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EGYPTIAN REFINING COMPANY
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
ERC HYDRO-CRACKING COMPLEX PROJECT AT MOSTOROD

APPENDIX 12.2 – CLEARANCE AND LAND CONTAMINATION STUDY PLAN FOR NORTH PLOT AND
SOUTH PLOT 1

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ERC Hydro-Cracking Complex Project at Mostorod FINAL VERSION

Appendix 12.2 – Clearance and Land Contamination Study Plan for North Plot and South Plot 1

51287-1

December 2008

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**APPENDIX 12.2 – CLEARANCE AND LAND CONTAMINATION STUDY PLAN FOR NORTH PLOT AND
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1. INTRODUCTION

1.1 Purpose

The objective of this Clearance and Land Contamination Study Plan for the North Plot and South Plot 1 is to outline the procedures to ensure that environmental management during clearance and land contamination studies is undertaken in accordance with national legal requirements and International and European Financial Institutions and ERC's requirements and commitments. As described in Chapter 12, the final version of the Plan will be prepared by the Contractor around the time of mobilising to Egypt. However, a preliminary draft Plan is presented here to enable a clear understanding of the approach and content of the Plan. Prior to mobilisation, the Contractor will prepare all the necessary risk assessments, method statements, management procedures and monitoring programmes in discussion with and as required by EEA and other relevant Regulators.

This Plan will need to be read and implemented in conjunction with other relevant documentation, including the Project Waste Management Plan (WMP), Oil and Fuel Management Plan, and Transport Management Plan.

The Contractor operates Environmental Management Systems in accordance with ISO 14000 principles and requirements (refer to Appendix 9 and 14 for additional details). Consequently, in order to maintain certification, the Contractor must show a continuous improvement in reducing their impact on the environment, including that impact associated with clearance and contamination investigation activities.

1.2 Scope

The Plan applies to the North Plot and South Plot 1 and will cover demolition, site clearance and site investigation for the purpose of characterising soil and groundwater contamination and associated risks.

1.3 Responsibilities

Project Director/Project Managers

The Project Director/Project Managers are specifically responsible for:

- Overall responsibility for ensuring that the Project prepares and implements the Project Environmental Management Plan together with any Procedures and Method Statements and complies with all legislative and contract requirements.
- Representing the Contractor matters relating to the Project with ERC, Project Management Consultants and the Regulatory Authorities.



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- Ensuring sufficient resources (people time and money) to plan, execute and monitor environmental aspects of the contract.
- Co-operating with internal and external audits; deciding and implementing appropriate actions resulting from environmental audits, environmental incidents and complaints.
- Managing of relationships between the Contractor, external environmental organisations/agencies and the general public.

Environmental Control Supervisor

The Environmental Control Supervisor is site-based and specifically responsible for:

- Ensuring that line management is aware of their obligations and responsibilities. Co-ordinating all environmental input to the Project.
- Preparation and maintenance of the Project Environmental Management Plan (PEMP) and Clearance and Land Contamination Study Plan for the North Plot and South Plot 1.
- Ensuring the EMP procedures and instructions are in place and comply with national legislation and International and European Financial Institution requirements.
- Liaison with ERC, EEAA, any sub-contractors, Statutory & Non-Statutory Authorities and Third Parties on all environmental matters.
- Liaison on a day-to-day basis with Project Management and in particular the Construction Department at the work face.
- Carrying out Weekly Site Inspections and environmental management awareness training.
- Development and provision of induction training and tool box talks.

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2. CONTEXT

2.1 Site Description

The North Plot is generally flat and surfaced with hard standing or compacted ground. Much of the area has been recently demolished, but some industrial buildings are present. The site is bounded by a residential area to the East, industrial buildings to the North and South, and Ismalia Canal to the West. The North Plot was formerly occupied by the General Company for Ceramic and Porcelain Products, Misr Glass Manufacturing, and El Nasr Glass and Crystal Company.

South Plot 1 has a gentle slope of 5 m or less towards the North, with a more pronounced, although still gentle slope in the North-Eastern corner immediately beyond the site boundary. The site is largely hard standing and bare ground, with a sizeable waste storage area. To the East lies an agricultural area, although a high stone wall and track road separate this from the South Plots. South Plot 1 is leased from CORC and is currently being used for temporary storage for non-hazardous solid waste from CORC and as a storage area for workshops, including a metal fabrication workshop.

2.2 Potential Contamination

As discussed in Chapter 5, due to the industrial history of the North and South Plots it is possible that the shallow soil has become contaminated. There is no knowledge of any contamination investigation having been carried out at either site. Investigation was not undertaken as part of the baseline studies for the ESIA because of a lack of knowledge of third party services such as telecoms and pipelines; and because South Plot 1 is under lease and not available for intrusive sampling until site occupation commence.

Historical use of the North Plot was related to porcelain and glass manufacture. Potential contaminants associated with this use include minerals, oxides and metals such as cadmium, chromium, copper, lead, mercury, nickel and zinc. Fuel may also be present in the soil or shallow groundwater depending on how it was handled and stored. It is possible that asbestos-containing materials (ACB) may be present in some of the buildings scheduled for demolition. If not carefully controlled, asbestos can become mixed with soil during demolition activities.

South Plot 1 is currently being used for temporary storage of non-hazardous solid waste from CORC and as a storage area for workshops, including a metal fabrication workshop. Potential contaminants include fuels, heavy metals and solvents.

It is also possible that contaminants originating from off-site sources may have migrated beneath the sites (see Table 5-17 in Chapter 5).

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Soil and groundwater contamination may present risks to a number of receptors including personnel who will be engaged in site redevelopment, off-site residents, future site users and environmental receptors including surface water (Ismalia Canal).

2.3 Proposed Work

Demolition of buildings and clearance work are required on both the North and South 1 Plots prior to redevelopment.

ERC requires that baseline conditions with respect to contamination be established and any risks associated with contamination be evaluated prior to site redevelopment. As discussed in Chapter 12, the approach to assessing risk involves the identification of source-pathway-receptor linkages:

Source	An entity or action which releases contaminants into the environment.
Pathway	A mechanism by which receptors can become exposed to contaminants.
Receptor	The human or ecological component at risk of experiencing an adverse response following exposure to a contaminant.

If any one of these three components is missing from a potential exposure scenario, then there can be no risk.

Defining the conceptual model of risk requires identification of all potential sources, pathways and receptors of contamination, and identifying plausible combinations of these three components. Potential pollutant linkages are then qualitatively assessed to identify plausible scenarios. The key sources, pathways and receptors are discussed in Chapter 12.

As discussed in Chapter 12, it is recommended that a phased approach be adopted to investigate and define the risks from soil and groundwater contamination:

- Phase I: Data Collection, Refinement of the Conceptual Site Model and Preliminary Site Investigation Design;
- Phase II: Preliminary Intrusive Site Investigation (prior to site demolition);
- Phase III: Preliminary Quantitative Risk Assessment;
- Phase IV: Detailed Site Investigation & Quantitative Risk Assessment (after site demolition);
- Phase V: Remediation Options Appraisal; and
- Phase VI: Remediation Design, Implementation and Verification.



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3. PROCEDURES

This section focuses on the procedures to be adopted to ensure that environmental management during clearance and land contamination studies is undertaken in accordance with national legal requirements and International and European Financial Institution and ERC's requirements and commitments.

Note that although it is common for site health and safety issues to be addressed in a separate plan, the discussion below includes health, safety and environmental issues because there is considerable overlap and inter-linking of these issues in terms of the work under consideration. However, it will ultimately be the Contractor's decision as to how to address the management of these issues.

3.1 Introduction

The key objective of any work undertaken on site, including demolition, clearance, intrusive investigation and, if required, remediation, is that no harm should be done to human or environmental receptors.

Health and safety goals of the Project should be to:

- Undertake the work in compliance with all applicable health and safety legislation;
- Comply with any additional requirements of International and European Financial Institutions and ERC;
- Complete the works free from risk as far as is practically possible;
- Prevent accidents occurring during the works and prevent long-term effects of illness;
- Minimise disruption to the public;
- Maintain safe and unimpeded access to and egress from the site; and,
- Complete the works in accordance with the programme and specified quality standards without putting people's health and safety at risk.

The environmental goals of the Project should be to:

- Undertake the work in compliance with all applicable environmental legislation;
- Comply with any additional requirements as defined by International and European Financial Institutions and ERC;
- Minimise environmental damage;
- Minimise the production of waste, wherever possible;



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- Store, handle, use, transport and dispose of materials in a manner that minimises their potential for damaging the environment;
- Be aware of environmentally sensitive receptors on site and in close proximity to the site; and
- Undertake works in such a way to minimise the effects on environmentally sensitive receptors on site and in close proximity to the site.

3.2 Legal Framework

All work must be undertaken in compliance with applicable Egyptian legislation.

3.3 Technical Specification

The work will be designed to achieve the aims set by ERC, which are likely to include, but may not be limited to:

- Demolition of specified existing structures;
- Removal of existing waste, debris resulting from demolition, and vegetation, and grubbing / re-grading works to provide a level site for redevelopment; and
- Identification and assessment of risks associated with soil and groundwater contamination beneath the site, and possible remediation to reduce significant risks.

It will be the responsibility of the Contractor to ensure that the technical design of the work (e.g. extent of site investigation) is sufficient to meet ERC's expectations, which includes compliance with Egyptian legislation and international good practice.

3.4 Hazard Identification and Risk Assessment

Hazard identification and risk assessment form the basis of the planning necessary to ensure that the above health, safety and environmental goals are met. A hazard is a property or situation which could lead to harm in particular circumstances. Risk is a combined estimate of the probability and magnitude of a defined hazard.

Hazards related to the proposed demolition, clearance and site investigation work may include, but not necessarily be limited to:

- Those associated with disused buildings and demolition activities (unstable structures, confined spaces, dust, etc.);
- Those associated with underground services (fire, explosion, electrocution, etc.);
- Chemical contamination (vapours, dust, direct contact, gases and odours; and releases of contaminated soil and groundwater into the environment);



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- Risk of fire and explosion (for example the presence of residual hydrocarbon liquids and vapours);
- Moving vehicles and heavy plant (including off- and between sites);
- Open excavations;
- Storage of chemicals and contaminated water;
- Manual handling of materials and equipment; and
- Noise and vibration.

Risk receptors can be human or environmental (e.g. flora, fauna, surface water). Those related to the proposed demolition, clearance and site investigation work may include, but not necessarily be limited to:

- Site personnel undertaking the work;
- Inspectors/visitors;
- General public (including site neighbours);
- Groundwater (from discharge of contaminants); and
- Ismailia Canal (discharge of contaminants).

Identification of **all** risks associated with the proposed work, followed by their assessment and the formulation of mitigation measures where necessary, will form the basis for the successful environmental management of the works.

Table 1 presents an appraisal of the risks that may be associated with the proposed work. This list is non-exhaustive and based on available information; it will be the Contractor's responsibility to compile the final list based on detailed knowledge of site conditions, scoping and timing of work, and other factors.

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Table 1 Potential Risks and Mitigation Considerations

Potential Risk	Mitigation Considerations
Encountering underground services	<p>Gather all available information on services prior to mobilisation to site – from previous site owners / occupants, service providers etc</p> <p>Request that service providers cut off services to site, if appropriate</p> <p>Carry out a remote service location survey prior to demolition / excavation</p> <p>Walk-over survey to identify excavation locations</p> <p>Awareness training for all personnel</p>
Fire and explosion	<p>No smoking on site</p> <p>No burning of waste</p> <p>Use intrinsically safe electrical equipment</p> <p>Test atmosphere before carrying out any hot work</p>

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Potential Risk	Mitigation Considerations
Exposure to contaminants during demolition	<p>Awareness training for all personnel</p> <p>Survey buildings/structures to identify hazardous materials (e.g. asbestos, hydrocarbons) prior to mobilisation to site</p> <p>Minimum and appropriate personal protective equipment (PPE) standard to be established and enforced for site workers (e.g. hard hat, protective gloves, chemically-resistant overalls, respiratory protection)</p>
Exposure to contamination during excavation	<p>Awareness training for all personnel</p> <p>Gather all information on potential contaminants prior to mobilisation – records from previous site owners, occupants etc.</p> <p>Site walk-over to identify possible surface contamination</p> <p>Minimum personal protective equipment (PPE) standard to be established and enforced for all undertaking excavation works (e.g. hard hat, protective gloves, chemically-resistant overalls)</p> <p>Establish and maintain protective hygiene arrangements (e.g. delineation of ‘clean’ and ‘dirty’ site areas, provision of washing/changing facilities, no eating/drinking/smoking except in designated areas)</p> <p>Monitoring for vapours and gases, and appropriate PPE to be available if required</p>

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Potential Risk	Mitigation Considerations
Release of contaminants in underground structures	Gather all information on presence of underground structures prior to mobilisation – records from previous site owners, occupants etc. Establish emergency response procedures
Exposure of off-site human receptors to contaminants (vapours and dust)	Boundary monitoring Plastic sheeting/water spraying during demolition
Nuisance to off-site residents (noise, odours, vibration)	ERC Community Relations Manager and the Contractor's Community Liaison Officers (CLOs) to maintain ongoing local community/stakeholder engagement Restrict working hours to avoid nuisance
Spread of contamination by vehicle movements	Vehicle wheel washing prior to leaving site Vehicles carrying demolition rubble or soil to be sheeted before leaving site
Danger to site personnel from vehicle movements	Establish designated routes for vehicle movement on site and keep separate from pedestrian walkways
Danger to site personnel from open excavations	Awareness training for all personnel Minimum personal protective equipment (PPE) standard to be established and enforced for all undertaking excavation works (e.g. hard hat, protective gloves, chemically-resistant overalls) Use barriers and fencing where excavations are to be left open

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Potential Risk	Mitigation Considerations
Release of contaminants into surface water (Ismailia Canal)	<p>Gather all information on presence of underground structures prior to mobilisation – records from previous site owners, occupants etc.</p> <p>Establish methodologies for investigation to avoid release of materials</p> <p>If necessary, pump contained water or liquids to secure storage tanks prior to appropriate disposal</p> <p>Establish emergency response procedures</p>
Boundary stability	<p>Consider stability of site boundaries and adjacent buildings or structures if demolition or excavation is to take place adjacent to site boundaries</p> <p>Provide protection if necessary</p>
Danger to trespassers	Secure site boundaries and exclude trespassers from site

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3.5 Monitoring and Review

Appropriate monitoring and review should be undertaken with the aim of continually improving the management of the Project with respect to health, safety and environment.

3.6 Site Security and Induction

An important part of risk reduction will be to restrict unauthorised access to the site during works, and to ensure that **all** authorised personnel (including visitors) undergo induction and awareness training before being allowed access to site.

Induction should include:

- Site hazards and mitigating measures;
- Duties and responsibilities of all staff;
- Appropriate methods of working;
- Definition of working areas on site (for example clean, refuelling, parking areas);
- The location of the first aid box and the name of the qualified first aider;
- Emergency response procedures;
- Arrangements for welfare matters; and
- Any other information which is important with respect to the site.

3.7 Site Rules

The establishment of site rules is critical to risk reduction. The following should be considered in developing a list of site rules:

- A single person should be identified as the person in charge of all activities on site. This person should be present on site at all times, and should be the first point-of-contact for anyone having questions or concerns relating to any aspect of the work. (In the following it is assumed that this person is the Environmental Control Supervisor.)
- The site-specific health, safety and environmental plans must be available and followed at all times.
- All persons entering the site must advise the Environmental Control Supervisor of their arrival and departure. All persons on site must have undergone induction.
- Persons having consumed alcohol or drugs should not be permitted on the site.

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- Smoking will not be permitted on site. Eating and drinking is only permitted in a designated area as defined during the safety induction. PPE must be removed before entering this area, and the hands must be thoroughly washed.
- Minimum Personal Protective Equipment (PPE) (e.g. hard hat, steel toe-capped boots, chemical-resistant overalls) is to be worn at all times other than in the clean area or as specified.
- Additional PPE must be available to all personnel and worn when deemed necessary (e.g. chemical-resistant gloves, half- or full-face respirator with suitable cartridge, ear defenders).
- If an unanticipated, potentially hazardous material or situation is encountered, then work must cease until the occurrence has been assessed. If in doubt, stop work.
- Avoid contact with any contaminated or potentially contaminated material or surface.
- Any ill effects must be reported at once, e.g. headache, dizziness, blurred vision, eye irritation.
- All personnel should look for signs of distress in others – e.g. skin rashes or discolouration, signs of mal-coordination, changes of demeanour, salivation, capillary responses, nervousness or excitability.
- In the event of any incident or accident the Environmental Control Supervisor must be called to the scene immediately.
- Individuals may only carry out tasks for which they are competent and authorised.
- Work should follow appropriate and approved method statements.
- Work will be conducted under a Permit to Work system.
- Appropriate attention will be given to other site users, personnel and local residents, phasing works to suit and avoiding or minimising nuisance by the use of noise, vibration and dust monitoring suppression measures.
- The entrances to the site will be kept locked at all times.

3.8 Reporting and Investigation of Incidents and Accidents

Health, safety and environmental performance should be monitored on site. During weekly safety meetings and on completion of the Project, a review should take place to assess how the standards set compared with those actually achieved in order that any shortcomings can be addressed for the remainder of the Project or projects in the future.

Incidents and accidents should be reported:

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- **Accident:** An unplanned uncontrolled event that results in personal injury, and/or damage to equipment, property or the environment.
- **Near Miss:** An unplanned, uncontrolled event that, under slightly different circumstances, could have resulted in an accident (also called a dangerous occurrence)
- **Hazard / Unsafe Behaviour / Unexpected Hazard:** An unsafe condition, procedure or action or behaviour which may in certain circumstances lead to an incident / has the potential to put someone at risk of injury. This may include hazards such as a service not being as shown on plans, incorrect PPE being worn, a method statement not being followed.

It is normal to investigate the following types of incidents:

- Incidents that result in medical aid, lost time incidents, restricted work injury, disability and fatalities;
- Incidents that cause equipment damage or loss, cause a loss of production, or cause significant environmental damage;
- Incidents that have the potential of causing medical aid or greater injuries, or equipment/process losses, or significant environmental damage.

3.9 Emergency Response

Given the nature of the site and the type of work proposed, there is significant potential for the occurrence of incidents that could threaten the environment as well as the health and safety of site operatives and the general public as works progress. The Contractor will identify these potential occurrences in advance, and will formulate emergency response procedures to be implemented in the event of such a situation arising. An Emergency Response Crew will be ready to respond to such incidents at all times that site works are ongoing; will have access to appropriate equipment; and will be adequately trained in the use of the equipment and implementation of the emergency response procedures.

Table 2 presents a non-exhaustive list of potential emergency situations and possible responses.

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Table 2 Potential Emergency Situations and Possible Responses

Emergency	Possible Response
Injury to site personnel	<ul style="list-style-type: none"> Stop work Ensure safety of all personnel Apply first aid when appropriate Call for emergency assistance
Fire	<ul style="list-style-type: none"> Stop work Ensure safety of all personnel Raise the alarm Shut down equipment where safe to do so Call for emergency assistance For small fires, and if safe to do so, control/extinguish using available equipment

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Emergency	Possible Response
Damage to services	<p>Stop work</p> <p>If service is electricity or gas, switch off machinery (do not move it)</p> <p>Evacuate area</p> <p>Contact relevant service company and emergency services if necessary</p> <p>Do not commence work until safe to do so</p>
Breaking of a structure or pipe resulting in release of liquid contaminants	<p>Construct bunds to contain release and prevent further spread</p> <p>Pump material to secure container</p> <p>Use absorbent material to clean up residual liquid</p> <p>Dispose of released material and, if appropriate, soil contaminated by the released liquid in accordance with Waste Management Plan</p>
Accidental discharge of contaminated liquid to surface water or surface drainage	<p>Identify source of discharge</p> <p>Control and prevent further discharge</p> <p>Notify authorities</p>

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Emergency	Possible Response
Spillage of contaminated material on public highway	<p>If the spill poses a risk to other users, cordon off the area</p> <p>For solid material, shovel/sweep up the material immediately and return to the vehicle or site for future disposal</p> <p>For liquid, prevent flow to drains and clean up using absorbent material</p>
Occurrence of elevated dust levels	<p>Cease work</p> <p>Apply mitigation – screens, dampening down etc.</p> <p>Site workers should have or-nasal dust filters available</p>
Occurrence of elevated noise levels	<p>Site workers to use hearing protection as necessary</p> <p>If off-site receptors are affected, work must stop and measures be implemented to remedy the situation</p>
Occurrence of elevated vapour levels (including odour)	<p>Remove affected people from work area</p> <p>Carry our confirmatory monitoring as required to characterise situation</p> <p>Upgrade respiratory protective equipment if this is sufficient to mitigate risks; if not the work method must be re-assessed</p> <p>Odorous stockpile material can be covered by absorbent material (e.g. sawdust)</p>

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Emergency	Possible Response
Encountering suspected asbestos	<p>Stop work</p> <p>Assess nature of the suspect material (e.g. bound or fibrous)</p> <p>If there is fibrous material or a significant quantity of bound material, work method may need to be altered while the material is sampled, identified and dealt with appropriately (possibly by a specialist contractor)</p>