8. ENVIRONMENT AND SOCIAL MANAGEMENT PLAN

Environmental and Social Management Plan (ESMP) is a site specific plan developed to ensure that the project is implemented in a sustainable manner. The ESMP for the UAEL plant has been prepared to ensure that project implementation is carried out by taking appropriate mitigation measures to minimize impacts on the environment and social issues during its life time.

This ESMP describes the role and responsibilities of UAEL plant personnel to ensure communication and implementation of the aforesaid management plans during operation phase.

This section describes Environmental Health and Safety and Social (EHS&S) organizational structure. It describes the requirements for periodic review and updation of the ESMP to address any new impacts due to change or modification of the project and also specifies documentation and record keeping requirements for the project.

8.1 Introduction

The ESMP is specified in order to describe the mitigation measures for all the impacts associated with the project during its operation phase. Some residual impact will however persist after the all mitigation measures are employed. The ESMP intends to delineate the monitoring and management measures to minimize such impacts by allocating management responsibility and suggesting skill requirement for implementation of these measures during the operational phase.

The ESMP includes the following:

- Mitigations suggested for adverse environmental and social impacts and associated risks;
- Institutional arrangement for the implementation of suggested measures;
- Monitoring arrangements for effective implementation of suggested mitigations for the project;
- Reporting requirement to the regulatory agencies and funding institutions.

As discussed in previous chapter the project has insignificant or minor impacts on account of land use, noise, water, hazardous material management etc. The moderate impacts are assessed for occupational health safety, while positive impacts were assessed for Socio-economic aspect. Mitigation measures are suggested for each one of these aspects and these are detailed in Table 8-1 along with responsibilities and time line.

An Environmental and Social Monitoring Plan is suggested to assess the compliance with respect environmental and social measures and standards in order to comply with the environmental regulation and abide to environmental standards (Table 8-2). Additionally, following detail management plans are also provided:

- Emergency Response Plan (Refer Chapter 10)
- Greenbelt Development Plan (Annexure XVII)
- Stakeholder Engagement Plan (Annexure XVIII)
- Occupational Health and Safety Plan (Annexure XIX)

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
1.	Land and Soil Environment	• Soil contamination from improper handling and spillage of hazardous waste or chemicals.	• Dustbins of good and long-lasting quality should be installed at different places to collect organic, plastic, glass and other garbage separately. • All workers shall be instructed to put garbage in designated bins as per segregation. • Metals, plastics, paper and glasses in the garbage shall be sold to vendors for recycling. • No open burning of waste shall be carried out at the site. • All hazardous waste collected at site shall be disposed off within a defined time period • Segregate hazardous waste at generation point and store at a confined and designated area • Storage of waste lube drums shall have restricted access • The lube storage area needs to be provided with secondary containment and trap to control contamination of runoffs.	To be undertaken all through the project life. Regular inspection (monthly) must be carried out to see implementation	• UAEL Environment and Social Officer
2.	Water Resource and Quality	The potential impact are: • Extraction of river water and hot water discharge;	• It is suggested that there shall be one toilet each for every 15 male and 10 female workers. • No waste water shall be disposed off outside the plant at any point of time. • The septic tank should be cleaned regularly and	To be undertaken all through the project life. Regular inspection (Monthly) must be	• UAEL Environment and Social Officer

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
		• Extraction of Groundwater • Inappropriate disposal of the municipal waste water. • Contamination of Storm water at oil handling area.	disposed off adequately. • Groundwater must be metered and record of extraction must be maintained at site. • Surface runoff from oil handling areas/devices shall be treated for oil separation before being discharged. • Strom water drains must be cleaned every year before monsoon.	carried out to see implementation	
3.	Air	• NOx Emissions from use of Natural gas	• UAEL undertakes regular maintenance and upkeep of engines to ensure good thermal efficiency • UAEL shall undertake biannual monitoring of stacks to ensure that the emissions are within the requisite limits • UAEL shall also undertake ambient air quality monitoring to verify compliance with the National standards and commitments with the lender. • Area which are under the control of UAEL and not yet paved shall be provided with green cover or regularly sprayed with water to avoid generation of fugitive dust, especially during summer.	To be undertaken all through the project life. Regular inspection (Monthly) must be carried out to see implementation Green Cover must be initiated within 1 month.	• UAEL Environment and Social Officer
4.	Ambient Noise Quality	• Noise due to operational machinery.	• Normal working hours of the worker in the high noise area shall be restricted to 4 hours only.	To be undertaken all through the project	• UAEL Environment and Social Officer

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
		• Movement of vehicles	• Workers working near high noise generation shall be provided with ear plugs/ ear muffs to limit exposure to occupational hazards. • Regular maintenance of equipment including lubricating moving parts, tightening loose parts and replacing worn out components should be conducted. • All enclosures shall be well maintained and keep closed at all times	life. Regular inspection must be carried out to see implementation	
5.	Ecology	• Modification of habitat. • Development of greenbelt	• To compensate the loss of flora and improve environmental quality, green belt along the project site boundary shall be developed. A total of 33% will be reserved for green area. • Native species will be selected and healthy seedlings will be planted at intervals of 4 × 4-m in 60 × 60 × 60-cm size pits filled with topsoil. • Attempts will be made to ensure that all open spaces, where tree plantation may not possible will be covered with shrubs and grass to prevent erosion of topsoil. • In addition, trees/ saplings may be planted in nearby areas beyond the project site in consultation with Forest Department.	Green Cover must be initiated within 1 month.	• UAEL Environment and Social Officer

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
6.	Socio-economics	The project activity creates employment and business opportunity around the project area.	• UAEL has provisions of annual medical checkups for all of its employees, to ensure good health of its migrant workforce, and minimise transmission of any infectious disease to the local community, UAEL is also advised to make provisions to include a screening for certain infectious diseases as per government or WHO protocol. • The workforce may be provided with health promotion strategies and basic information on transmission of common infectious diseases. Where in needed, the company should collaborate with the local health department and provide measures to prevent or contain and outbreak of diseases. • UAEL must continue to ensure that all important routes and passages used by the community are unaffected at all times. If an when a temporary blockage is anticipated, the community must be informed prior to its blockage, signage put up and an alternate route provided. In addition, at no juncture must an important community resource such as a mosque, tube wells etc be affected without the community's prior consent. • Provision of appropriate sanitary facilities for the workforce would minimise outbreak and	To be undertaken all through the project life. Regular inspection (Bi annually) must be carried out to see implementation	UAEL Environment and Social Officer

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
			transmission of infectious diseases. • The community must be informed of all major developments prior to each development in the plant, through notices and announcements. • To avoid any communal discord, all sections of the community, except the economically weak, must be provided with equal preference where in CSR measures and employment is concerned. Economically vulnerable groups such as the Rice mill workers and fishing community may be provided a special focus in the CSR plans, to ensure contribution towards their upliftment.		
7.	Traffic Movement	• Vehicles bringing consumables will increase in traffic volume negligibly • The only impacts envisaged due to unplanned entry to the site, parking of trucks, breakdowns, etc.	• Dedicated parking area shall be provided within the project site. No trucks shall be parked outside the plant. • The speed limit of vehicles shall be restricted to 25 km/hr on internal roads and populated areas • In case of breakdown, provisions shall be made for quick retrieval of vehicles. • Drivers shall be provided with training for safe driving. • Signage to be provide in the plant and near plant to facilitate traffic movement and parking • All drivers to be trained and evaluated in defensive	To be undertaken all through the project life. Regular inspection (Monthly) must be carried out to see implementation	UAEL Safety-In-Charge

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
			and off-road vehicle operations. • Inventory of the vehicles used in project along with their Pollution control documents, Driver's Licence (DL) and Registration Certificate (RC) will be maintained.		
8.	Occupational Health and Safety	The anticipated health and safety concerns are: • Hazards like high noise, fire, electric shocks etc. • Trip and fall, inadequate fall safe arrangements.	• Instructions and procedures are provided to all the workers • Safety belt and safety nets are used while working at height; • All works related to working at heights are undertaken during the daytime when sufficient sunlight is available; • A work permit system for all works related to working at heights (typically when working over 2m and above) and for hot jobs are implemented; • Prior to executing any work the integrity of the structures are inspected; • Only trained workers in climbing techniques and the use of fall protection measures, inspection, maintenance and replacement of fall protection equipment are engaged to work at heights; • Health and safety training is given on regular basis to all the employees;	To be undertaken all through the project life. Regular inspection (Bi annually) must be carried out to see implementation	UAEL Safety-in-Charge

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
			• All safety incidents are recorded and monitored with the objective of attaining zero incidences of mishaps. • Access to areas containing exposed electrical equipment is enclosed and posted with warning signs; • Workers involved in electric operations are provided with Personnel Protective Equipment (PPE) such as rubber gloves etc; • Employees involved in electrical works are trained in and familiar with the safety-related work practices, safety procedures, and other safety requirements pertaining to their respective job assignments. • Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment. The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present. • Provision of manual fire fighting equipment that is easily accessible and simple to use • Fire and emergency alarm systems that are both		

Table 8-1: Environmental and Social Management Plan

S. No.	Component	Potential Impacts Identified	Suggested Management Plan/ Mitigation Measures	Timeline	Responsibility
			audible and visible • Consider installation of hazard warning lights inside electrical equipment enclosures to warn of inadvertent energization; • Use of voltage sensors prior to and during workers' entrance into enclosures containing electrical components; • Deactivation and proper grounding of live power equipment and distribution lines according to applicable legislation and guidelines whenever possible before work is performed on or proximal to them; • Provision of specialized electrical safety training to those workers working with or around exposed components of electric circuits. This training should include, but not be limited to, training in basic electrical theory, proper safe work procedures, hazard awareness and identification, proper use of PPE, proper lockout/tag out procedures, first aid including CPR, and proper rescue procedures.		

Table 8-2: Environmental and Social Monitoring Plan

Component	Monitoring Parameters	Frequency	Location	Reference Standards
Environment Monitoring Plan				
Ambient Air	$PM_{2.5}$ and PM_{10}, SO_2, NO_x, CO	24-hr average samples, Biannually	Project Site	National Air quality Standards of Bangladesh (2005)
Stack Emission	SO_x, NOx , CO	Bi-annually (One sample each)	All the stacks	Standards for Gaseous Emission from Industries or Projects', Schedule 11 of the ECR, 1997
Surface Water Quality - River	DO, BOD, Oil and Grease, Temperature	Bi-annually (One sample each)	• Temperature – 100 m downstream of discharge point. • Temperature 100 upstream of the discharge point • Discharge from condenser with in the plant	Schedule 12 of the ECR 1997
Ground Water Quality	Total Coliform, Faecal Coliform, pH, Colour, Turbidity, Total Dissolved Solids, Total Hardness, Total Alkalinity, Chloride, Manganese, Arsenic, Iron	Bi-annually (One sample each)	Both bore wells	Bangladesh Standards for Drinking Water (ECR'97)
Noise	Hourly Day and Night time Leq levels	Once every quarter	Ambient Noise - 4 corners of the plant and in the APSCL residential colony. Work Place Noise – 1 m from the equipments engines and turbine.	Noise Pollution (Control) Rules, 2006
Soil	Organic matter, C, H, N, Alkalinity, Acidity, heavy metals and trace metal.	1 samples; Biannually	Project Site -same as above-	-
Plantation	Monitor progress of Greenbelt	Bi-annual	_	-

	Development			
Social Monitoring Plan				
Health and Hygiene of Workers	Exposure to diseases to the Workers	Annually	-	ILO's Technical and Ethical Guidelines for Workers' Health Surveillance (OSH No.72)
Employment Opportunities	To honour the local communities demand hence giving first preference to locals	Annually		World Bank's Group Guide on Investing in People: Sustaining Communities through Improved Business Practice
Stakeholder Engagement	Build trust and amiability amongst the stakeholders involved by conducting meetings with stakeholders	Twice a Year		World Bank's Group Guide on Stakeholder Engagement for Companies doing Business in Emerging Markets
Grievance Mechanism	Grievance raised, action taken, number of grievance committee meetings	Twice a Year		Compliance Advisor Ombudsman (CAO) Guide to Designing and Implementing Grievance Mechanisms for Development Projects
Proposed CSR Activities	Implementation of Proposed CSR Activities	Twice a Year		World Bank's Group Guide on Investing in People: Sustaining Communities through Improved Business Practice
Health and Safety Monitoring Plan				
Visual inspection of use of PPE	Physical verification for integrity and safety to use In case of respirators and SCBA arrange third party fit test	Every Week Six Monthly	Within the project-site	As per the technical specifications in the user manual
Electrical Safety	- Fayed Insulation - Differently rated wires used - Industrial wiring - Industrial plug-tops - Infra-red (Heat) Surveys	Every month Annual	Within the project-site High Voltage electrical installations	None High infra-red signatures
Regular Medical Check-up of Workers	Physical Examination Audiometry Spirometry Total Lung Capacity Eye Check up Vertigo Communicable/infe	Annual For Food handlers (three monthly)	All employees including contractor workers (if exposure is high)	

	ctious Diseases			
Preventive Maintenance	Preventive maintenance of all safety equipment like emergency switches, shut-off valves, emergency response equipment, etc.	Six Monthly	All equipment	Operability based on technical specifications
Illumination	Lux Levels	Six Monthly	General work environment	Emergency light- 10 lux Work-ways – 100 Lux Maintenance works 200 lux
Work Place Noise Monitoring	Time weighted average of noise levels	Six Monthly	High and moderate Noise areas	85dbA
Pressure Vessels	Working Pressure	Six Monthly	Boilers, Compressors, Pressure Vessels and pipe lines	Safe Working pressure
Lifting Tools and Tackles	Working Load	Annual Six monthly if lifting tools/tackles are exposed to heat	All lifting tools and tackles	Safe Working load

8.1.1 Monitoring Guidelines

It is recommended that UAEL undertakes the social monitoring activities through a third party consultant/NGO. The monitoring report shall include the following:

- Date and Time of Site Visit
- Aspects Monitored
- Records of Issues
- Records of Follow Up Action undertaken by UAEL
- Records of Outcome
- Observations and analysis of the assessment.

8.2 EHS&S Management Organization Structure

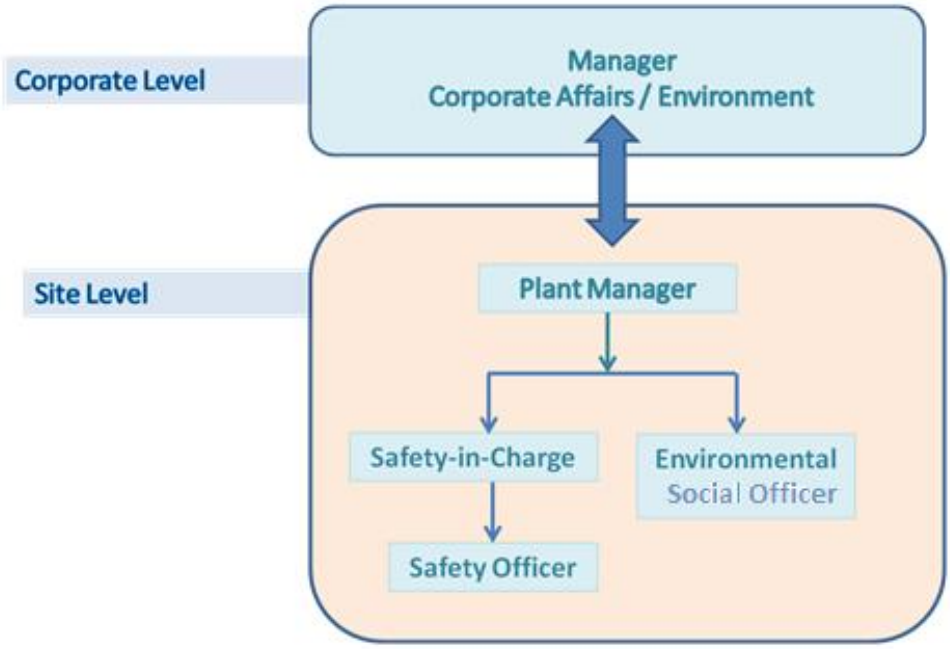
For the effective and consistent functioning of the project, an Environmental and Social Management Cell (ESMC) will be established for the project. During the operation phase, this Cell will include staff from the site and corporate office of UECL.

The overall management of the project will be undertaken through coordination between UECL corporate office and project site team. The activities will be managed through Plant Manager who will be supported by the Safety in charge and Environmental and Social Officer. The Plant Manager will coordinate with Environment and Social team at corporate level.

The major duties and responsibilities of Environmental and Social Management Cell will be as follows:

- To implement the environmental and social management plan along with other associated plans.
- To assure regulatory compliance with all relevant rules and regulations.
- To ensure regular operation and maintenance of pollution control devices.
- To initiate environmental and social monitoring as per approved schedule.
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.
- Maintain documentation of good environmental practices and applicable environmental laws as ready reference.
- Maintain environmental and social consultation related records.
- Coordination with regulatory agencies such as Department of Environment, external consultants, monitoring laboratories.
- Maintain of log of public complaints and the action taken.

Figure 8-1: Proposed Environmental Management Cell



8.2.1 Site –In-Charge

Plant Manager will supervise day to day activities related to the activities at site. He will report to the corporate team on Environment. His primary duties will include:

- Act as the primary interface between the corporate staff and all the staff working at site.
- Collect, review, and disseminate information regarding all activities at site.

- Process and prepare a summary on weekly basis from feedback, complaints and comments received from team members, including safety-in-charge and Environment Officer.

8.2.2 Environment and Social Officer

The Environment and Social officer shall work in coordination with the Safety-In-Charge and report to the Plant Manager and also to Corporate Environment Manager. He shall be stationed at Ashuganj. The Environment and Social Officer will have the following responsibilities:

- Shall maintain compliance with respect to legislative and world Bank requirements;
- Carry out audits, and inspection of all the project activities;
- Shall assess the need to conduct training programs and awareness activities on environmental aspects;
- Preparation of necessary documents and record keeping system;
- Review and updating of EMP for its effective implementation;
- If case of any non-conformity, he shall escalate matter to corporate team.
- Supervise compliance monitoring and analyses.
- Undertaking community development initiatives in the project villages;
- Keep record of all the CSR activities being undertaken for the project;
- Conduct periodic meetings with local community for understanding their grievances and outcomes of the CSR activities;
- Inform the local community about the Grievance Redress Mechanism and ensure effective implementation; and
- Manage all grievances of the project and record the actions taken.

8.2.3 Safety-In-Charge

He will be responsible for all days to day activities related to health and safety at site. He shall be stationed at Site and must communicate with corporate office whenever necessary. His responsibilities must include:

- Dissemination of information about the aspects of health and safety applicable to the project to staff at site;
- Responsible for implementation of safety measures at the project site;
- Work in association with Environmental Officer for addressing issues related to working environment and safety of the workers at site.
- Periodically review the EHS performance of the project during operation phase.
- Oversee daily activities of safety executives

8.3 Awareness and Training

Trainings are necessary for effective implementation of environment management plan. The project staff must be made aware of the importance of environmental protection and safety aspects. This awareness can be provided through periodic meetings.

8.4 Record Keeping and Reporting

Records should be maintained for regulatory, monitoring and operational issues. The record keeping requirements for the proposed project is summarized in Table 8-3.

Table 8-3: Record Keeping Requirements

Parameter	Particulars
Solid Waste Handling and Disposal	• Daily quantity of waste received; • Number of trips made to the Site per truck • Daily quantity treated and recycled; and • Daily quantity sent for landfill.
Regulatory Licenses (Environmental)	• Environmental Permits / Consents from DoE; • Details of in-house monitoring capabilities and the recognized agencies proposed for conducting the monitoring. • Inventory of chemicals present at site including those in the chemical laboratory set up at site.
Monitoring and Survey	• Records of all monitoring carried out during different stages of the project
Social	• Legal Register • Training Records • Medical Check up Records • Social Monitoring Reports • Auditing Reports • CSR Activities Report • Records of Stakeholder Engagement Activities Undertaken • Complaints Register and issues attended/closed
Health and Safety	• Employee environmental, health and safety records • Equipment inspection and calibration records, where applicable • Vehicle maintenance and inspection records • Medical Report Card (for the workers on site) • Records of training and mock drills along with attendance and photographs • Accident reporting o Date and time of the accident o Incident reports o Sequence of events leading to accident o Name of hazard involved in the accident o Emergency measure taken
General	• Facility layout diagram • Process flow • Audit reports, if any

8.5 Estimated Cost of EMP Implemanttaion

Annual cost of EMP implementation is identified itemwise for this project in Table 8-4.

Table 8-4: Annual Cost for EMP Implementation

S. No.	EMP Details	Capital Cost (Takka)		Opex per annum (Takka)	
1	Provision of Dustbins and Municipal Waste Management and Disposal	Dustbin Quantity = 20 @ Taka 3,750 each	75,000	Annual Salary of 3 Cleaners @ Taka 10,000 per month	360,000
2	Provision of Drinking Water	Cost of DM Plant	10,000,000	Taka 1,800,000 as Annual O&M Expense of DM Water Plant + Take 300,000 as Annual Salary of DM Plant Operator + Taka 96,000 for additional Drinking Water	21,96,000
3	Management of Septic tank and Soak pit	Construction Cost of Septic Tank & Soak Pit	200,000	Taka 84,000 as annual salary of Septic Tank and Soak Pit cleaners + Taka 15,000 as annual Septic Tank and Soak Pit cleaning cost	99,000
4	Greenbelt development, Landscaping	Sapling Cost	500,000	Taka 96,000 as annual Salary of Gardener + Taka 200,000 as annual Watering Cost	296,000
5	Establishing Analytical laboratory	Setup Cost	1,000,000	Taka 240,000 as annual Operation Cost	240,000
6	Environment monitoring during operation	Setting up of air Monitoring Station	3,000,000	Annual Monitoring Testing Expense	12,25,000
7	EHS management team salaries	No capex	-	Annual Salary	900,000
8	Provision of PPE	First Purchase	500,000	Re-Purchase Annually	50,000
9	Medical Check ups	First Aid Kit at plant	-	Annual Maintenance	350,000
10	Training and awareness	No capex	-	Annual Budget	200,000
	TOTAL		1,52,75,000		59,16,000