

HEALTH, SAFETY AND ENVIRONMENT PLAN



PROJECT: Provision of services on the Site Investigation related to Removal of Technical and Economic Barriers to Initiating the Clean-up Activities for Alpha-HCH, Beta-HCH and Lindane Contaminated Sites at at the Organic Chemical Industry of Skopje AD (OHIS)

CLIENT: UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO)
Vienna International Centre
PO BOX 300, A-1400, Vienna, Austria
Tel: +431 260260, e-mail: unido@unido.org

CONTRACTOR: POLYECO S.A.
16th km National Road Athens-Corinth, GR 19300,
Aspropyrgos, Greece
Bojana Ivanic, Tel: +381 64 910 6889,
info@polyecogroup.com, b.ivanic@polyecogroup.com

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APPENDIX A: ACTIVITY SPECIFIC SOPs

1. BACKGROUND

This document forms the Health, Safety and Environment (HSE) Plan of the POLYECO S.A. (Polyeco) for the execution of the project "Provision of services on the Site investigation related to Removal of Technical and Economic Barriers to Initiating the Clean-up Activities for Alpha-HCH, Beta-HCH and Lindane Contaminated Sites at the Organic Chemicals Industry of Skopje AD (OHIS)", issued by the United Nations Industrial Development Organization (UNIDO).

The Lindane complex in AD OHIS–Skopje had the plants HCH, Lindane and Alpha-, Beta-, Delta-Trichlorobenzene (TCB), where HCH, Lindane, Tri-chlorine benzyl and hydrochloric acid were produced. The Republic of Macedonia signed the Stockholm Convention on 23 May 2001, ratified it on 19 May 2004 and endorsed its National Implementation Plan (NIP) on 2 September 2005. After the inclusion of ten new POPs in the Stockholm Convention Annexes, Macedonia updated the existing NIP, given the basis for realization of activities linked with priorities and action plans for new POPs. Lindane and its isomers have been added to the Stockholm Convention as POPs in 2009. Due to this addition, OHIS site is now recognized as POPs contaminated site. Among others, one of the priorities in the "old" and "new" NIP is to solve the problem with HCH-isomers in OHIS, Skopje.

1.1. Project Description

Project "Removal of Technical and Economic Barriers to Initiating the Clean-up Activities for Alpha-HCH, Beta-HCH and Lindane Contaminated Sites at OHIS" comprises of the following components:

1. Legal framework and institutional capacities;
2. Characterization of the site and risk assessment;
3. Clean up strategies and plan;
4. Establishment of clean up mechanism and operations

The scope of the project are services within second component of the project, Characterization of the site and risk assessment, in detail Site investigation by sampling and analyses of the HCH contaminated site at the OHIS plant in Skopje. So far extensive field investigation were performed by Enacon, but more detailed information on contamination extend and character is needed, especially for δ -HCH dump and surrounding HCH-impacted soil.

The characterization shall include both α,β -HCH dump and δ -HCH dump, as well as the surrounding HCH contaminated soil and the wider area. Soil under the δ -HCH dump shall not be investigated, in order to prevent further contamination due to the opening of boreholes at the dump. Contamination of soil below the δ -HCH dump shall be investigated only after its removal.

A temporary capping is planned to be constructed for the α,β -HCH dump, therefore it is important for this study to assess the volume and contamination of the soil overlying this dump, but also to prepare a detailed topographic plan that will serve as a baseline for the design of the capping.

Two groundwater monitoring campaigns shall take place, which will serve as baselines for future evaluation of remedial actions. The first shall take place late in low season 2017 and the second early in spring 2018.

The project involves the following activities:

- Preparation of a Work Plan and Environmental and Health and Safety Plan for the operations of the project.
- Supply of necessary equipment for the site investigation, including packaging equipment, PPE, handling equipment etc. Materials will be centralised at the OHIS.
- Drilling of boreholes and surveying
- Collection of soil and waste samples,

- Collection of groundwater samples,
- Collection of ambient air samples,
- Collection of vegetables samples,
- Laboratory analyses,
- Assessment of the results of the investigation and the overall reporting.

1.2. Objectives of the HSE Plan

The HSE Plan aims in providing the teams completing the site investigation activities with easy-to-follow instructions regarding the hazards, risks and working methods to follow for site investigation for Alpha-HCH, Beta-HCH and Lindane Contaminated Sites in OHIS, Skopje.

The key objectives of this HSE Plan are to:

- Identify and assess the risks associated with the project of the site investigation activities.
- Outline HSE measures to minimize those risks to acceptable risk levels.
- Ensure that humans and the environment will not be harmed or put to unacceptable levels of risk during the work operations.

The management and staff of Polyeco attach great importance to HSE issues and how they affect the design and control of projects on site. An awareness of the importance of HSE within the company is promoted at all levels. The HSE Policies of the company demonstrate the commitment of the company with regards to all aspects of safety, health and welfare, both in the workplace and on the sites.

Polyeco commits to comply with all the applicable regulations for HSE and welfare of their employees or any other person in or near the site of the works and of members of public throughout the duration of the works.

The company recognizes that in order to achieve effective HSE protection, the cooperation of all employees, as well as subcontractors, involved in the project is necessary. Each member of staff regards HSE as an integral part of all the works undertaken.

2. COMMAND STRUCTURE

2.1. Organization Chart

The project organization chart is presented in Figure 1 below.

The chart graphically shows the functional organization structure and lines of communication for this project. The project structure, along with the selection of technical personnel, is designed to provide efficient management and a high level of technical competence to accomplish this project.

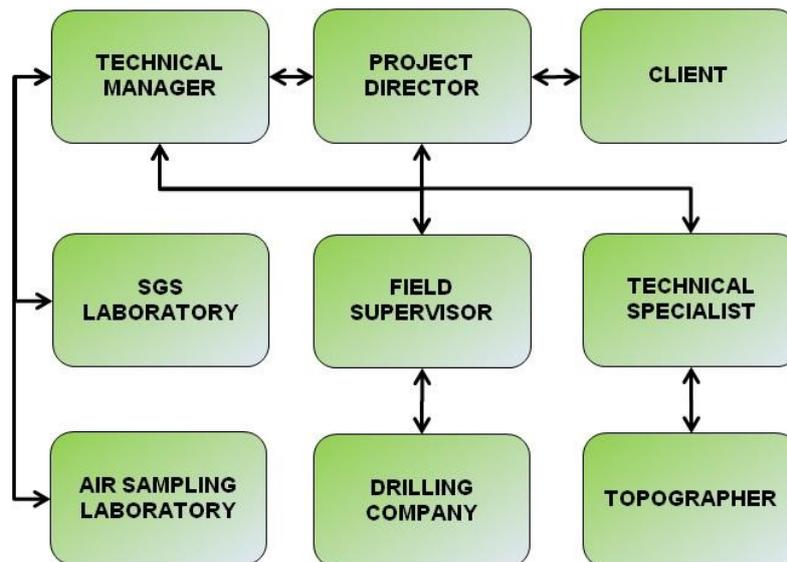


Figure 1: Organization chart

Polyeco shall work in close cooperation with UNIDO and POPs team of the Ministry. Connection between the Client and Polyeco reflects only the exchange of information regarding the project of works and relevant reporting

2.2. Positions Description and Responsibilities

Project Director

Mrs. Bojana Ivanić is an Environmental Engineer, with 9 years of experience in the management of a wide range of projects, including hazardous waste management activities. Bojana has worked also in Serbia in Dekonta - Czech company for waste management consultancy and also hazardous waste management, and since 2011 she works at POLYECO group of companies.

Bojana will act as Project Director in this Project. The Project Director will be responsible to the Client for the overall management of the project to ensure it is proceeding on schedule and within budget, according to the requirements of the contract and in compliance with the environmental, health and safety plan. The Project Manager will be the head of the Project and will coordinate all the Project Management Team and subcontractors. She will be responsible for:

- Providing updates to the Client on the progress of the works.
- Submitting deliverables.

- Coordinating the project management team.
- Overall financial and contractual management of the project.
- Liaising with the final disposal facility.
- Organizing the export of the waste.
- Preparing all project reports for the client.
- Preparing the detailed equipment list for the project.
- Keeping records of all applications to issue licenses, permissions, analyses results, topographical drawings etc

Technical Manager

Mr. Apostolos Korkolis is a Chemical Engineer with an MSc in Engineering Business Management and a PhD in Chemical Engineering. With more than 12 years of experience in Lab analyses, he has implemented a wide range of projects for the laboratory division of different companies since the year 2000. Apostolos has been working for Polyeco SA since 2013 as Director of Quality Control Laboratory and he is in charge for the production quality control, the laboratory management, the development of new analytical techniques, monitoring, waste identification and characterization, surveys and site characterization etc. Mr. Korkolis is a member of the Technical Chamber of Greece as well as of the Greek Association of Chemical Engineers and he is an Associate Member of the Institution of Chemical Engineers (ICheme), UK.

Apostolos will be the Technical Manager in this project and he will define all protocols and methods which will be followed in the course of the project. Apostolos will be liaising directly with the accredited laboratories for the laboratory analyses of the samples.

Technical Specialist

Mrs. Stavroula Kavouri has studied Geology and Geoenvironment, with MSc in Applied Environmental Geology and PhD in Materials Science. With 11 years of experience in laboratory tasks, she works for Polyeco since 2011 and she is responsible for the production line of alternative raw materials, the stabilization/Solidification of waste materials, site characterization and remediation projects, as well as for the execution of bioremediation and chemical stabilization technologies. Stavroula has a significant experience on the implementation of soil, surface water and groundwater monitoring and remediation plans also when working with Environmental Protection Engineering S.A.

Stavroula will be the Technical Specialist in this project and she will undertake the evaluation of results. Stavroula is experienced in site characterization surveys and an advanced GIS user and will be producing the final report based on the findings of the monitoring campaign. The report shall be presenting the results in 3D maps and contours and will be providing volume and mass calculations as per tender requirements

Field Supervisor

Mr. Anastasios Kostogiannis is a Chemical Engineer with an MSc in Energy Science with many years of experience in the field of hazardous waste management. He has worked for several years as a Chemical analyst for Polyeco laboratory and site operations, as quality manager for the joint venture of Polyeco and Titan cement in Egypt (MSW management project) and as a facility manager for a metal recycling company (WEEE recycling). He has extensive experience in waste, soil and water sampling procedures and techniques.

The Field Supervisor will be closely cooperating with the Project Director for the successful completion of the project.

Anastasios will be the Field Supervisor in this Project. He will be responsible for the following tasks:

- Training of the drilling company on health and safety issues related to HCH;
- Liaison with the drilling company and execution of the drillings;
- Collection of samples;

- Water pumping and direct measurements that are required for groundwater sampling, e.g. pH, redox potential, specific conductivity and pH with the use of multiparametric detector;
- Managing and organizing monitoring campaign;
- Ensuring that all works are executed in accordance with the Standard Operating Procedures (SOPs), Task Based Risk Assessments (TBRAs) and method statements.

Air Sampling Expert

A technician in the collection of ambient air samples shall attend the monitoring campaign, specifically to conduct this task. The technician will be an experienced employee of the Environmental Research Laboratory (EREL) of the Institute of Nuclear, Radiological Sciences and Technology, Energy and Safety, NCSR Demokritos, based in Athens, Greece.

2.3. Subcontractors of the Project

The following key subcontractors shall take part in the project:

- SGS Institut Fresenius GmbH in Berlin, Germany for the conduction of laboratory analysis
- Environmental Research Laboratory (EREL) of Demokritos for the execution of ambient air sampling.
- Geing, Krebs und Kiefer for drilling boreholes.

Both laboratories which will be used for this project are accredited for the specific types of analyses and sampling according to ISO 17025.

2.4. Deliverables

Monthly progress reports shall be prepared by the Contractor and submitted to UNIDO and to the POPs unit of MoEPP in accordance with the requirements of the tender.

To ensure safe practices during the sampling campaign the following documents will be prepared:

- A Risk Assessment of the sampling operations with risk minimization measures, and
- An Emergency Response Plan which will cover fire response and first aid measures.

The above plans shall be communicated to all site personnel. Records of incidents shall be kept in the HSE File.

During the performance of the works Daily Briefing Sheets and Daily Progress Reports will be produced by the Field Supervisor of works and shall be kept in files.

The following three reports shall be submitted as part of the project deliverables:

- 1st report detailing sampling and analysis plans, sampling locations and approvals to conduct boreholes.
- 2nd report detailing the sampling campaign once all samples are delivered at the laboratories for analysis.
- 3rd report presenting field survey results, analysis of data and detailed site investigation.

The 3rd report shall be produced upon completion of the project. The 3rd report will include detailed description of the characterization campaign including:

- Detailed description of all operations.
- A full documentary and photographic report of the services.
- The original laboratory protocols and tables of results.
- Comparison of results against the Dutch soil intervention values and ground water target values.
- Presentation of results on GIS taking into account Enacon results and results of Polyeco former monitoring campaign.
- Detailed topographic plans, contour maps and cross sections.

- Mass and volume calculations of waste types, contaminated soil and overlying soil at the dumps.

Since the final results shall be only available after the completion of the 2nd groundwater monitoring campaign early in March, a draft report shall be submitted to the client.

3. COMMUNICATIONS

Effective communication is a critical aspect for the successful implementation of the project. The lines of communication off-site and on-site are presented below.

3.1. Off-site Communications

Main contacts for implementation and supervision of project are shown in table below:

	Phone	Email	skype	Position
UNIDO				
Aleksandar Mickovski		aleksandar_mickovski@yahoo.com		National consultant
POLYECO				
Ilias Avramikos	+30 210 4060091	i.avramikos@polyecogroup.com	avramikos_polyeco	HSE manager
Bojana Ivanić	+381 64 910 6889	b.ivanic@polyecogroup.com	bojana.polyeco	Project Director
Anastasios Kostogiannis	+306942687 375	akostogiannis@gmail.com	N/A	Field Supervisor

Emergency communication plan

In the event of an emergency the following services and the Site manager must be contacted immediately:

Emergency calls	Telephone
Ambulance	194
Fire brigade, rescue service	193
Police	192
Field Supervisor (Anastasios Kostogiannis)	+306942687375 Local number pending

4. HEALTH, SAFETY AND ENVIRONMENTAL PLAN

The formulated HSE Plan is project-specific and contains all relevant information with regard to the known hazards identified and the mitigation measures necessary to control the risks. The Plan addresses the following:

- Site Responsibilities;
- Site Management;
- Training and Induction;
- First Aid;
- Personal Protective Equipment;
- Fire Fighting Extinguishers;
- Drilling and sampling activities
- Noise and Vibration

The Project Manager is responsible for ensuring that all members of the project team are briefed accordingly.

All members of the project team have the responsibility to comply with instructions and procedures that have been identified to control any highlighted risks. They shall report back to the Project Manager should any unforeseen risks arise or changes occur whilst undertaking their duties. In such circumstances a review of completed risk assessments and control methods / method statements is required. The HSE Plan may be modified if necessary.

4.1. Site Safety Organization

4.1.1. Responsibilities

Site activities associated with the operations of the project are deemed to be of a low to medium risk nature and mainly involve site investigation activities – drilling and sampling.

The HSE Manager of the project will be responsible for all issues in relation to the HSE. However, all employees will be accountable for environmental, HSE in relation to their acts and omissions.

The Project Director will be responsible for ensuring that sufficient resources have been allowed to comply with the obligations of HSE Legislation and to comply with Polyeco's HSE System requirements. The Project Director will ensure that all employees, sub-contractors and the client have access and a copy of this Plan. He shall also ensure that the Plan is regularly reviewed, in line with legislative changes or identified potential HSE incidents.

Full HSE Site Induction will be given to all site staff prior to commencement of the works. The Induction will be in accordance with the site specific Emergency Response Plan and HSE Plan.

4.1.2. Site Management

Prior to commencement of work on the site, the Project Director in cooperation with the Field Supervisor will establish the management organization for all HSE aspects relating to employee activities and the works to be undertaken. In general the Project Director will be fully responsible for the activities and the safe conduct of all employees on site and will carry out the following:

- Obtain in advance as much information as possible about any known existing hazards.
- Ensure that all site staff is fully aware of the site rules, procedures and HSE measures.
- Make a suitable and sufficient assessment of the risks to HSE of his site team and to persons for whom he is responsible who are under his employment.
- Prepare additional formal risk assessments where significant risks are identified.
- Where identified by the assessment, ensure that employees are provided with health surveillance and all needed personal protective equipment.
- Establish and give effect to appropriate procedures to be followed in the event of serious and imminent danger, and nominate a sufficient number of competent persons to implement those procedures.
- Provide his staff with comprehensive information and guidance on:
 - the risk to their health and safety identified in the risk assessment;
 - the protective and preventative measures to be taken;
 - the identity and location of the competent persons;
 - the procedures to be followed in the event of serious and imminent danger;
 - the procedures which will ensure that site staff is provided with adequate HSE training.

4.1.3. Training and Induction

- A Site Induction shall be held to all engaged site personnel before the commencement of the works. The Induction shall describe all significant hazards on the site including contamination. The Induction will notify employees of the site rules, including hygiene rules and Standard Operating Procedures.
- Copies of the HSE Procedures will be displayed in prominent accessible location at the site.
- The Field Supervisor will ensure that emergency procedures in the event of an accident are fully understood and implemented.
- Employees shall always follow the Risk Assessment Procedures.

4.2. Site Wide Elements

4.2.1. Site Access / Egress

- Only authorized personnel shall have access to the work areas, in agreement with the UNIDO.
- All traffic entering or leaving the site shall comply with the respective security policy.

4.3. First Aid

- The Field Supervisor shall ensure that suitable arrangements for the provision of First Aid are made. This includes making sure that necessary equipment is available at all times.
- All emergency phones (nearby hospitals etc.) will be available on site.

4.4. Personal Protective Equipment

The appropriate level of personal protective equipment (PPE) and respiratory protective equipment (RPE) will be specified in the Risk Assessments, which will accompany the works. Where applicable the equipment will conform to appropriate standards such as EN or BS.

The following equipment will be supplied, maintained and disposed of accordingly. Specified PPEs will be mentioned during the daily Tool Box Talk before the commencement of works, according to the specific job risk analysis.

Hazard	Equipment	Tasks
Respiratory Injuries		
Organic and Inorganic vapors	Ful/half face mask	Use of filters for the specified task as amends from daily TBT.
Hand Injuries		
Mechanical hazards	Gloves	All works.
Chemical hazards	Chemical resistant protective gloves	All works.
Foot Injuries		
Impact & Penetration Chemical hazards	Safety chemical resistant boots	All works.
Body Injuries		
Dirt Contamination	Single use overall Uniforms	Drilling and sampling.
Airborne dust	Goggles	Drilling and sampling.
Head protection	Helmets	All works.

4.4.1. Responsibilities with regards to PPE

It is within the Field Supervisor's responsibilities to:

- Ensure each member of staff has a full set of safety clothing in reasonable condition. The clothing will include, safety helmet and safety boots with cap and sole protectors.
- Provide replacement clothing as required.
- Use best endeavours to ensure that PPE is worn by all personnel.
- Ensure the availability of safety helmets and safety boots for the sole use of visitors and ensure that all visitors wear the appropriate protective clothing when on site.

Employee's responsibilities are to:

- Wear safety clothing at all times, i.e. safety helmet, and safety footwear. RPE and type of footwear worn as conditions dictate on site.
- Inform the Project Director when clothing needs replacing.
- Take reasonable care of personal protective equipment provided.

4.5. Fire Fighting Extinguishers

The Field Supervisor is responsible for ensuring that sufficient firefighting extinguishers of both CO₂ and powder are on-site. Prior the commencement of the works the Field Supervisor should inform all employees about the exact location of the firefighting equipment and how to use them in case of emergency.

4.6. Drilling and sampling activities

In order to reduce potential risks the following measures shall be employed:

- Personnel will be informed of the properties and the nature of the chemicals to be handled.
- Personnel will be trained for the proper use of fire extinguishers and safety equipment.
- PPE will be readily available on site.
- Smoking and eating will be prohibited in the working areas.
- Only authorized and trained personnel will be permitted to enter the working areas.
- Any spillages, including near-miss incidents, which may give rise to an environmental pollution incident shall be contained and removed immediately.

4.7. Air Emissions

The drilling works may give rise to increased air emissions. For this reason appropriate PPE will be utilized by all personnel during the execution of the works.

5. RISK ASSESSMENT

The current document presents the Risk Assessment of the project.

In order to manage the operational risks associated with the repackaging and transport activities, a Task Based Risk Assessment (TBRA) had to be carried out for all principal tasks. The objectives of the TBRA is to assess individual tasks to be undertaken in order to identify hazards, assess the level of risk and consider and specify control measures to be adopted in order to mitigate the risks identified.

The TBRA is a methodology developed after over 15 years of project implementation management of waste. It is based on standard methodologies of risk assessment. The aim of the TBRA is to:

Identify and where possible quantify hazards.

Identify who or what may be affected by the hazards and how that could happen.

Evaluate the risk (likelihood and intensity of exposure) and assess if current precautions are adequate.

Investigate methods and/or strategies to reduce or eliminate risks.

Record all findings and brief staff accordingly

Constantly review the assessment during project implementation and ensure assessments and assumptions are valid (supervision).

It is a format for recording data and information that can assist the operator in making objective decisions regarding the protection of workers and the environment. It also provides a methodology for establishing an order of priority in repackaging activities to reduce risks as and when they run.

An initial assessment consisting of a review of likely/potential hazards is carried out. If no hazards are identified then there is no requirement to take the risk assessment process any further other than to monitor and review the associated work / job tasks in the event of any changes or forthcoming information.

Where hazards are identified, further risk assessment shall be undertaken. Risks are assessed using risk evaluation to determine the degree of risk i.e. whether low, medium or high. The assessment considers severity and likelihood. Where the initial risk assessment indicates a medium or high risk, control measures are identified and introduced to reduce the risk to the lowest possible level. A final risk assessment calculation is then made and the findings recorded.

TASK / ACTIVITY	Drilling of boreholes		ASSESSMENT DATE		NEXT REVIEW	25/02/2018	RECORD No	RA-046
		TYPE OF RA	MAIN OPERATIONS <input checked="" type="checkbox"/>		TASK SPECIFIC <input type="checkbox"/>		LOCATION SPECIFIC <input type="checkbox"/>	
LOCATION	All locations	ASSESSOR	Bojana Ivanic	REVIEWER	P. Manolopoulos	MAIN OPER RA AVAILABLE		N/A
PERSONS AT RISK	Contractor, Subcontractor, Authorized Visitors			PTW REQUIRED	YES <input type="checkbox"/> / NO <input checked="" type="checkbox"/>	SPECIFY	N/A	
ASSOCIATED RAs / SOPs	SOP-046 Borehole drilling							

** To be used with the HSE Impact Matrix (A01-01) & HSE Risk Assessment Impact Flowchart(A01-02)*

No	POTENTIAL HAZARD / ENVIRON. ASPECT	RISK / ENVIRONMENTAL IMPACT	INITIAL RISK	CONTROL MEASURES	RESIDUAL RISK	ACTION BY
01	Movement of machines/ operation of drilling machine	<ul style="list-style-type: none"> Hit by moving machinery/ entrapment Entrapment/ hit by mobile plant Fall of object from height Hazardous manual tasks - musculoskeletal disorder (MSD) 	H6	<ul style="list-style-type: none"> Before moving / operating allow engine to run for sufficient time to reach operational temperature Ensure no persons are in machinery's vicinity before and during operation. Maintain exclusion zone and cease work if approached Follow manufacturer's instructions, specific safe work method statement/site rules Ensure no persons or obstructions in vicinity before start-up Connecting attachments/augers: <ul style="list-style-type: none"> Attach as per manufacturer's instructions 	M4	Safety Engineer On site manager/ Foreman

				<ul style="list-style-type: none"> ○ Attachment must only be used as specified by manufacturer ○ Ensure attachment is on a flat, level surface ○ Connect hydraulic hoses as required. Tighten bolts/cap to proper torque ○ Ensure all locking pins are secured in place ● Use of standard helmets (EN 397, EN50365) ● Following Standard Operating Procedures ● Ensure all rig components are regularly inspected and maintained. ● Secure high-risk components with a restraint (e.g. chains, wire slings) ● Plan tasks to minimize the requirement for working at height. ● Identify drop zones and restrict access to them 		
02	Skin exposure	<ul style="list-style-type: none"> ● Temporary or permanent damages ● Skin irritation, burns, redness, dry skin, other 	M3	<ul style="list-style-type: none"> ● Wear all appropriate PPE including face shield or full face mask to avoid skin exposure due to splash. ● For the accurate selection of the correct PPE, use the appendix "A01-03 EN for PPE" along with "SOP-102-Seelection of Personal Protective Equipment". ● Check the integrity of gloves and 	L1	On site manager/ Foreman

				<p>coverall, replace immediately if damaged</p> <ul style="list-style-type: none"> • First aid kit on site including eye wash • Check connections, hoses of pump before commencement of pumping. • Secure all pumping equipment • Check if pump is operating properly before commencement of works, using water for instance. 		
03	Inhalation of vapors	<ul style="list-style-type: none"> • Fatigue, headache, nausea, irritating to nose, throat and lungs • Retching and shortness of breath • Lung damage 	M3	<ul style="list-style-type: none"> • Check for possible smell and conduct gas measurements in order to check whether hazardous vapors are present. • Ventilate working area prior to entry. • For the accurate selection of the correct PPE that is, mask and filters, use the appendix “A01-03 EN for PPE” along with “SOP-102-Selection of Personal Protective Equipment”. 	L1	On site manager/ Foreman
04	Ingestion of waste	<ul style="list-style-type: none"> • Toxicity • May cause nausea, coughing, perforation of esophagus or stomach in case of corrosive substances, choking and/or shortness of breath 	M3	<ul style="list-style-type: none"> • Wear all appropriate PPE including face shield or full face mask to avoid possible ingestion due to splash. • No eating or drinking at working site • Check the integrity of gloves and coverall, replace immediately if 	L1	On site manager/ Foreman

				<ul style="list-style-type: none"> damaged Do NOT induce vomiting if waste is swallowed Cleaning/washing facilities on site 		
05	Injury from fallen objects	<ul style="list-style-type: none"> Injury/death 	M4	<ul style="list-style-type: none"> Always stay 3 meters away from the suspended load Wear Helmet Wear Safety boots 	L2	On site manager/ Foreman
06	Noise High levels of noise caused by breaking, and drilling works	Exposure to noise Occupational hearing loss / Hearing disorders (e.g. headaches, blood pressure)	M4	<ul style="list-style-type: none"> Noise level measurements where deemed necessary Hearing conservation examinations Obligatory use of hearing protection PPE at high noise areas 	L2	On site manager/ Foreman
07	Vibrations Use of impact and/or rotating power tools	Exposure to high frequency vibrations Neural / blood vessel disorders / joint disorders	M4	<ul style="list-style-type: none"> Use of anti-vibrating tools and gloves Keep safe distance from excavation machinery Breaks according to work load 	L2	On site manager/ Foreman
08	Services above or underground (utilities, public lines, etc.)	Electrocution Injury / possible death from pressure lines	H6	<ul style="list-style-type: none"> SOP-010 Lock Out and Tag Out Identify, label and protect/support or remove/bypass all existing underground utilities / public lines accordingly. 	M4	On site manager/ Foreman
09	Vehicle movements,	Accidental move	H6	<ul style="list-style-type: none"> Licensed drivers only. Vehicles not to enter the work area without prior 	M4	On site manager/

	<p>e.g. fork lifts, trucks etc.</p>	<p>Crash or struck between Physical injury to all parts of body, possible death Damage to vehicles and structures</p>		<p>arrangements by the Supervisor.</p> <ul style="list-style-type: none"> • Banksman to be used when reversing in tight spaces. Erect cones, light, signs, and barriers around work area. Vehicle engines to be switched off when vehicle is not in use. • Abide by traffic rules • Forklifts. Don't travel with forks up in air or overloaded, consider passers-by. Drive on even ground only. • Pedestrians to use footpaths where possible, wear high visibility clothing. Always be aware of moving plant and vehicles. 		<p>Foreman</p>
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6. STANDARD OPERATING PROCEDURES

The purpose of the SOPs is to provide clear instructions on the activities needed for the drilling and sampling activities. SOPs were prepared based on the specific conditions and hazards present.

All SOPs will be communicated to the employees before the commencement of the works. SOPs will be printed on site. The SOPs will be provided both in written instructions and also in posters and graphics form which will be available on site.

The following activity specific SOPs were prepared for the project and are presented in Appendix A:

- Borehole drilling
- Lifting Operations
- Hand tools, portable Tools and equipment
- Electrical safety
- Spill response

APPENDIX A: ACTIVITY SPECIFIC SOPs

