations, flammability, and heat-stress concerns. The potential for such hazards necessitates the use of gloves and safety shoes or boots that meet American National Standards Institute (ANSI) Z41.1, eye protection that meets ANSI Z87.1, and hard hats that meet ANSI Z89.1 levels of protection. All PPE use, equipment, and associated training must also meet appropriate requirements under OSHA. Personnel engaged in strenuous physical labor are required to wear sturdy work gloves.

**Table 2. Physical Hazards and Mitigation Measures**

<b>Potential Hazard</b>	<b>Source of Hazard</b>	<b>Procedures for Minimizing Hazard</b>
Struck by heavy equipment	Excavator and other heavy equipment	Maintain eye contact with operators. Use proper PPE (i.e., hard hats, steel toed boots, reflective vests, etc.). Remain in pedestrian areas.
Puncture of utility line	Electrical, gas, water, or sewer underground line	Locate existing utilities prior to start of operations. Maintain lines.
Slips, trips, or falls due to refuse and debris	Construction refuse and materials, trash, or	Maintain clean work areas and dispose of refuse promptly.
Fire/electrical hazard	Spark- or heat-producing equipment in the vicinity of combustibles	Operate equipment away from combustibles such as vegetation. Maintain portable fire extinguishers nearby (see Equipment Section). Eliminate ignition sources. Bond or ground equipment if working in wet and/or flammable areas. Ground all portable generators.

Heat stress

Personnel working in environments with high ambient temperatures may be subject to adverse temperature-related effects

Employ the buddy system. Each worker will be responsible for monitoring his/her buddy for signs of heat stress (loss of concentration, profuse sweating, dizziness, etc.).

The SSO will also monitor working conditions via use of an ambient monitor when conditions warrant. Work/rest regimens will be followed.

#### **4.0 SITE CONTROL**

The primary form of Site Control will be perimeter chain link fencing. Signage will be posted prohibiting unauthorized entry. Access to the Site is restricted to reduce the potential for exposure to its health and safety hazards. During hours of Site operation, Site entry and exit is permitted only at identified locations.

If soil and/or groundwater conditions are encountered which require PPE at Level C or above, a temporary Exclusion Zone boundary will be established by the SSO in coordination with an appropriate Environmental Professional. The limits of the Exclusion Zone will be determined in the field based on the task and weather conditions. This plan will need to be modified to address this change in condition.



## **5.0 DECONTAMINATION**

Personnel and equipment decontamination is necessary on sites with contaminated soils. Personnel decontamination will consist of:

- Removing and disposing of disposable coveralls or other outerwear (if used);
- Washing off safety footwear;
- Proper cleaning or disposal of gloves; and
- Thorough washing of face, arms and hands.

Wash stations should be made available by the General Contractor and be available on site and the water used for the wash stations should be collected into an appropriately labeled 55-gallon drum.

Decontamination of equipment should be performed. Equipment that comes in direct contact with impacted soil should be cleaned prior to exiting the site. Decontamination of large equipment should consist of physically removing gross contamination with shovels and brushes, followed by a detergent and water, high pressure wash with a clean water rinse. The Site Superintendent should be responsible for determining if decontamination solutions must be containerized. To prevent waste water run-off, equipment decontamination should be conducted in a contained area that consists of an impervious surface that is sloped to drain collected water to an appropriately labeled 55-gallon drum. At the end of each day, the lid should be placed on each drum and properly secured.

Water that is used for washing hands, water that was used to wash vehicles, or water used for decontamination purpose that comes into contact with impacted soil shall not be discharged to the sewer system without prior testing. This containerized water should be tested to determine the proper disposal of the water.

## **6.0 PERSONNEL PROTECTION**

### **6.1 Personal Protective Equipment**

Personal protection for the mass excavation is expected to be Level D or Modified Level D. At this time, worker exposure above OSHA PELs is not expected, and therefore, the use of respirators is not anticipated. However, Level C Protection is described below. If site conditions and/or exposure monitoring results indicate that worker exposure will exceed the PELs, this plan will need to be adjusted to incorporate additional PPE that will be necessary.

Personal protection for the archaeological survey and any other activities where workers may come into contact with groundwater, or if splashing conditions are present, is Modified Level D.

#### **6.1.1 Level D Protection**

Level D protection, consisting of the following items, is required for site workers who may encounter contaminated soil or groundwater.

- Long-sleeve shirt and long pants;
- Outer nitrile gloves for material handling (inner nitrile or similar surgical gloves are recommended when practical) and leather work gloves when shoveling soil containing petroleum hydrocarbons (to be disposed of properly according to local and State regulations if used in handling contaminated soils);
- Steel-toed safety boots;
- Safety glasses; and
- Hardhat.

Other personal protection readily available for use, if necessary, includes the following:

- Chemical-resistant outer gloves; and
- Hearing protection.

#### **6.1.2 Modified Level D Protection**

If site conditions and/or exposure monitoring results indicate that worker exposure will exceed the PELs, or where groundwater or splashing conditions are present, personnel will upgrade to **LEVEL D MODIFIED** personal protective equipment. A Level D Modified personal protective equipment ensemble consists of Level D PPE along with the addition of poly laminated Tyvek coveralls and chemically resistant boots and gloves.

In addition, workers who come in direct contact with soil and/or groundwater should take precaution to reduce exposures. This may require workers, from time to time, to don modified Level D personal protection equipment. Modified level D protection includes standard level D

safety gear with the addition of Tyvek coveralls, raingear or similar clothing to prevent dermal contact with contaminated soil/water to prevent work clothes from becoming contaminated. Modified level D does not include wearing an air-purifying respirator.

It is recommended that employees bring extra clothes to work every day in the event that they come into contact with contaminated soil or groundwater. If a worker does come into contact with contaminated soil or groundwater, they should change their clothes prior to leaving the Site to prevent exposure to others (i.e. riders of public transportation, business owners, family members, etc.). Clothes that have come into contact with contaminated soil or groundwater should be laundered separately from other clothes. Any disposable protective clothing utilized (i.e. Tyvek suits, gloves, etc.) should be removed daily and placed into a properly labeled waste drum. Each day, the lid should be placed on each drum and properly secured. When the drum is full, the lid should be secured and it should be removed from the site in accordance with the Virginia Solid Waste Management Regulations and taken to an appropriate facility for disposal. Other non-disposable personal protective equipment should be decontaminated on-site.

### **6.1.3 Level C Protection**

Level C protection is required at all locations where exposure monitoring exceeds action levels. Level C protection consists of Level D with the following additional items:

- Chemically resistant boots or outer rubber boots;
- Inner nitrile gloves and outer chemical-resistant gloves;
- Polycoated Tyvek; and
- Half face respirator with organic vapor cartridge. Change out schedule of the cartridges shall be at the end of the work shift. Workers using respirators shall be enrolled in a respirator protection program as required under OSHA 29 CFR1926.103 and shall be properly fit tested and be under a medical surveillance program.

## **7.0 EXPOSURE MONITORING**

A PID equipped with a 10.6 electron-volt (eV) bulb will be used to monitor for VOCs on a daily basis during site work activities. The PID will be calibrated on a daily basis with 100 parts per million (ppm) Isobutylene per the manufacturer's instructions. An action level of 25 ppm total VOCs above background and sustained for 15 minutes shall be considered sufficient to warrant upgraded PPE requirements for all potentially exposed workers. Monitoring of personal breathing zones and ambient air should occur at regular intervals (at least twice per hour or more frequent if levels approach 25 ppm). The table below summarizes the monitoring threshold limits and actions. An air monitoring data sheet is included in Appendix I.

**Table 3. Exposure Threshold Limits and Actions**

Contaminant	Location	Action Levels	Response
VOCs	Worker's breathing zone or in the immediate work area for sustained reading of 15 minutes in duration.	<25 ppm	Level D or D Modified and continued monitoring
		≥25 ppm	Inform the SSO, workers upgrade to Level C to include respiratory protection with organic vapor filters.
		≥100 ppm	Stop work and inform SSO. Implement engineering controls (i.e. ventilation fans, etc.) to reduce VOC levels.

If the action limit of 25 ppm above background is sustained for 15 minutes, workers will upgrade to Level C PPE as detailed in Section 5.1.3. If levels of 100 ppm above background are sustained for 15 minutes, additional engineering controls shall be implemented to reduce VOC levels (i.e. ventilation fans, etc.). Based on the available data, these levels are not expected to occur. At the discretion of the SSO additional exposure monitoring shall also be performed periodically during the project to monitor exposures of selected individuals for exposure to lead, arsenic, and selected VOCs. Samples will be collected using active sampling pumps or passive badges.

## **8.0 GENERAL SAFETY RULES**

This section outlines the general safety rules associated with work to be performed at the Project. Both ECS personnel and ECS subcontractors are expected to operate in a safe manner at all times. The following information is provided as general guidance for safe site practices:

- Wear the appropriate, prescribed PPE
- Tools, materials and supplies should be stored properly and in a secured area;
- Work surfaces should be free of obstructions:
- No smoking, eating or drinking;
- No matches, lighters or open flame;
- No horseplay; and
- Remove and dispose any protective outer wear prior to entering clean area.

## **9.0 EMERGENCY PROCEDURES**

This section outlines the procedures to be followed in the event of an emergency in association with the work being performed at the Project, including those associated with site evacuation, first aid and emergency assistance. In addition to the requirements outlined in this section the Contractor shall also comply with First Aid requirements as outlined under 29 CFR 1926.50.

### **9.1 First Aid**

A fire extinguisher and a first aid kit should be kept onsite while work is being performed. General first aid procedures are outlined below:

- **Skin/Eye Contact:** Use copious amounts of soap and water. Wash and rinse the affected area thoroughly, then provide appropriate medical attention. The affected area should be washed for at least 15 minutes upon chemical contact.
- **Inhalation:** Move to fresh air and, if necessary, transport to hospital. Any loss of consciousness or exposure to airborne toxic substances, even if the individual appears to have fully recovered, will require immediate treatment by a qualified physician.
- **Ingestion:** Notify the Poison Control Center and emergency medical facility and transport the individual to the nearest emergency medical facility.
- **Puncture Wound or Laceration:** Apply direct compression to stop or slow flow of blood. Transport the individual to the nearest emergency medical facility immediately.

All personnel should be aware of the potential to transmit disease from contact with bodily fluids. Personnel should assume that all bodily fluids are potentially infectious and use appropriate precautions. Controls to be considered are as follows:

- Use of the victims hand to control initial bleeding;
- Use of available PPE (gloves, etc.) to prevent contact;
- Wash promptly after contact with bodily fluids;
- Use barrier mask while giving CPR;
- Wash any work surface that contacted bodily fluids using a 10:1 solution of water to bleach as soon as possible.

If an injured individual requires medical attention beyond the capabilities of the first aid kit, the individual should be transported to INOVA Fairfax Hospital. A map illustrating the route to the hospital is attached. A copy of this HASP should accompany the injured worker to the hospital. The Site Safety Officer will be responsible for preparing a written report of all emergencies/accidents/injuries consisting of:

- Description of the emergency (type, date, time, duration); Number and names of

employees involved/exposed/injured; Description of the nature and severity of the exposures/injuries; Date, time, and name of all agencies/representatives notified;

- Description of first-aid treatment and corrective actions taken at the site; and
- Description of incident follow-up and resolution.

## **9.2 Emergency Assistance**

The name and telephone number of police, fire and other emergency response agencies are included. The name, telephone number and address of the INOVA Alexandria Hospital are also included below.

### **Emergency Services**

Fire/Rescue	911
Police	911
Poison Control Center	(800) 222-1222
National Response Center	(800) 424-8802

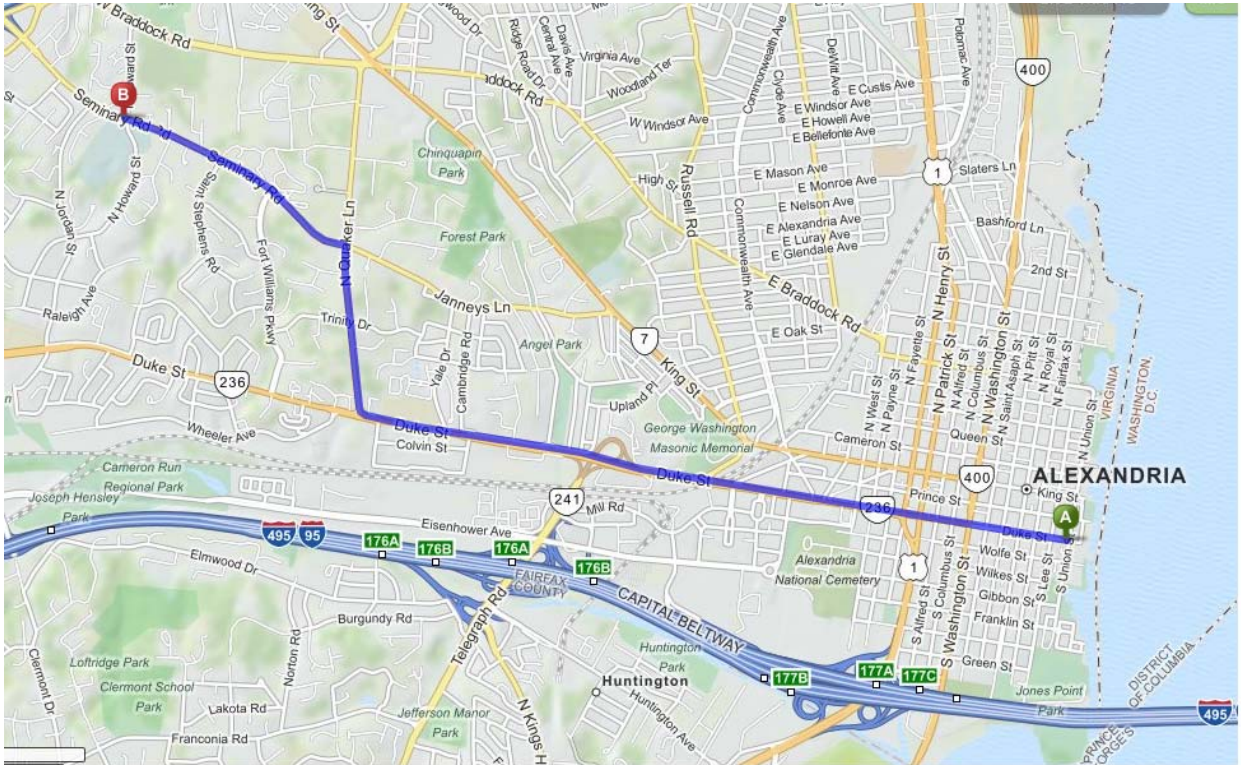
### **Medical Centers**

INOVA Alexandria Hospital  
4320 Seminary Road  
Alexandria, Virginia 22304  
(703) 504-3000

## **9.3 Directions to the Hospital**

1. Head **west** on **Duke Street** 2.6 mi.
2. Turn **right** onto **N. Quaker Lane** 0.6 mi.
3. Turn **left** onto **Seminary Road** 0.9 mi.
4. Arrive at **Inova Alexandria Hospital** on **left**

Figure 1  
Route to INOVA Alexandria Hospital  
4230 Seminary Road, Alexandria, VA 22304





## **10.0 TRAINING**

In accordance with CFR 1910.1200, all persons entering areas of known or suspected contamination, including visitors, will be given a **Hazard Awareness Orientation** by the SSO. The orientation will include a description of the health and safety concerns, the potential implications associated with the contaminated soil and groundwater, and actions to limit exposure such as the importance of washing hands/face when exiting the work area. The safety training should include a description of the chemical hazards found on site and methods to reduce and prevent worker exposure to those chemicals. The SSO shall maintain records identifying the name of each individual who has received hazard awareness communication and the date of the training. A log to record this information is provided in Appendix I.

Medical surveillance of workers is not required as part of this HASP as workers will not be required to don PPE above level D. If conditions warrant level C PPE, workers will be required to vacate the area rather than increase PPE. In the event exposure monitoring requires the need for PPE above Level D for completion of work activities, this Plan will need to be modified to address medical surveillance requirements and respiratory protection for use of Level C PPE.

**APPENDIX I**  
**AIR MONITORING DATA SHEET**



**APPENDIX II**  
**HAZARD AWARENESS ORIENTATION LOG**

**HAZARD AWARENESS ORIENTATION LOG**

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Job #: \_\_\_\_\_

Client: \_\_\_\_\_ Address: \_\_\_\_\_

Site Location: \_\_\_\_\_

Scope of Work: \_\_\_\_\_

---

**SAFETY TOPICS PRESENTED**

Protective Clothing/Equipment: \_\_\_\_\_

Chemical Hazards: \_\_\_\_\_

Physical Hazards: \_\_\_\_\_

Special Equipment: \_\_\_\_\_

Emergency Procedures: \_\_\_\_\_

Hospital: \_\_\_\_\_ Phone #: \_\_\_\_\_

Hospital Address &  
Route: \_\_\_\_\_

---

**ATTENDEES**

NAME (PRINTED)

SIGNATURE

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Meeting Conducted by: \_\_\_\_\_ Signed by: \_\_\_\_\_