



**Multilateral Investment
Guarantee Agency**
World Bank Group

ANNUAL MONITORING REPORT (AMR)

**225 MW COMBINED CYCLE POWER PLANT (DUAL FUEL-3RD UNIT), SIRAJGANJ,
BANGLADESH**

REPORTING PERIOD: (January, 2023) through (December, 2023)

AMR COMPLETION DATE: (04/03/2024)

I. INTRODUCTION

MEGA's Economics and Sustainability Group (MIGES)

The Economics and Sustainability Group (MIGES) oversee MIGA's country and project risk assessment; analysis of development impact of individual projects and MIGA's portfolio: evaluates and monitors project compliance with environmental, social and integrity policies.

Information provided in this AMR helps MIGES Environmental and Social specialists assess performance of projects on E&S. Follow up questions may be necessary to clarify information provided.

Preparation Instructions

MIGA's Contract of Guarantee requires North West Power Generation Limited to prepare a comprehensive Annual Monitoring Report (AMR) on the environmental and social (E&S) performance of its facilities and operations. This document comprises MIGA's preferred format for E&S performance reporting. The following template may be supplemented with annexes as appropriate to ensure all relevant information on project performance is reported.

The following points should assist you in completing this form. Please be descriptive in your responses and attach additional information/document(s) to supplement your answers as needed.

- Staff with specific responsibilities for environmental and social issues should complete this form.
- You may submit an electronic copy, fax or hard copy.
- The principal purpose of completing this form is to provide information on the following:
 1. Project Status/Update
 2. Summary of Key E&S Aspects during the Reporting Period
 3. New Development (Corporate)
 4. Action Plan Status and Update
 5. Deviations/non-compliances
 6. Development Effectiveness Indicators System (DEIS)
 7. Client's Feedback

Please note that some questions may not be applicable to your organization and also if it is early to assess issues/risks. So please "NA" or "No-Information Possible" to such questions.

Contact Information

Completed by	Mashuda Parvin		
Position in Organization:	DGM (EHS)	Tel:	+8801777736469
Email:	parvin@nwpngcl.gov.bd	Fax:	NA

II. PROJECT STATUS/ UPDATE

This section aims to update MIGA on the Project Status.

Select the current status of the project and provide a brief description of the developments in relation to the project over the reporting period. For example, has construction been started or completed, has new equipment been installed, has production capacity increased, or is the investment in new projects considered?

	Design (specify)		Construction		Expansion	√	Operation		Closure		Other
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Is there any new investment under development? (Corporate and Investment Funds)

	YES	√	NO
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Please provide details in section IV of this AMR report.

Please identify any other Interactional/Multilateral providing financing to the Project: NA

	World Bank (IBRD/IDA)		IFC		EBRD		EIB		ADB
	Kfw/DEG		FMO		OPIC		EDC		Other (specify)

Has the Project been subject to any existing or threatened complaint, order, directive, claim, citation or notice from any Authority? If yes, please provide details.

	YES	√	NO	Provide details
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Has the Project been subject to or received any written communication from any Person/entity, in either case, concerning the Project's failure to comply with any matter covered by the Performance Standards?

	YES	√	NO	Provide details
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If yes, please provide details.

Please attach any environmental and social reports prepared for other Interactional/Multilateral Finance Institutions/Export Credit Agencies or local regulatory authorities during the reporting period to this AMR report.

Not Applicable

III. SUMMARY OF KEY E&S ASPECTS

This section aims to identify the key E&S progress/activities/incidents during the Reporting period (include Summary of Key Findings for the Reporting Period e.g. non-compliances, significant incidents¹, social unrest, significant improvements/initiatives regarding E&S performance, etc.)

PSI: Assessment and Management of Environmental and social Risks and Impacts

Please provide details on the status of the following voluntary Management systems certification schemes at your facility, provide details below?

	Not being considered	Future consideration	Planning to implement	Currently implementing	Successfully implemented	Date of certification / recertification
ISO 900:2015					√	13 ^h October, 2025
ISO 14001: 2015					√	13 ^h October, 2025
ISO 45001:2018					√	13 ^h October, 2025
Other	Environmental Clearance Certificate from Department of Environment (DoE)				√	Certificate Validity upto 08/10/2024 (ANNEX-A)

* Certificate has been attached in ANNEX-A

Describe any changes in the organizational structure to manage environment, health and safety, labor and social aspects during the reporting period. Describe number of personnel in charge of E&S issues.

- NWPGCL has an EHS department staffed with 8 people;

Describe the level of environmental, social and health and safety training provided to staff. Provide annex with list of topics, hours of training and number of participants.

- ISO 14001:2015 Lead Auditor Training from BV
 - Mashour Mahmud Khan, DM (EHS), SPS
 - Farhana Choudhury, SDE (Procurement)
- ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Internal Auditor Training from BV
 - Mashuda Parvin, DGM (EHS), Corporate Office
 - A.J.M. Mustafizur Rahaman Talukder, DM (HR & Admin), Corporate Office
 - Mashour Mahmud Khan, DM (EHS), SPS
 - Tasdidul Anwar, AM (Admin), Corporate Office
 - Md. Julkar Nain, DM (EHS), SPS

¹Examples of significant incidents follow: Chemical and/or hydrocarbon materials spills; fire, explosion or unplanned releases, including during transportation; ecological damage/destruction; local population impact, complaint or protest; failure of emissions or effluent treatment; legal/administrative notice of violation; penalties, fines, or increase in pollution charges; negative media attention; chance cultural finds; labor unrest or disputes; local community concerns.

- S. M. Jahid Anwar, JAM (EHS), Corporate Office
- IFC Performance Standard Training by EQMS
 - Abdullah Al Quraishi, SE
 - Mashuda Parvin, DGM (EHS), Corporate Office
 - Mashioor Mahmud Khan, DM (EHS), SPS
 - Tahira Jahan, DM, (HR & Admin), Corporate Office
- IFC Performance Standard Training by IFC
 - Mashuda Parvin, DGM (EHS), Corporate Office
- ADB Safeguard Policy Statement
 - Mashuda Parvin, DGM (EHS), Corporate Office

Are you aware of any events or significant incidents that may have caused damage; brought about injuries or fatalities or other health problems; attracted the attention of outside parties; affected project labor or adjacent populations; affected cultural property; or created liabilities for your company? (if yes, please provide details and attach any incident reports to this AMR report)

	YES	√	NO	Provide details
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Describe any ongoing public consultation and disclosure, liaison with non-governmental organizations (NGOs, civil society and local communities or public relations efforts on environmental and social aspects.

- Stakeholder consultation meeting is ongoing. (Annex B)

Describe any ongoing social or community development initiatives, programs or dialogue.

- Community Development program is ongoing. (Annex C)

Briefly describe new initiatives implemented during the reporting period or additional managerial efforts on E&S aspects (e.g. Energy/water savings, sustainability report, waste minimization, etc)

- For energy saving initiatives (*Conversion of Tube lights into LED lights Program for Same Level Illumination as an when there is a possibilities*), we are replacing LED light with Tube light.
- Taking initiative for reducing Paper Consumption.

Briefly describe the number and type of comments and/or grievances received by the Company in relation to E&S issues? How many have been resolved and how many are pending? (Please attach a table with grievance redress registry)

- No grievance has been raised yet. (Scan copy of GRM book in attached in Annex D)

Describe activities completed under the community development plan. (Annex C)

- Cheque of BDT 3,00,000/- handover to ‘Sirajganj Sommilito Sangskritik Jot’.
- Cheque of BDT 5,00,000/- handover to DC of Sirajganj for the renovation of Officers Club, Sirajganj.
- Distributed blankets to 1000 helpless and destitute families.
- Distribution of relief among unemployed and helpless families of Sirajganj.

- Humanitarian relief to poor people before Eid-ul-fitr near Sirajganj Power Station.

Life, Fire and Safety

Do your offices including regional and branch offices have valid Fire Safety permits for all buildings including those on lease issued by appropriate local authorities?

√	YES		NO
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Provide details, [Annex-E \(Fire License\)](#)

When was the last fire safety inspection carried out by the appropriate local authority? What were the key findings of the inspection and have any outstanding issues been addressed?

Department of Civil Defense and Fire Service authority has visited the site and has issued Fire License ([Annex-E](#))

Has there been any fire incident in the reporting period? If yes, please provide fire incident report including the details of these incidents, the root cause along with corrective actions taken by your organization.

	YES	√	NO
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Provide details: [Not Applicable](#)

Please indicate if any first aid training was provided to staff during the reporting period.

√	YES		NO
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Provide details in [Annex-F](#)

Please complete the following table for project operations to describe basic fire safety precautions.

Fire Safety Verification activities	Mandatory Frequency	Date(s) performed (mm/dd/yyyy)	Observed Deficiencies	Corrective Actions and Schedule For Implementation
Fire Drills	Minimum: three (3)/ year	25/01/2023, 23/02/2023, 22/03/2023, 17/04/2023, 25/05/2023, 20/06/2023, 19/07/2023, 26/08/2023, 19/09/2023, 23/10/2023, 25/11/2023 & 26/12/2023		Enhance Staff training
Inspect and certify fire detection & suppression electrical & mechanical systems	Minimum	As per maintenance schedule		

PS2: Labour and Working Condition

Have you changed your Human Resources (HR) policies, procedures or working conditions during the reporting period?

	YES	√	NO
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Provide details

Provide the following information regarding your workforce:

NWPGCL

Site	Direct Employees	Female Direct Employees	employees terminated	employees hired	Contractor Employees
S-3 power plant	68	1	0	0	-

Has the Project been subject to any ongoing or, threatened, strikes, slowdowns or work stoppages by employees or any contractor or subcontractor? If yes, please provide details.

	YES	√	NO
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Provide details

Occupational Health and Safety

Describe the main changes implemented in terms of Occupational Health and Safety (OHS) during the reporting period, e.g. identification of hazards, substitution of chemicals, new controls, etc.

Occupational Health and Safety Indicators

Report Total Numbers for each parameter	This reporting period		Reporting period – previous year	
	Direct Employees	Contractor employees	Direct Employees	Contractor employees
Total number of Workers			-	-
Total man-hours worked Annual			0	0
Total number of lost time occupational injuries	0		0	0
Total number of lost workdays due to injuries	0		0	0
Number of fatalities	0	0	0	0

Provide details for the non-fatal injuries during this reporting period

Company or Contractor employee	Total workdays lost	Description of injury	Cause of accident	Corrective measures to prevent reoccurrence
NWPGCL	0	0	0	0

Describe in detail fatalities and vehicle accidents, including corrective measures (provide copies of OHS investigation and respective corrective plan).None

Significant Incidents

Date of incident	Type of incident	Brief Description of incident	Fatalities (Y/N)	# of fatalities	Preventive measures taken after the incident

Please describe any year-over-trends in reported indicators, non-fatal injuries and significant incidents.

No fatal injuries

Worker Accommodation: The project is now in operational phase, so no worker accommodation.

Please attach recent inspection checklists

PS3: Resource Efficiency and Pollution Prevention

Provide the following environmental monitoring data for this reporting period. If you already have all the data requested available in another format, this can be submitted instead. Please provide a scaled facility map showing the precise locations of all monitoring points.

Ambient noise

Please describe any year-over-trends. [NA](#)

Complete the table below to provide MIGA with quantitative data on project Noise levels. Please provide Host country maximum levels in country units in the table below.

How many monitoring points for Noise Sources will project has? [15 Points](#)

Monitoring Point Location:

1. In front of Administrative Building (Attachment 1)

Receptors		WBG Maximum Levels (WBG unit)		Project performance (WBG unit)		Host Country maximum levels (Host Country unit)		Project performance(Host Country unit)	
Residential; Institutional; Educational	Daytime 7:00-22:00	55	dBa	-	dBa	-	dBa	-	dBa
	Nighttime 22:00 -7:00	45	dBa	-	dBa	-	dBa	-	dBa
Industrial; Commercial	Daytime 7:00-22:00	70	dBa		dBa	-	dBa	-	dBa
	Nighttime 22:00 -7:00	70	dBa		dBa	-	dBa	-	dBa
Silent	Daytime 6:00-21:00	-		-		50	dBa	-	dBa
	Nighttime 21:00 -6:00	-		-		40	dBa	-	dBa
Residential	Daytime 6:00-21:00	-		-		55	dBa	-	dBa
	Nighttime 21:00 -6:00	-		-		45	dBa	-	dBa
Mixed	Daytime 6:00-21:00	-		-		60	dBa	-	dBa
	Nighttime 21:00 -6:00	-		-		50	dBa	-	dBa
Commercial	Daytime 6:00-21:00	-		-		70	dBa	-	dBa
	Nighttime 21:00 -6:00	-		-		60	dBa	-	dBa
Industrial	Daytime 6:00-21:00	-		-		75	dBa		dBa
	Nighttime 21:00 -6:00	-		-		70	dBa		dBa

**Blue blocks are national standard, ECR'1997 and subsequent amendment on 2006*

`Please complete a similar table for every location where Noise is monitored while specifying the location.

Air quality

Please provide details of NOx emissions and describe.

For Details, Please Check the **Attachment 1**

Liquid effluent discharges

Please describe any year-over-trends

Liquid effluent discharges (Industrial Waste Water Pool)

Date	pH	Temp (°C)
15.01.2023	8.41	26.5
11.02.2023	8.35	27.1
15.03.2023	8.44	30
17.04.2023	8.55	28.5
15.05.2023	8.62	29.5
15.06.2023	8.41	30
15.07.2023	8.29	29.2
15.08.2023	8.38	31
15.09.2023	8.39	30
15.10.2023	8.38	31
15.11.2023	8.43	29.6
17.12.2023	8.42	23.8

Complete the table below to provide MIGA with quantitative data on Project wastewater and ambient Water quality levels. Please provide Host Country maximum levels in Country units in the table below.

How many monitoring points for wastewater? **1 Location**

Monitoring point Location (Please See the Attachment 1)

Receptors	WBG Maximum Levels (WBG unit)		Project performance (WBG unit)		Host Country maximum levels (Host Country unit)*		Project performance (Host Country unit)	
pH	6-9	pH	-	pH	6-9	pH	-	pH
BOD	30	mg/L	-	mg/L	30	mg/L	-	mg/L
COD	125	mg/L	-	mg/L	200	mg/L	-	mg/L
Total Nitrogen	10	mg/L	-	mg/L	-	mg/L	-	mg/L
Total Phosphorus	2	mg/L	-	mg/L	8	mg/L	-	mg/L
Oil and grease	10	mg/L	-	mg/L	10	mg/L	-	mg/L

Receptors	WBG Maximum Levels (WBG unit)		Project performance (WBG unit)		Host Country maximum levels (Host Country unit)*		Project performance (Host Country unit)	
Total residual chlorine	0.2	mg/L	-	mg/L	1	mg/L	-	mg/L
Total Suspended Solids	50	mg/L	-	mg/L	100	mg/L	-	mg/L
Total Coliform bacteria	400	MPN/100 ml	-	MPN/100 ml	-	MPN/100 ml	-	MPN/100 ml

Note:

MPN: Most Probable Number

** Standards for Waste from Industrial Units or Projects Waste [See Rule 13]/ Places for determination of standards (Inland Surface Water)*

Please complete a similar table for every location where wastewater is monitored while specifying the location [NA](#)

Energy and Water Management (Jan 2023- Dec 2023)

Utility Type	Units	Annual Consumption			Total	Remarks
		S 1	S 2	S 3		
Water Use	Cubic Meter		866710		866710	
Gas	SCM		38340780.92	173742135.75		
HSD	Liter		21106546.00			

Greenhouse Gas Emissions

Please describe year-over-trends.

[Please See the Annex-G](#)

Waste and Hazardous Materials

Please provide quantities and description of wastes and any year-over-trend. Please provide details of any waste recovery/recycling. [Not Applicable](#).

If any of the EHS guidelines or local regulatory limits is exceeded and, if appropriate, describe the planned corrective actions to prevent re-occurrence. [Not Occurred](#)

PS4: Community Health, Safety and Security

Using the table below list and briefly describe any new initiatives implemented in relation to Community Health and Safety during the reporting period. Include risk assessments, new infrastructure and equipment; hazardous materials and safety management, transportation and exposure to disease.

Mitigation Measure	Expected or actual date of Implementation	Planned future mitigation efforts?
Off Site Emergency Response Plan disclose	04.09.2023	September, 2024

During the reporting period any emergency drills have been conducted with community participation? Are the communities aware of the emergency response plans? Please describe any changes in the Company's engagement with private/public security forces during the reporting period and any corresponding agreements.

The Sirajganj Power Hub (SPH) is KPI (key Point Installation) area. So, as per the Government rules, security guard was present to protect the SPH. As now there will be 4 power plants, so security guard number has been increased.

IV. ACTION PLAN STATUS AND UPDATE

Please update us in the current status of the action plan, define the dates when pending actions will be implemented. Please refer to the initial ESAP for the indicators and deliverables.

Task Title/ Description	Anticipated Completion Date	Indicator of Completion	Completion Date	Status as of DD/MM/YYYY	% Complete

All CP has been completed as per ESAP and CS activities are ongoing as per schedule.

Annex-H

V. DEVIATION/ NON-COMPLIANCES

The following are the identified deviation/non-compliances identified in reference to the following:

- (i) Performance Standards;
- (ii) Environmental and Social Action Plan;
- (iii) Non-compliance with local environmental and Social regulations
- (iv) Applicable EHS Guidelines

If there is any Non-compliances/deviations please record and provide additional information if necessary.

Please refer Environmental and Social Audit Report conduct by EQMS (conducted on 20-22 November, 2023 and final report submitted on January, 2024).

(Attachment -2)

Areas of Interests	Non-Compliances Identified	Corrective Action Plan	Status of Completion	Completion date
Performance Standards (PS1-8)				
Environmental and Social Action Plan				
Local Environmental and Social regulations				
Applicable EHS Guidelines				

Please explain the cause and, if appropriate, describe the planned corrective actions to prevent re-occurrence.

VI. Development Effectiveness Indicators System (DEIS)

Please fill out the DEIS indicators (to be based on the Contract of Guarantee)

Annex- I

VII. CLIENTS FEEDBACK

Please check the box that best represent your evaluation of the support received from MIGA. On dealing with E&S aspects of the project, how diligently in your opinion has MIGA been able:

Areas of MIGA Assistance	No opinion	Excellent level of support	Above the expectations	As reasonably expected	Below what was expected	Comments
To help in the interpretation and applicability of MIGA's Performance Standards		√				
To provide guidance for the implementation of the Environmental and Social Action Plan(ESAP)		√				
To share the outcomes of MIGA supervision visits to the project and on agreeing in corrective actions		√				
To demonstrate flexibility and creativity to guide the Company's management of project's E&S issues		√				

ANNEX-A: ISO Certificate

&

Updated Environmental Clearance Certificate (ECC)-2023-24


Bureau Veritas Certification

**NORTH-WEST POWER GENERATION
COMPANY LIMITED**


NORTH-WEST
POWER GENERATION
COMPANY LIMITED

**HEAD OFFICE: UNIQUE TRADE CENTER (LEVEL- 03 AND 04), 8 PANTHAPATH,
KAWRANBAZAR, DHAKA-1215, BANGLADESH**

This is a multi-site certificate, additional site(s) are listed on the next page(s)

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organization has been audited and found to be in accordance with the requirements of the Management System Standards detailed below.

Standards

**ISO 9001:2015, ISO 14001:2015 &
ISO 45001:2018**

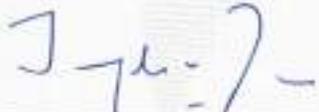
Scope of certification

**CORPORATE MANAGEMENT OF POWER PLANTS, POWER GENERATION &
SUPPLY TO THE NATIONAL GRID.**

Original cycle start date for ISO 9001 & ISO 14001: **14 October 2016**
Original cycle start date for ISO 45001: **28 August 2018**
Expiry date of previous cycle: **13 October 2022**
Recertification Audit date: **07 August 2022**
Recertification cycle start date: **11 October 2022**

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: **13 October 2025**

Certificate No. **IND.22.8649/IM/U** Version: 1 Issue date: **11 October 2022**


Signed on behalf of BVCH SAS UK Branch
Jagdish N. MANIAN
Director – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division


UKAS
MANAGEMENT SYSTEMS
CERTIFICATION
0008

Certification body address: 38 Floor, 66 Princes Street, London, E1 6NG, United Kingdom
Local office: Bureau Veritas (Bangladesh) Pvt. Ltd.
Symphony (5th Floor), Plot- 52/53, Road 142
South Avenue, Gulshan-2, Dhaka 1212, Bangladesh

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Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization.
To check this certificate validity please call +88 (02) 8626765.



Bureau Veritas Certification

NORTH-WEST POWER GENERATION COMPANY LIMITED



Standards

ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018

Scope of certification

CORPORATE MANAGEMENT OF POWER PLANTS, POWER GENERATION & SUPPLY TO THE NATIONAL GRID.

SITE	ADDRESS	SCOPE
HEAD OFFICE	UNIQUE TRADE CENTER (LEVEL - 03 AND 04), 8 PANTHAPATH, KAWRANBAZAR, DHAKA-1215, BANGLADESH	CORPORATE MANAGEMENT OF POWER PLANTS
SIRAJGANJ POWER STATION (UNIT-1, UNIT-2, UNIT-3)	SOYDABAD, SIRAJGANJ, BANGLADESH	POWER GENERATION & SUPPLY TO THE NATIONAL GRID
KHULNA 225 MW COMBINED CYCLE POWER PLANT	GOALPARA, KHALISHPUR, KHULNA, BANGLADESH	POWER GENERATION & SUPPLY TO THE NATIONAL GRID
BHERAMARA 410 MW COMBINED CYCLE POWER PLANT	BHERAMARA, KUSHITA, BANGLADESH	POWER GENERATION & SUPPLY TO THE NATIONAL GRID
MADHUMATI 100 MW HFO BASED POWER PLANT	MOLLAHAT, BAGERHAT, BANGLADESH	POWER GENERATION & SUPPLY TO THE NATIONAL GRID
SIRAJGANJ 7.6 MW GRID CONNECTED SOLAR PV POWER PLANT	SOYDABAD, SIRAJGANJ, BANGLADESH	POWER GENERATION & SUPPLY TO NORTHERN ELECTRICITY SUPPLY COMPANY

Certificate No. IND.22.8649/IMU

Version: 1

Issue date: 11 October 2022

Jagdish N. Manjan

Signed on behalf of BVCH SAS UK Branch
Jagdish N. MANJAN
Director - CERTIFICATION, South Asia
Commodities, Industry & Facilities Division



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Certification body address: 5th Floor, 86 Penton Street, London, E1 9NF, United Kingdom

Local office: Bureau Veritas (Bangladesh) Pvt. Ltd
Symphony 5th Floor, Plot-33/F-39, Road-142
South Avenue, Gulshan-2, Dhaka-1212 Bangladesh

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To check the certificate validity please call + 91 (02) 8836766.





গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
সিরাজগঞ্জ জেলা কার্যালয়
সঞ্জর্ঘি হাউস, হোল্ডিং নং-১৭৫, হোসেনপুর (দক্ষিণ)
সি. ও. রোড, সদর, সিরাজগঞ্জ-৬৭০০
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পরিবেশগত ছাড়পত্র নবায়ন

ছাড়পত্র নং: ২০-১১১০০৪

পরিবেশগত ব্যবস্থাপনা নিশ্চিতকরণ সাপেক্ষে সংযুক্ত শর্তে নিম্নবর্ণিত প্রতিষ্ঠান/প্রকল্পের অনুকূলে পরিবেশগত ছাড়পত্র নবায়ন প্রদান করা হলো:

প্রতিষ্ঠান/প্রকল্পের নাম	: সিরাজগঞ্জ ২২৫ মেগাওয়াট সিন্থেটিক গ্যাস (হুয়োল ক্যুরেল) গ্যাস ইউনিট।
উদ্যোগের নাম	: যাবস্থাপনা পরিচালক
সনাক্তকরণ নং	: ১০১১০
প্রতিষ্ঠান/প্রকল্পের কার্যক্রম	: ২২৫ মেগাওয়াট বিদ্যুৎ উৎপাদন
প্রতিষ্ঠান/প্রকল্পের শ্রেণী	: Red
প্রতিষ্ঠান/প্রকল্পের ঠিকানা	: মহলাকান, সদর, সিরাজগঞ্জ
প্রদানের তারিখ	: ২৭ নভেম্বর, ২০২৩ খ্রি.
মেয়াদ উত্তীর্ণের তারিখ	: ০৮ অক্টোবর, ২০২৪ খ্রি.



এ ছাড়পত্র মালিকের সাথে যুক্তভাবে সংযুক্ত শর্তসমূহী স্বাক্ষরক্রমে প্রত্যাশিত করতে হবে,
অন্যথাহ ছাড়পত্র বাতিল/অনিশ্চিত/অসংক্রান্ত হতে পারে।

বিজ্ঞপ্তি: এটি একটি নির্দিষ্ট কোডের ছাড়পত্র এবং এতে কোনোরূপ স্বাক্ষরের প্রয়োজন নেই।

পরিবেশগত ছাড়পত্র নবায়ন এর জন্য প্রয়োজন শর্তসমূহী:

ছাড়পত্রটি যাচাই করতে লিঙ্ক কলন: https://ecc.doe.gov.bd/certificate_verification

Page 1 of 2

সনস্করণ নং: ১০১১০ সিরাজুল ২২৫ জেলাশাসন সিবিপিপি (ডুয়েল ফুয়েল ৫৫ ইউসিটি) ছাত্রপত্র নং: ২৫-১১১০৫৪

১. মাসোবান, মমত, সিরাজুল-৫ অবস্থিত সিরাজুল ২২৫ জেলাশাসন সিবিপিপি (ডুয়েল ফুয়েল ৫৫ ইউসিটি) নামক ২২৫ জেলাশাসন বিদ্যালয় উপাধীনকারী পাঠদায় প্রার্থীর অনুলে ০৯/১০/২০১৮ খ্রি: তারিখে সার্বিক ১৮-১১৮-৫৯ নম্বরে ছাত্রপত্রের সকল শর্ত অপরিবর্তিত রূপে ছাত্রপত্র অংশী ০৮ অক্টোবর, ২০১৪ খ্রি: তারিখ পর্যন্ত শস্যায় করা হলো।



ANNEX-B: Stakeholder Consultation Program



**Sirajganj 225 MW Combined Cycle Power Plant
Dual Fuel – 2nd and 3rd Unit, Bangladesh**

Stakeholder Engagement Report 2023

Operation Stage

Prepared for
**North-West Power Generation Company Limited
(NWPGL)**

Prepared By

ELRC

871/1, Kazipara, Kafrul, Mirpur,
Dhaka-1216, Bangladesh

September 2023

EXECUTIVE SUMMARY

Ensuring a sustainable and reliable power supply is a crucial prerequisite for driving the socio-economic growth of Bangladesh. Currently, approximately 92.2% of the population in Bangladesh has access to electricity, including both off-grid and renewable sources (as per World Bank data from 2018). The country boasts an installed generation capacity of roughly 25,235 MW.

In accordance with the Government's Power Sector Master Plan of 2016 and taking into account the availability of fuel gas and High-Speed Diesel (HSD) in the region, the Northwest Power Generation Company Limited (NWPGL), an entity under the Ministry of Power, Energy and Mineral Resources (MoPEMR), has formulated a strategy to bolster electricity generation. This strategy involves the construction of a new Combined Cycle Power Plant (CCPP), encompassing the installation of the 3rd and 2nd units at Soydabad in Sirajganj.

NWPGL, operating under the Bangladesh Power Development Board (BPD&B), is spearheading this effort to augment Bangladesh's power generation capacity, thereby addressing the escalating demand for electricity. Central to this endeavor is the operation of a 225 MW Combined Cycle Power Plant in Sirajganj's Soydabad region.

This stakeholder engagement report focuses on the involvement of the stakeholders in the project, as outlined in the baseline study and Environmental Impact Assessment (EIA) guidelines established by the Government of Bangladesh (GOB). The report's findings will be informed by real-time participatory community meetings, focus group discussions, and key informant interviews conducted during the operational phase of the project. Recognizing the significance of stakeholders and their engagement, the North-West Power Generation Company Limited (NWPGL) has identified and mapped relevant stakeholders and devised an engagement plan to interact with them at various stages of the project's life cycle. In alignment with the Stakeholder Engagement Plan (SEP), NWPGL aims to establish and nurture sustainable relationships with its stakeholders.

This report has been compiled based on the stakeholder engagement activities carried out in accordance with NWPGL's established SEP. The Area of Influence (AoI) has been determined by taking into account the impacts associated with transportation activities, the recruitment and employment of laborers during both the construction and operation phases of the project, noise emissions during project operation, land utilization, dust generation, and air quality effects linked to operational activities.

Numerous training sessions, stakeholder meetings, Focus Group Discussions (FGDs), and Key Informant Interviews (KIIs) have been conducted with various stakeholder groups to gain insights into the current status of the project activity and its impact on the local community, existing environmental conditions, and the institutional framework. The interviews with NWPGL personnel aimed to gather feedback from local residents regarding the project's effects.

The stakeholders showed cooperation and exhibited positive behavior throughout the consultation. They expressed a positive opinion about the project's operational activities. The proponent is strongly advised to maintain regular stakeholder engagement in accordance with the established stakeholder engagement plan.

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1 CHAPTER 1: INTRODUCTION

1.1 Study Background

Power is the main driving force of current progress and also the foundation of the growth rate. The vision of the Bangladesh Government is to give access to moderate and reliable power to all by the year 2021 and following this present government's goal is to guarantee continuous and quality power supply for all by 2021 through a change in generation, transmission, and distribution methods. The Government of Bangladesh has announced the new policy, "Vision 2041" targeting Bangladesh to be a developed country by 2041. With the consistency of economic development, a secure power system would be necessary. The government has further expanded its vision focusing on the coming years up to 2041 and arranged the Power System Master Plan 2016 (PSMP). This plan expresses that in 2020, 2030, and 2041, the power demand would be 12545 MW, 27434 MW, and 52034 MW where the power supply would be 12949 MW, 30178 MW, and 57238 MW. Based on the future economic growth, fuel, demand, and supply, international cooperation, a new Power System Master Plan 2016 have been finalized Power System Master Plan (PSMP) 2016, aims at assisting Bangladesh in formulating extensive energy and power development plan up to the year 2041, covering energy balance, power balance, and tariff strategies. As per PSMP 2016, achieving middle to long term development issues and risks and formulate a comprehensive and result-oriented aid strategy for the energy sector by examining effective approaches for each issue. At present, about 92.2% (including off-Grid & Renewable) population of Bangladesh has access to electricity (World Bank, 2019) with an installed generation capacity of around 25,235 MW. Considering fuel gas & High-Speed Diesel (HSD) supply facilities in the area, the North-West Power Generation Company Limited (NWPGL), an enterprise of the Ministry of Power, Energy and Mineral Resources (MoPEMR) in line with the Government's Power Sector Master Plan of 2016, has planned to enhance the electricity generation by constructing a new Combined Cycle Power Plant (CCPP), 2nd and 3rd unit at Soyadabad, Sirajganj.

As per the definition of the Environment Conservation Rules (ECR), 1997 of Bangladesh, the proposed project falls under the "Red" Category Project. Hence, for the fulfillment of the condition required under this Category, an Environmental Impact Assessment (EIA) study has been carried out to assess the impacts of this Project, propose mitigation measures and its implementation plan (Environmental Management Plan). NWPGL has engaged Engineers Associates Limited (EAL), an experienced firm for such activities, for the preparation of EIA for the project following the Terms of Reference. Engineers Associates Limited (EAL) has conducted an EIA study and submitted the EIA report to DoE on May 11, 2014, for DoE approval. Finally, DoE has issued a Letter for Approval of EIA on July 16, 2014. NWPGL is seeking financial assistance from Standard Chartered Bank (hereinafter referred to as SCB or Bank or the Lenders). AECOM India has been engaged by NWPGL as independent auditors for carrying out the Environmental and Social Due Diligence of the project. The due diligence report is to be prepared following the International Finance Corporations Sustainability Framework 2012 (IFC) and its Performance Standards (PS) on Social and Environmental Sustainability to assess the compliance of the Project and the ability of the Project to comply with the requirements of the suggested reference framework.

1.2 Stakeholder Engagement

Stakeholder engagement is the process by which an organization involves people who may be affected by the decisions it makes or can influence the implementation of its decisions. More specifically, stakeholder engagement is a more inclusive and continuous process between a company and those potentially impacted that encompasses a range of activities and approaches and spans the entire life of a project. Additionally, Engagement is not an end in itself, but a means to help build better relationships with the societies in which we operate, ultimately resulting in improved business planning and performance.

Considering the importance of Stakeholders and their engagements, NWPGL has identified, mapped its relevant stakeholders, and developed an engagement plan to approach the stakeholders throughout the project life cycle. According to this Stakeholder Engagement Plan (SEP), NWPGL establishes a

sustainable relationship along with its stakeholders. This report has been prepared on the stakeholder engagement activities for 2018-2019 as guided by the established SEP of NWPGL.

1.3 Objectives

The overall objective of the consultation process will disseminate project information and incorporate the views of stakeholders in the design of the environmental and social mitigation measures, management plan, and monitoring plan. The specific objectives of the consultation process are to:

- a. Local people comments and suggestions on the project activity;
- b. Improve project design and thereby, minimize conflicts and delays in implementation.
- c. Increase long term project sustainability and ownership.
- d. Reduce problems of institutional coordination; and
- e. Consult stakeholders to gather the information needed to complete the assessment

1.4 Methodology for Consultation

The approach undertaken for information disclosure and consultation involved the following key processes.

- a. Mapping and identification of key stakeholders such as primary (direct project influence) and secondary (indirect project influence) stakeholders according to SEP;
- b. Undertaking expert consultations, interviews, and FGD's with the respective stakeholders;
- c. Assessing the influence and impact of the project on these stakeholder groups;
- d. Summarizing of key findings and observations from the consultations; and
- e. Preparing a future stakeholder engagement strategy consultation plan for a more detailed assessment at a microscopic level taking into account the various project lifecycle phases and their implications on the stakeholder.

2 CHAPTER 2: PROJECT DESCRIPTION

2.1 Project Location

The project site is located at about 15 km south-east of Sirajganj town, about 130 km north-west of Dhaka, and 1.8 km south-west from the western end of Bangabandhu bridge. Subsequently, NWPGL has applied for getting the land of 17.5 acres (Approximately 10 acres for Sirajganj 225 MW 2nd Unit and approximately 7.5 acres for Sirajganj 225 MW 3rd Unit) leased from BPDB as per the decision of GOB to establish the said power plants in the Sirajganj Generation Hub. The major components include a 150 MW gas turbo generator (GTG) with a bypass stack of 60 meters high, one horizontal type Heat Recovering Steam Generator (HRSG) with the main stack of 60 meters high for outdoor installation, and a heavy-duty condensing type Steam Turbo Generator (STG) for indoor installation in the configuration of 1:1:1, feedwater pumps, condensate extraction pumps, cooling towers, 230 KV plant sub-station, transformers, Gas Regulating Metering Station (RMS), Oil Separator Unit, Water Treatment Plant (WTP), Administration building, workshop, warehouse, guardhouses, internal roads, etc.

The project is a dual fuel-based Combined Cycle Power Plant (CCPP), which will be operated predominantly by Natural Gas (NG) but has also the provision of High-Speed Diesel (HSD) in case of emergency and non-availability of NG. The natural gas required for the Plant is 35 MMCFD and the Pashchimanchal Gas Company Limited (PGCL) will supply natural gas at a pressure of 500 psi through a 1.7 Km long and 18-inch diameter pipeline from its existing valve station to the PGCL RMS, which is to be constructed. From this RMS a 12-inch line will be extended up to the Power Plant's RMS (to be constructed inside the Plant's boundary) at a pressure of 350 psi. Liquid fuel (HSD) requirement is estimated to be about 920 m³/day at 80% PF. The oil will be supplied by Bangladesh Petroleum Corporation (BPC) from its Daulathpur and/or Khulna depot by railway wagons to Bangabandhu Bridge (Satu) West Railway Station and stored in the HSD tanks in the Plant.

The hot flue gas that is produced in the combustor will then be directed to the GTG, where it expands, loses pressure and temperature, and causes the GTG to spin and generate about 150 MW of power. The hot exhaust gas of GTG will pass through the HRSG and main stack to the atmosphere. The HRSG in turn will generate High Pressure (HP), Intermediate Pressure (IP), and Low Pressure (LP) steam that will be directed to the STG, which would, in turn, generate 75 MW of power, thus totaling the Plant output to 225 MW. The generated power of GTG and STG will be stepped up to grid voltage level (11/230 KV) by station transformers (240 MVA for GT and 120 MVA for ST) and feed to the national grid, via underground cables (Sirajganj sub-station), through the Plant sub-station.

Total water demand for Units 1-3 is 1400 m³/h, with the third Unit requiring 400 m³/h as per the feasibility Report. There is a provision for the fourth Unit to be constructed beside the third Unit. These units altogether will raise the water requirement to 2550 m³/h. Water requirement for Plant construction and operation can be fulfilled from groundwater and it was reported from the feasibility study that the maximum allowable withdrawal of groundwater is 3,200 m³/h without causing the conspicuous problem in the groundwater table of the SPS area (EAL, 2014 and SDCPL, 2015). The major air pollutants that are produced from the power generating units due to the burning of fossil fuels are SO_x, NO_x, CO₂, CO, and SPM. Major sources of contaminated water from the proposed power plant are blowdowns of HRSG, cooling tower, backwash and rejects of the water treatment plant, oily water from turbine floor and transformer area, etc.

2.2 Importance of the Project

At present total installed electricity generation capacity is 25,235 MW with 92.2% of the population of the country has the access to electricity. The Ministry of Power, Energy and Mineral Resources (MoPEMR) has forecasted that the increase in power demand in response to the desired economic growth of the country, will reach 34,000 MW by 2040. The Power System Master Plan (PSMP) also projected some scenarios of power demand concerning different GDP growth rates. All these variable projections are depicted in Figure 2-1.

To address the conflict between increasing power demand and prevailing shortage, BPDB has adopted a power generation enhancement plan till 2021 which is in line with the PSMP, 2016. The summary of the plan to increase power generation is depicted in Table 2-1. The plan includes different initiatives to generate additional electricity by diversifying fuel, rehabilitating age-old power plants, and importing electricity from neighboring countries. The Sirajganj 225 MW CCPP Project is one of such steps for contributing to meet the growing demand.

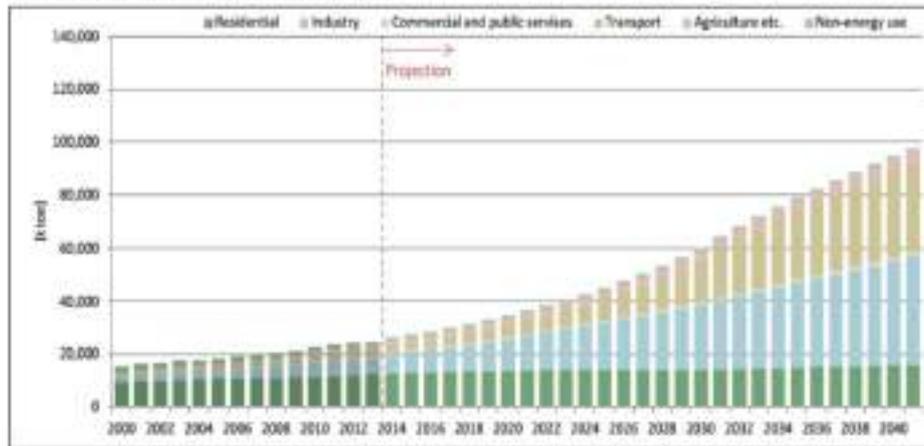


Figure 2-1: Projection of Final Energy Consumption (Energy Efficiency Scenario)¹

Table 2-1: Power Generation Enhancement Plan²

Sl. No.	Type	2015	2016	2017	2018	2019	2020	2021	Total
1.	Public (MW)	1,218	770	2,202	846	2,070	1,000	2,400	10,506
2.	Private (MW)	1,130	748	799	1,270	568	1,287	1,812	7,670
3.	Import (MW)	---	---	---	---	---	---	---	---
4.	Total	2,348	1,518	3,001	2,116	2,634	2,247	4,312	18,176

2.3 Potential Major Benefits

The power plant will trigger regional development, creation of employment opportunities, and thereafter improvement of livelihood. The power plant may also bring social and economic development to the region through infrastructural improvement, reducing energy shortfall, rural electrification, and industrial (power loom) development. The communication network will also be improved significantly and will increase livelihood opportunities during the construction period. Finally, the project would improve Environmental Performance by providing a means of effluent treatment of existing units; thus, significantly reducing the discharging of effluents in the canal around the site connected to the Jamuna River.

2.4 Area of Influence

The Area of Influence (Aoi) is determined by considering the impacts related to transportation activities, the hiring and use of laborers during operation of the Project, noise generated during operation of the Project, land use, dust generation, and air quality impacts related to operational activities.

¹ Source: PSMP 2016

² Source: Power Sector Emergency Information, System Planning Department, BPDB, February 16, 2015

The nearest settlements to the Project Site will be considered as the first impact zone. In other words, locals in the first impact zone may experience direct impacts from the Project. Operational works will cause dust and noise emission, in which nearest Ponchosona village area (distanced 0.2 km to the Project Site) and Boroshimul Village (distanced 1 km to the Project Site) may experience dust and noise impacts during the operation phase of the Project. Therefore, the first impact zone includes the Ponchosona village and Boroshimul village which are within a 2 km radius around the Project Site. The second impact zone includes the other residential area, which is within a 5 km radius of the Project site. Inhabitants within the second impact zone may experience indirect Project impacts such as direct and indirect job opportunities, providing goods and services to the Project and Project employees. Inhabitants in the first impact zone are more likely to experience impacts related to community health and safety than inhabitants located in the second impact zone. Further information on these impacts can be found in the EIA report. The Sirajganj Economic Zone is located on the west side of the Bangabandhu Bridge in the Sirajganj district, close to a power plant, just about 1 kilometer away. It's designed to host a range of industries including textiles, food processing, pharmaceuticals, leather, automobiles, LPG manufacturing, steel production, fisheries, and shipbuilding. The main goal of establishing this economic zone is to create a profitable and environmentally friendly business hub in the country. This initiative aims to attract both local and foreign investments, generating jobs for around 500,000 people and bringing significant foreign capital into Bangladesh's private sector. It's worth noting that there have been no reported cumulative environmental impacts associated with the Sirajganj Economic Zone and power plant that could adversely affect the local population and the environment.

Due to operational activity, local people may face dust or noise pollution and also other environmental hazards. For assessing the people's present status due to project activity this interview was conducted. Considering the primary stakeholders near the project area, a day-long interview has been conducted to ensure their comments on the project activity. According to the baseline study, this interview has been conducted on the premises of the project. As stated, the allocation of the Project Site causes no private land acquisition. Therefore, there will be no need to take mitigation measures for economic or physical displacement for the allocated site.

3 CHAPTER 3: LEGAL REQUIREMENTS

This section outlines the regulatory framework for the Project's stakeholder engagement activities, namely-

3.1 Asian Development Bank (ADB) Safeguard Policy Statement (2009)

ADB's Safeguard Policy Statement requires ADB's borrowers/clients to carry out meaningful consultation processes in all projects financed by ADB.

- a. For policy application, ADB will require borrowers/clients to engage with communities, groups, or people affected by proposed projects, and with civil society through information disclosure, consultation, and informed participation in a manner commensurate with the risks to and impacts on affected communities. For projects with significant adverse environmental, involuntary resettlement, or Indigenous Peoples impacts, ADB project teams will participate in consultation activities to understand the concerns of affected people and ensure that such concerns are addressed in project design and safeguard plans.
- b. The ADB's Safeguard Policy Statement emphasizes requirements for establishing a grievance mechanism that receives and facilitates the resolution of affected people's concerns, complaints, and grievances about a Project's environmental and social performance. The grievance mechanism should be scaled to Project risks and adverse impacts, address affected people's concerns and complaints promptly. It should also ensure the process is understandable and transparent, gender-responsive, culturally appropriate, and readily accessible to all segments of affected people. It should also not impede access to judicial or administrative remedies. The grievance mechanism should be delivered to the affected people in appropriate manner. ADB. 2011. Public Communications Policy. The policy promotes greater transparency and accountability by enabling ADB's stakeholders—especially people affected by development activities—to better participate in the decisions that affect them. ADB-assisted activities are expected to consider the right of people to seek, receive, and impart information and ideas, and consider feedback from its stakeholders, including affected people. Information shall be given to affected people early enough for them to provide meaningful inputs into project design and implementation.
- c. ADB's Policy on Cooperation with Civil Society Organizations (1998). The policy recognizes that NGOs can contribute valuable advice on the design of projects and can participate directly in implementation. To support effective cooperation with NGOs, the policy indicates that as appropriate, mechanisms to expand and strengthen interaction with NGOs in loan and technical assistance activities will be identified and existing mechanisms for consultation and dialogue with NGOs will be pursued and strengthened. Under this policy and the 2009 SPS, the Borrower is expected to carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation.
- d. Stakeholder Engagement requires clients to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities and, where relevant, Other Stakeholders.

3.2 The IFC Performance Standards (IFC PS:1 Stakeholder Engagement)

- a. **Stakeholder Engagement:** According to IFC PS-1 Stakeholder engagement is an ongoing process that may involve, in varying degrees, the following elements: stakeholder analysis and planning, disclosure and dissemination of information, consultation and participation, grievance mechanism, and ongoing reporting to Affected Communities. The nature, frequency, and level of effort of stakeholder engagement may vary considerably and will be commensurate with the project's risks and adverse impacts, and the project's phase of development. Stakeholder Analysis and Engagement Planning: Clients should identify the range of stakeholders that may be interested in their actions and consider how external communications might facilitate a dialog with all stakeholders. The client will develop and implement a Stakeholder Engagement Plan

that is scaled to the project risks and impacts and development stage, and be tailored to the characteristics and interests of the Affected Communities.

- b. **Disclosure of Information:** Disclosure of relevant project information helps Affected Communities and other stakeholders understand the risks, impacts, and opportunities of the project. The client will provide Affected Communities with access to relevant information.
- c. **Consultation:** When Affected Communities are subject to identified risks and adverse impacts from a project, the client will undertake a process of consultation in a manner that provides the Affected Communities with opportunities to express their views on project risks, impacts and mitigation measures, and allows the client to consider and respond to them. The extent and degree of engagement required by the consultation process should be commensurate with the project's risks and adverse impacts and with the concerns raised by the Affected Communities. **Informed Consultation and Participation:** For projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation (ICP) process that will build upon the steps outlined above in Consultation and will result in the Affected Communities' informed participation.
- d. **External Communications and Grievance Mechanisms:** Clients will implement and maintain a procedure for external communications that includes methods to (i) receive and register external communications from the public; (ii) screen and assess the issues raised and determine how to address them; (iii) provide, track, and document responses, if any; and (iv) adjust the management program, as appropriate. In addition, clients are encouraged to make publicly available periodic reports on their environmental and social sustainability. Where there are Affected Communities, the client will establish a grievance mechanism to receive and facilitate resolution of Affected Communities' concerns and grievances about the client's environmental and social performance.

4 CHAPTER 4: CONSULTATION

For the SEP, a stakeholder is defined as any individual, organization, or group which is potentially affected by the Project, or which has an interest in the Project and its impacts. The objective of stakeholder identification is to establish which stakeholders may be directly or indirectly affected – either positively or negatively - (“affected parties”) or have an interest in the Project (“other interested parties”). Particular effort must be made to identify any disadvantaged and vulnerable stakeholders who may be differentially or disproportionately affected by the Project or who may have difficulty participating in the engagement and development processes. Stakeholder identification is also an ongoing process and will require regular review and update.

There are several stakeholder meetings, FGDs, and KII that have been conducted with different stakeholder parties to understand the present situation of the project activity of the surrounding peoples, existing environmental settings as well as the institutional system. Most of the primary, secondary and other stakeholders presented in the interview session with NWPGL representative for assessing the feedback from the local people about the project activity. The agenda and discussed issues are presented in the following section.

4.1 Fire Service and Civil Defense

4.1.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Fire Service and Civil Defence Sub-Station, Sirajganj Sadar, Sirajganj
Consulted Person	Md. Rafiqul Islam
Designation/Position	F.S.I
Cell No.	01748867108
Consulted By	Md. Abdur Rab
Designation/Position	Assistant Consultant, ELRC
Date	17.08.2023
Time	11:05 AM

4.1.2 Discussions

Concerned Issues	Discussions
Involvement with the Emergency Preparedness Programs Taken by the NWPGL	Every month, events occur during the first week and the last week of the month.
Frequency of Programs Taken	Per unit, twice a month
Fire Incidents Reported	Not yet occurred
Remarks/Recommendation	It is necessary to be more alert and time conscious. Always need to be more alert and conscious about time

4.1.3 Photographs



Photo 4-1: Consultation with Fire Safety Personnel at Project Sub-Station

4.1.4 Recommendations

It is imperative for NWPGL to prioritize the consistent implementation of fire safety training for its workforce. This entails conducting regular fire drills and training sessions to ensure that all employees and staff are well-prepared to handle potential fire hazards effectively.

4.2 Ministry of Health and Family Welfare

4.2.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Upazila Health and Family Welfare Office, Sirajgarj Sadar, Sirajgarj
Consulted Person	SM Moniruzzaman
Designation/Position	SAMCO
Cell No.	01716323018
Consulted By	Md. Abdur Rab
Designation/Position	Assistant Consultant, ELRC
Date	17.08.2023
Time	10:40 AM

4.2.2 Discussions

Concerned Issues	Discussions
Available Health Facilities	The health facilities currently offered include primary treatment, maternal consultation, as well as awareness programs for communicable and non-communicable diseases.
Common Exposure Diseases (Last One Year)	There are no records available.
Health Problems Created from The Project Activities (If Any)	There is no health problem were recorded.
Health Improvement Initiatives Taken by NWPGL	Some initiatives were taken

4.2.3 Photographs



Photo 4-2: Consultation with Upazilla Medical Officer at Upazilla Health and Family Welfare Office

4.2.4 Recommendations

For any health-related inquiries or information, it is recommended to seek guidance from the nearby Union Health Complex or Upazilla Health Complex.

4.3 Department of Agriculture

4.3.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Bangladesh Agricultural Development Corporation (BADDC), Sirajganj Sadar, Sirajganj
Consulted Person	Md. Sabbir Ahmed Sifat
Designation/Position	Assistant Agriculture Officer (AEO)
Cell No.	01723906794
Consulted By	Md. Abdur Rab
Designation/Position	Assistant Consultant, ELRC
Date	17.08.2023
Time	09:45 AM

4.3.2 Discussions

Concerned Issues	Discussions
Agricultural Practices	The predominant agricultural practices involve cultivating a maximum of two crops in some cases and occasionally up to three crops.
Irrigation Practices	Irrigation techniques involve the utilization of shallow tube wells, river water sources, with deep tube wells being a less common option.
Irrigation Cost	The cost of irrigation for rice production per bigha (33 decimal) typically falls within the range of 10,000 to 12,000 BDT.
Production Rate	The production rate was not documented.
Annual Revenue	The annual revenue was not recorded.
Availability of Agricultural Labor	The availability of agricultural labor fluctuates and is not constant throughout every season.

Concerned Issues	Discussions
Labor Wages	Labor wages fluctuate from one season to another, typically ranging between 500 and 800 BDT.
Agricultural Problems Created from The Project Activities (Yes/No)	As of the reporting period, there have been no agricultural issues arising from project activities.
Remarks	N/A

4.3.3 Photographs



Photo 4-3: Consultation with SAAO, Sirajganj Sadar, Sirajganj

4.3.4 Recommendations

Installation of deep tube wells could potentially contribute to boosting agricultural productivity, and it's advisable to refrain from acquiring agricultural land for the project's extension or other purposes.

4.4 Department of Fisheries

4.4.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Upazilla Fisheries Office, Sirajganj Sadar, Sirajganj
Consulted Person	Md. Golam Rabby
Designation/Position	Fisheries Field Officer
Cell No.	01738580444
Consulted By	Md. Abdur Rab
Designation/Position	Assistant Consultant, ELRC
Date	17.06.2023
Time	9:25 AM

4.4.2 Discussions

Concerned Issues	Discussions
Fishing Scenario and Practices Around the Project Site	<p>The fishing activities in the project area include aquaculture, open water fishing, and the use of various equipment such as current nets, ber nets, wheels, dragnets, etc.</p> <p>Variety of Fish Species: A wide range of fish species are found in the area, including Chanda, Chela, Pangas, Chital, Rui, Katla, Bhangan, Kalbaosh, Punti, Bala, Cavasi, Tengra, Tilapia, Phasa, Pholi, Horina Chingri, Darkina, Parshi, Golda Chingri,</p>

Concerned Issues	Discussions
	Mrigal, Kol, Kolisha, Mola, Gazar/Gojar, Tara Baim, Tengra, Veda, Sha' Baim, Sho', Taki, Madhu pabda, and Magur.
Yearly Yield	The annual yield totals 8,567 metric tons in total, categorized by Upazilla.
Total Fishing Activities (Around the Project Site)	Fishing activities in the vicinity of the project site are a prominent part of the local economy and lifestyle. The community engages in a variety of fishing practices to sustain their livelihoods and meet local demand for fresh fish. Local fishermen employ specialized fishing methods such as 'Current jal,' 'Chandi jal' (Gill nets), and 'Ber jal' (Seine net) to capture large quantities of fish. These techniques are highly effective in the region's waters, contributing significantly to the local fishing activities.
Fish Availability (Around the Project Site)	The availability of fish in the vicinity of the project site is deemed satisfactory.
Fishing Areas (Around the Project Site)	Fishing zones in proximity to the project site encompass river and open water areas.
Fishing Problems Created from The Project Activities (Yes/No)	As of now, there have been no reported issues arising from project activities that affect fishing in the area.
Remarks	N/A

4.4.3 Photographs



Photo 4-4: Consultation with Upazilla Fisheries Officer, Sirajganj Sadar, Sirajganj

4.4.4 Recommendations

NWPGCL has been organizing focus group discussions and stakeholder consultations, during which the importance of protecting fisheries resources has been a key topic and recommended to expanding these efforts. NWPGCL can conduct additional awareness programs specifically tailored for the local fishermen.

4.5 Department of Public Health Engineering

4.5.1 Details of Consultation

Name of the Stakeholder (Institution/Community)	Department of Public Health Engineering (DPHE)
Consulted Person	Md. Kamrul Hossain

Designation	Sub Assistant Engineer
Cell No.	01715149341
Consulted By	Md. Abdur Rab
Designation	Assistant Consultant, ELRC
Date	17.08.2023
Time	10: 05 AM

4.5.2 Discussion

Concerned Issues	Discussions
Ground Water Condition Around the Project Site Area	In relation to the groundwater condition at the project site area, the water quality continues to be positive.
DTW Depth	Deep Tube Well (DTW) Depth ranges from approximately 150 to 300 feet
STW Depth	Shallow Tube Well (STW) Depth is around 35 to 40 feet.
DTW Installation Cost	DPHE has not incurred any recent installation costs for Deep Tube Wells (DTW).
STW Installation Cost	The installation cost for Shallow Tube Wells (STW) is approximately 2000 BDT per foot.
Observation Well near the Project	There are no observation wells in the vicinity of the plant site.
Ground Water Level Related Complaints	As of now, there have been no complaints from the local community concerning groundwater levels.
Remarks	Consider utilizing surface water as a substitute for groundwater in the cooling tower system.

4.5.3 Photographs



Photo 4-5: Consultation with Assistant Engineer, DPHE, Sirajganj Sadar, Sirajganj

4.5.4 Recommendations

NWPGCL can take measures to address any contamination in groundwater if arises and prioritize the utilization of surface water in accordance with applicable government guidelines and regulations.

4.6 Fishing Community

4.6.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Fishing Community, Boroshimul Village, Soydabad, Sirajganj
Consulted By	Md. Abdur Rab and Tofazzal Hossen

Designation/Position	Consultant, ELRC
Date	18.08.2023
Time	10:15 AM

4.6.2 Participants Details

Sl. No.	Name	Age	Locations
1.	Md. Sobhan Faraj	48	Ponchosona Village
2.	Md. Matin Howlader	38	Ponchosona Village
3.	Md. Rubel Imam	37	Boroshimul Village
4.	Baochu Mia	42	Ponchosona Village
5.	Md. Firoz Khandakar	39	Ponchosona Village
6.	Mokhlesur Rahman	34	Boroshimul Village

4.6.3 Discussions

Concerned Issues	Discussions
Fishing Areas Around the Project Site (Number)	Fishing locations in the vicinity of the project site primarily include the banks of the Jamuna River and several ponds located in proximity to the local residential areas, though not directly adjacent to the project area.
Fishing Practices	The predominant fishing methods employed in this region primarily involve the use of current nets, ber nets, wheels, and dragnets.
Available Fisheries	The available fishery resources within the project area encompass a diverse range of species, including Phasa, Cavasi, Tengra, Mrigal, Koi, Kolsha, Madhu Pabda, Chital, Rui, Katla, Chela, Pangas, Horina Bhangar, Kalbaosh, Punti, Baila, Mola, Tilapia, Chanda, Chingri, Darkina, Parshi, Golda Chingri, Magur, Pholi, Gazari/Gojar, Tara Baim, Tengra, Veda, Shal Baim, Shol, and Taki.
Quantity of Fisheries	The fisheries resources are abundant and meet the seasonal demand.
Fishing Problems Created by Project Activities Around the Project Site Area (Yes/No)	As of now, there have been no observed issues related to project activities that affect fishing in the area around the project site.
Remarks	No noteworthy concerns or problems have been raised during the reporting period. The fisheries community has reported that the fisheries resources and fish catches are in good overall condition.

4.6.4 Photographs



Photo 4-6: Focus Group Discussion (FGD) with Fishing Community

4.6.5 Recommendations

There has been no significant change in the quantity of riverside fisheries. After consulting with the fisheries officer and local fishermen in the project area, it has been determined that the project has no discernible direct or indirect impact on the growth or mortality of fisheries.

4.7 Agricultural Farmers

4.7.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Farmers Community, Boroshimul Village, Soyadabad, Sirajganj
Consulted By	Md. Abdur Rab and Tofazzal Hossen
Designation/Position	Consultant, ELRC
Date	16.08.2023
Time	11:15 AM

4.7.2 Participants Details

Sl. No.	Name	Age	Locations
1.	Md. Bashir Uddin	41	Ponchosona Village
2.	Ralan Mia	45	Boroshimul Village
3.	Abu Talab	62	Boroshimul Village
4.	Md Kamal	38	Boroshimul Village
5.	Mozammel Bhuiya	51	Boroshimul Village
6.	Alom Mridha	37	Boroshimul Village

4.7.3 Discussions

Concerned Issues	Discussions
Agricultural Practices (Single, Double and Triple)	Double (paddy-jute). Double cropping with paddy and jute involves planting rice (paddy) as the first crop, followed by jute as the second crop in the same field during a single growing season. This practice helps farmers diversify income sources, improve soil health through crop rotation, and utilize the same land more efficiently. It requires careful planning and management, including addressing specific pest and disease challenges and ensuring adequate water

Concerned Issues	Discussions
	supply.
Crop Types	Common crops in this region include paddy, pulses, jute, wheat, mustard, vegetables, and more.
Production Rate	Productivity has been on a declining trend over the past few years.
Irrigation Practices	Irrigation methods include the use of deep and shallow tube wells, as well as natural and surface water sources.
Irrigation Cost (Last and Present Year) Annual Revenue	The annual irrigation cost per Bigha (33 Decimal) has ranged from 10,000 to 13,000 BDT in the last and present years.
Agricultural Labor Availability	During the peak season, the availability of agricultural labor is limited.
Labourer Wages (Male, Female)	In the previous season, male laborers were paid between 400-500 BDT per day, whereas there is a lack of female workers in this region.
Remarks	The production rate is in decline from the few years. Relevant Agriculture department are working towards to find out the sustainable solutions for agriculture development.

4.7.4 Photographs



Photo 4-7: Focus Group Discussion (FGD) with Agricultural Farmers Community

4.7.5 Recommendations

In recent years, there has been a shortage of deep tube-wells, resulting in lower agricultural productivity. NWPGL is organizing regular focus group meetings with local farmers to understand their concerns and gather feedback on any potential effects from the power plant. They are also raising awareness among farmers about how to improve their agricultural practices by consulting with the Upazila agriculture office.

4.8 Community Consultation

On September 4, 2023, a Community Health, Safety, and Emergency Preparedness Program took place at Punorbason Madrasha in Soydabad, Sirajganj Sadar Upazila, within the Sirajganj district. The program commenced at 4:34 PM and had a total attendance of 45 individuals, representing various segments of the local community, including farmers, day laborers, businessmen, students, teachers, senior citizens, and political leaders. During the program, the community received awareness and education on health, safety, and emergency preparedness for the following concerns:

- Flood
- Gas Pipeline Leaks
- Oil Pipeline Leaks
- Traffic Accidents
- Communicable and Non-Communicable Diseases

4.0.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Local Residence/Community
Consulted By	Md. Rafiqul Karim and Md. Shafiqul Islam
Designation/Position	Consultant, ELRC
Date	04.09.2023
Time	04:34 PM

4.0.2 Discussions

Stakeholder Name	Professions	Discussions
Hanif	Local UP Member	<p>He focused on community collaboration and organization. It will be effective if there is a community task force comprising representatives from various segments of society to address safety concerns collectively.</p> <p>He emphasized that by working together, the community can create a safer and more prepared environment for everyone.</p> <p>In terms of any suitable job opportunities at the power plant, NWPGL, ought to prioritize local residents. Also, a medical camp can be established on behalf of NWPGL for the local people</p>
Sobhan Howlader	Businessman	<p>He expressed concerns about gas and oil pipeline leaks, emphasizing the potential hazards they pose to the community. No leaks were happened during the last year from the power plant.</p> <p>Sobhan suggested organizing awareness campaigns to educate the community about the signs of gas and oil leaks and the appropriate actions to take in such situations (if happens).</p>
Md Sukur	Farmer	<p>He shared his personal experiences with past floods in the area. No significant floods were occurred, and no croplands were affected.</p> <p>He stressed the importance of having an early warning system in place to give the community time to prepare and evacuate if necessary.</p>

		He also mentioned the need to build flood-resistant structures and raised platforms for storing essential supplies during floods.
Mid Jakaria	Teacher	He emphasized the role of education in promoting safety and preparedness. More awareness raising program can be arranged.
Ismail	Student	Need to be aware about prevalence of communicable and non-communicable diseases in the community. No diseases had been spread due to the power plant operation. He highlighted the significance of personal hygiene practices, and regular health check-ups to prevent the spread of diseases.
Abu Bakar	Day Labor	Suggested installing speed limits, traffic signs, on roads in the area to reduce accidents. Due to the operation of power plant, no accidents were occurred in the last year. Emphasized the importance of educating drivers and pedestrians about road safety rules and proper traffic etiquette.
Shahjahan	Farmer	No impacts on crops were observed during the last year from the power plant. Authorities need to be prepared and taken necessary measures if there are any issues raised. Talked about collaboration among local farmers to share best practices for flood-resistant crop varieties for flood situation happens.

4.8.3 Photographs

Photographs taken during the stakeholder consultation on community health, safety and emergency preparedness are depicted in the following Table.





Photo 4-8: Public Consultation Meeting (PCM) with Local Community

5 CHAPTER 5: CONCLUSION

Ensuring effective project operation is the primary concern for the project proponent aiming to establish a fully functional power plant. In preparation for the operational phase, a management plan was submitted. Before commencing operations, various responses were observed. However, during the operational phase and based on interview sessions conducted, a predominantly positive response was obtained.

Local community members who participated in the interviews expressed satisfaction with the project and had no objections to the power plant's operational activities. Additionally, this interview process has proven to be highly effective in shaping future stakeholder engagement strategies. Various stakeholders were involved in the interviews, and their feedback was positive, both regarding the overall agenda and the operational activities.

All relevant stakeholders, including the local healthcare unit, family welfare organizations, agriculture office, fisheries department, fishing and agricultural communities, and the local population, were considered for the interview. Each group responded positively and expressed a desire for the project to continue, with a focus on mitigating any adverse impacts.

It is strongly recommended that the proponent continues to prioritize and maintain an effective stakeholder engagement program as the project progresses.

The project operation is the major task for the proponent to establish a fully functioning power plant. Before the operation activity, a management plan had been submitted. The local people in the interview look happy about the project and also have no objection to the operation of the power plant activity. Besides, this interview is so effective on stakeholder engagement. Different professionals are participated in the interview and showed their positive responses on the whole agenda as well as operation activity.

All of the stakeholders are considered for this interview session including the local healthcare unit, family welfare, agriculture office, fisheries department, fishing community, agricultural community, and local people. All of them are well responded and well behaved. All of the stakeholders are commented about the operation as positive view, and they demand just to continue the activities with considering the environmental and social sustainability.

The proponent is recommended to properly maintain the stakeholder engagement program.

Annex 1: PCM Presentation Slides



WELCOME/স্বাগতম

Community Health Safety and Emergency Preparedness Program 2023

“সামাজিক স্বাস্থ্য নিরাপত্তা ও জরুরি প্রস্তুতিমূলক কার্যক্রম 2023”

Date: 04.09.2023 Time: 4:34 PM

Venue: Punorbason Graveyard Madrasha, Soydabad Sirajganj

North-West Power Generation Company Limited
Sirajganj 225 MW Combined Cycle Power Plant (Unit 2 and 3)




সামাজিক স্বাস্থ্য নিরাপত্তা ও
জরুরি প্রস্তুতিমূলক কার্যক্রম
2023






□ **আপেক্ষাশূন্য**

- বন্যা
- গ্যাস নিঃসরণ
- তেল নিঃসরণ
- সড়ক দুর্ঘটনা
- সচেতনক এবং অসচেতনক রোগ

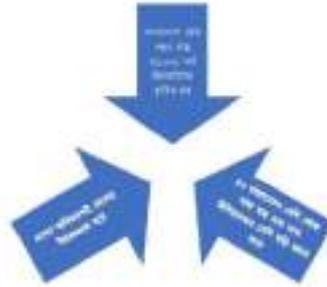



INTRODUCTION/ভূমিকা

- কমিউনিটিতে স্বাস্থ্য হুমকি, রাসায়নিক পদার্থ, বোঁয়া, ডাইরাস, ব্যাকটেরিয়া, নিম্ন ত্বরের বিকিরণ এবং পরিবেশে অন্যান্য সম্ভাব্য ক্ষতিকারক সাধারণ পদার্থ
- কমিউনিটি হেলথ ডাঙা সেফটি বলতে স্থায়ী কমিউনিটিগুলিকে প্রকল্পের কার্যক্রম (বন্যা, ভূমিধস, দূষণ বা অন্যান্য প্রাকৃতিক বা মানবসৃষ্ট বিলম্ব সহ), রোগ এবং দুর্ঘটনাজনিত পতনের কারণে সৃষ্ট বিপদ থেকে রক্ষা করাকে বোঝায়।
- কমিউনিটি প্রস্তুতি বলতে নাগরিকদের প্রশিক্ষণ, শিক্ষা এবং সম্পদ প্রদানের জন্য প্রচেষ্টা বোঝায় যা তাদের বাড়িগত এবং সমষ্টিগত ত্বরে সম্ভাব্য স্থায়ী দুর্ঘটনের হুমকির বিরুদ্ধে আগাম প্রস্তুতি নিতে সহায়তা করে থাকে।

FLOODS/বন্যা

Floods in Bangladesh/বাংলাদেশে বন্যা



FLOODS/বন্যা

Floods in Project Area

পাত বছর প্রকল্প এলাকায় কোনও গুরুতর বন্যা ঘটনা ঘটেনি, এবং অতিরিক্ত বৃষ্টির ফলে ক্ষণস্থায়ী জলবদ্ধতা স্থানীয় লোকদের জন্য সামান্য সমস্যা সৃষ্টি করেছিল, তবে কোনও গুরুতর সমস্যা বা ক্ষয়ক্ষতি হয়নি।



FLOODS/বন্যা

Preparation

বন্যা হওয়ার পূর্বে করণীয়

- বন্যা সম্পর্কিত তথ্যের পর্যবেক্ষণ ছাড়া
- কোথায় যেতে হবে তা সম্পর্কে সুস্পষ্ট ধারণা রাখা
- বিকল্প পথ সম্পর্কে জ্ঞান এবং অসুস্থ হলে বেশি কোথায় চিকিৎসা দেওয়া হবে পূর্বে অধ্যয়ন করা
- বসবাসের স্থান ও পুনঃস্থান পথ বিষয়ে পূর্বে করণীয় সম্পর্কে অধ্যয়ন করা
- পর্যাপ্তকৈ সংরক্ষণ রাখা
- অসুস্থ হলে বয়স্ক রক্তচাপ রোগী এক প্রোগ্রামে প্রবেশ করা হবে



FLOOD PREPAREDNESS

1. Pay attention to notifications via the radio, television & from government agencies/flood warning systems, etc.
2. Know the location of nearby evacuation routes
3. Have an emergency kit ready & enough food stock
4. Ensure family members know how to respond in an emergency

SAFETY STEPS



EMERGENCY KIT REQUISITES



FLOODS/বন্যা

• During A Flood

বন্যা

১. বন্যার সময় করণীয়

- স্থায়ী স্থানীয় সড়কটি বন্যার সময়ে প্রয়োজনীয় জল সংগ্রহের জন্য
- সড়কটির পানির স্তর খতিয়ে দেখে বা বন্যার সময় প্রয়োজনীয় পানি সংগ্রহের জন্য
- স্থায়ী স্থানীয় সড়কটি বন্যার সময় প্রয়োজনীয় জল সংগ্রহের জন্য
- স্থায়ী স্থানীয় সড়কটি বন্যার সময় প্রয়োজনীয় জল সংগ্রহের জন্য

FLOOD SAFETY GUIDE

What to do during a flood

Stay away from flooded areas

Disconnect all electrical appliances

Avoid consumption of the water
contaminated (drinking) by the authorities

Do not touch electrical wires that have fallen into the flood waters

Health care at the relief centers?

- **Always drink boiled water**
- **Use modern food only** (avoid eating raw vegetables & tubers/beans)
- **Cover all food & do not get exposed food**
- **Wash yourself & the surrounding area often**
- **Get treated before entering a relief center**
- **Disinfect garbage in the relief center**
- **Get vaccinated according to health's advice**
- **Use mosquito repellents & use mosquito coils/burners & burning**

FLOODS বন্যা

• After A Flood

বন্যা

১. বন্যার পরবর্তী করণীয়

- স্থায়ী স্থানীয় সড়কটি বন্যার সময়ে প্রয়োজনীয় জল সংগ্রহের জন্য
- স্থায়ী স্থানীয় সড়কটি বন্যার সময়ে প্রয়োজনীয় জল সংগ্রহের জন্য
- স্থায়ী স্থানীয় সড়কটি বন্যার সময়ে প্রয়োজনীয় জল সংগ্রহের জন্য
- স্থায়ী স্থানীয় সড়কটি বন্যার সময়ে প্রয়োজনীয় জল সংগ্রহের জন্য

POST FLOOD SAFETY TIPS

RE-ENTERING A HOUSE/BUILDING

1. There could be hidden dangers present so do not enter a flooded building.
2. Wear suitable footwear.
3. Check for dangerous verminous creatures that may be sheltering under debris in your building.
4. Examine the walls, floor, doors, windows & ceiling for cracks/structural stability.
5. Medicines, food (including canned goods) & drinking water contaminated by floodwater must be thrown away.
6. All electrical appliances need to be inspected & dried before reuse.
7. Report gas & water leaks, as well as electrical malfunctions, immediately.
8. Do not touch/see electrical outlets if area is still damp.

CHECK FOR HAZARDS

- 1. Check for any damaged gas pipes.
- 2. Check main water distribution that not if working in water & electrical system for damage.
- 3. Check for combustible liquid (gasoline, kerosene) and oil leaks.
- 4. Use a battery-powered torch to prevent risk of getting a fire.
- 5. Check again look for damage as it could be a hidden hazard.

GAS PIPELINE LEAKAGE/গ্যাস পাইপলাইনের ছিদ্র

Activities After Gas Leaking

- গ্যাস সিলিংয়ে পরবর্তী কার্যক্রম
 - সিলিং পরে পাইপ লাইনে একত্রিত থেকে প্রাপ্ত স্যেকশনকে সুরক্ষিত করে
 - কোন ক্ষতিতে ক্ষয় বা ক্ষয় পাইপ লাইন পরিষ্কার সম্পর্কে বিবেচনা



OIL PIPELINE LEAKAGE/তেল পাইপলাইনের ছিদ্র

Activities During Oil Leaking

- তেলের পাইপলাইন দুর্ঘটনার সময় কার্যক্রম
 - ক্ষতিগ্রস্ত অংশ স্থান থেকে সরিয়ে নেওয়া
 - তেল ছাড়াই পরিষ্কার করা, সীলিত বা সুরক্ষিত করা হয়ে যাওয়া
 - তেল এবং সীলিত বা পাত্রে সীলিত থেকে সরিয়ে নেওয়া



OIL PIPELINE LEAKAGE/তেল পাইপলাইনের ছিদ্র

Activities After Oil Leaking



তেলের পাইপলাইনে ত্রুটির পর্যবেক্ষণ করা যায়
 স্থানীয়কে খবর দিতে হবে যাতে তারা এর সংশোধন করতে পারে
 যেকোনো সড়ক সংকটের কারণে সড়ক ছেপে রাখা করতে হবে
 ত্রুটি দূর করা পর্যন্ত পরিবহন ব্যবস্থাপনা কোন ব্যক্তির দায় পড়বে না। তবে সড়ক সংকটের কারণে সড়ক ছেপে রাখা হবে।

ROAD ACCIDENT/সড়ক দুর্ঘটনা

Causes/কারণসমূহ

- অতিরিক্ত গতি
- ট্রাফিক আইন না মেনা
- ফোন ব্যবহার
- ঘুমিয়ে
- অতিরিক্ত মালামাল বহন
- সিট বেল্ট ব্যবহার না করা
- না দেখে বাজা পরোপার



ROAD ACCIDENT/ সড়ক দুর্ঘটনা

Prevention/প্রতিরোধ

- ❑ ট্রাফিক আইন মেনে চলা
- ❑ নিয়মিত যানবাহন রক্ষণাবেক্ষণ
- ❑ সিটবেল্ট পরিধান করা
- ❑ ফোন ব্যবহার থেকে বিরত থাকা
- ❑ সুরক্ষিত পথি বজায় রাখা
- ❑ হাতা পারাপারে সতর্ক থাকা



TRAFFIC ACCIDENT/সড়ক দুর্ঘটনা

During An Accident



- ❑ দুর্ঘটনার সময় করণীয়
 - ❖ দুর্ঘটনাকবলিত যানবাহন থেকে যাত্রীদের নিরাপদে সরিয়ে আনতে হবে
 - ❖ দুর্ঘটনাকবলিত স্থানে পাব্লিক চলাচল সাপেক্ষকভাবে বন্ধ রাখতে হবে
 - ❖ প্রাথমিক চিকিৎসা সেবা প্রদানকারী টিমের সাথে যোগাযোগ করতে হবে
 - ❖ দুর্ঘটনার সাদা বেশি হলে আহত ব্যক্তিদের স্থানীয় হাসপাতালে করে চিকিৎসাকেন্দ্রে বা কোম্পানী কনট্রোল সিদ্ধান্তিত চিকিৎসাসেবা কেন্দ্রে নিতে হবে
 - ❖ বিকটস্থ খানায় ক্রমত যোগাযোগ করতে হবে

TRAFFIC ACCIDENT/সড়ক দুর্ঘটনা

After An Accident



❑ দুর্ঘটনা পরবর্তী করণীয়

- ❖ আহত ব্যক্তিদের যতদ্রুত সম্ভব নিকটস্থ স্বাস্থ্যকেন্দ্রে নিয়ে প্রাথমিক চিকিৎসা দিতে হবে
- ❖ দুর্ঘটনাকবলিত অন্যেরা নিরাপদ ফিতা দিয়ে বেটন করতে হবে
- ❖ দুর্ঘটনা সংক্রান্ত তথ্য সংগ্রহ করতে হবে

COMMUNICABLE DISEASES/সংক্রামক রোগ



❑ সংক্রামক রোগ সংক্রামক এজেন্টের (যেমন: জীবাণু, ব্যাকটেরিয়া, কাল্পান, ইত্যাদি) দ্বারা সর্দি, জ্বর বা ক্ষয়ক্ষতি হতে, প্রাণী বা পরিবেশের উপর থেকে মধ্যস্থতার মাধ্যমে প্রেরণ করা হতে পারে

❑ সংক্রামিত রোগসমূহ

- ❖ টিবি
- ❖ হেপাটাইটিস
- ❖ মালেরিয়া
- ❖ কলেরা
- ❖ ইন্ডুয়েন্স
- ❖ এইচআইভ/এইডস

COMMUNICABLE DISEASES/সংক্রামক রোগ



Prevention/প্রতিরোধ



- পরিষ্কার - পরিষ্কার থাকুন
- টিকা দেওয়া
- স্বাস্থ্যকর খাদ্য

NON-COMMUNICABLE DISEASES/অসংক্রামক রোগ

একটি রোগ বা ব্যক্তি আরও ব্যক্তিদের মধ্যে ছড়ানোর ক্ষমতা না - একে অসংক্রামক রোগ বলে। রোগের বয়স নির্ধারণ করা কঠিন। হৃদরোগ, ডায়াবেটিস, ক্যান্সার এবং রক্তচাপের মতো রোগের কারণগুলি পরিষ্কার করা কঠিন।

চুলি বা রোগের কারণ

- হৃদরোগ
- ডায়াবেটিস
- ক্যান্সার
- রক্তচাপ
- অসংক্রামক রোগ
- পরিষ্কার পরিচ্ছন্নতা



Non-Communicable Diseases account for 71% of all deaths globally

The 4 major categories of non-communicable diseases



NON-COMMUNICABLE DISEASES/অসংক্রামক রোগ

Prevention/
প্রতিরোধ



**NO
SMOKING**





মৃদুপান মুক্ত থাকুন

খারাপের ব্যায়াম করুন

নিয়মিত চেকআপ করুন

CONCLUSIONS/উপসংহার

- এই কর্মসূচি অনুযায়ী, আমাদের স্বাস্থ্য ও নিরাপত্তা-সংক্রান্ত সতর্কতা মেনে চলা উচিত
- ব্যক্তিগত বা সম্মিলিতভাবে যে কোন ধরনের কমিউনিটি স্বাস্থ্য সুরক্ষার বাধ্যতামূলক আমাদের আরও সচেতন হওয়া উচিত
- গ্যাস এবং পাইপলাইন লিকেজের মতো কোন প্রকল্প-ভিত্তিক সমস্যা হলে, অবিলম্বে যথাযথ কর্তৃপক্ষকে জানাতে হবে
- সড়ক দুর্ঘটনা থেকে নিজেকে সুরক্ষিত রাখতে যাতায়াত নিয়ম মেনে চলতে হবে এবং অবশ্যই সতর্ক থাকতে হবে।
- সংক্রামণাঙ্ক এবং অসংক্রামণাঙ্ক রোগের প্রতি সচেতন হতে হবে, নিরাপত্তা এবং স্বাস্থ্য সুরক্ষার জন্য প্রতিরোধমূলক ব্যবস্থা নেওয়া প্রয়োজন।



Annex 2: PCM Attendance Sheets

Public Consultation Meeting
 Community Health, Safety and Emergency Preparedness Program 2023
 Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel), Sridahad, Sader, Siraganj
 Organized By: North-West Power Generation Company Limited (NWPGL)
 Supported By: Environmental Laboratory and Research Center (ELRC)
 Date: 24.05.23 Time: 11:30 AM Location: Sridahad, Siraganj

Slr	Participant Name	Profession	Address	Mobile No.	Signature
1	Mohammad Ali Dabb	Service Engineer	NWPGL	01720814311	MD
2	Mohammad Mahmud Khan	Service Engineer	NWPGL, SPS	01700022404	Muhammad
3	Md. Jaber	Member	Baranpura	01712825834	Jaber
4	Md. Faruk Khan	ELRC	ELRC	01711322976	Faruk
5	Saidur Rahman	Business	Baranpura	-	Saidur
6	Md. Badshah	Farmer	Baranpura	-	Badshah
7	Md. Badshah	Farmer	Baranpura	01734871528	Badshah
8	Md. Faruk Khan	Human	Baranpura	0173314624	Faruk
9	Abu Bakkar Siddique	Labour	Baranpura	-	Siddique
10	Abu Talab	Farmer	Baranpura	-	Talab
11	Shahidul	Farmer	Baranpura	-	Shahidul
12	Md. Kamal	Farmer	Baranpura	-	Kamal
13	Sartowar	Farmer	Baranpura	-	Sartowar
14	Belal	Student	Baranpura	-	Belal
15	Md. Sharif	Teacher	Baranpura	-	Sharif

Siraganj 225 MW CAPP 1 Public Consultation Meeting

Public Consultation Meeting
 Community Health, Safety and Emergency Preparedness Program 2023
 Sraggar 225 MW Combined Cycle Power Plant (Dual Fuel), Sebatad, Sagar, Sraggar
 Organized By: North-West Power Generation Company Limited (NWPGCL)
 Supported By: Environmental Laboratory and Research Center (ELRC)
 Date: 04-02-23; Time: 9:30 PM; Location: Sebatad, Sraggar

SN	Participant Name	Profession	Address	Mobile No.	Signature
16	Md. NURIF	student	Borshimul	01778-27009	NURIF
17	Md. HCL	student	Kanchinul	017299552	HCL
18	Md. Poyel	student	panchasona	0177332204	Poyel
19	Md. Hayer	student	Borshimul	01737278701	Hayer
20	Md. Nojor	student	panchasona	0177332204	Nojor
21	Md. Inowar	student	panchasona	0177332204	Inowar
22	Md. Rimon	student	panchasona	0177332204	Rimon
23	Md. Shoriful	Farmer	bagbati	0171926464	Shoriful
24	Md. Yusuf	student	panchasona	018190702	Yusuf
25	Md. Uzzal	student	Borshimul	019010995	Uzzal
26	Md. Ayub	Farmer	panchasona	0172076665	Ayub
27	Robin	Farmer	panchasona	—	Robin
28	Md. Sutar	Farmer	panchasona	—	Sutar
29	Rhaman	student	TEUPSH	01786687	Rhaman
30	Hassan	student	panchasona	—	Hassan

Public Consultation Meeting
 Community Health, Safety and Emergency Preparedness Program 2023
 Sragga 225 MW Combined Cycle Power Plant (Kul Fari), Sateba, Sagar, Sragga
 Organized By: North-West Power Generation Company Limited (NWPGL)
 Supported By: Environmental Laboratory and Research Center (ELRC)
 Date: 04.03.23 Time: 4:30 PM Location: Sateba, Sagar, Sragga

SN	Participant Name	Profession	Address	Mobile No.	Signature
31	ahab	student	panehosona	-	ahab
32	atik	student	panehosona	-	atik
33	mp. Nuro	student	Sarrahimul	-	mp. Nuro
34	mb. Al-Amin	student	fulbarri	-	mb. Al-Amin
35	mb. Fikriullah	Teacher	panehosona	01743-950218	mb. Fikriullah
36	mb. Jaturia	Teacher	panehosona	01743-690888	mb. Jaturia
37	Alom	Partner	panehosona	01743-085355	Alom
38	Kamilul	student	panehosona	01671-982401	Kamilul
39	hisan	student	panehosona	01650-28137	hisan
40	mahadi	student	Uluwara	01881-336350	mahadi
41	mariz	student	mahanpura	-	mariz
42	Ismail	student	Korshimul	-	Ismail
43	Alamin	labor	Korshimul	018746-520778	Alamin
44	Shazaban	farmer	panehosona	-	Shazaban
45	ah. sh	Partner	panehosona	-	ah. sh

ANNEX-C: Community Development Programme



North-West Power Generation Company Ltd. (NWPGL)
Sirajganj Power Station
Soydabad, Sirajganj

Community Development Programme

Date: 09.05.2023

Title	Cheque of BDT 3,00,000/- handover to 'Sirajganj Somnilito Sangskritik Jot'
Organizer	Sirajganj Power Station, NWPGL, Soydabad, Sirajganj
Time	07:00 PM-08.00 PM
Venue	Shahid M. Mosur Ali Auditorium, Sirajganj
Participants	President, Secretary, Artists and Staffs of 'Sirajganj Somnilito Sangskritik Jot', Sirajganj District, CE, SPS & Employees of Sirajganj Power Station.

Pictorial Evidence







North-West Power Generation Company Ltd. (NWPGL)
Sirajganj Power Station
Soydabad, Sirajganj

Community Development Programme

Date: 09.05.2023

Title	Cheque of BDT 5,00,000/- handover to DC of Sirajganj for the renovation of Officers Club, Sirajganj
Organizer	Sirajganj Power Station, NWPGL, Soydabad, Sirajganj
Time	11:00 AM-12:00 PM
Venue	DC office, Sirajganj
Participants	DC, Sirajganj District; CE, SPS & Employees of Sirajganj Power Station.

Pictorial Evidence





North-West Power Generation Company Ltd. (NWPGL)
Sirajganj Power Station
Soydabad, Sirajganj

Community Development Programme

Date: 25.01.2023 & 01.02.2023

Title	Distributed blankets to 1000 helpless and destitute families.
Organizer	Sirajganj Power Station, NWPGL, Soydabad, Sirajganj
Time	11:00 AM-03:00 PM
Venue	Various Sadar Upazilas of Sirajganj District like Chauhali, Kazipur, Belkuchi and surrounding areas of SPS.
Participants	With the co-operation of the local administration of various Sadar Upazilas of Sirajganj District like Chauhali, Kazipur, Belkuchi; CE, SPS & Employees of Sirajganj Power Station.
No of blankets	1000 (One Thousand)

Pictorial Evidence













North-West Power Generation Company Ltd. (NWPGL)
Sirajganj Power Station
Soydabad, Sirajganj

Community Development Programme

Date: 09.08.2023, 14.08.2023 & 15.08.2023

Title	Distribution of relief among unemployed and helpless families of Sirajganj.
Organizer	Sirajganj Power Station, NWPGL, Soydabad, Sirajganj
Time	10:00 AM-06.00 PM
Venue	Office of Deputy Commissioner, Sirajganj and near Sirajganj Power Station area
Participants	Employees of Office of Deputy Commissioner, Sirajganj and Sirajganj Power Station.
No of bags	4000 (Four Thousand) bags
Each bag contains:	<ol style="list-style-type: none">1. 10 kg rice2. 2 kg pulse3. 1 liter soyabean oil4. 1 kg salt

Pictorial Evidence









North-West Power Generation Company Ltd. (NWPGL)
Sirajganj Power Station
Soydabad, Sirajganj

Community Development Programme

Date: 15.05.2023

Title	Humanitarian relief to poor people before Eid-ul-fitr near Sirajganj Power Station.
Organizer	Sirajganj Power Station, NWPGL, Soydabad, Sirajganj
Time	11:00 AM-04:00 PM
Venue	Various places
Participants	DC, Sirajganj, Director, NWPGL; CE, SPS & Employees of Sirajganj Power Station.
No of bags	1000 (One Thousand) bags
Each bag contains:	<ol style="list-style-type: none">1. 10 kg rice2. 2 kg pulse3. 2 kg potato4. 1 kg onion5. 2 liter soybean Oil6. 1 kg salt7. 1 kg chickpeas8. 1 kg puffed rice9. 0.5 kg milk powder10. 0.5 kg vermicelli11. 1 kg sugar

Pictorial Evidence





ANNEX-D: Scan Copy of GRM Book

NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAIGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgment/address
<i>No grievances is found Admin 19/10/2019</i>									

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NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAIGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgment/address
<i>No grievances is found Admin 19/10/2019</i>									

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**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline /Mobile	Brief Description				Date of Acknowledgment/return	
<i>No. grievances is found Admin. reference</i>										

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**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline /Mobile	Brief Description				Date of Acknowledgment/return	
<i>No. grievances is found Admin. reference</i>										

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**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline /Mobile	Brief Description				Date of Acknowledgment/return	
		<i>No. grievance is found</i>								
		<i>Address: 25/10/2023</i>								

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**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline /Mobile	Brief Description				Date of Acknowledgment/return	
		<i>No. grievance is found</i>								
		<i>Address: 25/10/2023</i>								

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**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline /Mobile	Brief Description				Date of Acknowledgment/redress	

*No grievance is found
Admin
20/09/2020*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline /Mobile	Brief Description				Date of Acknowledgment/redress	

*No grievance is found
Admin
20/09/2020*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complainant			Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline / Mobile				Brief Description	Date of Acknowledgment/address

*No grievance is found
Admin
26/07/2023*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complainant			Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Particulars of Grievance	
		Name	Address	Landline / Mobile				Brief Description	Date of Acknowledgment/address

*No grievance is found
Admin
26/07/2023*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAIGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgment/address

*No grievance is found
Address: 19/11/2023*

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**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAIGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgment/address

*No Grievance is found
Address: 20/11/2023*

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ANNEX-E: Updated Fire License

ক্রমিক নং			অনিক্রম ০০৩			
		ফায়ার লাইসেন্স	প্রথম সংস্করণ ২০১২			
			V-09, P-35			
লাইসেন্স নম্বর	এডি/পাবনা-৩৮ ৪১/২০২১-২০২২					
এতদ্বারা অগ্নি প্রতিরোধ ও নির্বাপন আইন ২০০৩ এর ৪-খাড়া অনুযায়ী এবং উল্লিখিত শর্তাবলী সাপেক্ষে ফায়ার লাইসেন্স ইস্যু করা হইল।						
১। মালিকানা/কারখানার মালিক/ব্যবস্থাপক/তত্ত্বাবধায়কের নাম, পদবী ও ঠিকানা :						
প্রতিষ্ঠানের নাম : সিরাজগঞ্জ ২২৫ মে:ক:সা:বিদ্যালয় কেন্দ্র (১ম, ২য়, ৩য়) ইউনিট ও ৭.৬ মে:ও: সোলার প্রাট						
মালিকের নাম : প্রধান প্রকৌশলী।						
গ্রাম/রাস্তা: মডলগাতি, ডাকঘর: ভৈকুটিয়া ৭৪০০, বশোর সদর, বশোর।						
কোন :	বনাম:	ই.মেইল :				
২। মালিকানা/কারখানার অবস্থান :						
(ক) প্লট নং/হোল্ডিং নং : বড়শিমুল পঞ্চসোনা						
(খ) সাগ নং	(গ) বাড়ির নং	(ঘ) ফে এল নং				
(ঙ) নৌজা	(চ) রোড নং	(ছ) ডাকঘর সয়দাবাদ				
(জ) থানা সিরাজগঞ্জ	(ঝ) উপজেলা সিরাজগঞ্জ	(ঞ) জেলা সিরাজগঞ্জ				
৩। ভবনের ব্যবহার শ্রেণী :						
৪। ভবনের নির্মিত শ্রেণী ও পরিমাপ : পাকা ভবন						
শ্রেণী-১	শ্রেণী-২	শ্রেণী-৩	দৈর্ঘ্য	প্রস্থ	উচ্চতা	মোট মেঝের ক্ষেত্রফল (বর্গ মিটার)
						৩,৪৯,৩৫০ বর্গফুট।

৫। মাছ বস্তুর নাম ও মজুদ পরিমাণ : প্রাস্টিক জাতীয় দ্রব্য।

৬। ব্যবসার ধরন : বিদ্যুৎ উৎপাদন।

৭। অগ্নি বুকির মাত্রা : (ক) হালকা-১ (খ) হালকা-২ (গ) সাধারণ-১ (ঘ) সাধারণ-২ (ঙ) সাধারণ-৩ (চ) অতিমাত্রা

৮। অগ্নি বুকির শ্রেণীবিন্যাস (মোট ফ্লোর এরিয়ার আনুপাত ভিত্তিতে) : A.....%, B.....%, C.....%,

০৯। মাতঙ্গের পরিমাণ=১২০০/-টাকা, জ্যাটি=১৮০/- টাকা। D.....%, K.....%

১০। নবায়ন অর্থবছর ২০২১-২০২২(৩০ জুন ২০২২ খ্রি: পর্যন্ত)।

শিশুশ্রম নিষিদ্ধ

জরুরী প্রয়োজনে

সিরাঞ্জগঞ্জ ফায়ার স্টেশন-০১৭৩৩-০০২৫৪৯

বিজ্ঞানীয় নিয়ন্ত্রণ কক্ষ- ০১৭৩৩-৩৩৬৬৫৫

লাইসেন্সের শর্তাবলী

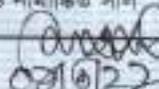
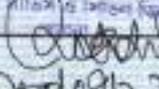
- (১) প্রতি বছর ৩০ জুনের মধ্যে এই লাইসেন্সের অনুকূলে মাতঙ্গের টাকা অগ্রিম লাইসেন্স ফি হিসাবে পরিশোধ করিতে হইবে।
- (২) এই লাইসেন্স হস্তান্তরযোগ্য নহে এবং কেবলমাত্র ত্রনমিক ২ এ উল্লিখিত অবস্থানের জন্যই প্রযোজ্য হইবে।
- (৩) লাইসেন্সের শর্তাবলী যথাযথভাবে পালিত হইতেছে কিনা তাহা যাচাই করার জন্য অফিসজরের ক্ষমতাপ্রাপ্ত কর্মকর্তা যে কোন কার্য দিবসে শুদাম বা কারখানা পরিদর্শন করিতে পারিবেন এবং পরিদর্শনকালে সর্বশ্রেষ্ঠ কর্তৃপক্ষ ইস্যুকৃত ফায়ার লাইসেন্সটি প্রদর্শন করিতে বাধ্য থাকিবেন।
- (৪) সার্বিক অগ্নি নিরাপত্তা ব্যবস্থা বাংলাদেশ ন্যাশনাল বিল্ডিং কোড ও অগ্নি প্রতিরোধ ও নির্বাপন আইন ২০০৩ এবং সর্বশ্রেষ্ঠ বিধির ভিত্তিতে নিশ্চিত করিতে হইবে।
- (৫) অগ্নি প্রতিরোধ ও নির্বাপন আইন ২০০৩ মোতাবেক লাইসেন্সের শর্ত ভঙ্গ করিলে শাস্তিযোগ্য অপরাধ হিসাবে ধণ্য হইবে।

০৬। উক্ত প্রতিরোধ আইনমত মান সম্পন্ন ৭/৬ সেন্টিমিটার ৪২২ টি ডিম্বি, ২১১ টি মিঞ্জি, ০৯/১০ মিঃ কোম ১০ টি

ফায়ার এক্সটিংগুইশার সংরক্ষণ করিতে হইবে।

০৭। ০১ টি হোকরীজ ব্যবস্থা এবং পর্যাপ্ত লানি ধারণ ক্ষমতা সম্পন্ন জ্বালানী জলাশয় রাখতে হবে।

কর্মকর্তা ও কর্মচারীদের হাতের সঠিক কর্তৃক প্রশিক্ষণের ব্যবস্থা করতে হবে। এছাড়াও অগ্নি কোড শর্ত আরোপিত হলে তা পালন করতে হবে।

তারিখ	চালান নং	মাসলের পরিমাণ	বর্ষ বছর (১ জুলাই-৩০ জুন)	নবায়নকারীর স্বাক্ষর ও নামাঙ্কিত সীল
২৫/২/২২	৫৫, ৫৬	= ২২০০/- vat: ২৫০/-	২০২১-২০২২	 ০৯/০২/২২ মোঃ আব্দুল হাফিজ ওয়ালমহল্লা ইউনিয়ন স্বাক্ষর ও নামাঙ্কিত সীল স্বাক্ষর
১৫/৩/২২	৩২৬ ৩২৭	= ২,২০০/- vat: ২৫০/-	২০২২-২০২৩	 ২৩/০৩/২২ মোঃ আব্দুল হাফিজ ওয়ালমহল্লা ইউনিয়ন স্বাক্ষর ও নামাঙ্কিত সীল স্বাক্ষর
১৫/৬/২৩	৪৩০ ৪৩১	২২০০/- vat: ২৫০/-	২০২৩-২০২৪	 ১৫/০৬/২৩ মোঃ আব্দুল হাফিজ ওয়ালমহল্লা ইউনিয়ন স্বাক্ষর ও নামাঙ্কিত সীল স্বাক্ষর

ANNEX-F: First Aid Training



North-West Power Generation Company Ltd. (NWPGL)
Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel-3rd Unit)
Soydabad, Sirajganj

Training on First Aid

Date: 23.08.2023

Trainer	Dr. Md. Golam Kibria
Time	02:00-04:00 PM
Venue	Zoom Meeting
Participants	All employee of Sirajganj Power Station
Training Session	<ol style="list-style-type: none">i. Discussion on First aid and importanceii. Use of First aid Kitiii. Question & Answer
Discussion issue	<ol style="list-style-type: none">1. Definition of first aid2. Emergency needs3. Incident in power plant4. First aid after attack<ol style="list-style-type: none">i. Unconsciousnessii. Heat strokeiii. Burnsiv. Wounds, Cut injury, Accident Injuryv. Electric Shockvi. Snake bite/Dog bite/Insects bitevii. Chemicals burn of eyeviii. Fracture5. First aid Items on First Aid Kits6. Use of First aid items
Trainer	Dr. Md. Golam Kibria
Venue	Zoom Meeting
Participants	All employee of Sirajganj Power Station

Attachment:

Attendance Sheet

Attendance Sheet

	NORTH-WEST POWER GENERATION COMPANY LIMITED Training Attendance Sheet	FORM NO: NW-DH-HR-F-005 EFFECTIVE DATE: 21.04.2018 REVISION NO: 00
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Location: Sirajganj Power Station	
Organizer Department	: HR
Course Name and ID	: Primary Management of Incident/Accident (First Aid)
Date	: 29/08/2023
Duration	: 02:00 (২০০০ ০৫:০০)
Total Man Hour	: 30x2 = 60
Facilitator	: জনাব ডাঃ গোলাম কিবরিয়া, সিনিয়র মেডিক্যাল অফিসার (কোরপ্রাইভ)

Office: Sirajganj 225 MW Combined Cycle Power Plant (Unit-3)

Sl. No.	Name of the Participants	Designation and Department/Office	Participant's Signature
1.	Muhammad Abul Hameed	DM	[Signature]
2.	Muhammad Shahidul Islam	ARI	[Signature]
3.	Mohammad Abangir Miah	JAM (Admin)	[Signature]
4.	Nisrat Jaron	O/A	[Signature]
5.	Abdul Alim	DRIVER	[Signature]
6.	Eni. Md. Saifur Rahman	DRIVER	[Signature]
7.	Md. Sarwar Hossain	JAM (A/P)	[Signature]
8.	Md. Masud Hossain	Helper	[Signature]
9.	Kashel Mee	SAE/EMD	[Signature]
10.	Md. Shipon Sheikh	Tech. (Elec)	[Signature]
11.	Mohammad Salim Miah	Foreman	[Signature]
12.	Lutful Bochor	AE (CS)	[Signature]
13.	Shishir Bandyopadhyay	SDE (IAC)	[Signature]
14.	Md. Salim Miah	Foreman (EMD)	[Signature]
15.	Md. Badruzzaman	TRE-EMD	[Signature]
16.	Md. Wafiqur	O.SS.	[Signature]
17.	Md. Maksudun Rahman	AE (MMD)	[Signature]
18.	Md. Moinur Rahman	SDE, MMD	[Signature]
19.	Md. Moinur Islam	AE, MMD	[Signature]
20.	Abdullah Mubin Choudhury	SDE, MMD	[Signature]
21.	Muhammad Islam	SAE, MMD	[Signature]
22.	Sabbir Ahmed	AE (Operation)	[Signature]
23.	Dipayan Mondal	AE (Operation)	[Signature]
24.	Md. Mamun Billah	SDE (Operation)	[Signature]
25.	Md. Saadul Hossain	HCL PESA	[Signature]
26.	Suzan Hossain	W/A	[Signature]
27.	Md. Saminur Alam	Foreman	[Signature]
28.	Salauddin Gazi	W/A	[Signature]
29.	Md. Saad Hossain	Technician - A, MMD	[Signature]
30.	Md. Moinur Rahman	SAE, MMD	[Signature]
31.	Md. Shaukat, Ahmed	SAE, MMD	[Signature]

ANNEX-G: Greenhouse Gas Emissions

Green House Gas Emission Calculation for Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel-3rd Unit)

Period: January, 2023 to December, 2023

Green House Gas Emissions

The Kyoto Protocol – United Nations Framework Convention on Climate Change nominates the following GHGs:

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous Oxide (N₂O);
- Hydrofluorocarbons (HFCs); and
- Perfluorocarbons (PFCs).

Inventories of GHG emissions can be calculated using published emission factors. Different gases have different greenhouse warming effects (referred to as warming potentials) and emission factors take into account the global warming potentials of the gases created during combustion. Typically, greenhouse gas emissions are reported in units of carbon dioxide equivalent (CO₂e). Gases are converted to CO₂e by multiplying by the gas global warming potential (GWP). The GWP of gases are as follows:

- GWP for CO₂ = 1
- GWP for CH₄ = 21
- GWP for N₂O = 310

When the global warming potentials are applied to the estimated emissions then the resulting estimate is referred in terms of CO₂-equivalent (CO₂e) emissions.

GHG emissions are estimated in two scopes:

- Scope 1 emissions are direct emissions from owned or controlled sources;
- Scope 2 emissions are indirect emissions from the generation of purchased energy;

Scope

Scope 1	Scope 2
<ul style="list-style-type: none"> • Fuel combustion from Combined cycle Power plant 	<ul style="list-style-type: none"> • Vehicles used by officials and other staff of NWPGL for official purpose

GHG Estimation and Impact

The combustion of natural gas produces GHGs. The amount of GHGs emitted by a power plant is a measure of its contribution to global warming and can be estimated based on fuel consumption. In order to estimate GHG emissions, the IFC recommended Carbon Emission Estimation Tool (CEET model – Version February 2014) has been used as set out below.

The quantification of the GHG emission is from January 2023 to December 2023.

Scope 1

Table 1: Estimated GHG Emissions from the Plant (In Natural Gas)

SL#	Particular	Value	Unit
A*	Net Heat Rate (Natural Gas in Combined Cycle)	8,172.69	KJ/KWH
B*	Gross Generation Capacity (Combined Cycle)	228,500.00	KW
C	Operating Days per year	209.94	days
D	Daily Operating Hours	24.00	Hours/day
E	Total Annual Output (B X C X D)	1,151,307,499.26	KWH
F	Annual Fuel Consumption (= E x A)	9,409,280,437,615.82	KJ
		9409.28	TJ
G*	Annual GHG Emission in Gas Turbine	536,809	tCO ₂ e/year

Table 2: Estimated GHG Emissions from the Plant (In HSD)

SL#	Particular	Value	Unit
A*	Net Heat Rate (Natural Gas in Combined Cycle)	14499.38	KJ/KWH
B*	Gross Generation Capacity (Combined Cycle)	228500	KW
C	Operating Days per year	0.23	days
D	Daily Operating Hours	24	Hours/day
E	Total Annual Output (B X C X D)	0	KWH
F	Annual Fuel Consumption (= E x A)	0	KJ
		0	TJ
G*	Annual GHG Emission in Diesel	0	tCO ₂ e/year

For Scope 1:

GHG Emission = (Natural Gas+HSD) tCO₂/year

GHG Emission = (536,809+0) tCO₂/year
= 536,809 tCO₂/year

For Scope 2:

For diesel and Compressed Natural Gas (CNG) used in the vehicles have been contributed 9 and 9 tCO₂/year respectively during the period of January 2023 to December 2023. GHG emission from fuel consumed in mobile vehicles is 18 tCO₂e/year.

GHG Emissions= (Diesel+CNG)

GHG Emissions= (9+9) = 18 tCO₂/year

Total GHG Emissions for Scope 1 and Scope 2

Total GHG Emissions= (Scope 1+Scope 2) tCO₂/year

Total GHG Emissions= (536,809+18) tCO₂/year
= 536,827 tCO₂/year

So, from January 2023 to December 2023, the annual emission of GHG from the Unit 3 is about 536,827 tCO₂/year.

ANNEX-H: Updated ESAP & CS

S. No (A)	Element (D)	Deliverable (E)	Responsibility	Timeline (F)	Responses (G)
1	Submit declaration for implementation of ESMS and revised ESHIA	Declaration Letter from NWP GCL	NWP GCL	Condition Precedent	Implemented
2	Environment & Social Management Plan (ESMP) to be developed by the EPC for the project taking into consideration ESMS of NWP GCL, EHSIA Environment & Social Management & Monitoring Plan and its subsequent revisions (if any).	ESMP	EPC	Condition Precedent	Implemented
3	NWP GCL to appoint Environment & Social Head at the corporate level	NWP GCL to prepare a job description and appointment date for E&S Manager	NWP GCL	Condition Precedent	Implemented
4	Unit-3 EHS and social reporting to corporate should be provisioned, by means of developing terms of reference/job description for EHS Manager for the Unit-3.	Job Description of EHS Manager of Unit-3	NWP GCL	Condition Precedent	Implemented
5	A specific training plan should be established specifying training requirements, definition of training sessions, duration, frequencies, syllabus, and verification of training programs through feedback forms. Training calendar to be developed in line with requirements of ESMS and ESHIA for construction and operation phase.	Develop a training calendar	NWP GCL & EPC	Condition Precedent	Implemented
6	EPC organogram to detail position for EHS and Social Officer before start of construction works.	Contractor organogram and appointment letters	Contractor	Condition Precedent	Implemented
7	Identify and finalize independent organization who will be responsible for implementation of environment monitoring compliance plan and EMP	Appointment of third party consultant	NWP GCL & EPC	Condition Precedent	Implemented

S. No (A)	Element (D)	Deliverable (E)	Responsibility	Timeline (F)	Responses (G)
8	Contractor agreements to incorporate review of EHS and Social performance of EPC of Unit-3 in line with ESMS and EHSIA	Formal Communication from NWPGCL to EPC and EPC agreement to the same	NWPGCL &EPC	Condition Precedent	Implemented
9	Develop Stakeholder Engagement Plan as per Performance Standard 1 and ESMS requirements NWPGCL &EPC to prepare and Lenders to approve Stakeholder	NWPGCL&EPC to prepare and Lenders to approve Stakeholder Engagement Plan	NWPGCL &EPC	Condition Precedent	Implemented
10	EPC to comply with Performance Standard 2 requirements such as prohibition of child and forced labour at work place, payment of wages, working hours etc. Workers accommodation to be provided as per IFC Performance Standards 2 requirements and time bound monitoring of quality of accommodation provided and basic services to be reviewed.	Formal communication from NWPGCL to EPC and EPC agreement to the same	NWPGCL &EPC	Condition Precedent	Implemented
11	During the construction phase, undertake semi annual labor audits of contractors and sub contractors.	Labour Audit report as a part of the E&S monitoring report	NWPGCL &EPC	To be reviewed on an ongoing basis as a part of the Semi annual/ annual site visits and reporting by Lender's E&S consultant	NA Now it is in operation stage
12	Workers and community grievance management procedure to be developed and implemented as per Performance Standard 1 requirements.	NWPGCL&EPC to prepare and Lenders to approve Grievance redress mechanism	NWPGCL &EPC	Condition Precedent	Implemented

S. No (A)	Element (D)	Deliverable (E)	Responsibility	Timeline (F)	Responses (G)
13	Provision of occupational health centre and medical examination of workers during construction phase to be ensured by EPC in line with ESMS and ESHIA requirements	Formal communication from NWPGCL to EPC and EPC agreement to the same	NWPGCL &EPC	Condition Precedent	Implemented
14	i) NWPGCL required to report publicly on an annual basis on GHG emission levels during the operational phase for the project. The company should disclose their GHG emissions annually through corporate reports, or through other voluntary disclosure which specifies details project level emissions on annual basis. ii) NWPGCL should strive for technically and financially feasible and cost effective options available to reduce project-related GHG emissions during the design, construction and operation of the Project.	i) Develop mechanism for GHG quantification ii) GHG Evaluation Report / MoM of technical design meetings	NWPGCL	To be reviewed on an ongoing basis as a part of the Semi annual/annual site visits and reporting by Lender's E&S consultant	Annex G
15	Adequacy and efficiency assessment of the CETP shall be provided before installation with identification of critical equipment for operations and its preventive maintenance schedule	Adequacy and efficiency assessment report/ technical design documents of ETP when finalized	NWPGCL	To be reviewed on an ongoing basis as a part of the Semi annual/annual site visits and reporting by Lender's E&S consultant	Implemented
16	NWPGCL should maintain minutes of meetings conducted with their stakeholders and should consider including the stakeholders in regular training exercises (e.g., simulations, drills, and debriefs of exercises and actual events) to familiarize them with proper	Records of minutes of meetings	NWPGCL	To be reviewed on an ongoing basis as a part of the Semi annual/annual site visits and reporting by Lender's	Implemented

S. No (A)	Element (D)	Deliverable (E)	Responsibility	Timeline (F)	Responses (G)
	procedures in the event of an emergency			E&S consultant	
17	Ensure that there is no office or labour camp around the RMS station and within a radius of at least 200m from the RMS station.	NWPGL to prepare and Lenders to approve general drawings from lenders for labour and officer accommodation	NWPGL &EPC	To be reviewed on an ongoing basis as a part of the Semi annual/annual site visits and reporting by Lender's E&S consultant	Implemented

ANNEX-I: Development Effectiveness Indicators



“শেখ হাসিনার উদ্যোগ, ধরে ধরে বিদ্যুৎ”
নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোম্পানি লিমিটেড
NORTH-WEST POWER GENERATION COMPANY LIMITED
 ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified
(An Enterprise of Bangladesh Power Development Board)
 ইউটিসি ভবন, (লেভেল ৬ ও ৬), ০৯-পাটুল্লা, কক্সবাজার সড়ক, ঢাকা-১২১২।
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Memo No. 27.28.0000.301.99.001.20.324

Date: 19/09/2023

Sirajganj 225 MW Combined Cycle Power Plant Project (Dual Fuel-3rd Unit)

Development Effectiveness Indicators

Section One: General Indicators

Key Impact Area	Result	Indicator	Status
Financial Performance	Return to all capital Providers	Financial rate of return	2.72% (From July, 2022 to June, 2023)
Economic Performance	Employment	Percentage of Female Employment (%)	Female Employee: 36 Percentage: 4.1% (Up to June, 2023)
	Employment	Temporary jobs during construction; permanent jobs	Total Employee: 893 Permanent Employee: 874 Temporary Employee: 19 (Up to June, 2023)
	Contribution to government	Taxes and Fees (US\$/year)	USD 52,054,819 (From July, 2022 to June, 2023)
Environmental and Social Performance	Improved E&S conditions	E&S Management Systems: (y/n)	Yes
Private Sector Development	Supports for domestic businesses	Purchases from domestic suppliers (US\$/year)	USD 287,301,064 (From July, 2022 to June, 2023)

Definitions

Taxes and Fees: All transfers to all levels of the government made by the Project Enterprise or its parent on its behalf, including: income or profit taxes, sales, and excise taxes, and VAT receipts. Other payments collected by the government include royalties, bonuses, dividends, management/concession fees, share of profit, licensing, permitting, etc. Specific subsidies to the Project Enterprise should be deducted.

E&S Management Systems: The indicator refers to the Project Enterprise's E&S Management System ("ESMS") and tracks whether the Project Enterprise is compliant with MIGA's Performance Standard 1 and has an ESMS active and in place.

Page 1 of 2

Purchases from domestic suppliers: The annual purchase of goods and services of the Project Enterprise from local suppliers (including raw materials, civil works, engineering and installation, security, gardening, cleaning, and marketing and research from local companies). This will exclude utility bills, government-provided services and imports handled through a local facilitating agent.

Direct Employment: Total number of employees working directly for the Project Enterprise as of the end of its fiscal year. The unit of account is a permanent full-time equivalent paid job. To be treated as permanent, the job should have a life expectancy of at least one year at the time of forecast. Part-time jobs are converted to full-time equivalent jobs on a pro rata basis with anything over 30 hours/week treated as full time. If the information is not available the rule-of-thumb is two part-time jobs equal a full-time job. Seasonal jobs are incidental to the operation. However, if the Investment Project relies heavily on seasonal jobs, as in the tourism sector for example, they should be included on a pro rata basis, a 3-month job becoming 0.25 of a full-time equivalent job (i.e., 4 jobs for 3 months equals one job on an annual basis).

Female Employment: Total female employment as a percentage of total employees in the Project Enterprise. This is a sub category of employment and so definition of total direct employment as described above should be used in this calculation. Subcontractor employment should not be reported.

Section Two: Sector - Specific Indicators

Power Produced	880.498791 GWhs (July, 2022 to June, 2023)
Improved Occupational Health and Safety	No Injury
Minimize Green House Gas Emission	560,590 tCO ₂ equivalent (July, 2022 to June, 2023)
Water efficiency	(During operations 3,458,230 m ³ consumed/ unit of production for S2&S3) (July, 2022 to June, 2023)

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19.9.2023
Mashuda Parvin
DGM (EHS) (Addl. Charge)
NWPGL, Dhaka

Md. Saiful Islam
19/09/2023
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ANNUAL ENVIRONMENTAL MONITORING REPORT OF SIRAJGANJ 225 MW COMBINED CYCLE POWER PLANT (DUAL FUEL-3rd UNIT), BANGLADESH



FEBRUARY 2023-JANUARY 2024

Operation Stage

ELRC

EXECUTIVE SUMMARY

The project is a dual fuel-based Combined Cycle Power Plant (CCPP), which is operated predominantly by Natural Gas (NG) but has also the provision of High-Speed Diesel (HSD) in case of emergency and non-availability of NG. The natural gas required for the Plant is 35 MMCFD and the Pashchimanchal Gas Company Limited (PGCL) has been supplied natural gas at a pressure of 500 psi through a 1.7 Km long and 16-inch diameter pipeline from its existing valve station to the PGCL RMS, which is to be constructed. From this RMS a 12-inch line has been extended up to the Power Plant's RMS (to be constructed inside the Plant's boundary) at a pressure of 350 psi. Liquid fuel (HSD) requirement is estimated to be about 920 m³/day at 80% PF. Bangladesh Petroleum Corporation (BPC) has sent the oil from its Daulathpur and/or Khulna depot via railroad wagons to Bangabandhu Bridge (Satu) West Railway Station, where it is kept in the Plant's HSD tanks. A variety of environmental and social criteria are used for environmental and social monitoring while the power plant is operating. Around the plant area, monitoring is done on a monthly, quarterly, biannual, and annual basis while taking important social and environmental factors into consideration. The primary goal of the monitoring is to identify common guidelines and methods for maintaining important environmental and social aspects by preventing and controlling environmental pollution and the management of nuisance brought on by the operation of the Power Plant in accordance with the terms of the contract and employer's requirements. The environmental and social implications of the power plant are addressed by the national Acts, Policies, Strategies, and Regulatory Frameworks. As a supplement, when appropriate, to Bangladesh's national laws and guidelines, we also intend to briefly cover the environmental, health, and social safety guidelines and performance criteria of the World Bank and International Finance Corporation. The investigation was carried out using the proper method, and a number of standards were used to compare the data. During the quarterly monitoring period, the following are included as parameters: ambient air quality, ambient and occupational noise level monitoring, wastewater, stormwater, surface, groundwater, drinking water analysis, social and health safety monitoring. In this study, each environmental and social concern is examined in detail and compared to standards. There haven't been any significant environmental, health, or safety issues this quarter, according to site monitoring. As a result, all the facilities have been improved and made sure to create a workplace that is environmentally friendly. Mitigation measures have also been implemented in order to promote the power plant while minimizing environmental impact and maintaining worker health and safety.

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ABBREVIATIONS AND ACRONYMS

AQ	Air Quality
BMD	Bangladesh Meteorological Department
BPC	Bangladesh Petroleum Corporation
BPDB	Bangladesh Power Development Board
BOD	Biological Oxygen Demand
CCPP	Combined Cycle Power Plant
CETP	Central Effluent Treatment Plant
COD	Chemical Oxygen Demand
DGPS	Differential Global Positioning System
DO	Dissolve Oxygen
DoE	Department of Environment
EC	Electrical Conductivity
ECA	Environment Conservation Act /Ecological Critical Area
ECC	Environmental Clearance Certificate
ECR	Environment Conservation Rules
EMP	Environmental Management Plan
EMF	Electromagnetic Field
GDP	Gross Domestic Product
GTG	Gas Turbine Generator
HRSG	Heat Recovering Steam Generator
HP	High Pressure
HSD	High Speed Diesel
IFC	International Finance Corporation
KV	Kilo Volt
KWh	Kilo Watt-hour

LP	Low Pressure
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forestry
MoFL	Ministry of Fisheries and Livestock
MoPEMR	Ministry of Power, Energy, and Mineral Resources
MoWR	Ministry of Water Resources
NEMAP	National Environmental Management Action Plan
NEP	National Environmental Policy
NG	Natural Gas
NO _x	Oxides of Nitrogen
NWPGCL	North-West Power Generation Company Limited
PPM	Parts Per Million
PGCL	Pashchimanchal Gas Company Limited
PSMP	Power System Master Plan
RMS	Regulating Metering Station
SO _x	Oxides of Sulfur
SPM	Suspended Particulate Matter
SPS	Sirajganj Power Station
STG	Steam Turbo Generator
TC	Total Coliform
TDS	Total Dissolved Solid
WTP	Water Treatment Plant

1 CHAPTER 1: INTRODUCTION

1.1 Background

Power is the main driving force of current progress and the foundation of the growth rate. The vision of the Bangladesh Government is to give access to moderate and reliable power to all by the year 2021 and following this present government's goal is to guarantee continuous and quality power supply for all by 2021 through a change in generation, transmission, and distribution methods. The Government of Bangladesh has announced the new policy, "Vision 2041" targeting Bangladesh to be a developed country by 2041. With the consistency of economic development, a secure power system would be necessary. The government has further expanded its vision focusing on the coming years up to 2041 and arranged the Power System Master Plan 2016 (PSMP). This plan expresses that in 2020, 2030, and 2041, the power demand would be 12545 MW, 27434 MW, and 52034 MW where the power supply would be 12949 MW, 30178 MW, and 57238 MW. Based on the future economic growth, fuel, demand, and supply, international cooperation, a new Power System Master Plan 2016 have been finalized Power System Master Plan (PSMP) 2016, aims at assisting Bangladesh in formulating extensive energy and power development plan up to the year 2041, covering energy balance, power balance, and tariff strategies. As per PSMP 2016, achieving middle to long term development issues and risks and formulate a comprehensive and result-oriented aid strategy for the energy sector by examining effective approaches for each issue. At present, about 92.2% (including off-Grid & Renewable) population of Bangladesh has access to electricity (World Bank, 2019) with an installed generation capacity of around 25,235 MW. Considering fuel gas & High-Speed Diesel (HSD) supply facilities in the area, the North-West Power Generation Company Limited (NWPGL), an enterprise of the Ministry of Power, Energy and Mineral Resources (MoPEMR) in line with the Government's Power Sector Master Plan of 2016, has planned to enhance the electricity generation by constructing a new Combined Cycle Power Plant (CCPP), 2nd and 3rd unit at Soydabad Sirajganj.

As per the definition of the Environment Conservation Rules (ECR), 1997 of Bangladesh, the proposed project falls under the "Red" Category Project. Hence, for the fulfillment of the condition required under this Category, an Environmental Impact Assessment (EIA) study has been carried out to assess the impacts of this Project, propose mitigation measures and its implementation plan (Environmental Management Plan). NWPGL has engaged Engineers Associates Limited (EAL), an experienced firm for such activities, for the preparation of EIA for the project following the Terms of Reference. Engineers Associates Limited (EAL) has conducted an EIA study and submitted the EIA report to DoE on May 11, 2014, for DoE approval. Finally, DoE has issued a Letter for Approval of EIA on July 16, 2014. NWPGL is seeking financial assistance from Standard Chartered Bank (hereinafter referred to as „SCB or „Bank or the „Lenders). AECOM India has been engaged by NWPGL as independent auditors for carrying out the Environmental and Social Due Diligence of the project. The due diligence report is to be prepared following the International Finance Corporations Sustainability Framework 2012 (IFC) and its Performance Standards (PS) on Social and Environmental Sustainability to assess the compliance of the Project and the ability of the Project to comply with the requirements of the suggested reference framework.

1.2 Environmental and Social Monitoring

Environmental and social monitoring during the operation stage of the power plant is comprised of a bunch of environmental and social parameters. The monitoring is conducted following the period of monthly, quarterly, biannually, and yearly basis around the plant area with considering environmental vital aspects as well as social parameters. The monitoring task is conducted with the following proper

methodology comprehensively. Environmental Laboratory and Research Center (ELRC) is the responsible organization for monitoring and compiling reports in due time in cooperation with the NWPGL.

1.3 The Objectives of Monitoring

The main objective of the monitoring is to identify standard guidelines and approaches to preserve key environmental and social aspects by preventing and controlling environmental pollution and the management of nuisance, resulting from the operation of the Power Plant following the conditions of contract and employer's requirements. The objectives of monitoring are listed below-

- To detect any disruption of environment according to national / project standard
- To identify the impact sources due to power plant operation
- To evaluate the qualitative and quantitative activities during operation
- To mitigate the identified impacts and promote best environmental on-site practices during the operation phase

1.4 Methodology for Preparation of The Report

This monitoring report is prepared to encompass the following approach to ensure all measures necessary to be included in this report are addressed comprehensively:

- Review of approved EIA reports
- Review of operation method statements
- Review of project implementation schedules
- Review of the baseline study
- Consultation with relevant authorities for issues of concern

1.5 EHSS Policy of NWPGL

North-West Power Generation Co. Ltd. (NWPGL) is committed to environmentally sound and socially responsible practices in all its business pursuits. NWPGL continually strives for a better environment and social performance in its project life cycle by providing a safe and healthy work environment along with cordial relations with the community we work with. To ensure this, NWPGL is committed to:

- Identify and manage risks as low as reasonably practicable where they have the potential to cause an injury or ill health to people, or unacceptable impacts on the environment or the community.
- Commit to prevention of Pollution and provide safe workplaces and systems of work, empower employees, contractors, and other stakeholders to address unsafe situations and carry out their work in a manner that does not present a risk to themselves, others, or the environment.
- Set objectives, targets, and plans which seek to improve performance in Environment, Health, Safety, and Social (EHSS) aspects.
- Provide organizational and institutional arrangements for the management of the environment and social issues.
- Ensure compliance with applicable national EHSS legal requirements and other international best EHSS practices.
- Require contractors and other stakeholders to manage EHSS using standards and practices that comply with this policy and guidelines.
- Social up-liftment and social safety.
- Periodic Review and report EHSS performance regularly.

The entire line management is responsible for establishing and overseeing NWPGL's commitment to managing the Environmental Health & Safety and Social aspect following this policy and monitoring the performance of the company concerning its implementation. The Management of NWPGL is responsible for the implementation of the EHSS Management System to ensure that the commitments made in this policy are being met.

2 CHAPTER 2: PROJECT DESCRIPTION

2.1 Brief Description

The project site is located at about 15 km south-east of Sirajganj town, about 130 km north-west of Dhaka, and 1.8 km south-west from the western end of Bangabandhu bridge. Subsequently, NWPGL had applied for getting the land of 17.5 acres (10 acres for Sirajganj 225 MW CCPP 2nd Unit and 7.5 acres for Sirajganj 225 MW CCPP 3rd Unit) leased from BPDB as per the decision of GoB to establish the said power plants in the Sirajganj Generation Hub. The major components include a 150 MW gas turbo generator (GTG) with a bypass stack of 60 meters high, one horizontal type Heat Recovering Steam Generator (HRSG) with the main stack of 60 meters high for outdoor installation, and a heavy-duty condensing type Steam Turbo Generator (STG) for indoor installation in the configuration of 1:1:1, feedwater pumps, condensate extraction pumps, cooling towers, 230 KV plant sub-station, transformers, Gas Regulating Metering Station (RMS), Oil Separator Unit, Water Treatment Plant (WTP), Administration building, workshop, warehouse, guardhouses, internal roads, etc.

The project is a dual fuel-based Combined Cycle Power Plant (CCPP), which has been operated predominantly by Natural Gas (NG) but has also the provision of High-Speed Diesel (HSD) in case of emergency and non-availability of NG. The natural gas required for the Plant is 35 MMCFD and the Pashchimanchal Gas Company Limited (PGCL) has supplied natural gas at a pressure of 500 psi through a 1.7 Km long and 16-inch diameter pipeline from its existing valve station to the PGCL RMS, which is to be constructed. From this RMS a 12-inch line will be extended up to the Power Plant's RMS (to be constructed inside the Plant's boundary) at a pressure of 350 psi. Liquid fuel (HSD) requirement is estimated to be about 920 m³/day at 80% PF. The oil has been supplied by Bangladesh Petroleum Corporation (BPC) from its Daulathpur and/or Khulna depot by railway wagons to Bangabandhu Bridge (Satu) West Railway Station and stored in the HSD tanks in the Plant.

The hot flue gas that is produced in the combustor will then be directed to the GTG, where it expands, loses pressure and temperature, and causes the GTG to spin and generate about 150 MW of power. The hot exhaust gas of GTG will pass through the HRSG and main stack to the atmosphere. The HRSG in turn will generate High Pressure (HP), Intermediate Pressure (IP), and Low Pressure (LP) steam that will be directed to the STG, which would, in turn, generate 75 MW of power, thus totaling the Plant output to 225 MW. The generated power of GTG and STG will be stepped up to grid voltage level (11/230 KV) by station transformers (240 MVA for GT and 120 MVA for ST) and fed to the national grid, via underground cables (Sirajganj sub-station), through the Plant sub-station.

Total water demand for Units 1, 2 & 3 is 1400 m³/h, with the third Unit requiring 400 m³/h as per the feasibility Report. There is a provision for the fourth Unit to be constructed beside the third Unit. These units altogether have been raised the water requirement to 2550 m³/h. Water requirement for Plant construction and operation are fulfilled from groundwater and it was reported from the feasibility study that the maximum allowable withdrawal of groundwater is 3,200 m³/h without causing the conspicuous problem in the groundwater table of the SPS area (EAL, 2014 and SDCPL, 2015). The major air pollutants that are produced from the power generating units due to the burning of fossil fuels are SO_x, NO_x, CO₂, CO, and SPM. Major sources of contaminated water from the proposed power plant are blowdowns of HRSG, cooling tower, backwash and rejects of the water treatment plant, oily water from turbine floor and transformer area, etc.

2.2 Importance of the Project

At present total installed electricity generation capacity is 25,235 MW with 92.2% of the population of the country has the access to electricity. The Ministry of Power, Energy, and Mineral Resources (MoPEMR) has forecasted that the increase in power demand in response to the desired economic growth of the country, will reach 34,000 MW by 2040. The Power System Master Plan (PSMP) also projected some scenarios of power demand concerning different GDP growth rates. All these variable projections are depicted in Figure 2-1.

To address the conflict between increasing power demand and prevailing shortage, BPDB has adopted a power generation enhancement plan till 2041 which is in line with the PSMP, 2016. The summary of the plan to increase power generation is depicted in Table 2-1. The plan includes different initiatives to generate additional electricity by diversifying fuel, rehabilitating age-old power plants, and importing electricity from neighboring countries. The Sirajganj 225 MW CCPP Project is one of such steps for contributing to meeting the growing demand.

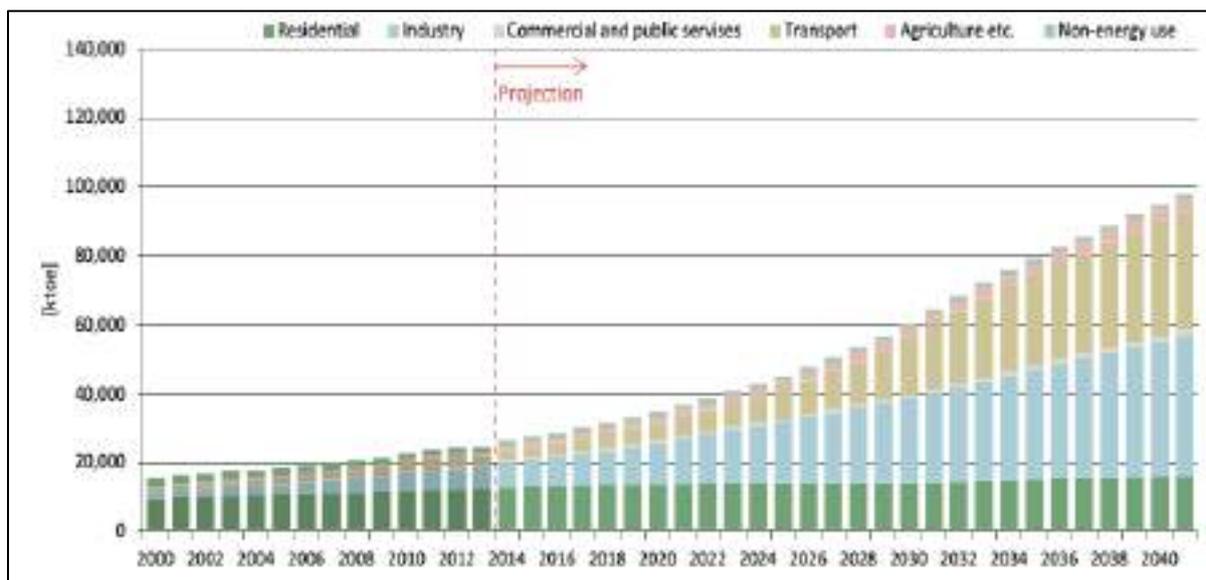


Figure 2-1: Projection of Final Energy Consumption (Energy Efficiency Scenario)¹

Table 2-1: Power Generation Enhancement Plan²

Sl. No.	Type	2015	2016	2017	2018	2019	2020	2021	Total
1.	Public (MW)	1,218	770	2,202	846	2,070	1,000	2,400	10,506
2.	Private (MW)	1,130	748	799	1,270	568	1,287	1,912	7,670
3.	Import (MW)	---	---	---	---	---	---	---	---
4.	Total	2,348	1,518	3,001	2,116	2,634	2,247	4,312	18,176

2.3 Potential Major Benefits

The power Plant will trigger regional development, creation of employment opportunities, and thereafter improvement of livelihood. The power plant may also bring social and economic development to the region through infrastructural improvement, reducing energy shortfall, rural electrification, and industrial (power loom) development. The communication network will also be improved significantly

¹ Source: PSMP 2016

² Source: Power Sector Emergency Information, System Planning Department, BPDB, May 16, 2015

and will increase livelihood opportunities during the operation period. Finally, the project would improve Environmental Performance by providing a means of effluent treatment of existing units; thus, significantly reducing the discharging of effluents in the canal around the site connected to the Jamuna River.

3 CHAPTER 3: LEGAL REQUIREMENTS

3.1 Policies

The national Acts, Policies, strategies, and regulatory frameworks are relevant to the environmental and social aspects of the Project. We also aim to briefly discuss the World Bank and International Finance Corporation's environmental, health, and social safety guidelines and the performance standards on environmental and social sustainability framework to complement, as applicable, the Bangladesh national policies and guidelines.

The Performance Standards on Environmental and Social Sustainability framework of IFC (January 1, 2012) outlines "IFC's commitments, roles, and responsibilities related to environmental and social sustainability and its commitment to transparency and good governance including its disclosure obligations concerning its investment and advisory services. The "performance standards" that are defined in the document are to assist implementation of the project sustainably through stakeholders' engagement to avoid risk and mitigate the unavoidable, as appropriate. Eight performance standards have been outlined in this document; they are:

- Assessment and Management of Environmental and Social Risks and Impacts
- Labor and Working Conditions
- Resource Efficiency and Pollution Prevention
- Community Health, Safety, and Security
- Land Acquisition and Involuntary Resettlement
- Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Indigenous Peoples
- Cultural Heritage

The Equator Principles is "a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making". The Equator Principles are a voluntary set of standards that are developed to support the implementation of environmental and social policies and the principles are outlined under 10 headings as noted under:

- Review and Categorization.
- Environmental and Social Assessment.
- Applicable Environmental and Social Standards.
- Environmental and Social Management System and Equator Principles Action Plan.
- Stakeholder Engagement.
- Grievance Mechanism.
- Independent Review.
- Covenants.
- Independent Monitoring and Reporting and
- Reporting and Transparency.

3.2 Environmental Standards

3.2.1 Ambient Air Quality

According to the Air Pollution (control) rules, 2022, the National Ambient Air Quality Standards and International Standards (IFC/WHO) has been depicted in Table 3-1.

Table 3-1: Ambient Air Quality Standards/ Guidelines

Sl. No.	Parameter	Bangladesh*		IFC/WHO**	
		24 hourlies (µg/m ³)	Annual(µg/m ³)	24 hourlies (µg/m ³)	Annual(µg/m ³)
1.	SPM*	-	-	-	-
2.	PM ₁₀	150	50	50	20
3.	PM _{2.5}	65	35	25(guideline)	10
4.	SO ₂	80	-	20	-
5.	NO _x	80	40	-	40
6.	CO*	5	-	-	-

*Note: CO and SPM concentrations and standards are 8-hourly only; *The Bangladesh National Ambient Air Quality Standards have been taken from the Air Pollution (control) rules, 2022 **WHO Ambient Air Quality Guideline Values (2005 and 2000), which are also being referred in the World Bank and IFC's General EHS Guidelines (2007). Represents the standard values applicable to the Project; NO_x in Bangladesh National Ambient Air Quality Standards to be reported as NO₂.*

As per the WB/IFC General EHS guidelines, ambient air quality results need to be compared with the relevant ambient air quality guidelines and standards by applying national legislated standards, or in their absence, the current WHO air quality guidelines, or other internationally recognized sources, such as the United States National Ambient Air Quality Standards and the relevant European Council Directives. Since Bangladesh has its own national ambient air quality standards, these local standards are considered as the applicable standard for the project.

3.2.2 Ground/Drinking Water Quality

According to ECR 2023, Schedule 2(B), the standard for drinking water has been depicted in Table 3-2.

Table 3-2: Bangladesh Standards for Ground/Drinking Water

Sl. No.	Parameter	Unit	Bangladesh Standards*
1.	pH	-	6.5-8.5
2.	Arsenic (As)	mg/L	0.05
3.	Total Dissolved Solid (TDS)	mg/L	1000
4.	Electrical Conductivity (EC)	mg/L	-
5.	Total Coliform (TC)	N/100mL	0
6.	Total Hardness	mg/L	500
7.	Chlorine (Cl)	mg/L	-
8.	Fluoride (F)	mg/L	1.0
9.	Iron (Fe)	mg/L	0.3-1
10.	Manganese (Mn)	mg/L	0.4
11.	Phosphate (PO ₄)	mg/L	-
12.	Sulphate (SO ₄)	mg/L	250

Source: ECR 2023, Schedule 2(B), Bangladesh.

3.2.3 Surface Water Quality

According to ECR 2023, Schedule 2(A), the standard for surface water has been depicted in Table 3-3.

Table 3-3: Bangladesh Standard for Inland Surface Water

Parameter	Unit	Analysis Methods	*Standard
pH	-	Ion Electrode method	6 - 9
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Gravimetric Method followed by Gravimetric Analysis	-
Total Residual Chlorine	mg/l	Standard method 4500-Cl B. Iodometric Method.	-
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	-
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	1000
Chemical Oxygen Demand (COD)	mg/l	Adaptation of the USEPA 410.4 approved method	50
Biological Oxygen Demand (BOD)	mg/l	5 days Incubation	6 or less
Chromium (Cr)	mg/l	ASTM D1687-92 diphenylcarbohydrozide method	0.05
Iron (Fe)	mg/l	EPA Phenanthroline method 315 B	-
Calcium (Ca)	mg/l	Oxalate Method	-
Zinc (Zn)	mg/l	Zincon Method	-
Lead (Pb)	mg/l	APHA - P3500-Pb Lead	0.1
Cadmium (Cd)	mg/l	3500-Cd Cadmium	-
Mercury (Hg)	mg/l	Amalgamation(ORP/A) Method	0.004
Arsenic (As)	mg/l	Modified Gutzeit Method	-
Total Alkalinity	mg/l	Colorimetric Method	-
Ammonium Nitrogen	mg/l	Adaptation of ASTM D 1426-92 method	-
Free Ammonia	mg/l	Adaptation of ASTM D 1426-92 method	-
Temperature	°C	Ion electrode method	-

Source: According to ECR 2023, Schedule 2(A); Best Practice based classification (Water Usable for Fisheries); BOD = Biological Oxygen Demand, mg/l = Milligram per Liter, pH = Negative decimal logarithm of the hydrogen ion activity in a solution; Notes: In water used for pisciculture, maximum limit of ammonia presence as Nitrogen is 1.2 mg/l.; Electrical conductivity for irrigation water – 2250 µmhos/cm (at a temperature of 25°C); Sodium less than 26%; boron less than 0.2%.

3.2.4 Wastewater Quality

According to ECR 2023, Schedule 4, the standard for wastewater from industrial units or projects has been depicted in Table 3-4.

Table 3-4: Wastewater Quality

Parameter	Unit	Analysis Methods	*Standard
Temperature	°C	Ion Electrode method	<5oC than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	-
pH	-	Ion Electrode method	6-9

Parameter	Unit	Analysis Methods	*Standard
Total Coliform (TC)	N/100ml	Membrane Filtration Method	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	-
Total Nitrogen (N)	mg/l	Chromotropic acid	-
Total Phosphorus (P)	mg/l	Amino Acid Method	8
Arsenic (As)	mg/l	Modified Gutzeit Method	0.2
Zinc (Zn)	mg/l	Zincon Method	5
Chromium (Cr)	mg/l	Turbidimetric Method	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	3
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	1
Total Suspended Solid	mg/l	Standard Methods (2005), 2540D	100
Total Dissolved Solid (TDS)	mg/l	Ion Electrode method	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	200
Biological Oxygen Demand	mg/l	5 days Incubation	30

Notes: These standards shall apply to all industries or projects other than those specified under the heading "Standards for sector-wise industrial effluent or emission." Compliance with these standards shall be ensured from the moment an industrial unit starts trial production, and in other cases, from the moment a project starts operation. These standards shall be inviolable even in case of any sample collected instantly at any point in time. These standards may be enforced more stringently if considered necessary because of the environmental conditions of a particular situation. Inland Surface Water means drains/ponds/tanks/water bodies/ ditches, canals, rivers, springs, and estuaries. Public sewerage system means treatment facilities of the first and second stages and the combined and complete treatment facilities. Irrigable land means such land area which is sufficiently irrigated by wastewater taking into consideration the quantity and quality of such water for cultivation of selected crops on that land. Inland Surface Water Standards shall apply to any discharge to a public sewerage system or land if the discharge does not meet the requirements of the definitions in notes 5 and 6 above.

3.2.5 Ambient and Occupational Noise Level

According to Ministry of Environment, Forest, and Climate Change. (2006). Noise Pollution (Control) Rules, 2006 (S.R.O. No. 212-Law/2006). The People's Republic of Bangladesh. Table 3-5.

Table 3-5: Ambient Noise Level Standards/ Guidelines

Sl. No.	Category of Area/Receptor	Bangladesh*		IFC-WHO**	
		Day (dB(A)) 6 AM – 9 PM	Night (dB(A)) 9 PM – 6 AM	Day (dB(A)) 7 AM – 10 PM	Night (dB(A)) 10 PM – 7 AM
1.	Silent Zone	50	40	55	45
2.	Residential Area	55	45	55	45
3.	Mixed Area	60	50	-	-
4.	Commercial Area	70	60	70	70
5.	Industrial Area	75	70	70	70

*Note: * Ministry of Environment, Forest, and Climate Change. (2006). Noise Pollution (Control) Rules, 2006 (S.R.O. No. 212-Law/2006). The People's Republic of Bangladesh.; **Guidelines values are for noise levels measured out of doors. Source:*

Guidelines for Community Noise, World Health Organization (WHO), 1999; As per IFC EHS noise level guidelines, Noise impacts should not exceed the levels presented in the above table.

4 CHAPTER 4: METHODOLOGY

4.1 Ambient Air Quality Monitoring

The existing ambient air quality of the study area will be monitored during the operation period of the power plant. The ambient status of major air pollutants viz. Particulate Matter (SPM, PM₁₀, and PM_{2.5}), Gaseous substances (NO_x, SO₂, and CO) will be assessed. All the parameters will be monitored for 24 hours. Haz-Scanner (HIM 6000) will be used to monitor the ambient air quality. The particulate and gaseous samples will be monitored and analysed as per the procedures specified in Table 4-1.

Table 4-1: Methodology for the Analysis of Ambient Air Quality.

SI. No.	Parameters	Analysis Procedure
1.	SPM	Particulates Sensor Light Scattering Nephotometer
2.	PM ₁₀	Particulates Sensor Light Scattering Nephotometer
3.	PM _{2.5}	Particulates Sensor Light Scattering Nephotometer
4.	SO ₂	High Sensitivity Electrochemical
5.	NO _x	High Sensitivity Electrochemical
6.	CO	High Sensitivity Electrochemical
7.	O ₃	High Sensitivity Electrochemical

Sources: Information Taken from ELRC Laboratory

Air quality monitoring samples will be monitored for a defined time interval and from different monitoring points within plant areas. Ambient air quality monitoring time and interval from one point to another point and conversion factor are specified in Table 4-2.

Table 4-2: Air Sample Collection Time and Data Converted Time

SI. No.	Parameters	Sample Collection time (Hr.)	Compared Standardized Time (Hr.) according to Air Pollution Control Rules, 2022.
1.	SPM	2	8
2.	PM ₁₀	2	24
3.	PM _{2.5}	2	24
4.	SO ₂	2	24
5.	NO _x	2	24
6.	CO	2	8
7.	O ₃	2	8

Sources: Information Taken from ELRC Laboratory

4.1.1 Air Quality Data Conversion Formula

Air quality data will be taken for 24 hours, and this data will be converted to 8 hours for SPM, CO, and O₃ to compare with the Air Pollution Control Rules 2022.

The data of the air quality will be converted into standard time by using the following equation:

$$C_{\text{long}} = C_{\text{short}} \left(\frac{t_{\text{short}}}{t_{\text{long}}} \right)^p$$

Where,

C_{long} = is the expected value in the standard time

C_{short} = is the measured value at the field level in a specific period

t_{short} = Period (converted into minutes from an hour) in the field level

t_{long} = Standard period (converted into minutes from an hour)

p = is the exponential factor.

4.2 Ambient and Occupational Noise Level Monitoring

The ambient noise level will be measured within the plant area 24 hours a daytime and nighttime in every location. One Noise data logger sound level meter (Teckoplus, Model: SLM25K) will be used to collect the ambient noise levels. After getting all the noise data it will be downloaded to a computer. The noise meter will be settled in a tripod and kept 2-3 m away from the sources. The only sensitive area will be covered. The noise level will be analyzed according to the methodology and compared with the Noise Pollution Control Rules, 2006. The SLM will be oriented towards the facility of interest for each measurement taken. The SLM will be calibrated before the noise monitoring survey is carried out. The sound level will be recorded in form of A-weighted equivalent continuous sound pressure level (L_{Aeq}) values with the use of A-weighting filters in the noise measuring instrument. Then noise level data will be analyzed to L_{Aeqday} , $L_{Aeqnight}$, L_{Amax} , and L_{Amin} .

The occupational noise level will be monitored in the plant boundary with considering the indoor environment for 8 hours in a specific location. One Noise data logger sound level meter (Teckoplus, Model: SLM25K) will be used to collect the occupational noise levels. After getting all the noise data it will be downloaded to a computer. The noise meter will be settled in a tripod and kept 1 m away from the machinery or source for achieving real-time occupational noise pollution. The only machinery will be covered. The SLM will be calibrated before the noise monitoring survey is carried out. The sound level will be recorded in form of A-weighted equivalent continuous sound pressure level (L_{Aeq}) values with the use of A-weighting filters in the noise measuring instrument.

4.3 Water Sampling

Water samples will be collected from the sources in the plant area. Water samples will be collected in a standard sampling bottle and 250 ml sterilized clean PET bottle for complete physio-chemical and bacteriological tests respectively. The samples will be analyzed as per standard procedure/method given in Standard Method for Examination of Water and Wastewater Edition 20, published by APHA as well as using an on-site field test kit. The ground/drinking, surface/waste/stormwater analysis method and protocol are presented in the following tables.

Table 4-3: Analysis Method for Ground Water Samples

Sl. No.	Parameters	Unit	Analysis Method
1.	Arsenic (As)	mg/L	Modified Gutzeit Method
2.	Biochemical Oxygen Demand (BOD)	mg/L	5 Days Incubation
3.	Calcium (Ca)	mg/L	Colorimetric Method
4.	Chloride (Cl ⁻)	mg/L	Hg (II) Thiocyanate Method
5.	Chemical Oxygen Demand (COD)	mg/L	Closed Reflux Method
6.	Dissolved Oxygen (DO)	mg/L	Hanna Combo Meter
7.	Electrical Conductivity (EC)	μS/cm	Hanna Combo Meter

Sl. No.	Parameters	Unit	Analysis Method
8.	Iron (Fe)	mg/L	Phenanthroline Method
9.	pH	--	Hanna Combo Meter
10.	Phosphate (PO ₄ ³⁻)	mg/L	Amino Acid Method
11.	Salinity	ppt	Hanna Combo Meter
12.	Sulphate (SO ₄ ²⁻)	mg/L	Turbidimetric Method
13.	Hardness	mg/L	Colorimetric Method
14.	Total Dissolved Solid (TDS)	mg/L	Hanna Combo Meter
15.	Temperature (T)	°C	Hanna Combo Meter
16.	Silica (SiO ₂)	mg/L	UV-VIS
17.	Lead (Pb)	mg/L	AAS
18.	Nitrogen (N)	mg/L	UV-VIS

Sources: Information Taken from ELRC Laboratory

Table 4-4: Analysis Method for Surface Water/Storm Water/Wastewater Samples

Sl. No.	Parameters	Unit	Analysis Method
1.	Alkalinity	mg/L	Colorimetric Method
2.	Arsenic	mg/L	Modified Gutzeit Method
3.	Biochemical Oxygen Demand (BOD)	mg/L	5 days Incubation
4.	Chemical Oxygen Demand (COD)	mg/L	Closed Reflux Method
5.	Dissolved Oxygen (DO)	mg/L	Hanna Combo Meter
6.	Calcium (Ca)	mg/L	Colorimetric Method
7.	Chloride (Cl ⁻)	mg/L	Hg (II) Thiocyanate Method
8.	Electrical Conductivity (EC)	µS/cm	Hanna Combo Meter
9.	Iron (Fe)	mg/L	Phenanthroline Method
10.	Magnesium (Mg)	mg/L	Calmagite Method
11.	pH	--	Hanna Combo Meter
12.	Phosphate (PO ₄ ³⁻)	mg/L	Amino Acid Method
13.	Potassium (K)	mg/L	Turbidimetric Method
14.	Salinity	ppt	Hanna Combo Meter
15.	Sulphate (SO ₄ ²⁻)	mg/L	Turbidimetric Method
16.	Temperature (T)	°C	Hanna Combo Meter
17.	Hardness	mg/L	Colorimetric Method
18.	Total Dissolved Solid (TDS)	mg/L	Hanna Combo Meter
19.	Sodium (Na)	mg/L	AAS
20.	Turbidity	NTU	Turbidity Meter
21.	Oil and Grease	mg/L	APHA 5520.B
22.	Nitrogen (N)	mg/L	UV-VIS
23.	Lead (Pb)	mg/L	AAS

Sources: Information Taken from ELRC Laboratory

4.4 Soil Sampling

The samples will be analyzed for parameters covering physio-chemical characteristics which include certain heavy metals and trace elements. Soil samples will be collected with a 500 mg sterilized clean PET jar to complete physio-chemical tests. The samples will be analyzed as per standard procedure/method given in Standard Method for Examination of Soil Experiment Edition, published by USGS and APHA. Details of the analysis method and protocol are presented in Table 4-5.

Table 4-5: Methods for Soil Sample Analysis

Sl. No.	Parameters	Unit	Analysis Method
1.	Electrical Conductivity (EC)	dS/m	EC Meter
2.	Bulk Density	g/cm ³	Combo Meter
3.	pH	-	pH Meter
4.	Organic Content	%	Combo Meter
5.	Calcium (Ca)	mg/kg	Ammonium Acetate Method
6.	Magnesium (Mg)	mg/kg	Ascorbic Acid Method
7.	Potassium (K)	mg/kg	Ammonium Acetate Method
8.	Sodium (Na)	meq/100g	Jackson Turbidimetric Method
9.	Nitrogen (N)	mg/kg	Jackson Turbidimetric Method
10.	Phosphorus (P)	mg/kg	Ascorbic Acid Method
11.	Sulfur (S)	mg/kg	Jackson Turbidimetric Method
12.	Boron (B)	mg/kg	Jackson Turbidimetric Method
13.	Copper (Cu)	mg/kg	Atomic Absorption Spectrometer
14.	Iron (Fe)	mg/kg	Atomic Absorption Spectrometer
15.	Manganese (Mn)	mg/kg	Atomic Absorption Spectrometer
16.	Zinc (Zn)	mg/kg	Atomic Absorption Spectrometer
17.	Lead (Pb)	mg/kg	Atomic Absorption Spectrometer
18.	Cadmium (Cd)	mg/kg	Atomic Absorption Spectrometer
19.	Arsenic (As)	mg/kg	Jackson Turbidimetric Method
20.	Mercury (Hg)	mg/kg	Atomic Absorption Spectrometer

Sources: Information Taken from ELRC Laboratory

4.5 Electro-Magnetic Field Monitoring

The Electro-Magnetic Field (EMF) in the plant area will be monitored by using an EMF meter for 2 hours. One EMF meter will be used to collect the EMF levels. After getting all the EMF data it will be downloaded to a computer. The EMF meter will be settled in a tripod and kept 0 m, 3 m, 5m, and 10m away from the sources respectively. The only switchyard area will be covered. The EMF will be analyzed according to the proper methodology and compared with the standard of ICNIRP. The EMF meter will be calibrated before the monitoring carrying out. The EMF will be recorded in form of mv/m equivalent continuous magnetic fluctuation.

4.6 Environmental Health Safety and Social Monitoring

Environmental Health Safety and Social Monitoring will be conducted during the operation period depending on the EIA review, DoE guidelines and baseline review. Almost all the Environmental Health

Safety and Social Monitoring parameters will be considered during the monitoring period. The methodology of Environmental Health Safety and Social Monitoring is presented in Table 4-6.

Table 4-6: Environmental Health Safety and Social Monitoring Method

Sl. No.	Parameters	Methodology
1.	Stack Emission Monitoring	Stack emission data will be collected from NWPGL and compiled in the quarterly and yearly report
2.	Leak Detection	Leak detection checklists and data will be collected from NWPGL and compiled in the quarterly and yearly report
3.	Meteorology	The meteorology data will be collected from NWPGL every month and compiled in the quarterly and yearly report
4.	Wastes Generation and Management	Visual inspection with pictorial evidence will be maintained from the starting of the plant operation till the end. Besides all documents will be oriented in the quarterly and yearly based report.
5.	Worker Health	Health inspection or checkup reports will be collected from the health unit of NWPGL every quarter and year
6.	Labor and Working Conditions	Visual observation and pictorial evidence will be kept of working conditions, potable water supply, and hygiene toilets every quarter and every year
7.	Emergency Response Plan	Upgradation, update, and modification of the ERP will be collected from the NWPGL
8.	Health and Safety Preparedness	Upgradation, update, and modification of the HSP will be collected from the NWPGL
9.	Community Relationship	FGD with the local community every quarter to inspect the community relationship with the plant
10.	Grievance Mechanism	Visual inspection with pictorial evidence will be maintained from the starting of the plant operation till the end. Besides all documents will be oriented in the quarterly and yearly based report.
11.	CSR Program	FGD with local community and documentation from the NWPGL

5 CHAPTER 5: MONITORING RESULTS AND DISCUSSION

Ambient air quality, ambient and occupational noise level monitoring, wastewater, stormwater, surface, groundwater, drinking water analysis, social and health safety monitoring are the things included as the parameters during the monitoring period. All the environmental and social issues are separately discussed and described in this section with comparing to the standard.

5.1 Physical Environment

According to the baseline study of the project and scope specifications, physical environmental monitoring has been included the stack emission, ambient air quality, ambient noise level, leak detection of the pipeline, meteorological status, wastewater, stormwater, surface water, and groundwater sampling, monitoring, analyzing, and evaluating. This section of the report contains physically monitoring data orientation and discussion.

5.1.1 Stack Emission Monitoring

Stack emission monitoring result has been observed from the EHS cell. Normally, in this part, all the CEMS data of Unit 3 has been checked. In this yearly period, stack emission data from February 2023 to December 2023 were available. From the observation from February 2023 to December 2023, the average maximum concentration of SO₂ has been found about 2.39 mg/m³ in July, August and September 2023. There is no standard set by Bangladesh Government for the SO₂. Average NO_x was ranging from 25.27 to 53.44 mg/m³ last year. As per the Bangladesh standard, the range of NO_x is 200 mg/m³ (as per Schedule 5 Air Pollution Control Rules 2022). The average CO concentration from the stack of unit 3 has been ranging from 1.71 mg/m³ to 4.27 mg/m³. The maximum CO concentration has been observed in October 2023. The average CO₂ concentration from the stack of unit 2 has been found to range from 1.94% to 3.25%. Maximum average CO₂ concentration has been found in February 2023. The average stack emission data are presented in **Table 5-1** and detailed stack emission (CEMS) data are presented in **Annex D** for more clarification.

Table 5-1: Average Stack Emission from the Power Plant

Sl. No.	Parameters	Unit	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
1.	NO _x	mg/m ³	25.27	28.54	47.73	50.19	53.44	46.66	45.30	42.93	47.74	0.00	0.00
2.	CO	mg/m ³	2.36	2.51	1.71	1.78	1.73	3.74	4.11	3.86	4.27	0.00	0.00
3.	CO ₂	%	3.25	3.03	2.55	2.70	2.73	2.07	1.94	2.12	2.25	0.00	0.00
4.	SO ₂	mg/m ³	0.08	0.04	0.07	0.01	0.04	2.39	2.35	2.39	2.35	0.00	0.00

Sources: CEMS Data from EHS Cell

5.1.2 Ambient Air Quality

5.1.2.1 Locations

The objective of the surrounding air quality observing system was to set up the standard encompassing air quality in the study area. The profile of the plant is mainly rural on the north-western and Jamuna River on the eastern side. The major sources of air pollution noted within the study area include vehicular movement and machinery emissions apart from the plant. Ambient air quality has been monitored in plant activities. The location details are as follows in Table 5-2. Monitoring photographs from February 2023 to December 2023 are attached in **Annex B-1**.

Table 5-2: Ambient Air Quality Monitoring Locations

Sl. No.	Code	Monitoring Locations	GPS Coordinate	February-April 2023		May-July 2023		August-October 2023		Nov. 2023-January 2024	
				Date	Time	Date	Time	Date	Time	Date	Time
1.	AAQ1	Plant Premises	24°23'8.04"N 89°44'44.77"E	15.04.2023	09:15 AM	16.07.2023	09:30 AM	20.10.2023	09:30 AM	20.12.2023	09:10 AM
2.	AAQ2	In front of Main Gate	24°23'15.09"N 89°44'33.94"E	16.04.2023	03:30 PM	17.07.2023	02:40 PM	21.10.2023	10:45 AM	21.12.2023	10:25 AM
3.	AAQ3	Rehabilitation Village	24°23'39.31"N 89°44'16.81"E	17.04.2023	09:40 AM	18.07.2023	09:35 AM	22.10.2023	10:00 AM	22.12.2023	09:30 AM
4.	AAQ4	Kader House (Ponchosona Village)	24°23'19.47"N 89°44'24.50"E	18.04.2023	03:10 PM	19.07.2023	03:10 PM	23.10.2023	09:20 AM	23.12.2023	10:10 AM
5.	AAQ5	Bangabandhu Eco Park	24°23'58.16"N 89°44'50.71"E	19.04.2023	09:20 AM	20.07.2023	09:35 AM	24.10.2023	09:40 AM	24.12.2023	02:40 PM

Source: Annual site visit of ELRC monitoring team in February 2023-December 2023

5.1.2.2 Results and Discussion

Sampling was done in 24 hours. Among all the parameters of ambient air SPM, CO and O3 had been converted for 8 hours and the rest of the parameters were calculated on a 24-hourly basis. Both particulate and gaseous samples were analyzed as per the proper procedures. Analysis results of every location are briefly mentioned in the following sections.

5.1.2.3 Summary findings of in-house air quality monitoring

The ambient air quality has been monitored on the last year basis on a monitoring period during the operation period of Unit 3. This monitoring result shows that, during the dry season in December 2023, there appears to be a high concentration of certain parameters. During this monitoring year all the parameters concentration are found within the standard compared with Air Pollution (control) rules, 2022.

Table 5-3: Summary findings of in-house air quality monitoring

Location	Ambient Air Pollutants' Concentration in µg/m3																											
	SPM				PM10				PM2.5				SO2				NO2				CO				O3			
	Apr 23	Aug 23	Oct 23	Dec 23	Apr 23	Aug 23	Oct 23	Dec 23	Apr 23	Aug 23	Oct 23	Dec 23	Apr 23	Aug 23	Oct 23	Dec 23	Apr 23	Aug 23	Oct 23	Dec 23	Apr 23	Aug 23	Oct 23	Dec 23	Apr 23	Aug 23	Oct 23	Dec 23
AQ-1	114.2	89.3	98.6	142.4	75.52	60.2	64.7	85.4	39.34	27.8	28.1	43.5	16.02	11.3	12.3	15.8	17.45	12.6	12.4	19.8	0.03	0.03	0.04	0.06	11.4	8.4	9.2	11.7
AQ-2	129.34	90.2	92.2	137.6	84.23	63.2	61.9	82.6	45.22	29.5	32.8	40.9	19.6	12.6	13.1	16.5	22.5	14.2	13.7	18.2	0.03	0.03	0.04	0.05	12.2	7.3	8.2	10.6
AQ-3	108.15	69.2	71.8	128.8	68.34	46.2	48.3	77.9	41.32	24.3	26.7	36.4	14.4	9.5	10.2	13.8	17.34	10.4	10.6	14.9	0.04	0.03	0.05	0.05	10.3	7.6	7.6	9.3
AQ-4	102.45	89.3	92.6	131.7	76.23	62.4	65.8	80.2	43.45	29.8	30.8	38.2	7.5	6.7	9.7	11.6	11.34	7.5	9.8	11.4	0.02	0.02	0.03	0.04	10.1	7.4	8.1	10.5
AQ-5	106.5	53.4	56.9	110.3	68.2	38.6	40.2	75.7	38.1	18.5	19.9	28.1	6.5	6.4	10.5	14.2	10.3	9.2	10.8	12.3	0.02	0.03	0.02	0.03	7.4	6.2	6.9	8.7
Air Pollution (control) rules, 2022*	-				150				65				80				80				5				100			
IFC/WHO Standard	-				50				25				20				40 (Annual)				-				100			

Note: Legend: SPM -Suspended Particulate Matter, PM10 -Particulate Matter of a diameter of 10 micron or less, PM2.5 -Particulate Matter of a diameter of 2.5 micron or less, SO2 -Sulphur Di-Oxide, NOx -Oxides of Nitrogen, CO - Carbon Monoxide, O3 - Ozone

5.1.3 Ambient Noise Level

5.1.3.1 Locations

Ambient noise levels were recorded at thirteen locations in the study area during last year's monitoring period. Noise levels were recorded in the form of sound pressure levels using three different digital sound level meters at the same time. Detail list of noise level monitoring locations is given in Table 5-4. Noise levels were measured at every location at different times. The sound level was recorded in form of A-weighted equivalent continuous sound pressure level (Leq) values with the use of A-weighting filters in the noise measuring instrument. Monitoring photographs from February 2023 to January 2024 are attached in **Annex B-2**.

Table 5-4: Ambient Noise Level Monitoring Locations

Sl. No.	Code	Location	GPS Coordinate	Category	Date	Time	
						Day	Night
1.	ANL1	South-West Corner of the Power Plant	24°23'3.44"N 89°44'42.63"E	Industrial Area	18.04.2023	09:18 AM	09:12 PM
					20.07.2023	09:15 AM	09:21 PM
					21.10.2023	09:29 AM	09:14 PM
					22.12.2023	09:07 AM	09:23 PM
2.	ANL2	Middle of Two Corner Point	24°23'3.39"N 89°44'42.36"E	Industrial Area	18.04.2023	10:18 AM	09:30 PM
					20.07.2023	09:10 AM	09:10 PM
					21.10.2023	10:29 AM	09:26 PM
					22.12.2023	09:30 AM	09:15 PM
3.	ANL3	Northwest Site	24°23'11.08"N 89°44'42.08"E	Industrial Area	18.04.2023	09:10 AM	09:10 PM
					20.07.2023	09:10 AM	09:30 PM
					21.10.2023	09:07 AM	09:26 PM
					22.12.2023	09:18 AM	09:22 PM
4.	ANL4	Northeast Site	24°23'11.32"N 89°44'38.86"E	Industrial Area	18.04.2023	09:12 AM	09:16 PM
					20.07.2023	09:34 AM	09:34 PM
					21.10.2023	09:25 AM	09:10 PM
					22.12.2023	09:17 AM	09:05 PM
5.	ANL5	Northwest Site	24°23'11.11"N 89°44'42.06"E	Industrial Area	18.04.2023	04:35 PM	09:25 PM
					20.07.2023	04:42 PM	09:35 PM
					21.10.2023	04:28 PM	09:45 PM
					22.12.2023	09:43 AM	09:05 PM
6.	ANL6	Northeast Site	24°23'11.11"N 89°44'44.99"E	Industrial Area	18.04.2023	09:21 AM	09:12 PM
					20.07.2023	09:29 AM	09:32 PM
					21.10.2023	09:25 AM	09:30 PM
					22.12.2023	11:45 AM	09:22 PM
7.	ANL7	Southeast Corner	24°23'3.18"N 89°44'50.56"E	Industrial Area	18.04.2023	11:24 AM	10:46 PM
					20.07.2023	11:44 AM	10:38 PM
					21.10.2023	11:22 AM	10:37 PM

					22.12.2023	02:42 PM	10:34 PM
8.	ANL8	Infront of S.T.G Building	24°23'8.08"N 89°44'44.81"E	Industrial Area	18.04.2023	12:54 PM	11:39 AM
					20.07.2023	01:16 PM	11:43 AM
					21.10.2023	01:11 PM	11:46 AM
					22.12.2023	03:51 PM	10:52 PM
9.	ANL9	Administration Building (Outdoor)	24°23'11.63"N 89°44'46.14"E	Mixed Area	18.04.2023	03:24 PM	12:12 PM
					20.07.2023	03:23 PM	12:20 PM
					21.10.2023	03:17 PM	12:16 PM
					22.12.2023	05:21 PM	11:52 PM
10.	ANL10	Northeast Site	24°23'14.59"N 89°44'50.67"E	Silent Area	18.04.2023	05:13 PM	09:42 PM
					20.07.2023	05:32 PM	09:47 PM
					21.10.2023	05:34 PM	10:18 PM
					22.12.2023	10:07 AM	09:21 PM
11.	ANL11	Administration Building (Indoor 2nd floor)	24°23'11.92"N 89°44'46.35"E	Mixed Area	18.04.2023	10:31 AM	09:21 PM
					20.07.2023	10:44 AM	09:32 PM
					21.10.2023	10:28 AM	09:43 PM
					22.12.2023	11:39 AM	09:34 PM
12.	ANL12	Residential Building	24°23'14.64"N 89°44'49.46"E	Residential Area	18.04.2023	12:31 PM	10:14 AM
					20.07.2023	12:44 PM	10:28 AM
					21.10.2023	12:10 PM	10:26 AM
					22.12.2023	01:32 PM	10:18 PM
13.	ANL13	Main Gate of the Power Plant	24°23'15.20"N 89°44'34.20"E	Industrial	18.04.2023	04:21 PM	10:41 PM
					20.07.2023	04:35 PM	10:43 PM
					21.10.2023	03:21 PM	11:51 PM
					22.12.2023	04:15 PM	10:53 PM
14.	ANL14	Infront of G.T.G Building	24°23'8.71"N 89°44'42.81"E	Industrial Area	18.04.2023	04:21 PM	10:41 PM
					20.07.2023	04:35 PM	10:43 PM
					21.10.2023	03:21 PM	11:51 PM
					22.12.2023	04:15 PM	10:53 PM
15.	ANL15	Infront of S.T.G Building	24°23'7.97"N 89°44'44.88"E	Industrial Area	18.04.2023	05:13 PM	09:42 PM
					20.07.2023	05:32 PM	09:47 PM
					21.10.2023	05:34 PM	10:18 PM
					22.12.2023	10:07 AM	09:21 PM

Source: Annual site visit of ELRC monitoring team in February 2023-January 2024

5.1.3.2 Results and Discussion

An electronic and auto-recorded noise meter has been used to conduct the study. The recorded noise levels summary monitoring results are discussed in this section.

Table 5-5: Noise Level Monitoring Results from February 2023 – December 2023

Sl. No.	Code	April 2023				August 2023				October 2023				December 2023				*Bangladesh Standard		**WHO/IFC Standard	
		LeqDay	LeqNight	L _{max}	L _{min}	LeqDay	LeqNight	L _{max}	L _{min}	LeqDay	LeqNight	L _{max}	L _{min}	LeqDay	LeqNight	L _{max}	L _{min}	Day	Night	Day	Night
1.	ANL1	67.4	52.4	67.4	48.5	66.3	55.2	70.3	51.3	65.8	53.1	71.9	46.2	64.3	54.5	72.4	45.2	75	70	70	70
2.	ANL2	65.5	58.6	71.4	54.3	65.2	50.3	67.3	47.1	64.3	51.5	66.8	44.8	65.6	52.1	67.5	43.1	75	70	70	70
3.	ANL3	64.2	55.3	69.3	51.4	63.1	51.1	71.3	47.2	64.2	52.6	70.8	45.7	64.2	50.2	71.5	44.6	75	70	70	70
4.	ANL4	63.9	53.5	68.3	50.4	65.1	54.2	71.4	49.8	64.7	53.6	71.5	47.2	64.1	54.7	72.3	48.9	75	70	70	70
5.	ANL5	59.3	52.1	72.5	48.4	62.4	54.3	66.2	50.2	61.8	55.8	72.7	51.7	62.9	54.7	72.1	52.3	75	70	70	70
6.	ANL6	57.2	51.4	67.4	44.2	57.6	52.4	60.5	46.2	58.8	53.7	62.8	45.8	58.2	52.9	62.4	46.6	75	70	70	70
7.	ANL7	55.4	42.6	58.4	38.7	54.2	41.3	57.3	38.1	55.3	42.8	59.3	39.5	56.5	42.4	59.8	38.3	75	70	70	70
8.	ANL8	53.7	39.2	59.2	36.6	52.5	38.2	58.2	35.5	53.7	39.5	59.4	36.3	53.4	39.1	59.9	39.9	75	70	70	70
9.	ANL9	54.6	46.2	59.4	41.4	45.4	43.3	55.2	40.6	46.7	44.8	57.8	41.3	47.9	44.4	57.2	42.8	60	50	-	-
10.	ANL10	45.7	38.5	52.5	35.5	43.1	38.7	49.2	34.8	44.8	37.2	48.6	35.8	45.2	37.6	49.4	34.6	50	40	55	45
11.	ANL11	45.3	39.5	50.5	35.1	47.2	43.1	47.6	35.1	48.1	44.8	46.9	36.9	49.8	44.7	54.2	39.2	60	50	-	-
12.	ANL12	47.4	38.7	57.3	35.6	45.3	38.7	54.3	34.7	46.4	39.2	55.9	35.8	46.1	38.9	55.2	34.5	55	45	55	45
13.	ANL13	55.8	51.3	64.5	44.6	54.1	51.2	63.2	42.5	55.2	50.7	64.6	42.6	54.6	51.3	62.2	44.5	75	70	70	70
14.	ANL14	67.5	62.4	73.4	54.2	62.4	58.4	71.3	50.2	61.8	57.6	69.8	47.2	62.3	56.2	67.4	46.6	75	70	70	70
15.	ANL15	68.4	63.5	72.1	54.6	64.3	59.5	71.2	51.6	64.3	58.2	70.4	48.5	62.4	57.8	70.4	46.3	75	70	70	70

Note: * According to Noise Pollution (Control) Rules, 2006

**Guidelines for Community Noise, World Health Organization (WHO), 1999

According to Noise Pollution (Control) Rules, 2006 categorizations, the current monitoring location falls into Industrial zone (ANL1 – ANL8 and ANL13), mixed zone (ANL9 and ANL11), residential zone (ANL12), and silent zone (ANL10). According to the ambient noise level monitoring for this February 2023-January 2024, there have been no locations that exceeded the standard of Bangladesh (Noise Pollution Control Rules, 2006). It has been recommended to close the doors and windows of the administration building or other official or residential areas for all time to avoid the inside noise level.

5.1.4 Leak Detection

The pipeline route has been continuously observed by the EHS cell for identifying any leakage or disturbance. During this year regularly and continuously observations have been conducted for better safety and security. In this report, leak detection data from February 2023-January 2024 were available. There has been no leak detected in this current monitoring period. The detailed leak detection data are presented in **Annex E** for more clarification.

5.1.5 Meteorological Data

To conceptualize the physical environmental condition of the study area, meteorological data of that area was collected; mainly from the Bangladesh Meteorological Department (BMD) which were synchronized from the nearest stations of Tangail. The summary of the analysis of the meteorological parameters is discussed in the following Table 5-6.

Table 5-6: Meteorological Data of the Project Site from January 2023 to December 2023

Sl. No.	Period	Temperature (°C)			Rain Fall (mm)	Rain Days	Win Speed (km/h)				Average Pressure (mb)	Humidity (%)	Average UV Index
		Max	Min	Average			Max Wind	Average Gust	Average Wind	Direction			
1.	Jan. 2023	25	15	20	6	1	12.8	15	8.8	SW	1014	51	3
2.	Feb. 2023	28	17	22.5	19.5	2	12.6	15.1	8.4	SWS	1011.9	54	5
3.	Mar. 2023	32	21	26.5	50.5	4	21.1	17.9	10.3	N	1008.4	48	7
4.	Apr. 2023	34	25	29.5	164.5	11	18.8	18.8	11.2	N	1005.2	56	6
5.	May 2023	34	26	30	365.3	19	20.5	20.9	12.9	NE	1002.7	66	8
6.	Jun. 2023	33	27	30	440.3	22	23.3	27.6	17.3	NE	989.4	70	6
7.	Jul. 2023	32	27	29.5	390.6	25	20	24.4	15.1	NN	993.6	65	5
8.	Aug. 2023	32	27	29.5	409.6	24	18.4	21.7	12.9	NN	1000.9	77	6
9.	Sept. 2023	32	26	29	322.4	20	20.8	22.7	14.7	EN	1003.8	73	7
10.	Oct. 2023	31	24	27.5	168.2	10	16.3	16.5	11.1	SW	1008	72	5
11.	Nov. 2023	29	20	24.5	9.9	1	13.7	14.5	9.3	WS	1011.7	60	5

Sl. No.	Period	Temperature (°C)			Rain Fall (mm)	Rain Days	Win Speed (km/h)				Average Pressure (mb)	Humidity (%)	Average UV Index
		Max	Min	Average			Max Wind	Average Gust	Average Wind	Direction			
12.	Dec. 2023	26	17	21.5	11.8	1	13.5	15.5	9.1	SW	1013.6	54	5

Sources: BMD and World Weather Online

Besides, from the CEMS data, meteorological data has also been observed. The meteorological data is also obtained from the CEMS data during the monitoring period. The detailed meteorological data is attached in **Annex F**.

5.1.5.1 Temperature

Bogura and Tangail are the two nearest BMD stations from the project site. The analysis of the temperature data of last year (January 2023-December 2023), collected from these BMD stations shows that the monthly variation of average maximum temperature for a whole year is between 34°C to 26°C (Figure 5-1).

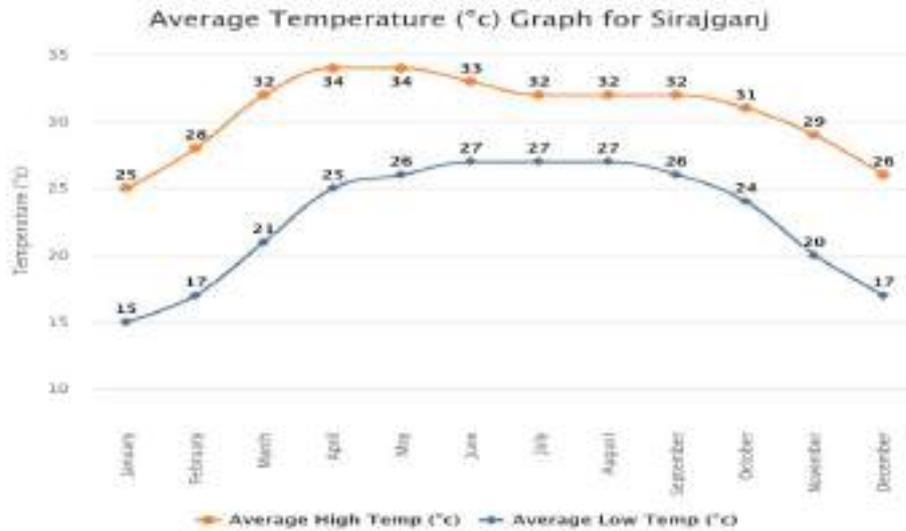


Figure 5-1: Yearly Average Temperature in the Project Area (Sirajganj)

5.1.5.2 Rainfall

Monsoon is a prominent season here. The average monthly rainfall during the monsoon season in Sirajganj is 440.3mm and the lowest rainfall recorded is 6 mm in the dry season (Figure 5-2).

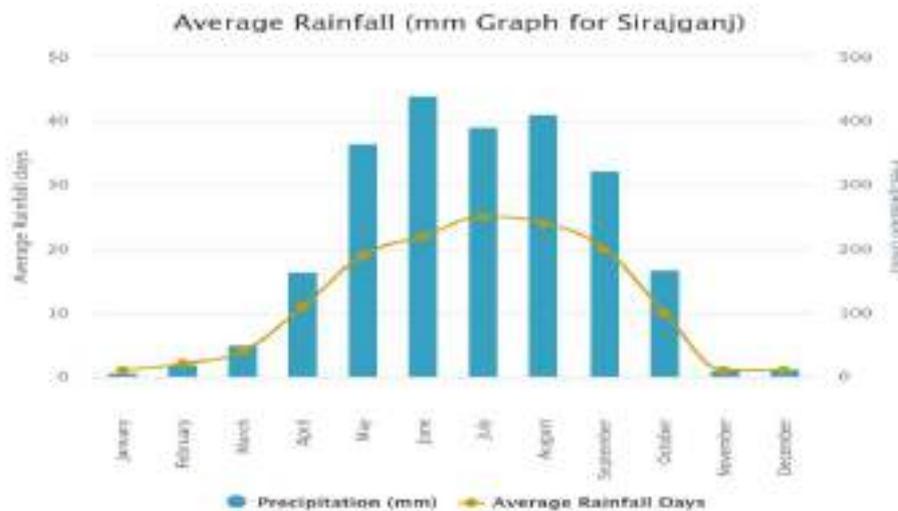


Figure 5-2: Yearly Average Rainfall in the Project Area (Sirajganj)

5.1.5.3 Wind Speed and Direction

The maximum yearly wind speed recorded in June 2023 was 23.3 km/h and the lowest in January 2023 was 12.6 km/h (Figure 5-3).



Figure 5-3: Yearly Wind Speed Pattern in the Project Area (Sirajganj)

The direction of the wind is represented through the wind-rose diagram in the following figure. It can be seen from the figure that the maximum wind direction is NE, SE, and SW (Figure 5-4).

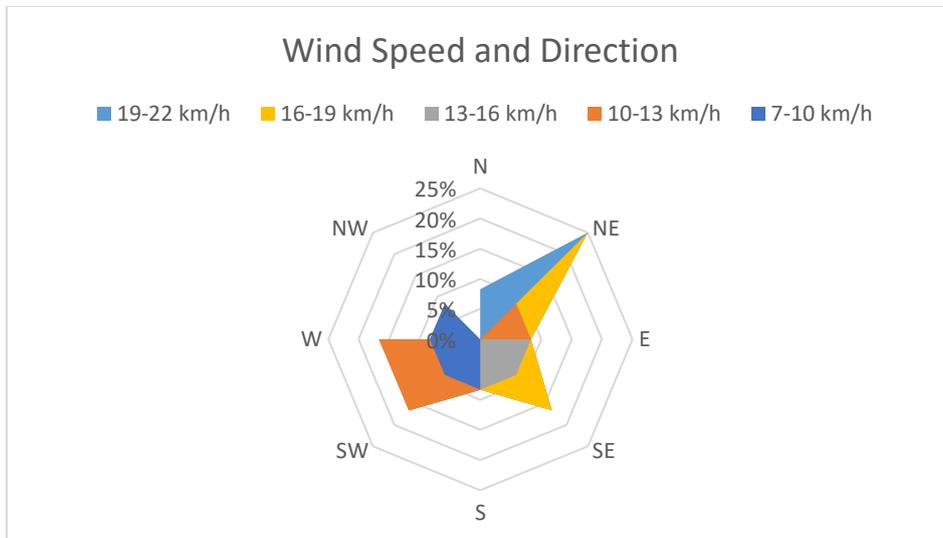


Figure 5-4: Yearly Wind Rose Pattern in the Project Area (Sirajganj)

Besides, the annual average wind pressure is January 2023 as 1013.6 mb and the lowest in June 2023 as 989.4 mb (Figure 5-5).

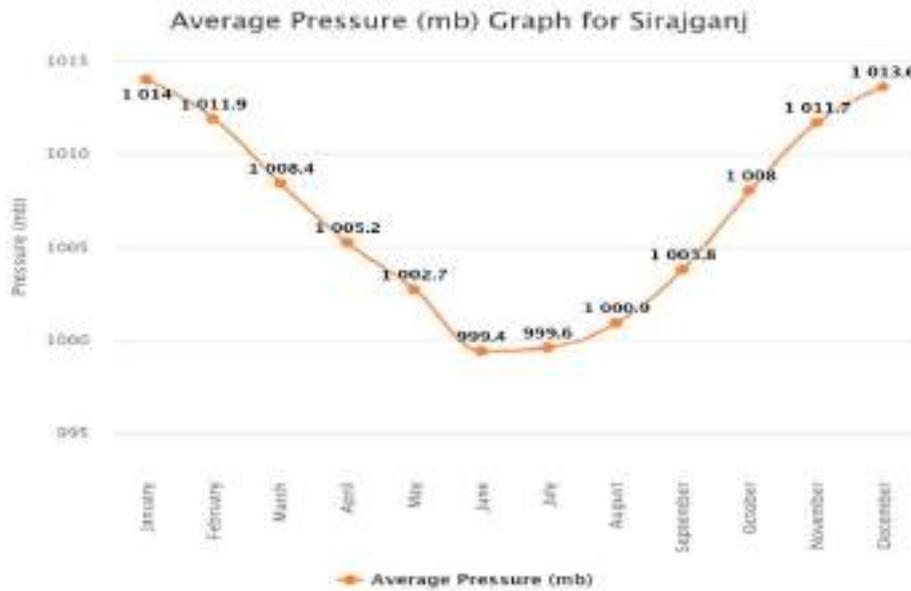


Figure 5-5: Yearly Average Pressure in the Project Area (Sirajganj)

5.1.5.4 Humidity and Cloud Cover

The average highest humidity of the year is shown in July 2023 as 79% and the lowest in February 2023 as 50%. According to the diagram most cloud cover observed in July 2023 as 71% and lowest in February 2023 as 6% (Figure 5-6).

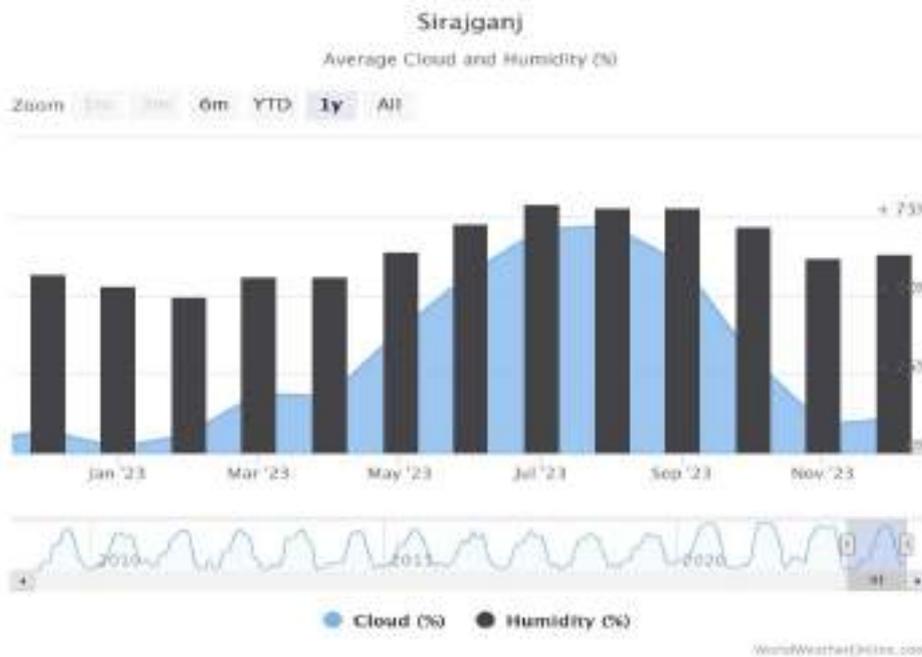


Figure 5-6: Yearly Cloud Cover and Humidity Index in the Project Area (Sirajganj)

5.1.5.5 Sunshine Hours

The average maximum sunshine hour in the project area during the last year was 345.1 hours in December 2023 with 30 sunny days. (Figure 5-7).

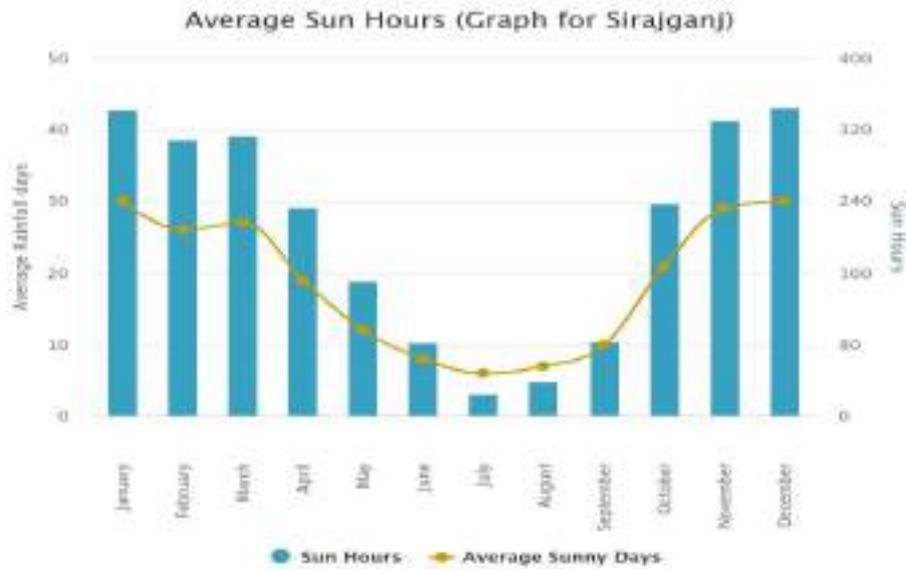


Figure 5-7: Yearly Sundays and Sun Hours in the Project Area (Sirajganj)

According to the diagram, most visibility was 9-10 km and the UV index ranged from 5 to 8 in the last monitoring year (Figure 5-8).



Figure 5-8: Yearly Average Visibility and UV Index in the Project Area (Sirajganj)

5.1.6 Wastewater Quality

5.1.6.1 Locations

Wastewater sampling and analysis were undertaken to understand the current condition of the water after being treated in the treatment plant. Every month, one sample has been taken from the last chamber of the warehouse from where the water was ready to discharge. The details of wastewater sampling have given in Table 5-7. Monitoring photographs from February 2023 to January 2024 are attached in **Annex B-5**.

Table 5-7: Details of Wastewater Sampling Locations

Sl. No.	Code	Location	GPS Coordinate	Source	Time	Date
1.	WW1	Effluent Discharge Channel	24°23'4.05"N 89°44'46.91"E	Last Point of Warehouse	09:42 AM	16.03.2023
					09:22 AM	17.04.2023
					09:32 AM	21.06.2023
					10:04 AM	20.07.2023
					09:46 AM	20.09.2023
					09:41 AM	23.10.2023
					09:09 AM	24.12.2023
					09:15 AM	04.01.2024

Source: Annual site visit of ELRC monitoring team in February 2023-January 2024

5.1.6.2 Results and Discussion

In all the months from February 2023 to January 2024, wastewater has been tested for determining the chemical, physical and biological parameters in the plant area. All the tested data has also been compared with the standard and depicted in the following Table 5-8.

Table 5-8: Wastewater Quality Analysis Result

Sl. No.	Parameter	Unit	Concentration								*Standard
			March 2023	April 2023	June 2023	July 2023	September 2023	October 2023	December 2023	January 2024	
1.	Temperature	°C	29.0	29.0	25.0	25.5	25.6	25.9	24.8	24.7	<5oC than the surface water temperature

Sl. No.	Parameter	Unit	Concentration								*Standard
			March 2023	April 2023	June 2023	July 2023	September 2023	October 2023	December 2023	January 2024	
2.	Dissolved Oxygen (DO)	mg/l	4.7	4.5	5.2	5.4	5.4	5.6	5.7	5.3	-
3.	pH	-	6.1	6.7	6.4	6.7	6.7	6.8	6.8	6.6	6-9
4.	Total Coliform (TC)	N/100ml	25	27	16	23	17	24	20	22	-
5.	Fecal Coliform (FC)	N/100ml	11	12	12	07	14	11	15	13	-
6.	Total Nitrogen (N)	mg/l	14.1	14.4	12.6	13.2	11.7	13.1	12.8	14.2	-
7.	Total Phosphorus (P)	mg/l	3.3	3.4	2.8	3.1	2.9	3	3.0	3.4	8
8.	Arsenic (As)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.2
9.	Zinc (Zn)	mg/l	0.8	0.9	1.2	1.8	1.3	1.9	1.4	1.8	5
10.	Chromium (Cr)	mg/l	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.5
11.	Copper (Cu)	mg/l	0.05	0.05	0.04	0.02	0.05	0.03	0.06	0.04	3
12.	Electrical Conductivity	µs/cm	400	410	430	280	435	286	470	240	-
13.	Oil and Grease	mg/l	3.14	3.14	3.17	4.56	4.17	4.84	4.83	4.32	10
14.	Total Residual Chlorine	mg/l	0.05	0.05	0.05	0.05	0.06	0.04	0.08	0.06	1
15.	Total Suspended Solid (TSS)	mg/l	44	45	43	36	40	38	42	39	100
16.	Total Dissolved Solid (TDS)	mg/l	205	210	220	160	222	156	219	132	-
17.	Chemical Oxygen Demand (COD)	mg/l	46	48	28	23	26	24	22	20	200
18.	Biological Oxygen Demand (BOD)	mg/l	23.7	24.5	25.0	18	27	19	19	21	30

Note: *According to ECR 2023, Schedule 4

As per the proposed guideline, Temperature, Dissolved Oxygen (DO), pH, Total Coliform (TC), Fecal Coliform (FC), Total Nitrogen (N), Total Phosphorus (P), Arsenic (As), Zinc (Zn), Chromium (Cr), Copper (Cu), Electrical Conductivity (EC), Oil and Grease (O & G), Total Residual Chlorine, Total Suspended Solid (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD) has been tested. From the test result of pH, we can see that from February 2023 to January 2024, the pH was within the standard level. Electrical Conductivity was also under standard level this year. The maximum concentration of EC has found in December 2023 which was 470 $\mu\text{s}/\text{cm}$. So, in all the months it was under the standard level. Oil and Grease, Total Residual Cl, TSS, TDS, COD, and BOD were not a big concern as in all the months, the concentrations were under the standard. But it is not a common scenario, the sampling chamber was scheduled to clean within 2 days. So, after cleaning the chamber hopefully, all the concentrations will be under control as previous. We will also closely monitor the scenario year and mention it in the next yearly report.

5.1.7 Storm Water Quality

5.1.7.1 Locations

The stormwater sample has been collected from the combined discharge channel of Units 2, 3, and 4. The sample has been collected for the whole year. A total of one sample in this year has been collected to check the water quality. Details have given in Table 5-9. Monitoring photographs are attached in **Annex B-6**.

Table 5-9: Details of Storm Water Sampling Locations

Sl. No.	Code	Location	GPS Coordinate	Source	Time	Date
1.	StW1	Discharge Point	24°23'1.55"N 89°44'44.11"E	Surface Water Body	10:12 AM	20.05.2023
2.					11:17 AM	22.06.2023
3.					10:40 AM	19.07.2023

Source: Annual site visit of ELRC monitoring team in May, June and July 2023

5.1.7.2 Results and Discussion

In all the months from May, June and July 2023, stormwater has been tested for determining the chemical, physical and biological parameters in the plant area. All the tested data has also been compared with the standard and depicted in the following Table 5-10.

Table 5-10: Storm Water Quality Analysis Result

Sl. No.	Parameter	Unit	Concentration			*Standard
			May 2023	June 2023	July 2023	
1.	Temperature	°C	23.8	24.1	24.9	<5°C than the surface water temperature

Sl. No.	Parameter	Unit	Concentration			*Standard
			May 2023	June 2023	July 2023	
2.	Dissolved Oxygen (DO)	mg/l	7.3	7.4	7.5	-
3.	pH	-	7.7	7.8	7.6	6-9
4.	Total Coliform (TC)	N/100ml	19	21	22	-
5.	Fecal Coliform (FC)	N/100ml	23	17	19	-
6.	Total Nitrogen (N)	mg/l	10.6	9.3	12.7	-
7.	Total Phosphorus (P)	mg/l	2.4	2.0	2.7	8
8.	Arsenic (As)	mg/l	<0.01	<0.01	<0.01	0.2
9.	Zinc (Zn)	mg/l	1.2	1.2	1.3	5
10.	Chromium (Cr)	mg/l	0.03	0.02	0.04	0.5
11.	Copper (Cu)	mg/l	0.02	0.03	0.03	3
12.	Electrical Conductivity (EC)	µs/cm	764	750	736	-
13.	Oil and Grease	mg/l	2.2	2.5	2.3	10
14.	Total Residual Chlorine	mg/l	0.03	0.02	0.04	1
15.	Total Suspended Solid (TSS)	mg/l	75	89	80	100
16.	Total Dissolved Solid (TDS)	mg/l	395	370	402	-
17.	Chemical Oxygen Demand (COD)	mg/l	38	45	40	200
18.	Biological Oxygen Demand (BOD)	mg/l	9.3	10.7	9.9	30

Note: * According to ECR 2023, Schedule 4

The concentration levels of Temperature, Dissolved Oxygen (DO), pH, Total Coliform (TC), Fecal Coliform (FC), Total Nitrogen (N), Total Phosphorus (P), Arsenic (As), Zinc (Zn), Chromium (Cr), Copper (Cu), Electrical Conductivity (EC), Oil and Grease (O & G), Total Residual Chlorine, Total Suspended Solid (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD) for the stormwater were varied from months to months. So, from the test result, we can see that all of the parameters were under the standard level.

5.1.8 Surface Water Quality

5.1.8.1 Locations

Surface water sample has been collected from 50m distance of the outlet. Normally dry and monsoon seasons need to be covered as per the instructions to find out water quality. So, we have taken and tested the water sample in every three months interval for covering the period of monsoon and post-monsoon season. The detail of the sampling has been depicted in Table 5-11. Monitoring photographs from February 2023 to January 2024 are attached in **Annex B-3**.

Table 5-11: Details of Surface Water Sampling Locations

Sl. No.	Code	Location	GPS Coordinate	Source	Time	Date
1.	SW1	50m Downstream from Discharge Point	24°23'1.47"N 89°44'44.65"E	Canal	09:30 AM	17.04.2023
					10:10 AM	21.06.2023
					09:15 AM	23.10.2023
					10:35 AM	24.12.2023

Source: Annual site visit of ELRC monitoring team in February 2023-January 2024

5.1.8.2 Results and Discussion

The surface water of the plant area is analyzed depending on the biological and chemical parameters. All the parameters are compared with the standard level. The following Table 5-12 has been presented the surface water analyzed results with comparing to the standard.

Table 5-12: Surface Water Quality Analysis Result

Sl. No.	Parameter	Unit	February-April 2023	May-July 2023	August-October 2023	Nov. 2023-January 2024	*Standard
1.	pH	-	7.8	7.4	7.7	7.6	6.5 - 8.5
2.	Electrical Conductivity (EC)	µs/cm	600	450	465	470	-
3.	Oil and Grease (O & G)	mg/l	3.4	2.1	2.3	2.2	-
4.	Total Residual Chlorine	mg/l	0.04	0.03	0.02	0.03	-
5.	Total Suspended Solid (TSS)	mg/l	55	68	70	72	-
6.	Total Dissolved Solid (TDS)	mg/l	300	220	228	230	-
7.	Chemical Oxygen Demand (COD)	mg/l	16	11	10	11	-
8.	Biological Oxygen Demand (BOD)	mg/l	2.0	2.0	2.2	2.4	6 or less
9.	Chromium (Cr)	mg/l	<0.01	<0.01	<0.01	<0.01	-
10.	Iron (Fe)	mg/l	0.04	0.03	0.04	0.05	-
11.	Calcium (Ca)	mg/l	95	84	85	90	-
12.	Zinc (Zn)	mg/l	0.02	0.02	0.03	0.04	-

Sl. No.	Parameter	Unit	February-April 2023	May-July 2023	August-October 2023	Nov. 2023-January 2024	*Standard
13.	Lead (Pb)	mg/l	<0.005	<0.005	<0.005	<0.006	-
14.	Cadmium (Cd)	mg/l	0.03	0.03	0.04	0.03	-

Note: * According to ECR 2023, Schedule 2(A), Best Practice based classification (Water Usable for Fisheries)

As per the contract document, pH, EC, Oil and Grease, Total Residual Cl, TSS, TDS, COD, BOD, Cr, Fe, Ca, Zn, Pb, Cd has been tested. There are no surface water parameters exceeding the standard according to ECR 2023, Schedule 2(A).

5.1.9 Ground Water Quality

5.1.9.1 Locations

Groundwater samples were collected for determining the quality of existing sources. Deep tube wells in the plant area were selected as the sources of groundwater. Detail of the sampling location is provided in Table 5-13. Monitoring photographs from February 2023 to January 2024 are attached in **Annex B-4**.

Table 5-13: Details of Ground-Water Sampling Locations

Sl. No.	Code	Location	GPS Coordinate	Source	Time	Date
1.	GW1	Store House	24°23'4.80"N 89°44'50.63"E	Deep Tube Well	11:10 AM	21.04.2023
					10:55 AM	21.06.2023

Source: Annual site visit of ELRC monitoring team in February 2023 - January 2024

5.1.9.2 Results and Discussion

Analysis results of the groundwater are represented in Table 5-14 where the values are compared with the standard limit.

Table 5-14: Ground Water Quality Analysis Result

Sl. No.	Parameter	Unit	February-April 2023	May-July 2023	*Standard
1.	pH	-	7.5	6.6	6.5-8.5
2.	Arsenic (As)	mg/l	<0.001	<0.001	0.05
3.	Total Hardness	mg/l	205.32	367.8	500
4.	Chlorine (Cl)	mg/l	0.22	0.84	-
5.	Fluoride (F)	mg/l	0.23	0.43	1.0
6.	Iron (Fe)	mg/l	0.4	0.71	0.3-1
7.	Manganese (Mn)	mg/l	0.05	0.08	0.4
8.	Phosphate (PO ₄ ³⁻)	mg/l	1.6	3.7	-
9.	Sulphate (SO ₄ ²⁻)	mg/l	113.1	165.4	250

Note: *According to ECR 2023, Schedule 2(B)

According to the tested results of groundwater quality, all the considered parameters were under the standard level during this yearly period. The groundwater quality is quite acceptable for industrial use and drinking purposes.

5.1.10 Ground Water Level

Ground water condition around the plant site is found well. Two specific consultations with DPHE & BADC have been conducted and found that the concerned DPHE & BADC do not experience any depletion of ground water level within the plant site between the years 2023-2024. Also, geographically the area is highly enriched with iron. Though from the testing, we have found limited iron in the ground water sample. Consultation summary has been presented below-

5.1.10.1 Details of Consultation

Name of the Stakeholder	Bangladesh Agricultural Development Corporation	Department of Public Health Engineering
Consulted Person and Designation Details	Sharmistha Sen, Agricultural officer, BADC, Sirajganj	Md. Wali Ullah, Executive Engineer, DPHE, Sirajganj
Contact No.:	01714333491	01714333491
Consulted By	Abdur Rab	Abdur Rab
Designation	Consultant, ELRC	Consultant, ELRC
Date	24.12.2023	24.12.2023
Time	10:15 AM	03:05 PM

5.1.10.2 Discussion

Concerned Issues	Discussions
Ground Water Condition Around the Power Plant	The overall quality is good. Iron problem found in the groundwater around the power plant
DTW Depth	138-295 ft
STW Depth	30-35 ft
DTW Installation Cost	No recent installation has been incurred by DPHE
STW Installation Cost	2000 BDT per feet
Observation Well near the Plant	There is no observation well near the plant site
Ground Water Level Related Complaints	There are no complaints yet from the local people regarding ground water level
Observation Well near Plant Site	There is no observation well near the plant site
Remarks	Need Deep Tube-well Installation (within WAPDA area)

5.1.10.3 Photographs



Photo 5-1: Consultation with DPHE Personnel Twice in the Year**5.1.11 Ground Water Scarcity**

Focus group discussion has been conducted several times around the plant area among the local community and agriculture farmers for finding any ground water scarcity-related issues. Local agriculture farmers and the community confirmed that they haven't experienced any ground water scarcity during the last irrigation period. Farmers usually use shallow tube well for irrigation and it costs 4500 BDT per Bigha (33 decimal). They also confirmed that this irrigation cost remains unchanged compared to the past five years.

5.1.11.1 Details of Consultation

Name of the Stakeholder	Farmers Community, Boroshimul and Ponchosona Village, Soydabad, Sirajganj	Local Community, Boroshimul and Ponchosona Village, Soydabad, Sirajganj
Consulted By	Syed Galib Shah	Syed Galib Shah
Designation	Consultant, ELRC	Consultant, ELRC
Date	24 December 2023	24 December 2023
Time	10:00 AM	11:30 AM

5.1.11.2 Discussion

Concerned Issues	Discussions
Faced Any Ground Water Level Problem	Not Yet. Unchanged as Past Five Years
Ground Water Availability in Cropping Seasons	Available
Boring Layer of Shallow Tube Well	40-50 ft
Cost of Boring Well	1500-2000 BDT for 1 ft
Alternative Irrigation System	Surface Water Based Irrigation but Rare
Household Use Pattern of Water	Ground Water (Hand Tube Well)
Scarcity During Dry Season	No. Easily Accessible.

5.1.11.3 Participant Details

Sl. No.	Name	Profession	Age	Locations
Agriculture Farmers				
1.	Abdul Halim	Farmer	45	Boroshimul Village
2.	Md. Rashid Molla	Farmer	43	Boroshimul Village
3.	Md. Khalek Shikder	Farmer	36	Boroshimul Village
4.	Shah Aman Ullah	Farmer	29	Boroshimul Village
5.	Md. Selim Mia	Farmer	52	Ponchosona Village
6.	Md. Khalilur Rahman	Farmer	25	Ponchosona Village
7.	Md. Babu Sheikh	Farmer	43	Ponchosona Village
8.	Sorab Haque	Farmer	40	Ponchosona Village
Local Community				
9.	Sakib Mia	Business	44	Punorbashon Village
10.	Rahim Molla	Business	32	Boroshimul Village

Sl. No.	Name	Profession	Age	Locations
11.	Kader Molla	Day Labour	52	Punorbashon Village
12.	Hiron Ali	Farmer	46	Punorbashon Village
13.	Rashid Sheikh	Service	31	Boroshimul Village
14.	Nazrul Islam	Student	26	Punorbashon Village
15.	Sayed Ali	Business	39	Ponchosona Village

5.1.11.4 Photographs



Photo 5-2: Focus Group Discussion

5.1.12 Soil Quality

5.1.12.1 Locations

Soil samples have been collected from the surroundings of the plant boundary. Specific three locations have been considered to collect the soil sample during this yearly monitoring period. The detail of the sampling has been depicted in Table 5-15. Monitoring photographs from February 2023 to January 2024 are attached in Annex B-10.

Table 5-15: Details of Soil Sampling Locations

Sl. No.	Code	Location	GPS Coordinate	Source	Time	Date
1.	SQ1	Southeast Boundary (Behind Army Camp)	24°23'2.07"N 89°44'51.98"E	Plant Adjacent Open Soil	11:25 AM	20.07.2023
2.	SQ2	Northeast Boundary (Behind Residential Area)	24°23'16.02"N 89°44'50.95"E		11:50 AM	20.07.2023
3.	SQ3	Northern Boundary (Behind PGCL Switching Station)	24°23'15.95"N 89°44'43.69"E		01:53 PM	20.07.2023

Source: Annual site visit of ELRC monitoring team in February 2023-January 2024

5.1.12.2 Results and Discussion

The following Table 5-16 has been presented the soil analyzed results.

Table 5-16: Soil Quality Analysis Result

Sl. No.	Parameter	Unit	Concentration		
			SQ1	SQ2	SQ3
1.	Electrical Conductivity (EC)	dS/m	1.6	1.4	1.7

Sl. No.	Parameter	Unit	Concentration		
			S01	S02	S03
2.	Bulk Density	g/cm ³	1.48	1.53	1.61
3.	pH	-	7.4	7.5	7.4
4.	Organic Content	%	0.42	0.40	0.38
5.	Calcium (Ca)	mg/kg	4.6	3.2	3.5
6.	Magnesium (Mg)	mg/kg	3.4	3.0	2.4
7.	Potassium (K)	mg/kg	0.06	0.08	0.07
8.	Sodium (Na)	mq/100g	1.03	1.02	0.87
9.	Nitrogen (N)	mg/kg	0.02	0.03	0.01
10.	Phosphorus (P)	mg/kg	1.5	1.1	1.5
11.	Sulphur (S)	mg/kg	24.2	21.4	18.3
12.	Boron (B)	mg/kg	0.06	0.04	0.08
13.	Copper (Cu)	mg/kg	2.3	1.8	2.1
14.	Iron (Fe)	mg/kg	23.0	21.2	19.6
15.	Manganese (Mn)	mg/kg	19.2	17.1	19.1
16.	Zinc (Zn0)	mg/kg	1.6	1.2	1.3
17.	Lead (Pb)	mg/kg	9.4	5.4	7.1
18.	Cadmium (Cd)	mg/kg	0.04	0.03	0.03
19.	Arsenic (As)	mg/kg	0.12	0.10	0.15
20.	Mercury (Hg)	mg/kg	0.06	0.05	0.06

There has no standard been initiated from the GoB in Bangladesh but according to the EIA report, all the parameters are considered as non-polluted. Besides, there has been no contamination observed during the monitoring period according to visual observation. So, according to the visual inspection and parameter test, the soil quality is quite safe from contamination.

5.2 Waste Generation and Management

The ELRC team visited the location and noted the waste generation and management problems according to the EMP. As both Unit 2 and Unit 3 sites are adjacent and have no median boundary between them, the management activities are common for both units. But it has been managed by separate manpower which has been distributed equally. The plan was developed using EIA mitigation measure recommendations to reduce and/or eliminate any potential negative environmental and social consequences of the power plant. For the handling of wastes, there are several bins for various types of waste on or near the plant site. The waste container comes in several colors to accommodate the various waste materials. Everywhere the bins are available for storing the garbage, including at offices, homes, inside road networks, industrial sites, etc. The water treatment facility has no sludge. Our staff has been going there every month with a member of the HSE team. In the vicinity of the facility, several waste kinds have been discovered, and the proponent has also kept records on them. Specific wastes management has been explained in Table 5-17.

Table 5-17: Wastes Generation and Management of the Power Plant Premises

Sl. No	Types of Wastes	Waste Generation	Handling, Storage, and Management	Disposal
1.	Non-Hazardous Solid Wastes (Domestic Wastes)	<ul style="list-style-type: none"> The canteen, kitchen, and residential portion of the power plant site typically produce domestic waste. 	<ul style="list-style-type: none"> Domestic wastes from the allocated area have been gathered by competent staff for storage and later processing; they have been separated from the primary source by providing an adequate waste bin with proper labeling. 	<ul style="list-style-type: none"> It has been dumped at the government-designated dumping yard after being collected from the power plant vicinity. Several of them are also utilized for growing plants.
				N/A
		Photo 5-3: The Generation Area of Domestic Wastes	Photo 5-4: Waste Bin for Collecting and Storing Organic Wastes	Photo 5-5: Dumping into the Government Approved Designated Area

Sl. No	Types of Wastes	Waste Generation	Handling, Storage, and Management	Disposal
	(General Wastes)	<ul style="list-style-type: none"> General wastes are usually generated from the office area, accommodation area, machinery, etc. 	<ul style="list-style-type: none"> Initially, general wastes are preserved in a waste bin with appropriate labeling. Then, the wastes are collected by responsible personnel for storage and further processing. 	<ul style="list-style-type: none"> Non-hazardous and disposal general wastes have been dumped into the authorized dumping area of the power plant. General wastes are also sometimes sold to a third party.
				
		<p>Photo 5-6: Waste Bin for Primary Segregation of the General Wastes</p>	<p>Photo 5-7: Storage and Accumulation for Transportation</p>	<p>Photo 5-8: Designated Dumping Yard</p>
2.	Generation of Hazardous Solid Wastes	<ul style="list-style-type: none"> Hazardous solid waste is produced in the labs, warehouse, mechanical repair shop, and machinery area, among other places. The initial step of waste creation involves the separation of hazardous solid wastes. 	<ul style="list-style-type: none"> A temporary collection of preliminary wastes has been made in a location for transportation to the specified disposal site. When treating hazardous materials, strict precautions have been used. 	<ul style="list-style-type: none"> Hazardous solid wastes are stored with the proper labeling in a well-protected preservation area. Only designated personnel with proper training have been handled the hazardous wastes in the power plant.

Sl. No	Types of Wastes	Waste Generation	Handling, Storage, and Management	Disposal
		 <p>Photo 5-9: Hazardous Solid Wastes Segregation at the Source</p>	 <p>Photo 5-10: Primary Accumulation Area</p>	 <p>Photo 5-11: Designated Area for Preserving Hazardous Wastes to Further Processing</p>
3.	<p>Generatio n of Hazardous Liquid Wastes and Sludge</p>	<ul style="list-style-type: none"> ▪ Hazardous liquid wastes generated by the workshop, different types of machinery, the maintenance area, chemical leaching, fuel leaching, and so on. ▪ There have been no hazardous liquid wastes observed during the last year monitoring period ▪ This year, there has been no sludge created by the treatment facility. 	<ul style="list-style-type: none"> ▪ In the power plant, all hazardous liquids (chemicals, fuels, grease, mobil, etc.) are originally stored in a sealed container and a separate closed bin. ▪ Strict cautions have been maintained during the handling of hazardous materials. 	<ul style="list-style-type: none"> ▪ The sealed container, empty chemical drums, and other hazardous materials were stored in a concrete-floored suitable shade area for future processing and disposal.

Sl. No	Types of Wastes	Waste Generation	Handling, Storage, and Management	Disposal
		<p style="text-align: center;">N/A</p>	 <p style="text-align: center;">Photo 5-12: Absence of Hazardous Liquid Wastes</p>	 <p style="text-align: center;">Photo 5-13: Sealed Container Placement</p>

5.3 Ecosystem and Biodiversity

5.3.1 General Description

The study area is located at Saidabad Union of Sirajganj Sadar Upazila under the Sirajganj district of Bangladesh. This area is dominated by homestead vegetation, roadside plantation, and some forest tree species that occurred at the Bangabandhu Bridge Eco Park. Vegetation attributes and plant health, noise disturbance to wildlife, and fish diversity and composition were studied, and necessary field survey was conducted to know the current status of the ecosystem and biodiversity of the study area, and the impact of the power plant on its adjacent ecosystem and biodiversity. This study included quadrat sampling at 8 locations for monitoring of plant health, faunal survey and noise recording at same locations to monitor disturbance to wildlife, and boat to boat survey, market survey, stakeholder consultation, etc. for monitoring of capture and culture fisheries diversity and composition. A field study was conducted by ELRC Ecology Team for yearly monitoring of the parameters in October 2023.

5.3.2 Objectives of the Study

The objectives of monitoring of ecosystem and biodiversity are as follows -

- Assessing the vegetation attributes, ecosystem health status and plant disease infection inside the study area and adjacent vegetation areas;
- Checking noise disturbance on wildlife and changes in their behavior at study locations;
- Assessing capture and culture fisheries diversity and composition.

5.3.3 Limitation of the Study

- It is difficult to compare the plant growth with baseline data due to the unavailability of adequate baseline information;
- All these works require extensive and long-period fieldwork to get proper information;
- Assessment of noise disturbance on wildlife requires systematic fieldwork for an extensive period to get good information.

5.3.4 Plant Health

Plant health was assessed through quadrat sample plots at 8 locations in and around the Power Plant, Boroshimul Village, and Eco Park areas as specified in the EIA study. A 25 m x 25 m sample plot was taken to observe vegetation attributes and plant health parameters. The 8 quadrat sample plots were taken as follows: 2 quadrates inside the power plant, 1 quadrat at the close proximity to the power plant, 2 quadrates at Baroshimul village, 2 quadrates near the forest office of the Eco Park and 1 quadrat at the northern boundary of the Eco Park **Figure 5-9**. It was not feasible to take 2 quadrates inside the power plant due to insufficient space for plotting the quadrates. For this reason, one quadrat was considered within 50 m of the southern boundary of the power plant.

Figure 5-9: Map showing the locations of quadrat sample plots

For monitoring of plant health, a set of parameters were selected to assess and record the information of those vegetation attributes. The team identified and recorded all the species present in each quadrat, measured tree height, canopy coverage and girth/circumference at breast height (GBH) for trees with GBH > 10 cm, and recorded trees with disease or wound through visual observation in each quadrat. GPS positions of all 8 quadrats were also recorded. Plant health was assessed by following criteria and categorized as excellent, good and poor.

- **Trunk (or bole):** Healthy trees have a straight and long trunk that keeps and maintains their strength and form.
- **Evidence of new growth:** Trees produce new growth every year that become evident through new shoots, increased tree height and diameter.
- **Full branches:** A healthy tree does not have dead or broken branches.
- **Strong bark:** Healthy trees are absent of loose or peeling bark on the trunk and branches.
- **Healthy leaves:** Abundant number of leaves in proper colour, shape, and size according to the season are a good indicator of a healthy plant.

Figure 5-10: Field activities of plant health monitoring in and around the project area

Source: ELRC Study Team, October 2023

Assessing trees with the disease requires extensive field visits. The ecology team visually observed for following characteristics in each quadrat to record trees with diseases/unhealthy trees.

- Cavities, cracks, and holes in the trunk or limbs;
- Wilting;
- Bare patches;
- Broken or leaf-free branches;
- Abnormal leaf colour, shape, and size;
- Holes in leaves;
- Visible insects or insect evidence;
- Disease evidence;
- Fungus growth;
- Oozing sap.

5.3.5 Plant Growth and Canopy Coverage

The average DBH (diameter at breast height) inside the power plant and at the close proximity of the power plant were 10.66 cm and 24.9 cm respectively. Fruiting trees like Mango (*Mangifera indica*), Guava

(*Psidium guajava*), Lychee (*Litchi chinensis*), Papaya (*Carica papaya*) etc. are abundant inside the power plant whereas adjacent plantations are mainly composed of Eucalyptus (*Eucalyptus camaldulensis*) trees. However, high species richness composed of different timber, fuelwood and medicinal plants was observed in Boroshimul Village and Eco park areas. Also, the Jhau (*Casuarina equisetifolia*) plantation was observed beside the railways near the Eco park. The average DBH measured at Boroshimul Village and Eco Park were 32.45 cm and 24.72 cm respectively. There are no tree species of conservation significance found in the study locations. The growth and health of trees inside the power plant and at all study locations outside the power plant were assessed to be excellent (**Table 5-18**).

Table 5-18: Vegetation attributes of sampled quadrates in the study area

Quadrate Number	Quadrate Name	Average GBH (cm)	Average DBH (cm)	Canopy Coverage (%)	Health
Q 1	CMC inside power plant	33.5	10.66	30	Excellent
Q 2	Residential Area inside the power plant	44.76	14.25	70	Excellent
Q 3	Near to the power plant	78.28	24.9	55	Excellent
Q 4	Boroshimul Village 1	98.6	31.4	60	Excellent
Q 5	Boroshimul Village 2	105.34	33.5	65	Excellent
Q 6	Near Forest Office 1 of Eco Park	76.75	24.43	75	Excellent
Q 7	Near Forest Office 2 of Eco Park	82.36	26.2	80	Excellent
Q 8	The northern end of Eco Park	70.76	22.521	70	Excellent

Source: ELRC Field Survey, October 2023

5.3.6 Plant Diseases

Health and disease infection status of all the quadrates were likely to be excellent. Very few tree species were traced to be infected at the quadrates of inside the power plant and Boroshimul village due to fungal, insect or other infections which are not possibly occurred because of the power plant.

The following measures will be taken to mitigate the observed plant diseases in the study area -

- For Mechanical Control - Cut the infected parts of the plants and burn them to get rid of the pathogens.
- For Chemical Control - Consult with the Upazila Agricultural Officer, Sirajganj Sadar Upazila, and apply the suggested pesticides and insecticides in the prescribed manner.

Figure 5-11: Disease-infected trees observed in and around the power plant

	
<p>Coconut tree (<i>Cocos nucifera</i>)</p>	<p>Pomelo (<i>Citrus maxima</i>)</p>
	
<p>Guava (<i>Psidium guajava</i>)</p>	<p>Mango tree (<i>Mangifera indica</i>)</p>

Source: ELRC Field Survey, October 2023

5.3.7 Fruit Productivity

During the monitoring period, the Ecology Team conducted a visual assessment of fruit production within the power plant, yielding outstanding results. In the residential area, a noticeable abundance of various fruits, including Mango, Banana, Guava, Papaya, Coconut, and Sapodilla, was observed.

Figure 5-12: Fruit Production observed inside the power plant

		
<p>Guava (<i>Psidium guajava</i>)</p>	<p>Mango (<i>Mangifera indica</i>)</p>	<p>Papaya (<i>Carica papaya</i>)</p>

Source: ELRC Field Survey, October 2023

5.3.8 Disturbance to Wildlife

Disturbance of noise on wildlife behavior was observed by the presence of wildlife species with a special focus on birds of various type and their behavior as foraging, ranging, nesting, and aggregatory. The noise level was measured at each point by a noise meter to relate the presence of wildlife as well as abnormal behavior according to the method of scan sampling methods³.

5.3.9 Wildlife Behavior to Noise

The study area is primarily dominated by various bird species. During the field visit, a total of 38 bird species from 24 families were identified. (Table 5-20 and Figure 5-13). Behavioral observations were conducted not only through quadrat sampling plots but also by recording sound intensity at various points. Disturbances were noted by observing behaviors such as foraging, resting, ranging, roosting, and playing among different animals, particularly birds. The presence and expression of normal behavior suggested a very low impact of noise disturbance on birds.

The ELRC study team recorded noise levels at all quadrat locations. The study found that the noise level in Boroshimul village was below 45 dB, which is under the tolerance limit for birds (Although the noise level inside the power plant exceeded 55 dB, species such as Jungle Myna (*Acridotheres fuscus*), Oriental Magpie Robin (*Copsychus saularis*), Spotted Dove (*Streptopelia chinensis*), and Common Myna (*Acridotheres tristis* among others, were commonly observed spending their resting and foraging time around the power plant area. This observation suggests that these bird species were highly adapted to noise disturbances from the power plant. Additionally, due to the construction of the Bangabandhu Rail Bridge near the Eco park, the noise level has risen to more than 45 dB during the daytime, but the bird abundance was higher in this area.

Observations of bird behavior, including foraging, resting, flying, ranging, and aggregation, as well as the presence of terrestrial fauna, indicated that the impact of noise on wildlife behavioral change is minimal within the power plant and absent at the study location.

Table 5-19: Noise level measured at the study area

Quadrat Name	Noise Level (dB)	
CMC inside power plant	55-65	Very lower-level behavioral change may happen without the major behavioral changes was not observed in the field
Residential Area inside power plant	50-55	Any behavioral changes were not observed in the field
Close proximity at the corner power plant	55-60	Any behavioral changes were not observed in the field
Boroshimul Village 1	40-45	Any behavioral changes were not observed in the field

³ Altmann, J. 1974. Observational study of behavior: sampling methods. *Behaviour*, 49: 227-267.

Boroshimul Village 2	40-45	Any behavioral changes were not observed in the field
Northern end of Eco Park	45-50	Any behavioral changes were not observed in the field

Figure 5-13: Observed bird species at the study area

		
Rufous Treepie (<i>Dendrocitta vagabunda</i>)	Black-rumped flameback (<i>Dinopium benghalense</i>)	Fulvous-breasted Woodpecker (<i>Dendrocopos macei</i>)
		
White Wagtail (<i>Motacilla alba</i>)	Jungle Babbler (<i>Argya striata</i>)	White-throated Kingfisher (<i>Halcyon smyrnensis</i>)
		
Streak-throated Woodpecker (<i>Picus xanthopygaeus</i>)	Blue-throated Barbet (<i>Psilopogon asiaticus</i>)	Spotted Dove (<i>Streptopelia chinensis</i>)
		
Indian Pond Heron (<i>Ardeola grayii</i>)	Cinereous Tit (<i>Parus cinereus</i>)	Little Cormorant (<i>Microcarbo niger</i>)
		

Black Kite (<i>Milvus migrans</i>)	Bank Myna (<i>Acridotheres ginginianus</i>)	Common Myna (<i>Acridotheres tristis</i>)
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Source: ELRC Study Team, October 2023

Table 5-20: Observed bird species at the study area

Sl. No.	Common Name	Scientific Name	Local Name	Family	IUCN Local Status*
1	Asian Koel	<i>Eudynamys scolopaces</i>	Kokil, koel	Cuculidae	LC
2	Asian palm swift	<i>Cypsiurus balasiensis</i>	Ashio Talbatashi	Apodidae	LC
3	Asian Pied Starling	<i>Sturnus contra</i>	Go shalik	Sturnidae	LC
4	Bank Myna	<i>Acridotheres ginginianus</i>	Gaang Shalik	Sturnidae	LC
5	Black Drongo	<i>Dicrurus macrocercus</i>	Kala Fingey	Dicruridae	LC
6	Black kite	<i>Milvus migrans</i>	Bhubon chil	Accipitridae	LC
7	Black-hooded Oriole	<i>Oriolus xanthornus</i>	Kalamatha Benebou	Oriolidae	LC
8	Black-rumped Flameback	<i>Dinopium benghalense</i>	Halde Pakhi	Picidae	LC
9	Black-winged Cuckooshrike	<i>Coracina melaschistos</i>	Kalapakh Kabashi	Campephagi dae	LC
10	Blue-throated Barbet	<i>Psilopogon asiatica</i>	Neelgola Basantha	Megalaimida e	LC
11	Brown Shrike	<i>Lanius cristatus</i>	Khoira Latora	Laniidae	LC
12	Cattle Egret	<i>Bubulcus ibis</i>	Go-Boga	Ardidae	LC
13	Chestnut-tailed Starling	<i>Sturnia malabarica</i>	Shonkho Shalik	Sturnidae	LC
14	Cinereous Tit	<i>Parus cinereus</i>	Boro Tit	Paridae	LC
15	Common Kingfisher	<i>Alcedo atthis</i>	Pati Machranga	Alcedinidae	LC
16	Common Myna	<i>Acridotheres tristis</i>	Shalik/Bhat Shalik	Sturnidae	LC
17	Common Tailorbird	<i>Orthotomus sutorius</i>	Tuntuni	Cisticolidae	LC
18	Coppersmith Barbet	<i>Psilopogon haemacephalus</i>	Boshonto Bouri	Megalaimida e	LC

Sl. No.	Common Name	Scientific Name	Local Name	Family	IUCN Local Status*
19	Eurasian Collared-Dove	<i>Streptopelia decaocta</i>	Eurasian Konthi Ghugu	Columbidae	LC
20	Fulvous-breasted woodpecker	<i>Dendrocopos macei</i>	Batabi Kathkurali	Picidae	LC
21	House Crow	<i>Corvus splendens</i>	Pati Kak	Corvidae	LC
22	House Sparrow	<i>Passer domesticus</i>	Pati choro	Passeridae	LC
23	Indian Pond Heron	<i>Ardeola grayii</i>	Deshi Kanibok	Ardeidae	LC
24	Jungle Babbler	<i>Turdoides striata</i>	Bon Chatare	Locustellidae	LC
25	Jungle Myna	<i>Acridotheres fuscus</i>	Jhuti Shalik	Sturnidae	LC
26	Large-billed Crow	<i>Corvus macrorhynchos</i>	Dar kak	Corvidae	LC
27	Lineated Barbet	<i>Psilopogon lineatus</i>	Dagi Basantabouri	Megalaimidae	LC
28	Little Cormorant	<i>Microcarbo niger</i>	Choto Pankouri	Phalacrocoracidae	LC
29	Long-tailed Shrike	<i>Lanius schach</i>	Lenja Latora	Laniidae	LC
30	Oriental Magpie Robin	<i>Copsychus saularis</i>	Doel	Muscicapidae	LC
31	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Bangla bulbul	Pycnonotidae	LC
32	Rufous Treepie	<i>Dendrocitta vagabunda</i>	Khoira Harichacha	Corvidae	LC
33	Small Minivet	<i>Pericrocotus cinnamomeus</i>	Choto Saheli	Campephagidae	LC
34	Spotted Dove	<i>Streptopelia chinensis</i>	Tila Ghughu	Columbidae	LC
35	Streak-throated Woodpecker	<i>Picus xanthopygaeus</i>	Dagigola Kathkurali	Picidae	LC
36	White Wagtail	<i>Motacilla alba</i>	Dhola Khonjon	Motacillidae	LC
37	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	Dholagola Maachranga	Halcyonidae	LC
38	Yellow-footed Green Pigeon	<i>Treron phoenicopterus</i>	Holdeypa Harial	Columbidae	LC

Source: ELRC Study Team, October 2023

5.3.10 Fish Diversity and Composition

5.3.10.1 Capture Fisheries

A total of 42 species of fish were recorded under 24 families. Cyprinidae was recorded as dominant family comprising (7 species), followed by Bagridae (4 species), Channidae and Mastacembelidae (3 species respectively) (Table 5-21). Two species of crustacean were also recorded during the capture fish study period. Observed fish and crustaceans during the study period are presented **Figure 5-14**. According to IUCN (2015), Baghair (*Bagarius bagarius*) is categorized as Critically Endangered (CR), two (02) species as Endangered (EN) One as Vulnerable (VU), two (02) as Near Threatened (NT) and the rest of the species as Least Concern (LC) in nature.

Figure 5-14: Observed fish and crustaceans in the study period

		
Cenia (<i>Gagata cenia</i>)	Kani Pabda (<i>Ompok bimaculatus</i>)	Rani Mach (<i>Botia dario</i>)
		
Kajuli (<i>Ailia coila</i>)	Khorsula (<i>Rhinomugil corsula</i>)	Tatkini (<i>Cirrhinus reba</i>)
		
Rita (<i>Rita rita</i>)	Bele (<i>Glossogobius giuris</i>)	Baghair (<i>Bagarius bagarius</i>)
		
Gulsha Tengra (<i>Gulsha Tengra</i>)	Kankila (<i>Xenentodon cancila</i>)	Tara Baim (<i>Macragnathus aculeatus</i>)
		
Sal Baim (<i>Mastacembelus armatus</i>)	Goda Chingri (<i>Macrobrachium rosenbergii</i>)	Goda Icha (<i>Macrobrachium rude</i>)

Source: ELRC Study Team, October 2023

Table 5-21: Observed Fish and Crustacean Species within the Study Area

SI.No.	Local Name	English Name	Scientific Name	Family	Local Status*	Global Status**
1	Ayre	Long-whiskered catfish	<i>Sperata aor</i>	Bagridae	VU	LC
2	Bacha	Bacha	<i>Eutropiichthys vacha</i>	Schilbeidae	LC	LC
3	Baghair	Gangetic Goonch	<i>Bagarius bagarius</i>	Sisoridae	CR	NT
4	Bata	Bata Labeo	<i>Labeo bata</i>	Cyprinidae	LC	LC
5	Bele	Tank Goby	<i>Glossogobius giuris</i>	Gobiidae	LC	LC
6	Boal	Freshwater shark	<i>Wallago attu</i>	Siluridae	VU	NT
7	Catla	Catla	<i>Gibelion catla</i>	Cyprinidae	LC	NE
8	Cenia	Indian Gagata	<i>Gagata cenia</i>	Sisoridae	LC	LC
9	Chala Punti	Swamp Barb	<i>Puntius chola</i>	Cyprinidae	LC	LC
10	Chapila	Indian River Shad	<i>Gudusia chapra</i>	Engraulidae	VU	LC
11	Foli	Bronge Feather-back	<i>Notopterus notopterus</i>	Notopteridae	VU	LC
12	Gajar	Great Snakehead	<i>Channa marulius</i>	Channidae	EN	LC
13	Gol chanda	Indian Glass Perch	<i>Pseudambassis ranga</i>	Ambassidae	LC	LC
14	Guchi Baim	Stripped Spinyeel	<i>Macragnathus pancalus</i>	Mastacembelidae	LC	LC
15	Gulsha Tengra	Day's Mystus	<i>Mystus bleekeri</i>	Bagridae	LC	LC
16	Gutum	Peppered Loach	<i>Lepidocephalichthys guntea</i>	Cobitidae	LC	LC
17	Jat punti	Spotfin swamp barb	<i>Puntius sophore</i>	Cyprinidae	LC	LC
18	Kachki	Ganges River Sprat	<i>Corica soborna</i>	Clupeidae	LC	LC
19	Kaika, Kakila	Freshwater Garfish	<i>Xenentodon cancila</i>	Belonidae	LC	NE

Sl.No.	Local Name	English Name	Scientific Name	Family	Local Status*	Global Status**
20	Kajuli	Gangetic Ailia	<i>Ailia coila</i>	Schilbeidae	LC	NT
21	Kalibaus	Orange Fin Labeo	<i>Labeo calbasu</i>	Cyprinidae	LC	LC
22	Kani Pabda	Butter Catfish	<i>Ompok bimaculatus</i>	Siluridae	EN	NT
23	Khorsula	Corsula Mullet	<i>Rhinomugil corsula</i>	Mugilidae	LC	LC
24	Koi	Climbing Perch	<i>Anabas testudineus</i>	Anabantidae	LC	DD
25	Lal Chanda	Highfin Glassy Perchlet	<i>Parambassis lala</i>	Ambassidae	LC	NE
26	Magur	Walking Catfish	<i>Clarias batrachus</i>	Clariidae	LC	LC
27	Meni	Mottled Nandus	<i>Nandus nandus</i>	Nandidae	NT	LC
28	Mola	Mola Carplet	<i>Amblypharyngodon mola</i>	Cyprinidae	LC	LC
29	Nama Chanda	Elongate Glass-perchlet	<i>Nama Chanda</i>	Ambassidae	LC	LC
30	Pangas	Pungas	<i>Pangasius pangasius</i>	Pangasiidae	EN	LC
31	Phasa	Gangatic Hairfin Anchovy	<i>Setipinna phasa</i>	Engraulidae	LC	LC
32	Rani	Bengal loach	<i>Botia dario</i>	Cobitidae	EN	LC
33	Rita	Rita	<i>Rita rita</i>	Bagridae	EN	LC
34	Rui	Rohu Carp	<i>Labeo rohita</i>	Cyprinidae	LC	LC
35	Sal Baim	Tire-track Spinyeel	<i>Mastacembelus armatus</i>	Mastacembelidae	EN	LC
36	Sar Punti	Olive Barb	<i>Systomus sarana</i>	Cyprinidae	NT	LC
37	Shing	Stinging Catfish	<i>Heteropneustes fossilis</i>	Heteropneustidae	LC	LC
38	Shol	Snakehead Murrel	<i>Channa striatus</i>	Channidae	LC	LC
39	Taki	Spotted Snakehead	<i>Channa punctata</i>	Channidae	LC	LC

Sl.No.	Local Name	English Name	Scientific Name	Family	Local Status*	Global Status**
40	Tara Baim	One-stripe Spinyeel	<i>Macrornathus aculeatus</i>	Mastacembelidae	NT	NE
41	Tatkini	Reba	<i>Cirrhinus reba</i>	Cyprinidae	NT	LC
42	Tengra	Asian Striped Catfish	<i>Mystus vittatus</i>	Bagridae	LC	LC
43	Ghoda Icha	Ghoda River Prawn	<i>Macrobrachium dolichodactylus</i>	Palaemonidae	LC	NE
44	Golda Chingri	Giant Freshwater Shrimp	<i>Macrobrachium rosenbergii</i>	Palaemonidae	LC	LC

Source: ELRC Study Team, October 2023

*IUCN Bangladesh. 2015. Red List of Bangladesh Volume 5: Freshwater Fishes; LC=Least Concern, NT= Near Threatened, EN= Endangered, CR= Critically Endangered, DD=Data Deficient, NE= Not Evaluated

**IUCN 2023. The IUCN Red List of Threatened Species. Version 2022-2. (<https://www.iucnredlist.org/>)

5.3.10.2 Fish Diversity Index

Shannon diversity index:

As a measure of diversity, the most popular and widely used is Shannon's diversity index (H). In the Shannon index, p is the proportion (n/N) of the individuals of one particular species found (n) divided by the total number of individuals found (N), ln is the natural log, \sum^n is the sum of the calculations, and S is the number of species.

$$\text{Shannon diversity index (H)} = - \sum_{i=1}^S p_i \ln p_i$$

In the current study Shannon's diversity index (H) = 2.98

Simpson Diversity Index:

Simpson diversity index (λ) were calculated since it is well accepted that all species at a site and across systematic groups contribute equally to its biodiversity. In the Simpson index, p is the proportion (n/N) of the individuals of one particular species found (n) divided by the total number of individuals of one particular species found (n) divided by the total number of individuals found (N), \sum^n is still the sum of the calculations, and it is the number of species.

$$\text{Simpson diversity index } (\lambda) = 1 / (\sum_{i=1}^S p_i^2)$$

In the current study the Simpson's diversity index (λ) = 0.91

5.3.10.3 Habitat Suitability Index (HSI)

Habitat suitability index (HSI) modelling is a tool for developing maps and information upon which living resource and environmental managers and conservationists can base decisions (USFWS 1980a, 1980b, 1981; Terrell 1984; Bovee and Zuboy 1988). The models are based on suitability indices that reflect habitat quality for a particular species or life stage over a range of possible environmental conditions, such as temperature, salinity, PH, BOD, DO etc. The catchment of the mighty Brahmaputra-Jamuna River is about 47,000 sq km within Bangladesh. The river holds a wide range of fish and crustaceans comprising the project site. The area holds 44 species, as mentioned earlier.

For the model, HSI values from 0 to 1 were assigned to ranges of each environmental variable, depending on how favorable the range is for survival, growth, and reproduction (following Table). An SI of 1.0 was assigned to the most favorable conditions. An SI of 0.5 was assigned to an environmental range of approximately average suitability, which was intended to represent habitat about half as suitable as the most favorable habitat. An SI of 0.1 was assigned to that portion of a range in conditions in which the species or life stage can occur but is rare. This SI value represents habitat about 1/10 as suitable as the most favorable habitat. The definitions of HSI are given in **Table 5-22**.

Table 5-22: Definitions of suitability index values

Suitability index Value	Description of Habitat use
1	High density or relative abundance in field studies; high reproductive or growth potential; active preference in behavioral studies
0.5	Common occurrence or average density in field studies; average reproductive or growth potential
0.1	Rare occurrence or low density in field studies; tolerance documented in field or laboratory studies; little potential for growth or reproduction

0	Little or no occurrence in field studies; mortality may occur in laboratory or field studies; active avoidance in behavioral studies
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There are different parameters for surface water that are potential for aquatic habitat. The team considered common parameters and compared them with “The Environment Conservation Rules, (ECR, 2023), Schedule 2(A); Best Practice based classification (Water Usable for Fisheries). Consideration was made on primary data and the Suitability Index value found 0.5 for all parameters. The study concludes with the interpretation that the project area and its fisheries resources have “**High density or relative abundance in field studies; high reproductive or growth potential; active preference in behavioral studies**”.

Table 5-23: Environmental variables included the habitat suitability index and the data resolution

HSI Index Environmental Parameter	Unit	Result*	Standard**	Suitability Index value	Remarks
BOD	mg/l	2.2	6 or less	1	N/A
EC	µS/cm	465	-	1	
COD	mg/l	30	50	1	
pH	-	7.7	6 – 9	1	
Temperature	°C	28.1	-	1	
TDS	mg/L	750	1000	1	

*Source: ELRC Study Team, October 2023

** ECR 2023, Schedule 2(A); Best Practice based classification (Water Usable for Fisheries)

5.3.10.4 Suitability of fish spawning/ hatchling and Egg release area

There are different periods (in a year) for fish species to release eggs and hatches. From the primary and secondary sources, it has been found that the culture fisheries practiced in a controlled way for egg hatchling and spawning periods. Additionally, different egg hatchling periods were confirmed in open-water fish species within the study area. In Jamuna, Rui, Katla, Mrigal spawn in May to June, Boal spawned in June to July, Bagha air spawned in May-June and Chital spawn in May June in a year. The suitability of fish spawn takes place in pockets/lagoons of char lands, trapped in lagoons, scour areas, deep water etc. The following table shows the egg hatchling period and places of spawn in Jamuna River.

Table 5-24: Suitability of fish spawning/hatchling and Egg release

Name of the species	Fish spawn and hatchling Period	Suitable area
Rui, Katol, Mrigal	May-June (egg release during rain & thunderstorm)	River (Hatchling trapped in pockets/lagoons of char lands with clear water)
Boal	June-July (egg release by rubbing with bushes of char land fringes)	Trapped in lagoons; some manage to escape in the river, and some are caught (net) or dried up.
Bagha air	June-July (egg release in deep water)	Mostly found in the scour area

Chital	May-June (building nest at scours and release egg on blocks, geo bags and submerged boat or other objects)	Scours of the river and after attaining the size of fingerling they move individually
Aor	May-June (Point- nest building by making hole in deep water and hatching a mucous-like things and hatchlings feed on the mucous.	Deep Water
Hilsha	December-January and May-August	It goes upstream in deep water (17-25 m) for laying eggs where the current is high

5.3.10.5 Culture Fisheries

Bangladesh is endowed with extremely rich and extensive inland and marine water resources. The freshwater bodies of Bangladesh are considered home to at least 265 species of finfishes (Rahman, 2005). This sector, therefore, contributes about 3.69% in GDP (Gross Domestic Product) and 22.76% in agricultural GDP and supplies about 60% of animal protein consumption.

In the culture fisheries, the dominant species are Rui, Catla, Tilapia, Mrigal, Sarpunti, and other common carp within the study area. The production varies on pond size, seasons, fish species and intensive practice. The highest price encountered for Rui fish and lowest on tilapia. The price varies from 130-700 taka per kg within the observed area.

It is mentionable that, the ponds do hold a threshold amount of water during the post-monsoon period (October to February) and the utmost amount in monsoon (May to July) within the study area. Thus, the production is highest in the monsoon period. Three sample ponds were studied to observe the production, and available fish species (**Figure 5-15: Culture Ponds Around the Project Area**). **Table 5-25** shows a summarization of the cultured fish and their production. From the table, the highest production for commercial consumption has been come across from Saidabad Union under Shirajganj Sadar Upazilla which is about 2000 kg of fish per year and the lowest is 250 kg/year. **Table 5-25 & Table 5-26** shows the list of fish species cultured in the study area.

Figure 5-15: Culture Ponds Around the Project Area



Source: ELRC Study Team, October 2023

Table 5-25: Production and Culture practices in the study area

Name of the pond owner	Village	Union	Upazilla	Pond Size	Species Cultured	Culture Period	Total Fish Production

Md. Zia	Panchosona	Saidabad	Sirajginj Sadar	300 Decimal	Rui, Catla, Mrigal, Sarpunti, Tilapia	04 years	7000-8000 kg/year
Hossain Molla	Panchosona	Saidabad	Sirajginj Sadar	150 Decimal	Rui, Catla, Common carp, Silver Carp	04 years	3000- 4500 kg /year
Jafar Ali	Punorbashon	Saidabad	Sirajginj Sadar	90 Decimal	Tilapia, Grasscarp, Catla, Rui	06 years	2000 kg/ year

Source: ELRC Study Team, October 2023

Table 5-26: List of Cultured Fish species recorded in the study area

Scientific Name	Local Name	English Name	Order	Family
Catla Catla	Catla	Catla	Cypriformes	Cyprinidae
Ctenopharyngodon idella	Grass carp	Grass carp	Cypriformes	Cyprinidae
Cyprinus carpio	Carfu	Common carp	Cypriformes	Cyprinidae
Hypophthalmichthys molitrix	Silver carp	Silver carp	Cypriformes	Cyprinidae
Labeo Bata	Bata	Bata Labeo	Cypriformes	Cyprinidae
Labeo Calbasu	Kalibaus	Orange Fin Labeo	Cypriformes	Cyprinidae
Labeo rohita	Rui	Rohu Carp	Cypriformes	Cyprinidae
Oreochromis niloticus	Nilotica	Nile tilapia	Cichliformes	Cichlidae
Puntius sarana	Sarpunti	Olive Barb	Cypriformes	Cyprinidae

Source: ELRC Study Team, October 2023

5.3.11 CONCLUSION

In the study areas, no tree species of conservation importance were identified. The trees inside the power plant and in the surrounding locations demonstrated excellent growth and health. The assessment of wildlife, including bird activities and terrestrial fauna, indicated minimal impact on behavioral patterns inside the power plant and no discernible impact at the study locations. Furthermore, there was no notable impact on fisheries resources in the study area attributed to the operation of power plant.

5.4 Land and Agricultural Resources

5.4.1 Land Use and Land Cover Change

The total area in the power plant is 6.87 ha of Unit 2 & 3. Surrounding the power plant area 3.65 ha is about as NCA. Besides, other land area remains fallow due to sand filling above flood level. Detailed land use data is presented in Table 5-27 and Figure 5-16.

Table 5-27: Detailed Land Use of the Project Area

SI. No.	Land Use	Project Area	
		Area (ha)	% Of NCA
1.	Net Cultivable Area (NCA)	3.65	100

2.	Char land/sand	0	0
3.	Forest (Eco-Park/Forest)	0	0
4.	Industrial Area	0	0
5.	Other land uses (Brickfield, Chatal, Important Places, and Sand Quarry)	0	0
6.	Road (Access Road, National Road, Railway, Regional Road, Rural Road, and Zilla road)	0	0
7.	Rural Settlement with Homestead Vegetation	0	0
8.	Sirajganj Power Plant	0	0
9.	Urban Built-up Area	0	0
10.	Water Bodies (Baor, Beel, Canal, Ditch, Pond, River, Seasonal Water Body)	0	0
11.	Total	3.65	100

Sources: Upazilla Office of the Department of Agriculture, Sadar, Sirajganj

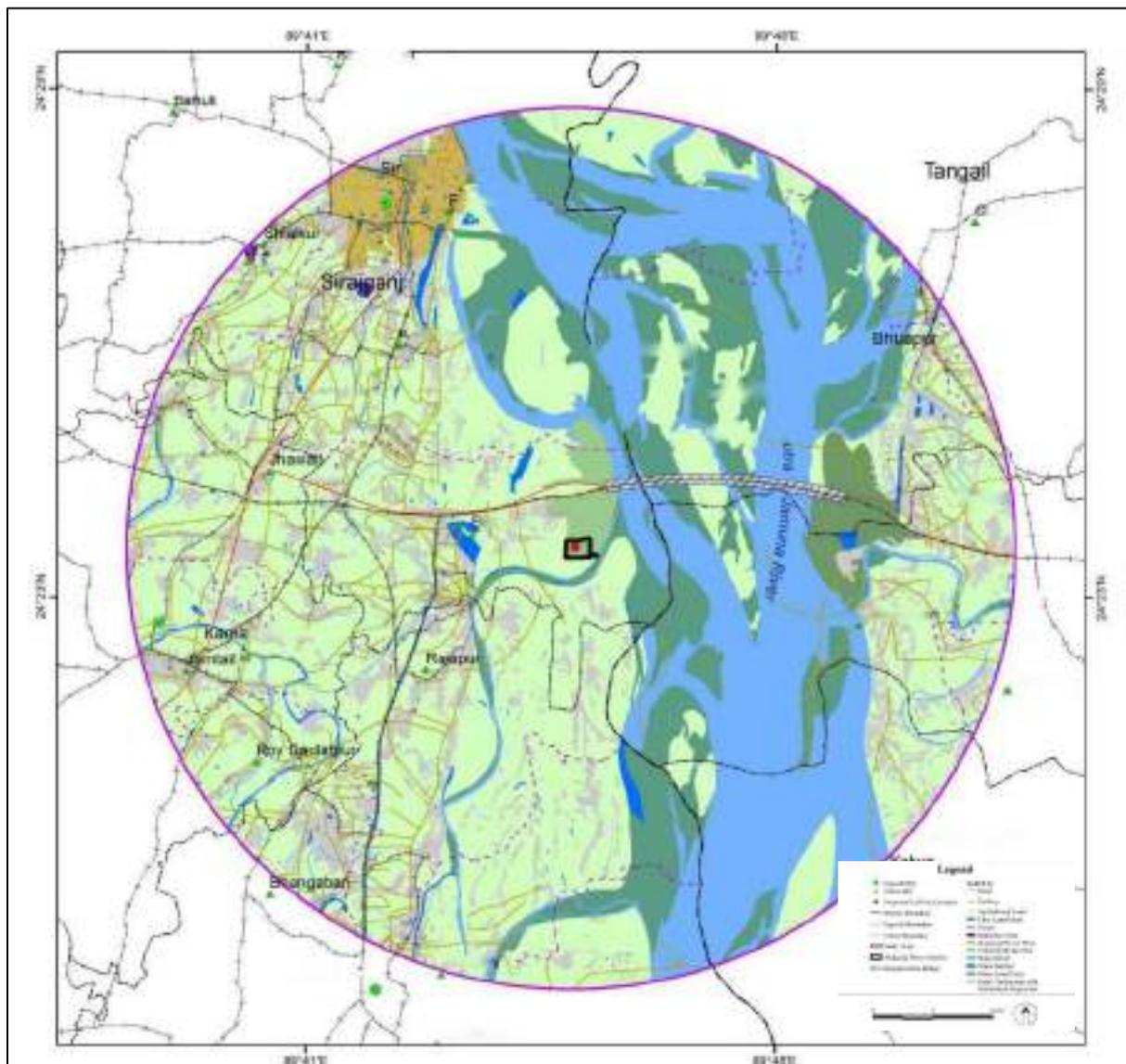


Figure 5-16: Land Use of the Project Area

5.4.2 Agricultural Production

Assessing agricultural production, DoA, and farmer's community are reliable sources for understanding the scenario in the project area.

5.4.2.1 FGD With Agriculture Farmers Community

FGD with the agriculture farmers community has been conducted twice in this yearly period. The detailed consultation is depicted in this section.

▪ Consultation Details

Name of the Stakeholder (Institution/Community)	Farmers Community, Boroshimul Village, Soydabad, Sirajganj
Consulted By	Abdur Rab
Designation/Position	Consultant, ELRC
Date	24 December 2023
Time	11:40 AM

▪ Participants Details

Sl. No.	Name	Age	Locations
1.	Md. Salam Howlader	45	Boroshimul Village
2.	Md. Kuddus Molla	43	Boroshimul Village
3.	Md. Khalek Shikder	36	Boroshimul Village
4.	Shah Aman Ullah	29	Boroshimul Village
5.	Abdul Halim	52	Ponchosona Village
6.	Md. Habibur Rahman	25	Ponchosona Village
7.	Md. Babul Mia	43	Ponchosona Village
8.	Sobhan Munshi	40	Ponchosona Village

▪ Discussions

Concerned Issues	Discussions
Agricultural Practices (Single, Double and Triple)	Double (paddy-jute)
Crop Types	Common Crops are paddy, pulse, jute, wheat, mustard, vegetables, etc.
Production Rate	Productivity is being decreasing for the last few years
Irrigation Practices	Deep and shallow tube well, natural and surface water
Irrigation Cost (Last and Present Year) Annual Revenue	10000-12000 BDT per Bigha (33 Decimal)
Agricultural Labor Availability	Scarce in peak season
Labourer Wages (Male, Female)	It cost 450-500 BDT a day for male labor last season; whether female employees are unavailable in this region.
Remarks	Production rate is decreasing

▪ Photographs



Photo 5-14: Focus Group Discussion (FGD) with Agricultural Farmers Community

5.4.2.2 KII with Department of Agriculture

The ELRC team has been conducted an interview with the Upazilla agriculture officer for understanding the plant surrounding agricultural production and loss scenario in 2023. A few secondary documents have been found for further clarifications and the details consultation explained below-

▪ Consultation Details

Name of the Stakeholder (Institution/Community)	Department of Agriculture, Upazilla Office, Sadar, Sirajganj
Consulted Person	Sharmishtha Sen Gupta
Designation/Position	Additional Agriculture Officer
Cell No.	01765873452
Consulted By	Md. Abdur Rab
Designation/Position	Consultant, ELRC
Date	24.12.2023
Time	11:30 AM

▪ Discussions

Concerned Issues	Discussions
Agricultural Practices	Two crops field maximum and some of them three crops
Irrigation Practices	Shallow tube well, River water, and Deep tube well (rare)
Irrigation Cost	Rice production cost per bigha (33 decimal): 10000-12000 BDT
Production Rate	Available
Annual Revenue	Available
Availability of Agricultural Labor	Not available all the season
Labor Wages	Vary season to season 400-700 BDT
Agricultural Problems Created from The Power Plant Operation (Yes/No)	No problem has been reported yet
Remarks	Need Deep tube-well installation for proper irrigation

▪ Photographs



Photo 5-15: Consultation with SAAO, Sirajganj Sadar, Sirajganj

▪ Secondary Data Review from the DoA

Crop area, yield, annual crop production, crop damage in the project surroundings is presented in Table 5-28.

Table 5-28: Crop Area, Yield and Annual Crop Production and Damage in the Project Surroundings

Sl. No.	Crop Name	Crop Area (ha)	Damage Free		Damaged		Total Production (ton)	Production Loss (ton)
			Area (ha)	Yield (ton/ha)	Area (ha)	Yield (ton/ha)		
1.	HYV T. Aus	1,123	904	2.8	159	2.1	2,932	498
2.	B. Aus	778	602	2.2	164	1.2	1,394	361
3.	HYV T. Aman	6,123	4,571	3.2	1,485	2.3	15,303	4,922
4.	Lt. Aman	4,052	3,678	2.5	410	1.8	10,123	1,045
5.	HYV Boro	8,104	7,645	3.1	869	2.5	29,304	3,293
6.	Total Rice	20,180	17,400	14	3,087	10	59,056	10,119
7.	Mustard	1,034	1,024	1.5	0	0	1,684	0
8.	Potato	789	801	24	0	0	19,284	0
9.	Sesame	792	789	1.1	0	0	870	0
10.	Wheat	2,673	2,786	3.4	0	0	9,273	0
11.	Pulses	721	702	1	0	0	736	0
12.	Jute	4,023	3,984	3.5	0	0	14,823	0
13.	Sugarcane	512	524	39	0	0	22,039	0
14.	Winter Vegetables	712	702	18	0	0	12,034	0
15.	Summer Vegetables	2,145	2,293	16	0	0	34,045	0
16.	Total Non-Rice	13,401	13,605	108	0	0	114,788	0
17.	Total	33,631	31,058	121	3,087	10	173,844	10,119

Sources: Upazilla Office of the Department of Agriculture, Sadar, Sirajganj

5.5 Occupational Health and Safety

The components of occupational health and safety at the power plant include occupational noise level, electromagnetic field exposure, and worker health condition. Occupational health and safety are

defined as any type of interruption caused by a plant-oriented environment during working hours. This section discusses work-related health and safety hazards, as well as mitigating strategies.

5.5.1 Occupational Noise Level

5.5.1.1 Locations

Occupational noise levels were recorded at nine locations in the study area. Noise levels were recorded in the form of sound pressure levels using the different digital sound level meters at the same time. Details list of noise level monitoring locations is given in Table 5-29. The sound level was recorded in form of A-weighted equivalent continuous sound pressure level (Leq) values with the use of A-weighting filters in the noise measuring instrument. Monitoring photographs from February 2023 to January 2024 are attached in **Annex B-8**.

Table 5-29: Occupational Noise Level Monitoring Locations

Sl. No.	Code	Location	GPS Coordinate	Category	Date	Time
1.	ONL1	RMS Building	24°23'8.79"N 89°44'41.06"E	Industrial Area	21.04.2023	09:10 AM
					23.06.2023	08:55 AM
					22.10.2023	09:05 AM
					21.12.2023	08:34 AM
2.	ONL2	Control Building	24°23'11.82"N 89°44'47.12"E	Industrial Area	21.04.2023	05:32 PM
					23.06.2023	04:43 PM
					22.10.2023	05:34 PM
					21.12.2023	04:43 PM
3.	ONL3	Administrative Building	24°23'11.63"N 89°44'46.14"E	Mixed Area	21.04.2023	01:15 AM
					23.06.2023	11:25 AM
					22.10.2023	01:35 AM
					21.12.2023	09:06 AM
4.	ONL4	Health Unit	24°23'11.56"N 89°44'46.58"E	Silent Area	21.04.2023	08:21 PM
					23.06.2023	07:12 PM
					22.10.2023	08:21 PM
					21.12.2023	05:02PM
5.	ONL5	Residential Building	24°23'14.62"N 89°44'47.89"E	Residential Area	21.04.2023	04:39 AM
					23.06.2023	10:32 AM
					22.10.2023	04:40 AM
					21.12.2023	09:14 AM
6.	ONL6	Gas Booster Area	24°23'12.41"N 89°44'43.00"E	Industrial Area	21.04.2023	01:12 AM
					23.06.2023	07:28 PM
					22.10.2023	01:03AM
					21.12.2023	05:21 PM
7.	ONL7	Air Compressor	24°23'12.05"N 89°44'44.37"E	Industrial Area	21.04.2023	08:18 AM
					23.06.2023	09:10 AM
					22.10.2023	08:10 AM

Sl. No.	Code	Location	GPS Coordinate	Category	Date	Time
					21.12.2023	08:30 AM
8.	ONL8	GTG Building	24°23'6.82"N 89°44'47.12"E	Industrial Area	21.04.2023	05:13 PM
					23.06.2023	06:16 PM
					22.10.2023	05:00 PM
					21.12.2023	06:01 PM
9.	ONL9	STG Building	24°23'15.28"N 89°44'31.97"E	Industrial Area	21.04.2023	01:37 AM
					23.06.2023	01:14 PM
					22.10.2023	01:20 AM
					21.12.2023	11:02 AM

Source: Annual site visit of ELRC monitoring team in February 2023-January 2024

5.5.1.2 Results and Discussion

As per the contract specifications, every quarter noise level of the plant area also has been monitored in different locations to find out the occupational effect of the noise level. As per the comment of the auditor, an 8-hour noise level has been monitored at the plant site. The monitoring points have been increased over the last year. GTG, STG, Air Booster and Gas Booster area covered for occupational noise in the last month. The data has been given in Table 5-30.

Table 5-30: Occupational Noise Level at Plant Site

Sl. No.	Code	Period	Noise Level (dBA)			*Standard (dBA)
			LeqAvg	L _{max}	L _{min}	
1.	ONL1	February-April 2023	68.3	73.2	62.4	Less than 80
		May-July 2023	67.2	74.5	61.2	
		August-October 2023	67.8	74.5	61.2	
		November 2023-January 2024	65.4	75.2	61.2	
2.	ONL2	February-April 2023	67.4	70.3	64.8	
		May-July 2023	68.4	70.4	58.9	
		August-October 2023	67.1	70.4	58.9	
		November 2023-January 2024	64.5	71.6	58.9	
3.	ONL3	February-April 2023	58.4	58.3	55.2	
		May-July 2023	57.4	61.3	57.2	
		August-October 2023	57.9	64.6	49.5	
		November 2023-January 2024	56.7	65.3	49.5	
4.	ONL4	February-April 2023	57.2	57.4	55.3	
		May-July 2023	56.1	59.3	51.5	
		August-October 2023	55.6	59.3	51.5	
		November 2023-January 2024	57.3	58.2	51.5	
5.	ONL5	February-April 2023	57.1	53.8	56.5	
		May-July 2023	55.8	62.5	50.3	
		August-October 2023	56.4	62.5	50.3	

Sl. No.	Code	Period	Noise Level (dBA)			*Standard (dBA)
			Leq _{Avg}	L _{max}	L _{min}	
		November 2023-January 2024	58.2	60.9	50.3	
6.	ONL6	February-April 2023	71.3	77.2	67.4	
		May-July 2023	67.3	78.5	64.5	
		August-October 2023	65.1	78.5	64.5	
		November 2023-January 2024	63.7	76.3	64.5	
7.	ONL7	February-April 2023	73.4	76.3	70.5	
		May-July 2023	72.5	77.4	64.1	
		August-October 2023	71.3	77.4	64.1	
		November 2023-January 2024	72.1	76.6	64.1	
8.	ONL8	February-April 2023	75.6	74.8	71.6	
		May-July 2023	71.2	75.8	62.3	
		August-October 2023	70.6	75.8	62.3	
		November 2023-January 2024	71.4	77.1	62.3	
9.	ONL9	February-April 2023	74.1	77.4	70.2	
		May-July 2023	73.6	77.2	56.1	
		August-October 2023	74.2	77.2	56.1	
		November 2023-January 2024	75.6	76.7	56.1	

Note: *Labor Rule 2015 (Chapter:7; Page: 7355), Occupational noise level cannot exceed 80 dBA

From the test result, it has been found that at NL9, the Leq is quite higher than the other places. Also in the Gas Booster, GTG, and Air Booster area, the noise level is high. There is no standard in ECR, 1997 for working near machinery area but according to Labor Rules 2015, all the locations have remained under 80 dBA. But the machinery has been covered with the brick wall and as a result, it doesn't affect much in ambient noise level. In RMS and control building, the noise level was varied from 64.5 to 68.4 during the working period. In administrative buildings, health units, and residential areas, the noise level is below 60 dBA. So, it has been recommended to wear an earplug while working in a noisy area that is more than 75 dBA.

5.5.2 Electro-Magnetic Field

5.5.2.1 Locations

To understand the exposure of the worker to the electromagnetic field, EMF has been monitored at the plant site. A detail of the monitoring location is provided in Table 5-31. Monitoring photographs from February 2023 to January 2024 are attached in **Annex B-9**.

Table 5-31: Details of Electro-Magnetic Field Monitoring Locations

Sl. No.	Code	Location	GPS Coordinate	Time	Date
1.	EMF1	Switch Yard	24°23'10.39"N 89°44'40.94"E	11:37 AM	17.04.2023
				02:10 PM	22.06.2023
				10:25 AM	21.10.2023
				12:20 PM	21.12.2023

Source: Site visit of ELRC monitoring team from February 2023 to January 2024

5.5.2.2 Results and Discussion

Analysis results of the EMF are represented in Table 5-32 where the values are compared with the standard limit.

Table 5-32: Testing Result of Electro-Magnetic Field

Sl. No.	Code	Period	Distance	EMF (mv/m)	*Standard (mv/m)
1.	EMF1	February-April 2023	0m	0	120 (for Worker)
			3m	0	
			5m	0	
			10m	0	
		May-July 2023	0m	0	
			3m	0	
			5m	0	
			10m	0	
		August-October 2023	0m	0	
			3m	0	
			5m	0	
			10m	0	
		November 2023-January 2024	0m	0	
			3m	0	
			5m	0	
			10m	0	

**According to International Commission on Non-Ionizing Radiation Protection (ICNIRP)*

At the in-plant site, the electromagnetic field has been monitored every quarter from a different distance (0m, 3m, 5m, and 10m) of the corner of the switchyard area. During this monitoring year no EMF data were found as the plant remained closed during those monitoring days. Although awareness meeting and training has been conducted in the last year among the people.

5.5.3 Worker Health

SPS medical unit performed a health checkup program for its workers involved in operation & maintenance. As a part of the health checkup program, Workers' different health parameters i.e., Hb%, ESR, TLC, Nu, Lm, Mo, Eo, B, BI, S.CR, SGPT, LF, ECG, Hearing, Pus C, EPI C, etc. have been tested. Subsequently, a health checkup report has been prepared by the medical unit frequently. All the health checkup reports have been attached with **Annex G**.

5.6 Labor and Working Conditions

A power plant's labor and working circumstances are influenced by factors such as drinking water quality, the availability of cleanliness facilities, and so on. This section addresses labor and working conditions challenges through appropriate experimentation.

5.6.1 Potable Water Supply

Potable water supply for the power plant is well facilitated including office building and residential area. All the drinking water supplies are filtered-oriented. Available water supply is observed during this year

in the power plant premises. The potable water supply sources are presented in the following Photo 5-16.



Photo 5-16: Proper Potable Water Supply in Office Building and Residential Area

5.6.2 Drinking Water Quality

5.6.2.1 Locations

Drinking Water sampling and analysis were undertaken to understand the overall water quality characteristics of the groundwater of the study area. The sample was taken from drinking water sources from the study area. Detail of the sampling location is provided in Table 5-33. Monitoring photographs from February 2023 to January 2024 are attached in **Annex B-7**.

Table 5-33: Details of Drinking Water Sampling Locations

Sl. No.	Code	Location	GPS Coordinate	Source	Time	Date
1.	DW1	Control Building	24°23'11.72"N 89°44'47.22"E	Supply Water	10:28 AM	21.02.2023
					09:15 AM	16.03.2023
					10:17 AM	17.04.2023
					10:32 AM	20.05.2023
					10:55 AM	22.06.2023
					11:23 AM	20.07.2023
					10:25 AM	18.08.2023
					09:10 AM	22.09.2023
					10:12 AM	23.10.2023
					11:02 AM	22.11.2023
					03:25 PM	24.12.2023
2.	DW2	Admin Building	24°23'11.95"N 89°44'46.00"E	Supply Water	10:10 AM	04.01.2024
					11:04 AM	21.02.2023
					11:00 AM	16.03.2023
					12:58 PM	17.04.2023
					11:54 AM	20.05.2023
					10:25 AM	22.06.2023
					11:36 AM	20.07.2023
11:02 AM	18.08.2023					

Sl. No.	Code	Location	GPS Coordinate	Source	Time	Date
					11:04 AM	22.09.2023
					12:51 PM	23.10.2023
					11:22 AM	22.11.2023
					03:35 PM	24.12.2023
					10:30 AM	04.01.2024
3.	DW3	Residential Building	24°23'14.77"N 89°44'49.31"E	Supply Water	11:27 AM	21.02.2023
					11:26 AM	16.03.2023
					01:21 PM	17.04.2023
					10:32 AM	20.05.2023
					10:25 AM	22.06.2023
					10:34 AM	20.07.2023
					11:14 AM	18.08.2023
					11:26 AM	22.09.2023
					01:12 PM	23.10.2023
					11:37 AM	22.11.2023
					04:25 PM	24.12.2023
					10:50 AM	04.01.2024

Source: Annual site visit of ELRC monitoring team in February 2023-January 2024

5.6.2.2 Results and Discussion

Analysis results of the drinking water are represented in Table 5-34 where the values are compared with the standard limit.

Table 5-34: Drinking Water Quality Analysis Result

Parameters	Unit	Concentration																														*Standard						
		February 2023			March 2023			April 2023			May 2023			June 2023			July 2023			August 2023			September 2023			October 2023			November 2023				December 2023			January 2024		
		DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3	DW1	DW2	DW3		DW1	DW2	DW3	DW1	DW2	DW3
pH	-	7.2	7.1	7.3	7.1	7.4	7.3	7.1	7.2	7.3	7.3	7.2	7.3	7.3	7.1	7.4	7.5	7.2	7.2	7.4	7.2	7.5	7.4	7.3	7.5	7.3	7.4	7.3	7.8	7.6	7.3	7.5	7.6	7.4	7.6	7.5	7.5	6.5-8.5
Arsenic (As)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
Total Dissolved Solid (TDS)	mg/L	150	180	160	150	180	160	150	180	160	150	180	160	150	180	160	170	160	170	155	178	167	172	164	168	170	163	168	165	172	165	168	170	162	168	166	167	1000
Electrical Conductivity (EC)	mg/L	290	350	310	290	355	310	290	350	310	285	345	320	290	350	310	310	290	300	293	342	318	321	296	316	320	296	315	287	338	312	320	295	313	318	291	315	-
Total Coliform (TC)	N/100 mL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hardness	mg/L	215	221	223	215	220	224	215	220	224	215	221	223	216	220	225	220	220	230	219	216	231	222	218	234	222	216	233	220	222	228	225	220	231	218	220	230	500
Chlorine (Cl)	mg/L	1.2	2.2	1.2	1.2	2.0	1.1	1.2	2.1	1.2	1.2	2.2	1.2	1.2	2.1	1.2	1.1	0.9	0.7	1.3	2	1.4	1.2	0.8	0.9	1.2	0.8	0.9	1.4	1.9	1.2	1.1	0.9	0.7	1.4	0.9	0.7	-
Fluoride (F)	mg/L	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.4	0.3	0.1	0.2	0.3	0.4	0.3	0.5	0.4	0.3	0.5	0.4	0.5	0.4	0.6	0.5	0.4	0.6	0.5	0.6	0.5	1.0
Iron (Fe)	mg/L	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.03	0.01	0.02	0.03	0.02	0.02	0.03	0.02	0.03	0.03	0.02	0.03	0.03	0.05	0.04	0.03	0.04	0.04	0.04	0.03	0.04	0.3-1
Manganese (Mn)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.4
Phosphate (PO4)	mg/L	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.4	0.3	0.4	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.5	0.4	0.5	0.4	0.4	0.4	0.3	0.4	-
Sulphate (SO4)	mg/L	11	11	8	12	10	8	12	11	7	11	11	8	12	11	8	10	9	12	11	13	10	12	11	13	12	12	13	14	11	13	11	13	15	13	15	12	250

Note: * According to ECR 2023, Schedule 2(B)

According to the tested results, we can see that a total of three sources have been considered and tested every month. pH, As, Total Hardness, Cl, F, Fe, Mn, PO₄, and SO₄ has been tested for confirming the drinking water quality. The concentration levels of all the parameters for supply water were found within the acceptable limit set by the DoE, GoB for drinking water. So, the water is supplying for drinking purposes in Unit 3 is safe to drink.

5.6.3 Availability of Hygiene Toilets

An adequate number of toilets are provided to workers. Standards range from 1 unit to 15 persons to 1 unit per 6 persons. For urinals, usual standards are 1 unit to 15 persons. Moreover, toilet facilities are conveniently located and easily accessible. Toilet rooms are accessible without any individual passing through any sleeping room. In addition, all toilet rooms are well-lit, have good ventilation or external windows, have sufficient hand washbasins. All toilets have been found regularly cleaned & maintained. The toilet facilities of the power plant are oriented in the following Photo 5-17.



Photo 5-17: Neat and Clean Toilet Facilities in Office and Residence

Source: Annual site visit of ELRC monitoring team in February 2023-January 2024

5.7 Community Health, Safety and Security

This section included the emergency response plan, health, and safety preparedness, and community relationship with the power plant.

5.7.1 Community Health (Status of Communicable and Vector-Borne Diseases)

Communicable diseases, also known as infectious diseases or transmissible diseases, are illnesses that result from the infection, presence, and growth of pathogenic (capable of causing disease) biologic agents in an individual human or another animal host. Besides, Disease that results from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks, and fleas. Examples of vector-borne diseases include Dengue fever, West Nile Virus, Lyme disease, and malaria. The ELRC team has been conducted a KII with the medical personnel near the power plant for collecting documents on communicable and vector-borne diseases. But unfortunately, they have no records on it and just trying to explain the verbal statement. The details of KII are presented below-

5.7.1.1 Consultation Details

Name of the Stakeholder (Institution/Community)	Upazila Health and Family Welfare Office, Sirajganj Sadar, Sirajganj
Consulted Person	Dr. Iftekhar Ahmed Toslim
Designation/Position	Upazila Health and Family Welfare Officer
Cell No.	01919848050
Consulted By	Md. Abdur Rab
Designation/Position	Consultant, ELRC
Date	20 July 2023
Time	11:13 AM

5.7.1.2 Discussions

Concerned Issues	Discussions
Available Health Facilities	Primary Treatment, Maternal Consultation, Communicable and Non-communicable Disease Related Awareness
Common Exposure Diseases (Last One Year)	No Records Available
Health Problems Created from The Project Activities (If Any)	No
Health Improvement Initiatives Taken by NWPGL	No Initiative taken
Remarks	Denied to take pictures

5.7.2 Safety and Security

Safety and security of the community and the power plant are the concern issues in this section and specifically, all the available safety and security aspects are explained here.

5.7.2.1 Emergency Preparedness and Responses

The NWPGL has updated the emergency preparedness and responses plan and according to the plan numerous awareness training, first aid training, and other emergency-related activities have been demonstrated in the power plant. The emergency preparedness and responses plan has also been disclosed to the respective stakeholders for their support and services. The detailed report of the emergency preparedness and responses plan and activities are attached with **Annex H**.

5.7.2.2 Community Relationship Program/Community Awareness, Training

▪ Training on Community Emergency Preparedness

Community Health, Safety, and Emergency Preparedness Program has been conducted on 04 September 2023 at Punorbason Madrasha at Soydabad in Sirajganj Sadar Upazila under Sirajganj district with proper COVID-19 precaution and following management guidelines. The proceedings commenced at 02:35 PM. The program has been attended by a total of 36 people, which represent local people, day laborers, businessmen, students, teachers, senior citizens, and political leaders. The detailed presentation or training module is attached with **Annex I**. The community has been made a train of the Community Health, Safety, and Emergency Preparedness related to the following issues.

- Flood
- Gas Pipeline leakage

- Oil Pipeline leakage
- Traffic accident
- Communicable and non-communicable diseases

Target Audience	Local Residence/Community
Trainer	Md. Rofiu Karim and Md. Shafiqul Islam
Designation/Position	Consultant, ELRC
Date	04.09.2023
Time	02:10 PM

Photographs



Photo 5-18: Training on Community Health, Safety and Emergency Preparedness Program with Local Community

5.7.3 Treated Wastewater Basis Irrigation

Normally treated wastewater has been discharged to the nearest channel which is usually locked except monsoon period. Also, the adjacent land is sandy, and no agricultural activities in that area. So, there is no chance of using the treated water in irrigation land.

5.8 Grievance Mechanism

According to the SPS documentation, there have been no complaints gathered this year. Numerous complaint box has been placed in the important places of the plant area. Written or verbal complaints are absent in this whole year. The details of the grievance mechanism are placed in **Annex J**.

5.9 Emergency Response Plan

NWPGCL authority has prepared a common Emergency Response Plan for the Sirajganj Power Complex which is applicable for all the 3 units. As per the plan, proper training has been provided to the staff of the SPS. The emergency response plan is included in **Annex K**.

5.10 Health and Safety Preparedness

According to the requirement of health and safety preparedness, the NWPGCL has been conducted a lot of mock drilling, fire drilling, fire training, etc. All the records of the health and safety-related preparedness program have been presented in **Annex L**.

5.11 Community Relationship

The NWPGCL has been initiated a lot of tasks to develop the community relationship and that's why the ELRC team was conducted FGD among the local community to understand the community relationship with the SPS. This section is oriented toward community engagement-related aspects.

5.11.1 Details of FGD

Name of the Stakeholder (Institution/Community)	Local Residence/Community
Consulted By	Md. Abdur Rab and Tofazzal Hossain
Designation/Position	Assistant Consultant, ELRC
Date	21 October 2023
Time	11:20 PM

5.11.2 Participant Details and Discussion Summary

Sl. No.	Participants	Profession	Address	Comment/Question/Suggestions/Expectations	Reply/Response from Project Proponent
1.	Md. Salam Uddin	Farmer	Boroshimul Village	<ul style="list-style-type: none"> There haven't been any noticeable effects on air quality this quarter. On the agricultural ground, there were no signs of oil or grease leaching. 	The project's effects on the environment and society are being closely monitored and controlled.
2.	Md. Abbas Mia	Farmer	Boroshimul Village	<ul style="list-style-type: none"> The project proponent's efforts to run a CSR program are highly valued by the community. 	The proponent has put important safeguards in place to adequately address environmental threats.

Sl. No.	Participants	Profession	Address	Comment/Question/Suggestions/Expectations	Reply/Response from Project Proponent
					It is guaranteed that dangerous items are handled precisely.
3.	Md. Hasan	Farmer	Ponchosona Village	<ul style="list-style-type: none"> ▪ The establishment of this plant will provide the locals with a plethora of small business prospects. ▪ To reduce the acoustic impact of sound-generating gear, regular maintenance is necessary. ▪ The CSR initiative has successfully fostered a close relationship between project staff and the neighborhood. 	To efficiently reduce any possible negative effects, the project complies with applicable regulations and normal operating processes.
4.	Tapos Joarder	Businessman	Boroshimul Village	<ul style="list-style-type: none"> ▪ There haven't been any noticeable effects on air quality this quarter. ▪ On the agricultural ground, there were no signs of oil or grease leaching. 	The proponent has put important safeguards in place to adequately address environmental threats. It is ensured that dangerous items are handled precisely.
5.	Md. Monowar Hossain	Farmer	Boroshimul Village	<ul style="list-style-type: none"> ▪ Local farmers might receive a variety of agricultural seeds from the plant authority. ▪ There have been no reported incidents involving the project in the neighborhood. 	This is what the plant authority plans to classify as one of their CSR initiatives. When it comes to mishaps, the supporters take the necessary precautions and proceed with extreme caution.
6.	Md. Abdur Rahim	Farmer	Ponchosona Village	<ul style="list-style-type: none"> ▪ There was no influence on any agricultural land from the project activity. 	There were no harmful activities done that would affect the project

Sl. No.	Participants	Profession	Address	Comment/Question/Suggestions/Expectations	Reply/Response from Project Proponent
				<ul style="list-style-type: none"> Rehabilitating local roadways is necessary to provide better traffic flow. 	area's agricultural resources.
7.	Md. Saifur Rahman	Farmer	Ponchosona Village	<ul style="list-style-type: none"> It is necessary to arrange for more health and safety education and awareness campaigns. 	Organizing and moving up
8.	Md. Rofiul Islam	Farmer	Ponchosona Village	<ul style="list-style-type: none"> There were no infectious disease outbreaks as a result of the project's operations. 	We are keeping up regular health check-ups and taking all necessary safeguards.
9.	Md. Selim Hawlader	Fisherman	Ponchosona Village	<ul style="list-style-type: none"> There was no effect of the project operations on any fishery resources. This quarter, no cases of gas pipe leaks were reported. 	All environmental parameter is being regularly monitored.
10.	Md. Samsul Alom	Fisherman	Ponchosona Village	<ul style="list-style-type: none"> Creation of new job opportunities for jobless people. There were no signs of oil and grease leaking on agricultural land. Neither agricultural fields nor aquatic bodies have any hazardous waste observations made. 	<ul style="list-style-type: none"> preparing and moving forward. Every quarter, the proponent holds training sessions. Plant management will talk about this issue more in the future.
11.	Md. Ruhul Amin	Day Labor	Boroshimul Village	<ul style="list-style-type: none"> Encouraging local residents to have more work opportunities would be beneficial. There have been no reports of gas line leaks this quarter. 	Organizing and advancing
12.	Ahesanul karim	Student	Boroshimul Village	There must be employment opportunities in the plant.	The authority will talk about this issue further in the future.

5.11.3 Photographs



Photo 5-19: FGD with Local Community in Boroshimul Village



Photo 5-20: FGD with Local Community, Ponchosona Village



Photo 5-21: FGD with Fisherman and Agricultural Farmers in Boroshimul Village

5.12 CSR Program

CSR program is the term of community relationship build-up related issues. The NWPGL authorities have been conducted a few CSR programs this year. Due to the pandemic situation, the program is quite slow but hopefully will speed up after the situation. The details CSR program this year is presented in a section comprised of social development, health care development, and community aid.

5.12.1 Social Development Program

The NWPGL had taken a lot of steps for developing the community around the plant area. Financial, logistic, intellectual, etc. support has been provided to the community for social bonding and development. An important contribution of NWPGL for social development is depicted in **Annex M-1**.

5.12.2 Health Care Development Program

The health care development program provides funding to support activities that improve access to quality primary health and medical services in the community. The NWPGL has already been taken initiative on those issues and in the last year, a few steps had been fulfilled on health care development such as covid 19 awareness, mask, sanitizer distribution, expanding medical facilities, progressing medical campaign, etc. Important health care development-related evidence is presented in **Annex M-2**.

5.12.3 Aid to Community

Such like the previous year, NWP GCL has participated in aid campaigns and distribution aid to needy people during the Covid situation in 2023. Besides, as always NWP GCL frequently participates in aid programs for the community in any pandemic, disaster, flood, etc. Important aid disbursement to the community in 2023 is presented in detail in **Annex M-3**.

5.13 GHG Emission

The Kyoto Protocol – United Nations Framework Convention on Climate Change nominates the following GHGs:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Hydrofluorocarbons (HFCs) and
- Perfluorocarbons (PFCs).

Inventories of GHG emissions can be calculated using published emission factors. Different gases have different greenhouse warming effects (referred to as warming potentials) and emission factors consider the global warming potentials of the gases created during combustion. Typically, greenhouse gas emissions are reported in units of carbon dioxide equivalent (CO₂e). Gases are converted to CO₂e by multiplying by the gas global warming potential (GWP). The GWP of gases are as follows⁴:

- GWP for CO₂ = 1
- GWP for CH₄ = 21
- GWP for N₂O = 310

When the global warming potentials are applied to the estimated emissions then the resulting estimate is referred to in terms of CO₂-equivalent (CO₂e) emissions.

The emission includes 2 scopes:

- ❖ Scope 1 emissions are direct emissions from owned or controlled sources;
- ❖ Scope 2 emissions are indirect emissions from the generation of purchased energy;

Scope 1 and Scope 2 for this power Plant are given below.

Scope 1	Scope 2
<ul style="list-style-type: none"> • Fuel combustion from Combined cycle Power plant 	<ul style="list-style-type: none"> • Vehicles used by officials and other staff of NWP GCL for official purpose;

5.13.1 GHG Estimation and Impact

The combustion of natural gas produces GHGs. The amount of GHGs emitted by a power plant is a measure of its contribution to global warming and can be estimated based on fuel consumption. To estimate GHG emissions, the IFC recommended Carbon Emission Estimation Tool (CEET model – Version February 2014)⁵ has been used as set out below. The quantification of the GHG emission is from January 2023 to December 2023.

Scope 1:

⁴ Source: Intergovernmental Panel on Climate Change (IPCC) (1995), Second Assessment Report

⁵ http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/CB_Home/Measuring+Reporting/

Table 5-35: Estimated GHG Emissions from the Plant (In Natural Gas)

SL#	Particular	Value	Unit
A*	Net Heat Rate (Natural Gas in Combined Cycle)	8,172.69	KJ/KWH
B*	Gross Generation Capacity (Combined Cycle)	228,500.00	KW
C	Operating Days per year	209.94	days
D	Daily Operating Hours	24.00	Hours/day
E	Total Annual Output (B X C X D)	1,151,307,499.26	KWH
F	Annual Fuel Consumption (= E x A)	9,409,280,437,615.82	KJ
		9409.28	TJ
G*	Annual GHG Emission in Gas Turbine	536,809	tCO ₂ e/year

*Based on the natural gas specification provided by NWPGL

Table 5-36: Estimated GHG Emissions from the Plant (In HSD)

SL#	Particular	Value	Unit
A*	Net Heat Rate (Natural Gas in Combined Cycle)	14499.38	KJ/KWH
B*	Gross Generation Capacity (Combined Cycle)	228500	KW
C	Operating Days per year	0.23	days
D	Daily Operating Hours	24	Hours/day
E	Total Annual Output (B X C X D)	0	KWH
F	Annual Fuel Consumption (= E x A)	0	KJ
			TJ
G*	Annual GHG Emission in Diesel	0	tCO ₂ e/year

*Based on HSD specification provided by NWPGL

Scope 2:

Estimated GHG Emissions from the fuel consumed Vehicles

For diesel and Compressed Natural Gas (CNG) used in the vehicles have been contributed 9 and 9 tCO₂/year during the period of January 2023 to December 2023. GHG emission from fuel consumed in mobile vehicles is 18 tCO₂e/year.

Total GHG Emissions

Total GHG Emission = Natural Gas+HSD+Mobile Vehicles

$$= (536,809+0+18) \text{ tCO}_2/\text{year}$$

$$= 536,827 \text{ tCO}_2/\text{year}$$

So, from January 2023 to December 2023, the annual emission of GHG from Unit 3 is about 536,827 tCO₂/year.

6 CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

The project site is located at about 15 km south-east of Sirajganj town, about 130 km north-west of Dhaka, and 1.8 km south-west from the western end of Bangabandhu bridge. The major components include a 150 MW gas turbo generator (GTG) with a bypass stack of 60 meters high, one horizontal type Heat Recovering Steam Generator (HRSG) with the main stack of 60 meters high for outdoor installation, and a heavy-duty condensing type Steam Turbo Generator (STG) for indoor installation in the configuration of 1:1:1, feedwater pumps, condensate extraction pumps, cooling towers, 230 KV plant sub-station, transformers, Gas Regulating Metering Station (RMS), Oil Separator Unit, Water Treatment Plant (WTP), Administration building, workshop, warehouse, guardhouses, internal roads, etc. The annual environment, health safety, and social monitoring have been conducted for inspecting the environmental disruption due to power plant -oriented activities. Mitigation measures are the most significant parts of organizing such a power plant in an environmentally sound manner. Following the baseline assessment, management standards and policies are put in place to limit environmental, health, and safety consequences. The quantitative and qualitative components of EHS are being considered for inclusion in the yearly monitoring and management. Surface water, drinking water, stormwater, wastewater, groundwater, and EMF are all examined/monitored in order to determine the source of the disturbance and implement appropriate mitigation measures. Wastewater and stormwater are perfectly safe to discharge into nearby water bodies. Surface water is free of contamination caused by power plants, such as no liquid waste discharged into a water body without treatment. According to the test results, groundwater and drinking water from the power plant vicinity are safe. All quantitative parameters are compared to the power plant's current Bangladesh Standard. Domestic wastes and liquid wastes are the primary waste generation from the power plant region, where no hazardous waste contamination is detected. Every major location has several dustbins and waste bins for waste sorting and disposal. All the wastes have also been disposed of in government-designated places or sold out to a third party. Scrap materials are properly fenced according to the management guidelines. Water spraying on the power plant road is continuing for reducing dust generation and pollution. Accommodation, sanitation, and water supply facilities are properly ensured in the power plant area. To avoid any accidents, comprehensive health and safety planning has been implemented. Furthermore, health screenings and other associated training have been undertaken to provide a long-term working environment. According to site monitoring, no severe environmental, health, or safety issues have been identified in this quarter. As a result, all facilities will be enhanced and maintained in order to create an environmentally sound workplace. Any and all mitigating measures will be used to develop the power plant while protecting the environment and maintaining the health and safety of the personnel.

ANNEXURE

Annex A: Laboratory Analysis Reports

Annex A-1: Ambient Air Quality Lab Report

February-April 2023



Ref: ELRC/Ambient Air Quality/ 26229271

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Ambient Air Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Monitoring Activity	: Ambient Air Quality
Monitoring Personnel	: Abdur Rab, Asst. Consultant, ELRC
Monitoring Location	: Project Area (AAQ1), In front of Main Gate (AAQ2), Rehabilitation Village (AAQ3), Ponchosona Village (AAQ4), and Bangabandhu Eco Park (AAQ5)
Monitoring Date	: 15.04.2023
Analysis Date	: 26.04.2023

Description of Analysis :

Location	Ambient Air Pollutants Concentration ($\mu\text{g}/\text{m}^3$)						
	SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	O ₃
AAQ1	114.2	75.52	39.34	16.02	17.45	0.03	11.4
AAQ2	129.34	84.23	45.22	19.6	22.5	0.03	12.2
AAQ3	108.15	68.34	41.32	14.4	17.34	0.04	10.3
AAQ4	102.45	76.23	43.45	7.5	11.34	0.02	10.1
AAQ5	106.5	68.2	38.1	6.5	10.3	0.02	7.4
Duration (hr.)	8	24	24	24	24	8	8
Air Pollution (control) rules, 2022*	-	150	65	80	80	5	100
IFO/WHO Standard	-	50	25	20	40 (Annual)	-	100
Method of Analysis Instrument Use: Hor-Scanner™ HMF 6000	Light Scattering Nephelometer	Light Scattering Nephelometer	Light Scattering Nephelometer	High Sensitivity Electrochemical	High Sensitivity Electrochemical	High Sensitivity Electrochemical	High Sensitivity Electrochemical

Note: Legend: SPM - Suspended Particulate Matter, PM₁₀ - Particulate Matter of a diameter of 10 micron or less, PM_{2.5} - Particulate Matter of a diameter of 2.5 micron or less, SO₂ - Sulphur Di-Oxide, NO_x - Oxides of Nitrogen, CO - Carbon Monoxide, O₃ - Ozone



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May-July 2023



Ref: ELRC/Ambient Air Quality/ 2023/271

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Ambient Air Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Monitoring Activity : Ambient Air Quality
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : Project Area (AAQ1), In front of Main Gate (AAQ2), Rehabilitation Village (AAQ3), Ponchosona Village (AAQ4), and Bangabandhu Eco Park (AAQ5)
Monitoring Date : 16.07.2023-20.07.2023
Analysis Date : 11.08.2023

Description of Analysis :

Location	Ambient Air Pollutants Concentration ($\mu\text{g}/\text{m}^3$)						
	SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	O ₃
AAQ1	89.3	60.2	27.8	11.3	12.6	0.03	8.4
AAQ2	90.2	63.2	29.5	12.6	14.2	0.03	7.3
AAQ3	69.2	46.2	24.3	9.5	10.4	0.03	7.6
AAQ4	89.3	62.4	29.8	6.7	7.5	0.02	7.4
AAQ5	53.4	38.6	18.5	6.4	9.2	0.03	6.2
Duration (hr.)	8	24	24	24	24	8	8
Air Pollution (control) rules, 2022*	-	150	65	80	80	5	100
ICD/WHO Standard	-	50	25	20	40 (Annual)	-	100
Method of Analysis Instrument Use: Mair-Scanner™ MM 6000	Light Scattering Nephelometer	Light Scattering Nephelometer	Light Scattering Nephelometer	Algo Sensitivity Electrochemical	Algo Sensitivity Electrochemical	Algo Sensitivity Electrochemical	Algo Sensitivity Electrochemical

Note: TSP- Suspended Particulate Matter, PM₁₀- Particulate Matter of a diameter of 10 microns or less, PM_{2.5}- Particulate Matter of a diameter of 2.5 microns or less, SO₂- Sulphur Dioxide, NO_x- Oxides of Nitrogen, CO- Carbon Monoxide, O₃- Ozone

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August-October 2023



Ref: ELRC/Ambient Air Quality/ 2023/027

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Ambient Air Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Monitoring Activity	: Ambient Air Quality
Monitoring Personnel	: Abdur Rab, Asst. Consultant, ELRC
Monitoring Location	: Project Area (AAQ1), In front of Main Gate (AAQ2), Rehabilitation Village (AAQ3), Ponchosona Village (AAQ4), and Bangabandhu Eco Park (AAQ5)
Monitoring Date	: 20.10.2023-23.10.2023
Analysis Date	: 01.11.2023

Description of Analysis :

Location	Ambient Air Pollutants Concentration ($\mu\text{g}/\text{m}^3$)						
	SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	O ₃
AAQ1	98.6	64.7	28.1	12.3	12.4	0.04	9.2
AAQ2	92.2	61.9	32.8	13.1	13.7	0.04	8.2
AAQ3	71.8	48.3	26.7	10.2	10.6	0.05	7.6
AAQ4	92.6	65.8	30.8	9.7	9.8	0.03	8.1
AAQ5	56.9	40.2	19.9	10.5	10.8	0.02	6.9
Duration (hr.)	8	24	24	24	24	8	8
Air Pollution (control) rules, 2022*	-	150	65	60	60	5	100
WHO Standard	-	50	25	20	40 (Annual)	-	100
Method of Analysis Instrument Use: Haz-Scanner™ HW 6030†	Light Scattering Nephelometer	Light Scattering Nephelometer	Light Scattering Nephelometer	High Sensitivity Electrochemical	High Sensitivity Electrochemical	High Sensitivity Electrochemical	High Sensitivity Electrochemical

Note: SPM- Suspended Particulate Matter; PM₁₀- Particulate Matter of a diameter of 10 micron or less; PM_{2.5}- Particulate Matter of a diameter of 2.5 micron or less; SO₂- Sulphur Dioxide; NO_x- Oxides of Nitrogen; CO- Carbon Monoxide; O₃- Ozone

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November 2023-January 2024



Ref: ELRC/Ambient Air Quality/ 2024/001

ELRC ENVIRONMENTAL LABORATORY

Monitoring Results of Ambient Air Quality

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Monitoring Activity : Ambient Air Quality
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : Project Area (AAQ1), In front of Main Gate (AAQ2), Rehabilitation Village (AAQ3), Ponchosona Village (AAQ4), and Bangabandhu Eco Park (AAQ5)
Monitoring Date : 20.12.2023-24.12.2023
Analysis Date : 01.01.2024
Description of Analysis :

Location	Ambient Air Pollutants Concentration (µg/m ³)						
	SPM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	O ₃
AAQ1	142.4	85.4	43.5	15.8	19.8	0.06	11.7
AAQ2	137.6	82.6	40.9	16.5	18.2	0.06	10.6
AAQ3	129.8	77.9	36.4	13.8	14.9	0.05	9.3
AAQ4	131.7	80.2	38.2	11.6	11.4	0.04	10.5
AAQ5	110.3	75.7	28.1	14.2	12.3	0.03	8.7
Duration (hr.)	8	24	24	24	24	8	8
Air Pollution (control) rules, 2022*	-	150	65	60	60	5	100
WHO Standard	-	50	25	20	40 (Annual)	-	100
Method of Analysis Instrument Use: Haz-Scanner™ HM 6030†	Light Scattering Nephelometer	Light Scattering Nephelometer	Light Scattering Nephelometer	High Sensitivity Electrochemical	High Sensitivity Electrochemical	High Sensitivity Electrochemical	High Sensitivity Electrochemical

Note: SPM- Suspended Particulate Matter; PM₁₀- Particulate Matter of a diameter of 10 micron or less; PM_{2.5}- Particulate Matter of a diameter of 2.5 micron or less; SO₂- Sulphur Dioxide; NO_x- Oxides of Nitrogen; CO- Carbon Monoxide; O₃- Ozone

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Annex A-2: Ambient Noise Level Lab Report

February-April 2023



Ref: ELRC/Ambient Noise Quality/2023/102514

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Ambient Noise Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 3
Monitoring Activity	: Ambient Noise Quality
Monitoring Personnel	: Tofazzal Hossain, Consultant, ELRC
Monitoring Location	: ANL1: South-West Corner of the Project ANL2: Middle of Two Corner Point ANL3: North West Site ANL4: North East Site ANL5: South East Corner ANL6: North East Site ANL7: South West Site (Boundary Corner) ANL8: North West Site (Boundary Corner) ANL9: Administration Building (Outdoor) ANL10: Medical (Indoor) ANL11: Administration Building (Indoor 2nd floor) ANL12: Residential Building ANL13: Main Gate of the Project ANL14: Infront of G.T.G Building ANL15: Infront of S.T.G Building
Monitoring Date	: 16.04.2023-18.04.2023
Analysis Date	: 27.04.2023
Description of Analysis	:

Code	Noise Level (dBA)				*Bangladesh Standard		**WHO/EC Standard	
	L ₉₀ day	L ₉₀ night	L _{max}	L _{min}	Day	Night	Day	Night
ANL1	67.4	52.4	67.4	48.5	75	70	70	70
ANL2	65.5	58.6	71.4	54.3	75	70	70	70
ANL3	64.2	55.3	69.3	51.4	75	70	70	70
ANL4	63.9	53.5	68.3	50.4	75	70	70	70
ANL5	59.3	52.1	72.5	48.4	75	70	70	70
ANL6	57.2	51.4	67.4	44.2	75	70	70	70
ANL7	55.4	42.6	58.4	38.7	75	70	70	70
ANL8	53.7	39.2	59.2	36.6	75	70	70	70
ANL9	54.6	46.2	58.4	41.4	60	50	-	-
ANL10	45.7	38.5	52.5	35.5	50	40	55	45



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Code	Noise Level (dBA)						*Bangladesh Standard	**WHO/IFC Standard
	L _{eq,1hr}	L _{eq,3hr}	L _{eq,6hr}	L _{eq,12hr}	Day	Night	Day	Night
ANL11	45.3	38.5	50.5	35.1	60	50	-	-
ANL12	47.4	38.7	57.3	35.6	55	45	55	45
ANL13	55.8	51.3	64.5	44.6	75	70	70	70
ANL14	67.5	62.4	73.4	54.2	75	70	70	70
ANL15	68.4	63.5	72.1	54.6	75	70	70	70

Category of Area/Receptor	Bangladesh*		IFC-WHO**	
	Day (dB(A)) 6 AM – 9 PM	Night (dB(A)) 9 PM – 6 AM	Day (dB(A)) 7 AM – 10 PM	Night (dB(A)) 10 PM – 7 AM
Silent Zone	50	40	55	45
Residential Area	55	45	55	45
Mixed Area	60	50	-	-
Commercial Area	70	60	70	70
Industrial Area	75	70	70	70

*Ministry of Environment, Forest, and Climate Change, (2008) Noise Pollution (Control) Rules, 2008 (S.R.O. No. 277-Law/2008), The People's Republic of Bangladesh.

**Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999. As per IFC EHS noise level guidelines, Noise impacts should not exceed the levels provided in the above table.

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May-July 2023



Ref: ELRC/Ambient Noise Quality/20230102514

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Ambient Noise Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 3
Monitoring Activity	: Ambient Noise Quality
Monitoring Personnel	: Tofazzal Hossain, Consultant, ELRC
Monitoring Location	: ANL1; South-West Corner of the Project ANL2; Middle of Two Corner Point ANL3; North West Site ANL4; North East Site ANL5; South East Corner ANL6; North East Site ANL7; South West Site (Boundary Corner) ANL8; North West Site (Boundary Corner) ANL9; Administration Building (Outdoor) ANL10; Medical (Indoor) ANL11; Administration Building (Indoor 2nd floor) ANL12; Residential Building ANL13; Main Gate of the Project ANL14; Infront of G.T.G Building ANL15; Infront of S.T.G Building
Monitoring Date	: 20.06.2023-23.06.2023
Analysis Date	: 28.06.2023
Description of Analysis	:

Code	Noise Level (dBA)				*Bangladesh Standard		**WHO/IC Standard	
	Leqday	Leqnight	L _{max}	L _{min}	Day	Night	Day	Night
ANL1	66.3	55.2	70.3	51.3	75	70	70	70
ANL2	65.2	50.3	67.3	43.1	75	70	70	70
ANL3	63.1	51.1	71.3	43.2	75	70	70	70
ANL4	65.1	54.2	71.4	48.8	75	70	70	70
ANL5	62.4	54.3	66.2	56.2	75	70	70	70
ANL6	57.6	52.4	60.6	46.2	75	70	70	70
ANL7	54.2	41.3	57.3	34.1	75	70	70	70
ANL8	52.5	38.2	56.2	35.5	75	70	70	70
ANL9	45.4	40.3	55.2	46.6	80	50	-	-
ANL10	43.1	38.7	49.2	34.8	90	40	55	45
ANL11	47.2	40.1	47.6	35.1	80	50	-	-
ANL12	45.3	38.7	54.3	34.7	55	45	55	45
ANL13	54.1	51.2	63.2	42.5	75	70	70	70
ANL14	62.4	56.4	71.3	56.2	75	70	70	70
ANL15	64.3	59.5	71.2	51.6	75	70	70	70



Category of Area/Receptor	Bangladesh*		IFC-WHO**	
	Day (dB(A)) 6 AM – 9 PM	Night (dB(A)) 9 PM – 6 AM	Day (dB(A)) 7 AM – 10 PM	Night (dB(A)) 10 PM – 7 AM
Silent Zone	50	40	55	45
Residential Area	55	45	55	45
Mixed Area	60	50	-	-
Commercial Area	70	60	70	70
Industrial Area	75	70	70	70

*Ministry of Environment, Forest, and Climate Change. (2006). Noise Pollution (Control) Rules, 2006 (S.R.O. No. 217-Law/2006). The People's Republic of Bangladesh.

**Guideline values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999. As per IFC/ENS noise level guidelines, Noise impacts should not exceed the levels presented in the above table.

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August-October 2023



Ref: ELRC/Ambient Noise Quality/20231636

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Ambient Noise Quality**

Project Name	: Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 3
Monitoring Activity	: Ambient Noise Quality
Monitoring Personnel	: Tofazzal Hossain, Consultant, ELRC
Monitoring Location	: ANL1; South-West Corner of the Project ANL2; Middle of Two Corner Point ANL3; North West Site ANL4; North East Site ANL5; South East Corner ANL6; North East Site ANL7; South West Site (Boundary Corner) ANL8; North West Site (Boundary Corner) ANL9; Administration Building (Outdoor) ANL10; Medical (Indoor) ANL11; Administration Building (Indoor 2nd floor) ANL12; Residential Building ANL13; Main Gate of the Project ANL14; Infront of G.T.G Building ANL15; Infront of S.T.G Building
Monitoring Date	: 20.10.2023-21.10.2023
Analysis Date	: 01.11.2023
Description of Analysis	:

Code	Noise Level (dBA)				*Bangladesh Standard		**WHO/IFC Standard	
	Leq _{day}	Leq _{night}	L _{max}	L _{min}	Day	Night	Day	Night
ANL1	65.6	53.1	71.9	46.2	75	70	70	70
ANL2	64.3	51.5	68.8	44.8	75	70	70	70
ANL3	64.2	52.6	70.8	45.7	75	70	70	70
ANL4	64.7	53.6	71.5	47.2	75	70	70	70
ANL5	61.6	55.8	72.7	51.7	75	70	70	70
ANL6	58.8	53.7	62.8	45.8	75	70	70	70
ANL7	55.3	42.8	59.3	39.5	75	70	70	70
ANL8	53.7	39.5	59.4	36.3	75	70	70	70
ANL9	48.7	44.8	57.8	41.3	60	50	-	-
ANL10	44.8	37.2	48.6	35.8	50	40	55	45
ANL11	48.1	44.8	49.9	36.9	60	50	-	-
ANL12	48.4	38.2	55.9	35.8	55	45	55	45
ANL13	55.2	50.7	64.6	42.6	75	70	70	70
ANL14	61.6	57.6	69.8	47.2	75	70	70	70

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Code	Noise Level (dBA)				*Bangladesh Standard		**WHO/IFC Standard	
	$L_{eq,1h}$	$L_{eq,6h}$	L_{max}	L_{min}	Day	Night	Day	Night
ANL15	64.3	58.2	70.4	48.5	75	70	70	70

Category of Area/Receptor	Bangladesh*		IFC-WHO**	
	Day (dB(A)) 6 AM – 9 PM	Night (dB(A)) 9 PM – 6 AM	Day (dB(A)) 7 AM – 10 PM	Night (dB(A)) 10 PM – 7 AM
Silent Zone	50	40	55	45
Residential Area	55	45	55	45
Mixed Area	60	50	-	-
Commercial Area	70	60	70	70
Industrial Area	75	70	70	70

* Ministry of Environment, Forest, and Climate Change, GOB, Noise Pollution (Control) Rules, 2008 (S.R.O. No. 312-Law/2008), The People's Republic of Bangladesh.

** Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999. As per IFC/WHO noise level guidelines, Noise impacts should not exceed the levels presented in the above table.



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November 2023-January 2024



Ref: ELRC/Ambient Noise Quality/2024/016

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Ambient Noise Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 3
Monitoring Activity	: Ambient Noise Quality
Monitoring Personnel	: Tofazzal Hossain, Consultant, ELRC
Monitoring Location	: ANL1; South-West Corner of the Project ANL2; Middle of Two Corner Point ANL3; North West Site ANL4; North East Site ANL5; South East Corner ANL6; North East Site ANL7; South West Site (Boundary Corner) ANL8; North West Site (Boundary Corner) ANL9; Administration Building (Outdoor) ANL10; Medical (Indoor) ANL11; Administration Building (Indoor 2nd floor) ANL12; Residential Building ANL13; Main Gate of the Project ANL14; Infront of G.T.G Building ANL15; Infront of S.T.G Building
Monitoring Date	: 20.12.2023-22.12.2023
Analysis Date	: 01.01.2024
Description of Analysis	:

Code	Noise Level (dBA)				*Bangladesh Standard		**WHO/IFC Standard	
	$L_{eq,1h}$	$L_{eq,6h}$	L_{max}	L_{min}	Day	Night	Day	Night
ANL1	64.3	54.5	72.4	45.2	75	70	70	70
ANL2	65.6	52.1	67.5	43.1	75	70	70	70
ANL3	64.2	50.2	71.5	44.6	75	70	70	70
ANL4	64.1	54.7	72.3	48.9	75	70	70	70
ANL5	62.9	54.7	72.1	52.3	75	70	70	70
ANL6	58.2	52.9	62.4	46.6	75	70	70	70
ANL7	56.5	42.4	59.8	38.3	75	70	70	70
ANL8	53.4	39.1	59.9	39.9	75	70	70	70
ANL9	47.9	44.4	57.2	42.8	60	50	-	-
ANL10	45.2	37.6	49.4	34.6	50	40	55	45
ANL11	49.8	44.7	54.2	39.2	60	50	-	-
ANL12	46.1	38.9	55.2	34.5	55	45	55	45
ANL13	54.6	51.3	62.2	44.5	75	70	70	70
ANL14	62.3	56.2	67.4	46.6	75	70	70	70

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Code	Noise Level (dBA)				*Bangladesh Standard		**WHO/IFC Standard	
	L _{eq,day}	L _{eq,night}	L _{max}	L _{min}	Day	Night	Day	Night
ANL15	62.4	57.8	70.4	48.3	75	70	70	70

Category of Area/Receptor	Bangladesh*		IFC-WHO**	
	Day (dB(A)) 6 AM – 9 PM	Night (dB(A)) 9 PM – 6 AM	Day (dB(A)) 7 AM – 10 PM	Night (dB(A)) 10 PM – 7 AM
Silent Zone	50	40	55	45
Residential Area	55	45	55	45
Mixed Area	60	50	-	-
Commercial Area	70	60	70	70
Industrial Area	75	70	70	70

*Ministry of Environment, Forest and Climate Change (2009). Noise Pollution (Control) Rules, 2009 (S.R.O. No. 212-Law/2009). The People's Republic of Bangladesh.

**Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999. As per IFC/WHO noise level guidelines, Noise impacts should not exceed the levels provided in the above table.



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Annex A-3: Surface Water Quality Lab Report

February-April 2023



Ref: ELRC/Water Quality/2023/277

ELRC WET LABORATORY**Test Results of Surface Water Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 2 & 3
Sampling Activity	: Surface Water Quality
Sampling Personnel	: Abdur Reb, Asst. Consultant, ELRC
Sampling Location	: SW1; 50m Downstream from Discharge Point
GPS Coordinate	: 24°23'1.45"N 89°44'44.89"E
Sampling Date	: 17.04.2023
Analyses Date	: 03.05.2023

Description of Analysis :

Parameter	Unit	Analysis Methods	Concentration	*Standard
pH	-	Ion Electrode method	7.8	6 - 8
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	600	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Gravimetric Method followed by Gravimetric Analysis	3.4	-
Total Residual Chlorine	mg/l	Standard method 4500-Cl B, Iodometric Method.	0.04	-
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	55	-
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	300	1000
Chemical Oxygen Demand (COD)	mg/l	Adaptation of the USEPA 410.4 approved method	16	50
Biological Oxygen Demand (BOD)	mg/l	5 days Incubation	2.0	6 or less
Chromium (Cr)	mg/l	ASTM D1887-82 diphenylcarbohydrazide method	<0.01	0.05
Iron (Fe)	mg/l	EPA Phenanthroline method 315 B	0.04	-
Calcium (Ca)	mg/l	Oxalate Method	95	-
Zinc (Zn)	mg/l	Zincin Method	0.02	-
Lead (Pb)	mg/l	APHA - P3500-Pb Lead	<0.005	0.1
Cadmium (Cd)	mg/l	3500-Cd Cadmium	0.03	-

* According to ECR 2023, Schedule 2(A): Best Practice based classification (Water Usable for Fisheries)
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Parameter	Unit	Analysis Methods	Concentration	*Standard
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	0.004
Total Alkalinity	mg/l	Colorimetric Method	165	-
Ammonium Nitrogen	mg/l	Adaptation of ASTM D 1428-92 method	1.0	-
Free Ammonia	mg/l	Adaptation of ASTM D 1428-92 method	2.0	-
Temperature	°C	Ion electrode method	22.1	-

* According to ECR 2023, Schedule 2(A); Best Practice based classification (Water Usable for fisheries)

--End--



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May-July 2023



Ref: ELRC/Water Quality/2023/23

ELRC WET LABORATORY**Test Results of Surface Water Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity : Surface Water Quality
Sampling Personnel : Abdur Rab, Asst. Consultant, ELRC
Sampling Location : SW1; 50m Downstream from Discharge Point
GPS Coordinate : 24°23'1.45"N 89°44'44.89"E
Sampling Date : 21.06.2023
Analyses Date : 12.07.2023

Description of Analysis :

Parameter	Unit	Analysis Methods	Concentration	*Standard
pH	-	Ion Electrode method	7.4	6 - 9
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	490	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Gravimetric Method followed by Gravimetric Analysis	2.1	-
Total Residual Chlorine	mg/l	Standard method 4500-Cl B. Iodometric Method.	0.03	-
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	68	-
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	220	1000
Chemical Oxygen Demand (COD)	mg/l	Adaptation of the USEPA 410.4 approved method	11	50
Biological Oxygen Demand (BOD)	mg/l	5 days Incubation	2.0	6 or less
Chromium (Cr)	mg/l	ASTM D1687-92 diphenylcarbohydrazide method	<0.01	0.05
Iron (Fe)	mg/l	EPA Phenanthroline method 315 B	0.03	-
Calcium (Ca)	mg/l	Oxalate Method	84	-
Zinc (Zn)	mg/l	Zincon Method	0.02	-
Lead (Pb)	mg/l	APHA - P3500-Pb Lead	<0.005	0.1
Cadmium (Cd)	mg/l	3500-Cd Cadmium	0.03	-

* According to ECR 2023, Schedule 2(A): Best Practice based classification (Water Usable for fisheries) - P.T.D-

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Parameter	Unit	Analysis Methods	Concentration	*Standard
Mercury (Hg)	mg/l	Amalgamation(DRP/A) Method	<0.01	0.004
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	-
Total Alkalinity	mg/l	Colorimetric Method	145	-
Ammonium Nitrogen	mg/l	Adaptation of ASTM D 1426-92 method	1.0	-
Free Ammonia	mg/l	Adaptation of ASTM D 1426-92 method	2.0	-
Temperature	°C	Ion electrode method	23.4	-

* According to ECR 2023, Schedule 2(A), Best Practice based classification (Water Usable for Fisheries)
-END-

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August-October 2023



Ref: ELRC/Water Quality/2023/029

ELRC WET LABORATORY**Test Results of Surface Water Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 2 & 3
Sampling Activity	: Surface Water Quality
Sampling Personnel	: Abdur Rab, Asst. Consultant, ELRC
Sampling Location	: SW1; 50m Downstream from Discharge Point
GPS Coordinate	: 24°23'1.45"N 89°44'44.89"E
Sampling Date	: 23.10.2023
Analyses Date	: 01.11.2023

Description of Analysis :

Parameter	Unit	Analysis Methods	Concentration	*Standard
pH	-	Ion Electrode method	7.7	6 - 9
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	465	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Gravimetric Method followed by Gravimetric Analysis	2.3	-
Total Residual Chlorine	mg/l	Standard method 4500-Cl B. Iodometric Method.	0.02	-
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	70	-
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	228	1000
Chemical Oxygen Demand (COD)	mg/l	Adaptation of the USEPA, 410.4 approved method	10	50
Biological Oxygen Demand (BOD)	mg/l	5 days incubation	2.2	6 or less
Chromium (Cr)	mg/l	ASTM D 1687-02 diphenylcarbohydrazide method	<0.01	0.05
Iron (Fe)	mg/l	EPA Phenanthroline method 315 B	0.04	-
Calcium (Ca)	mg/l	Oxalate Method	85	-
Zinc (Zn)	mg/l	Zincon Method	0.03	-
Lead (Pb)	mg/l	APHA - P3500-Pb Lead	<0.005	0.1
Cadmium (Cd)	mg/l	3500-Cd Cadmium	0.04	-

*According to ECR 2023, Schedule 2(A): Best Practice based classification (Water Usable for fisheries)

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Parameter	Unit	Analysis Methods	Concentration	*Standard
Mercury (Hg)	mg/l	Amalgamation(DRP/A) Method	<0.01	0.004
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	-
Total Alkalinity	mg/l	Colorimetric Method	147	-
Ammonium Nitrogen	mg/l	Adaptation of ASTM D 1426-92 method	1.2	-
Free Ammonia	mg/l	Adaptation of ASTM D 1426-92 method	2.2	-
Temperature	°C	ion electrode method	25.6	-

* According to ECR 2023, Schedule 2(A): Best Practice based classification (Water Usable for Fisheries)

—END—

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November 2023-January 2024



Ref: ELRC/Water Quality/2024/013

ELRC WET LABORATORY**Test Results of Surface Water Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Surface Water Quality
Sampling Personnel	: Abdur Rab, Asst. Consultant, ELRC
Sampling Location	: SW1; 50m Downstream from Discharge Point
GPS Coordinate	: 24°23'1.45"N 89°44'44.89"E
Sampling Date	: 24.12.2023
Analyses Date	: 01.01.2024

Description of Analysis

Parameter	Unit	Analysis Methods	Concentration	*Standard
pH	-	Ion Electrode method	7.6	6 - 9
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	470	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Gravimetric Method followed by Gravimetric Analysis	2.2	-
Total Residual Chlorine	mg/l	Standard method 4500-Cl B. Iodometric Method	0.03	-
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	72	-
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	230	1000
Chemical Oxygen Demand (COD)	mg/l	Adaptation of the USEPA, 410.4 approved method	11	50
Biological Oxygen Demand (BOD)	mg/l	5 days incubation	2.4	5 or less
Chromium (Cr)	mg/l	ASTM D1987-02 diphenylcarbohydrosode method	<0.01	0.05
Iron (Fe)	mg/l	EPA Phenanthroline method 315 B	0.05	-
Calcium (Ca)	mg/l	Oxalate Method	80	-
Zinc (Zn)	mg/l	Zincin Method	0.04	-
Lead (Pb)	mg/l	APHA - P3500-Pb Lead	<0.006	0.1
Cadmium (Cd)	mg/l	3500-Cd Cadmium	0.03	-

* According to ECR 2022, Schedule 2(A): Best Practice based classification (Water Usable for Fishery)

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Parameter	Unit	Analysis Methods	Concentration	*Standard
Mercury (Hg)	mg/l	Amalgamation (ORP/A) Method	<0.01	0.004
Arsenic (As)	mg/l	Modified Gutzit Method	<0.01	-
Total Alkalinity	mg/l	Colorimetric Method	152	-
Ammonium Nitrogen	mg/l	Adaptation of ASTM D 1426-92 method	1.3	-
Free Ammonia	mg/l	Adaptation of ASTM D 1426-92 method	24	-
Temperature	°C	Ion electrode method	24.3	-

* According to ECR 2023, Schedule 20A: Best Practice based classification (Water Usable for Fisheries)

—END—

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Annex A-4: Wastewater Quality Lab Report

February-April 2023



Ref: ELRC/Water Quality/20230223

ELRC WET LABORATORY**Test Results of Wastewater Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Wastewater Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: WW1; Effluent Discharge Channel
GPS Coordinate	: 24°23'4.05"N 89°44'46.91"E
Sampling Date	: 16.03.2023
Analysis Date	: 06.04.2023
Description of Analysis	:

Parameter	Unit	Analysis Methods	Concentration	*Standard
Temperature	°C	Ion Electrode method	29.0	-5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	4.7	-
pH	-	Ion Electrode method	6.1	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	25	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	11	-
Total Nitrogen (N)	mg/l	Chromotropic acid	14.1	-
Total Phosphorus (P)	mg/l	Amino Acid Method	3.3	8
Arsenic (As)	mg/l	Modified Gutzeit Method	-0.01	0.2
Zinc (Zn)	mg/l	Zincan Method	0.8	5
Chromium (Cr)	mg/l	Turbidimetric Method	0.01	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.05	3
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	400	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	3.14	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	0.05	1
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	44	100
Total Dissolved Solid (TDS)	mg/l	Ion Electrode method	205	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	46	200

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Parameter	Unit	Analysis Methods	Concentration	*Standard
Biological Oxygen Demand	mg/l	5 days Incubation	23.7	30

* According to ECR 2023, Schedule 4



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Ref: ELRC/Water Quality/20230279

ELRC WET LABORATORY**Test Results of Wastewater Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Wastewater Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: WW1; Effluent Discharge Channel
GPS Coordinate	: 24°23'4.05"N 89°44'46.91"E
Sampling Date	: 17.04.2023
Analysis Date	: 05.05.2023
Description of Analysis	:

Parameter	Unit	Analysis Methods	Concentration	*Standard
Temperature	°C	Ion Electrode method	29.0	-5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	4.5	-
pH	-	Ion Electrode method	6.7	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	27	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	12	-
Total Nitrogen (N)	mg/l	Chrosotropic acid	14.4	-
Total Phosphorus (P)	mg/l	Amino Acid Method	3.4	8
Arsenic (As)	mg/l	Modified Gutzeit Method	-0.01	0.2
Zinc (Zn)	mg/l	Zincon Method	0.9	5
Chromium (Cr)	mg/l	Turbidimetric Method	0.01	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.05	3
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	410	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	3.14	10
Total Residual Chlorine	mg/l	Adeptation of the EPA DPD 330.5	0.05	1
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	45	100
Total Dissolved Solid (TDS)	mg/l	Ion Electrode method	210	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	48	200

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Parameter	Unit	Analysis Methods	Concentration	*Standard
Biological Oxygen Demand	mg/l	5 days Incubation	24.5	30

* According to ECR 2023, Schedule 4

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May-July 2023



Ref: ELRC/Water Quality/2023/274

ELRC WET LABORATORY**Test Results of Wastewater Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Wastewater Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: WW1; Effluent Discharge Channel
GPS Coordinate	: 24°23'4.05"N 89°44'46.91"E
Sampling Date	: 21.06.2023; 20.07.2023
Analysis Date	: 05.07.2023; 28.07.2023
Description of Analysis	:

Parameter	Unit	Analysis Methods	Concentration of WW1		*Standard
			June	July	
Temperature	°C	Ion Electrode method	25.0	23.5	<5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	5.2	5.4	-
pH	-	Ion Electrode method	6.4	6.7	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	16	23	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	12	07	-
Total Nitrogen (N)	mg/l	Chromotropic acid	12.8	13.2	-
Total Phosphorus (P)	mg/l	Amino Acid Method	2.8	3.1	8
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	<0.01	0.2
Zinc (Zn)	mg/l	Zincan Method	1.2	1.8	5
Chromium (Cr)	mg/l	Turbidimetric Method	<0.01	<0.01	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.04	0.02	3
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	430	280	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	3.17	4.56	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	0.05	0.05	1
Total Suspended Solid	mg/l	Standard Methods (2005), 2540D	43	36	100
Total Dissolved Solid (TDS)	mg/l	Ion Electrode method	220	160	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	28	23	200
Biological Oxygen Demand	mg/l	5 days Incubation	25.0	18	30

* According to ECR 2023, Schedule 4

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August-October 2023



Ref: ELRC/Water Quality/2023/008

ELRC WET LABORATORY**Test Results of Wastewater Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Wastewater Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: WW1; Effluent Discharge Channel
GPS Coordinate	: 24°23'4.05"N 89°44'46.91"E
Sampling Date	: 23.10.2023
Analysis Date	: 02.11.2023
Description of Analysis	:

Parameter	Unit	Analysis Methods	Concentration of WW1		*Standard
			Sep	Oct	
Temperature	°C	Ion Electrode method	25.6	25.9	<5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	5.4	5.6	-
pH	-	Ion Electrode method	6.7	6.8	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	17	24	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	14	11	-
Total Nitrogen (N)	mg/l	Chromotropic acid	11.7	13.1	-
Total Phosphorus (P)	mg/l	Amino Acid Method	2.9	3	8
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	<0.01	0.2
Zinc (Zn)	mg/l	Zincon Method	1.3	1.9	5
Chromium (Cr)	mg/l	Turbidimetric Method	<0.01	<0.01	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.05	0.03	3
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	435	286	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	4.17	4.84	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	0.06	0.04	1
Total Suspended Solid	mg/l	Standard Methods (2005), 2540D	40	38	100
Total Dissolved Solid (TDS)	mg/l	Ion Electrode method	222	156	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	26	24	200
Biological Oxygen Demand	mg/l	5 days incubation	27	19	30

*According to ECR 2023, Schedule 4

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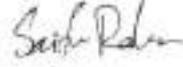
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November 2023-January 2024



Ref: ELRC/Water Quality/2024/004

ELRC WET LABORATORY

Test Results of Wastewater Quality

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Wastewater Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: WW1; Effluent Discharge Channel
GPS Coordinate	: 24°23'4.05"N 89°44'46.91"E
Sampling Date	: 24.12.2023
Analysis Date	: 01.01.2024
Description of Analysis	:

Parameter	Unit	Analysis Methods	Concentration of WW1		*Standard
			Nov	Dec	
Temperature	°C	Ion Electrode method	24.8	24.7	-5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	5.7	5.3	-
pH	-	Ion Electrode method	6.8	6.6	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	20	22	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	15	13	-
Total Nitrogen (N)	mg/l	Chromotropic acid	12.8	14.2	-
Total Phosphorus (P)	mg/l	Amino Acid Method	3.0	3.4	8
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	<0.01	0.2
Zinc (Zn)	mg/l	Zincon Method	1.4	1.8	5
Chromium (Cr)	mg/l	Turbidimetric Method	<0.01	<0.01	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.06	0.04	3
Electrical Conductivity (EC)	µs/cm	Ion Electrode method	470	240	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	4.83	4.32	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	0.06	0.06	1
Total Suspended Solid	mg/l	Standard Methods (2005), 2540D	42	39	100
Total Dissolved Solid (TDS)	mg/l	Ion Electrode method	219	132	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	22	20	200
Biological Oxygen Demand	mg/l	5 days Incubation	19	21	30

*According to ECR 2023 Schedule 4

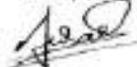
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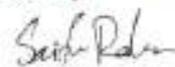
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Annex A-5: Storm Water Quality Lab Report

May-July 2023



Ref: ELRC/Water Quality/2023/281

ELRC WET LABORATORY

Test Results of Storm Water Quality

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 2 & 3
Sampling Activity : Storm Water Quality
Sampling Personnel : Tofazzal Hossain, Consultant, ELRC
Sampling Location : SW1; Effluent Discharge Channel
GPS Coordinate : 24°23'1.55"N 89°44'44.11"E
Sampling Date : 20.05.2023
Analysis Date : 11.06.2023
Description of Analysis :

Parameter	Unit	Analysis Methods	Concentration	*Standard
Temperature	°C	Ion Electrode method	23.8	<5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	7.3	-
pH	-	Ion Electrode method	7.7	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	19	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	23	-
Total Nitrogen (N)	mg/l	Chromotropic acid/ VIS Spec.	10.6	-
Total Phosphorus (P)	mg/l	Amino Acid Method	24	8
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	0.2
Zinc (Zn)	mg/l	Zincion Method	1.2	5
Chromium (Cr)	mg/l	ASTM D1687-92 diphenylcarbohydrazide	0.03	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.02	3
Electrical Conductivity (EC)	µs/cm	Ion electrode method	764	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	2.2	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	0.03	1
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	75	100
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	395	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	58	200
Biological Oxygen Demand	mg/l	5 days incubation	9.3	30

* According to ECP 2023, Schedule 4

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Ref: ELRC/Water Quality/2023/281

ELRC WET LABORATORY**Test Results of Storm Water Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 2 & 3
Sampling Activity : Storm Water Quality
Sampling Personnel : Tofazzal Hossain, Consultant, ELRC
Sampling Location : STW1; Effluent Discharge Channel
GPS Coordinate : 24°23'1.55" N 89°44'44.11" E
Sampling Date : 22.06.2023
Analysis Date : 11.07.2023
Description of Analysis :

Parameter	Unit	Analysis Methods	Concentration	*Standard
Temperature	°C	Ion Electrode method	24.1	<5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	7.4	-
pH	-	Ion Electrode method	7.8	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	21	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	11	-
Total Nitrogen (N)	mg/l	Chromotropic acid/ VIS Spec.	0.3	-
Total Phosphorus (P)	mg/l	Amino Acid Method	2.0	8
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	0.2
Zinc (Zn)	mg/l	Zincon Method	1.2	5
Chromium (Cr)	mg/l	ASTM D1687-92 diphenylcarbohydrazide	0.02	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.03	3
Electrical Conductivity (EC)	µs/cm	Ion electrode method	750	-
Oil and Grease (O & G)	mg/l	USEPA1 Hexane Extractable Method	2.5	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	0.02	1
Total Suspended Solid (TSS)	mg/l	Standard Methods (2005), 2540D	122	100
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	370	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	45	200
Biological Oxygen Demand	mg/l	5 days incubation	4.1	30

* According to ECR 2023, Schedule 4

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Ref: ELRC/Water Quality/2023/284

ELRC WET LABORATORY**Test Results of Storm Water Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity : Storm Water Quality
Sampling Personnel : Tofazzel Hossain, Consultant, ELRC
Sampling Location : StW1; Effluent Discharge Channel
GPS Coordinate : 24°23'1.55" N 89°44'44.11" E
Sampling Date : 19.07.2023
Analysis Date : 10.08.2023
Description :

Parameter	Unit	Analysis Methods	Concentration	*Standard
Temperature	°C	Ion Electrode method	24.9	<5°C than the surface water temperature
Dissolved Oxygen (DO)	mg/l	Ion Electrode method	7.5	-
pH	-	Ion Electrode method	7.8	6-9
Total Coliform (TC)	N/100ml	Membrane Filtration Method	22	-
Fecal Coliform (FC)	N/100ml	Membrane Filtration Method	19	-
Total Nitrogen (N)	mg/l	Chromotropic acid/ VIS Spec.	12.7	-
Total Phosphorus (P)	mg/l	Amino Acid Method	2.7	8
Arsenic (As)	mg/l	Modified Gutzeit Method	-0.01	0.2
Zinc (Zn)	mg/l	Zincen Method	1.3	5
Chromium (Cr)	mg/l	ASTM D1687-92 diphenylcarbazide	0.04	0.5
Copper (Cu)	mg/l	Adaptation of EPA 200.8 method	0.03	3
Electrical Conductivity (EC)	µs/cm	Ion electrode method	736	-
Oil and Grease (O & G)	mg/l	USEPA/ Hexane Extractable Method	2.3	10
Total Residual Chlorine	mg/l	Adaptation of the EPA DPD 330.5	0.04	1
Total Suspended Solid (TSS)	mg/l	Standard Methods (2006), 2540D	80	100
Total Dissolved Solid (TDS)	mg/l	Ion electrode method	402	-
Chemical Oxygen Demand	mg/l	Adaptation of the USEPA 410.4	40	200
Biological Oxygen Demand	mg/l	5 days Incubation	9.9	30

* According to ECR 2023, Schedule 4

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Annex A-6: Ground Water Quality Lab Report

February-April 2023



Ref: ELRC/Water Quality/2023/280

ELRC WET LABORATORY**Test Results of Ground Water Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity : Ground Water Quality
Sampling Personnel : Abdur Reb, Asst. Consultant, ELRC
Sampling Location : GW1; Store House
GPS Coordinate : 24°23'4.80"N 89°44'50.63"E
Sampling Date : 21.04.2023
Analysis Date : 06.05.2023

Description of Analysis :

Parameter	Unit	Analysis Methods	Concentration	*Standard
pH	-	Ion Electrode method	7.5	6.5-8.5
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	0.05
Total Hardness	mg/l	EDTA Titration method	201	500
Chlorine (Cl)	mg/l	Hg (II) Thiocyanate Method	0.21	-
Fluoride (F)	mg/l	SPADNS Method	0.23	1.0
Iron (Fe)	mg/l	Phenanthroline Method	0.34	0.3-1
Manganese (Mn)	mg/l	Periodate method	0.04	0.4
Phosphate (PO ₄)	mg/l	Amino Acid Method	1.1	-
Sulphate (SO ₄)	mg/l	Turbidimetric Method	113.1	250

** According to ECR 2002, Schedule 2(B)

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May-July 2023



Ref: ELRC/Water Quality/2023/275

ELRC WET LABORATORY**Test Results of Ground Water Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity : Ground Water Quality
Sampling Personnel : Abdur Rab, Asst. Consultant, ELRC
Sampling Location : GW1; Store House
GPS Coordinate : 24°23'4.80"N 89°44'50.63"E
Sampling Date : 21.06.2023
Analysis Date : 06.07.2023

Description of Analysis :

Parameter	Unit	Analysis Methods	Concentration	*Standard
pH	-	Ion Electrode method	7.4	6.5-8.5
Arsenic (As)	mg/l	Modified Gutzeit Method	<0.01	0.05
Total Hardness	mg/l	EDTA Titration method	203	500
Chlorine (Cl)	mg/l	Hg (II) Thiocyanate Method	0.17	-
Fluoride (F)	mg/l	SPADNS Method	0.21	1.0
Iron (Fe)	mg/l	Phenanthroline Method	0.31	0.3-1
Manganese (Mn)	mg/l	Periodate method	0.03	0.4
Phosphate (PO4)	mg/l	Amino Acid Method	1.1	-
Sulphate (SO4)	mg/l	Turbidimetric Method	112.1	250

** According to ECR 2023, Schedule 2B/

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Annex A-7: Occupational Noise Level Lab Report

February-April 2023



Ref: ELRC/Occupational Noise Quality/2023/291

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Occupational Noise Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 2 & 3
Monitoring Activity : Occupational Noise Quality
Monitoring Personnel : Abdur Reb, Asst. Consultant, ELRC
Monitoring Location : ONL1: RMS Building
 ONL2: Control Building
 ONL3: Administrative Building
 ONL4: Health Unit
 ONL5: Residential Building
 ONL6: Gas Booster Area
 ONL7: Air Compressor
 ONL8: GTG Building
 ONL9: STG Building
Monitoring Date : 19.04.2023-21.04.2023
Analysis Date : 28.04.2023

Description of Analysis :

Code	Noise Level (dBA)		
	$L_{eq,TOT}$	L_{max}	L_{min}
ONL1	88.3	73.2	82.4
ONL2	67.4	70.3	64.8
ONL3	58.4	58.3	55.2
ONL4	57.2	57.4	55.3
ONL5	57.1	53.8	50.5
ONL6	71.3	77.2	67.4
ONL7	73.4	76.3	70.5
ONL8	75.8	74.8	71.8
ONL9	74.1	77.4	70.2

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May-July 2023



Ref: ELRC/Occupational Noise Quality/2023/275

ELRC ENVIRONMENTAL LABORATORY
Monitoring Results of Occupational Noise Quality

Project Name : Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Monitoring Activity : Occupational Noise Quality
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : DNL1; RMS Building
 DNL2; Control Building
 DNL3; Administrative Building
 DNL4; Health Unit
 DNL5; Residential Building
 DNL6; Gas Booster Area
 DNL7; Air Compressor
 DNL8; GTG Building
 DNL9; STG Building
Monitoring Date : 21.06.2023-23.06.2023
Analysis Date : 28.07.2023

Description of Analysis :

Code	Noise Level (dBA)		
	$L_{eq,T}$	L_{max}	L_{min}
DNL1	67.2	74.5	61.2
DNL2	68.4	70.4	58.6
DNL3	58.2	64.6	48.5
DNL4	56.1	59.3	51.5
DNL5	55.6	62.5	50.3
DNL6	67.3	78.5	64.5
DNL7	72.5	77.4	64.1
DNL8	71.2	75.8	62.3
DNL9	73.6	77.2	56.1

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August-October 2023



Ref: ELRC/Occupational Noise Quality/2023/031

ELRC ENVIRONMENTAL LABORATORY
Monitoring Results of Occupational Noise Quality

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Monitoring Activity : Occupational Noise Quality
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : ONL1: RMS Building
 ONL2: Control Building
 ONL3: Administrative Building
 ONL4: Health Unit
 ONL5: Residential Building
 ONL6: Gas Booster Area
 ONL7: Air Compressor
 ONL8: GTG Building
 ONL9: STG Building
Monitoring Date : 21.10.2023 to 22.10.2023
Analysis Date : 01.11.2023

Description of Analysis :

Code	Noise Level (dBA)		
	Leq _{9hr}	L _{max}	L _{min}
ONL1	67.8	74.5	61.2
ONL2	67.1	70.4	58.9
ONL3	57.9	64.6	49.5
ONL4	55.6	59.3	51.5
ONL5	56.4	62.5	50.3
ONL6	65.1	76.5	64.5
ONL7	71.3	77.4	64.1
ONL8	70.6	75.6	62.3
ONL9	74.2	77.2	56.1

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November 2023-January 2024



Ref: ELRC/Occupational Noise Quality/2024/015

ELRC ENVIRONMENTAL LABORATORY
Monitoring Results of Occupational Noise Quality

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Monitoring Activity : Occupational Noise Quality
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : ONL1: RMS Building
 ONL2: Control Building
 ONL3: Administrative Building
 ONL4: Health Unit
 ONL5: Residential Building
 ONL6: Gas Booster Area
 ONL7: Air Compressor
 ONL8: GTG Building
 ONL9: STG Building

Monitoring Date : 21.12.2023
Analysis Date : 01.01.2024

Description of Analysis :

Code	Noise Level (dBA)		
	Leq _{9hr}	L _{max}	L _{min}
ONL1	85.4	75.2	61.2
ONL2	84.5	71.6	58.9
ONL3	56.7	45.3	49.5
ONL4	57.3	58.2	51.5
ONL5	58.2	60.9	50.3
ONL6	83.7	76.3	64.5
ONL7	72.1	76.6	64.1
ONL8	71.4	77.1	62.3
ONL9	75.9	76.7	56.1

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Annex A-8: Electro-Magnetic Field Lab Report

February-April 2023



Ref: ELRC/Electro-Magnetic Field/20230102520

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Electro-Magnetic Field**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 3
Monitoring Activity : Electro-Magnetic Field
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : EMF1; Switch Yard
GPS Coordinate : 24°23'10.39"N 89°44'43.60"E
Monitoring Date : 17.04.2023
Analysis Date : 22.04.2023

Description of Analysis :

Code	Distance	EMF (mV/m)	*Standard	Remarks
EMF1	0m	0	120 (for Worker)	Plant was remained closed during the monitoring day.
	3m	0		
	5m	0		
	10m	0		

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May-July 2023



Ref: ELRC/Electro-Magnetic Field/20230102520

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Electro-Magnetic Field**

Project Name : Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 3
Monitoring Activity : Electro-Magnetic Field
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : EMFI; Switch Yard
GPS Coordinate : 24°23'11.08"N 89°44'42.18"E
Monitoring Date : 22.06.2023
Analysis Date : 27.06.2023

Description of Analysis :

Code	Distance	EMF (mV/m)	*Standard	Remarks
EMFI	0m	0	120 (for Worker)	Plant was remained closed during the monitoring day.
	3m	0		
	5m	0		
	10m	0		



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August-October 2023



Ref: ELRC/Electro-Magnetic Field/20231037

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Electro-Magnetic Field**

Project Name : Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 3
Monitoring Activity : Electro-Magnetic Field
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : EMFI; Switch Yard
GPS Coordinate : 24°23'11.08"N 89°44'42.18"E
Monitoring Date : 21.10.2023
Analysis Date : 01.11.2023

Description of Analysis :

Code	Distance	EMF (mV/m)	*Standard	Remarks
EMFI	0m	0	120 (for Worker)	Plant was remained closed during the monitoring day.
	3m	0		
	5m	0		
	10m	0		



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November 2023-January 2024



Ref: ELRC/Electro-Magnetic Field/20241017

ELRC ENVIRONMENTAL LABORATORY**Monitoring Results of Electro-Magnetic Field**

Project Name : Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 3
Monitoring Activity : Electro-Magnetic Field
Monitoring Personnel : Abdur Rab, Asst. Consultant, ELRC
Monitoring Location : EMFI; Switch Yard
GPS Coordinate : 24°23'11.08"N 89°44'42.18"E
Monitoring Date : 21.12.2023
Analysis Date : 01.01.2024

Description of Analysis :

Code	Distance	EMF (mV/m)	*Standard	Remarks
EMFI	0m	0	120 (for Worker)	Plant was remained closed during the monitoring day.
	3m	0		
	5m	0		
	10m	0		



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Annex A-9: Drinking Water Quality Lab Report

February-April 2023



Ref: ELRC/Water Quality/2023/282

ELRC WET LABORATORY**Test Results of Drinking Water Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Drinking Water Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: DW1: Control Building DW2: Admin Building DW3: Residential Building
GPS Coordinate	: 24°23'11.72" N 89°44'47.22" E 24°23'11.95" N 89°44'46.00" E 24°23'14.77" N 89°44'49.31" E
Sampling Date	: 21.02.2023
Analysis Date	: 06.03.2023

Description of Analysis :

Parameters	Unit	Analysis Methods	Concentration			*Standard
			DW1	DW2	DW3	
pH	-	Ion Electrode method	7.2	7.1	7.3	6.5-8.5
Arsenic (As)	mg/L	Modified Gutzeit Method	<0.01	<0.01	<0.01	0.05
Total Dissolved Solid (TDS)	mg/L	Ion Electrode method	150	180	180	1000
Electrical Conductivity (EC)	mg/L	Ion Electrode method	290	350	310	-
Total Coliform (TC)	N/100mL	Membrane Filtration Method	0	0	0	0
Total Hardness	mg/L	EDTA Titration Method	215	221	223	500
Chlorine (Cl)	mg/L	Hg (II) Thiocyanate Method	1.2	2.2	1.2	-
Fluoride (F)	mg/L	SPADNS Method	0.1	0.2	0.2	1.0
Iron (Fe)	mg/L	Phenanthroline Method	0.02	0.01	0.02	0.3-1
Manganese (Mn)	mg/L	Periodate method	<0.01	<0.01	<0.01	0.4
Phosphate (PO4)	mg/L	Amino acid method	0.3	0.2	0.3	-
Sulphate (SO4)	mg/L	Turbidimetric Method	11	11	0	250

** According to ECR 2023, Schedule 2B/

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Ref: ELRC/Water Quality/2023/283

ELRC WET LABORATORY**Test Results of Drinking Water Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Drinking Water Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: DW1: Control Building DW2: Admin Building DW3: Residential Building
GPS Coordinate	: 24°23'11.72" N 89°44'47.22" E 24°23'11.95" N 89°44'46.00" E 24°23'14.77" N 89°44'49.31" E
Sampling Date	: 16.03.2023
Analysis Date	: 03.04.2023

Description of Analysis :

Parameters	Unit	Analysis Methods	Concentration			*Standard
			DW1	DW2	DW3	
pH	-	Ion Electrode method	7.1	7.4	7.3	6.5-8.5
Arsenic (As)	mg/L	Modified Gutzeit Method	<0.01	<0.01	<0.01	0.05
Total Dissolved Solid (TDS)	mg/L	Ion Electrode method	150	180	160	1000
Electrical Conductivity (EC)	mg/L	Ion Electrode method	290	355	310	-
Total Coliform (TC)	N/100mL	Membrane Filtration Method	0	0	0	0
Total Hardness	mg/L	EDTA Titration Method	215	220	224	500
Chlorine (Cl)	mg/L	Hg (II) Thiocyanate Method	1.2	2.0	1.1	-
Fluoride (F)	mg/L	SPADNS Method	0.2	0.1	0.2	1.0
Iron (Fe)	mg/L	Phenanthroline Method	0.02	0.01	0.02	0.3-1
Manganese (Mn)	mg/L	Periodate method	<0.01	<0.01	<0.01	0.4
Phosphate (PO4)	mg/L	Amino acid method	0.2	0.2	0.3	-
Sulphate (SO4)	mg/L	Turbidimetric Method	12	10	8	250

**According to ECR 2023, Schedule 2B/

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Ref: ELRC/Water Quality/2023/284

ELRC WET LABORATORY**Test Results of Drinking Water Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Drinking Water Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: DW1: Control Building DW2: Admin Building DW3: Residential Building
GPS Coordinate	: 24°23'11.72" N 89°44'47.22" E 24°23'11.96" N 89°44'46.00" E 24°23'14.77" N 89°44'49.31" E
Sampling Date	: 17.04.2023
Analysis Date	: 05.05.2023

Description of Analysis :

Parameters	Unit	Analysis Methods	Concentration			*Standard
			DW1	DW2	DW3	
pH	-	Ion Electrode method	7.1	7.2	7.3	6.5-8.5
Arsenic (As)	mg/L	Modified Gutzeit Method	<0.01	<0.01	<0.01	0.05
Total Dissolved Solid (TDS)	mg/L	Ion Electrode method	150	160	160	1000
Electrical Conductivity (EC)	mg/L	Ion Electrode method	290	350	310	-
Total Coliform (TC)	N/100mL	Membrane Filtration Method	0	0	0	0
Total Hardness	mg/L	EDTA Titration Method	215	220	224	500
Chlorine (Cl)	mg/L	Hg (II) Thiocyanate Method	1.2	2.1	1.2	-
Fluoride (F)	mg/L	SPADNS Method	0.2	0.1	0.2	1.0
Iron (Fe)	mg/L	Phenanthroline Method	0.02	0.01	0.02	0.3-1
Manganese (Mn)	mg/L	Periodate method	<0.01	<0.01	<0.01	0.4
Phosphate (PO4)	mg/L	Amino acid method	0.2	0.2	0.3	-
Sulphate (SO4)	mg/L	Turbidimetric Method	12	11	7	250

**According to ECR 2023, Schedule 2B/

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May-July 2023



Ref: ELRC/Water Quality/2023/277

ELRC WET LABORATORY**Test Results of Drinking Water Quality**

Project Name : Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity : Drinking Water Quality
Sampling Personnel : Tofazzal Hossain, Consultant, ELRC
Sampling Location : DW1; Control Building
 : DW2; Admin Building
 : DW3; Residential Building
GPS Coordinate : 24°23'11.72"N 89°44'47.22"E
 : 24°23'11.95"N 89°44'46.00"E
 : 24°23'14.77"N 89°44'49.31"E
Sampling Date : 20.05.2023
Analysis Date : 06.06.2023

Description of Analysis :

Parameters	Unit	Analysis Methods	Concentration			* Standard
			DW1	DW2	DW3	
pH	-	Ion Electrode method	7.3	7.2	7.3	6.5-8.5
Arsenic (As)	mg/L	Modified Gutzeit Method	<0.01	<0.01	<0.01	0.05
Total Dissolved Solid (TDS)	mg/L	Ion Electrode method	150	180	160	1000
Electrical Conductivity (EC)	mg/L	Ion Electrode method	295	345	320	-
Total Coliform (TC)	N/100mL	Membrane Filtration Method	0	0	0	0
Total Hardness	mg/L	EDTA Titration Method	215	221	223	500
Chlorine (Cl)	mg/L	Hg (II) Thiocyanate Method	1.2	2.2	1.2	-
Fluoride (F)	mg/L	SPADNS Method	0.1	0.2	0.2	1.0
Iron (Fe)	mg/L	Phenanthroline Method	0.02	0.01	0.02	0.3-1
Manganese (Mn)	mg/L	Periodate method	<0.01	<0.01	<0.01	0.4
Phosphate (PO ₄)	mg/L	Amino acid method	0.3	0.2	0.3	-
Sulphate (SO ₄)	mg/L	Turbidimetric Method	11	11	8	250

** According to ECR 2023, Schedule 2B/



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Ahmed Jubayer
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Ref: ELRC/Water Quality/2024/017

ELRC WET LABORATORY**Test Results of Drinking Water Quality**

Project Name : Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel) Unit 2 & 3
Sampling Activity : Drinking Water Quality
Sampling Personnel : Tofazzal Hossain, Consultant, ELRC
Sampling Location : DW1; Control Building
 DW2; Admin Building
 DW3; Residential Building
GPS Coordinate : 24°23'11.72"N 89°44'47.22"E
 24°23'11.95"N 89°44'46.00"E
 24°23'14.77"N 89°44'49.31"E
Sampling Date : 24.12.2023
Description of Analysis :

Parameters	Unit	DW1	DW2	DW3	Standard
pH	-	7.5	7.8	7.4	6.5-8.5
Arsenic (As)	mg/L	<0.01	<0.01	<0.01	0.05
Total Dissolved Solid (TDS)	mg/L	168	170	162	1000
Electrical Conductivity (EC)	mg/L	320	295	313	-
Total Coliform (TC)	N/100mL	0	0	0	0
Total Hardness	mg/L	225	220	231	500
Chlorine (Cl)	mg/L	1.1	0.9	0.7	-
Fluoride (F)	mg/L	0.5	0.4	0.6	1.0
Iron (Fe)	mg/L	0.03	0.04	0.04	0.3-1
Manganese (Mn)	mg/L	<0.01	<0.01	<0.01	0.4
Phosphate (PO4)	mg/L	0.5	0.4	0.4	-
Sulphate (SO4)	mg/L	11	13	15	250

**According to ECR 2022, Schedule 2B)

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Annex A-10: Soil Quality Lab Report



Ref: ELRC/Water Quality/2023/029

ELRC WET LABORATORY**Test Results of Drinking Water Quality**

Project Name	: Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel); Unit 2 & 3
Sampling Activity	: Soil Quality
Sampling Personnel	: Tofazzal Hossain, Consultant, ELRC
Sampling Location	: SQ1: Plant Adjacent Open Soil SQ2: Plant Adjacent Open Soil SQ3: Plant Adjacent Open Soil
GPS Coordinate	: 24°23'2.07"N 89°44'51.88"E 24°23'16.02"N 89°44'50.95"E 24°23'15.95"N 89°44'43.69"E
Sampling Date	: 20.07.2023
Analysis Date	: 05.08.2023

Sl. No.	Parameter	Unit	Concentration		
			SQ1	SQ2	SQ3
1.	Electrical Conductivity (EC)	dS/m	1.6	1.4	1.7
2.	Bulk Density	g/cm ³	1.48	1.53	1.61
3.	pH	-	7.4	7.5	7.4
4.	Organic Content	%	0.42	0.40	0.38
5.	Calcium (Ca)	mg/kg	4.8	3.2	3.5
6.	Magnesium (Mg)	mg/kg	3.4	3.0	2.4
7.	Potassium (K)	mg/kg	0.06	0.08	0.07
8.	Sodium (Na)	meq/100g	1.03	1.02	0.87
9.	Nitrogen (N)	mg/kg	0.02	0.03	0.01
10.	Phosphorus (P)	mg/kg	1.5	1.1	1.5
11.	Sulphur (S)	mg/kg	24.2	21.4	18.3
12.	Boron (B)	mg/kg	0.06	0.04	0.06
13.	Copper (Cu)	mg/kg	2.3	1.8	2.1
14.	Iron (Fe)	mg/kg	23.0	21.2	19.6
15.	Manganese (Mn)	mg/kg	18.2	17.1	18.1
16.	Zinc (Zn)	mg/kg	1.6	1.2	1.3
17.	Lead (Pb)	mg/kg	9.4	5.4	7.1
18.	Cadmium (Cd)	mg/kg	0.04	0.03	0.03
19.	Arsenic (As)	mg/kg	0.12	0.10	0.15
20.	Mercury (Hg)	mg/kg	0.06	0.05	0.06

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14.	Iron (Fe)	mg/kg	23.0	21.2	19.6
15.	Manganese (Mn)	mg/kg	19.2	17.1	19.1
16.	Zinc (Zn)	mg/kg	1.6	1.2	1.3
17.	Lead (Pb)	mg/kg	9.4	5.4	7.1
18.	Cadmium (Cd)	mg/kg	0.04	0.03	0.03
19.	Arsenic (As)	mg/kg	0.12	0.10	0.15
20.	Mercury (Hg)	mg/kg	0.05	0.03	0.07

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Annex B: Monitoring Photographs

Annex B-1: Air Quality Monitoring Photographs



February 2023-April 2023



May 2023-July 2023



August 2023-October 2023



November 2023-January 2024

Source: Annual Environmental Monitoring of ELRC

Annex B-2: Noise Level Monitoring Photographs

February 2023-April 2023



Figure 6-1 : ANL1; South-West Corner of the Project



Figure 6-2: ANL2; Southeast Corner of the Project



Figure 6-3: ANL3; Middle of the Project



Figure 6-4: ANL4; Middle of the North West and South West



Figure 6-5: ANL5; North West Site



Figure 6-6: ANL6; Northeast Site



Figure 6-7: ANL7; Infront of G.T.G Building



Figure 6-8: ANL8; Infront of S.T.G Building



Figure 6-9: ANL9; Administration Building (Outdoor)



Figure 6-10: ANL10; Medical (Indoor)



Figure 6-11: ANL11; Administration Building (Indoor 2nd Floor)



Figure 6-12: ANL12; Residential Building



Figure 6-13: ANL13; Main Gate of the Project

May 2023-July 2023



Photo 6-1: ANL1; South-West Corner of the Project



Photo 6-2: ANL2; South East Corner of the Project



Photo 6-3: ANL3; Middle of the Project



Photo 6-4: ANL4; Middle of the Northwest and Southwest



Photo 6-5: ANL5; Northwest Site



Photo 6-6: ANL6; Northeast Site



Photo 6-7: ANL7; Infront of G.T.G Building



Photo 6-8: ANL8; Infront of S.T.G Building



Photo 6-9: ANL9; Administration Building (Outdoor)



Photo 6-10: ANL10; Medical (Indoor)



Photo 6-11: ANL11; Administration Building (Indoor 2nd Floor)



Photo 6-12: ANL13; Main Gate of the Project

August 2023-October 2023



Photo 6: ANL1; South-West Corner of the Project



Photo 7: ANL2; Southeast Corner of the Project



Photo 8: ANL3; Middle of the Project



Photo 9: ANL4; Middle of the Northwest and South West



Photo 10: ANL5; Northwest Site



Photo 11: ANL6; Northeast Site



Photo 12: ANL7; Infront of G.T.G Building



Photo 13: ANL8; Infront of S.T.G Building



Photo 14: ANL9; Administration Building (Out Door)



Photo15: ANL10; Medical (Indoor)



Photo16: ANL11; Administration Building (Indoor 2nd Floor)



Photo 17: ANL12; Residential Building



Photo 18: ANL13; Main Gate of the Project

November 2023-January 2024



Photo 6: ANL1; South-West Corner of the Project



Photo 7: ANL2; Southeast Corner of the Project



Photo 8: ANL3; Middle of the Project



Photo 9: ANL4; Middle of the North West and South West



Photo 10: ANL5; North West Site



Photo 11: ANL6; North East Site



Photo 12: ANL7; North- Western Corner of the Project



Photo 13: ANL8; South-Western Corner of the Project



Photo 14: ANL9; Administration Building (Out Door)



Photo15: ANL10; Medical (Indoor)



Photo16: ANL11; Administration Building (Indoor 2nd Floor)



Photo 18: ANL12; Main Gate of the Project



Photo 18: ANL13; Infront of G.T.G Building

Source: Annual Environmental Monitoring of ELRC

Annex B-3: Surface Water Sampling Photographs

February 2023-April 2023



May 2023-July 2023



August 2023-October 2023



November 2023-January 2024



SW1; 50m Downstream from Discharge Point

Source: Annual Environmental Monitoring of ELRC

Annex B-4: Ground Water Sampling Photographs

February 2023-April 2023



May 2023-July 2023



GW1; Store House

Source: Annual Environmental Monitoring of ELRC

Annex B-5: Waste Water Sampling Photographs

February 2023-April 2023



May 2023-July 2023



August 2023-October 2023



November 2023-January 2024



WW1; Effluent Discharge Channel

Source: Annual Environmental Monitoring of ELRC

Annex B-6: Storm Water Sampling Photographs

May 2023-July 2023



StW1; Discharge Point

Source: Annual Environmental Monitoring of ELRC

Annex B-7: Drinking Water Sampling Photographs

February 2023-April 2023



May 2023-July 2023



August 2023-October 2023



November 2023-January 2024



DW1; Control Building



DW2; Admin Building



DW3; Residential Building

Source: Annual Environmental Monitoring of ELRC

Annex B-8: Occupational Noise Monitoring Photographs



Source: Annual Environmental Monitoring of ELRC

Annex B-9: Electro-Magnetic Field Monitoring Photographs

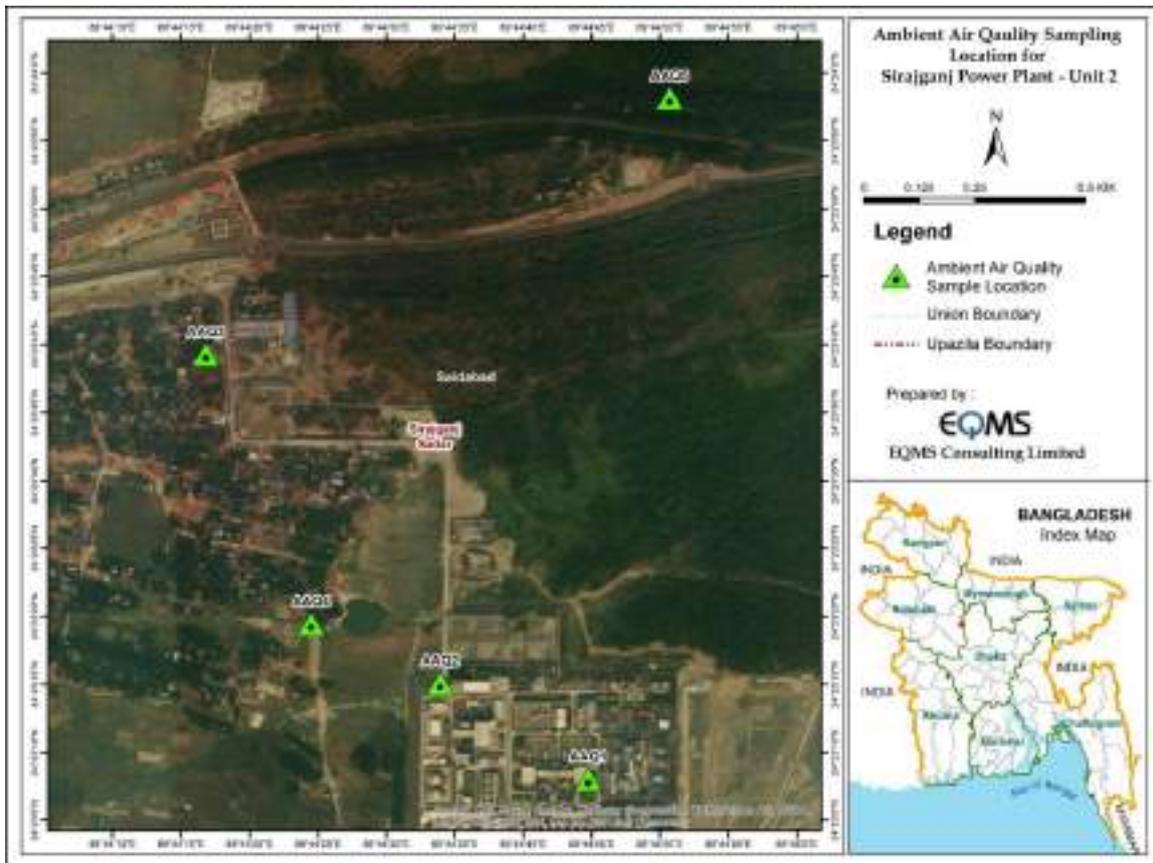


Source: Annual Environmental Monitoring of ELRC

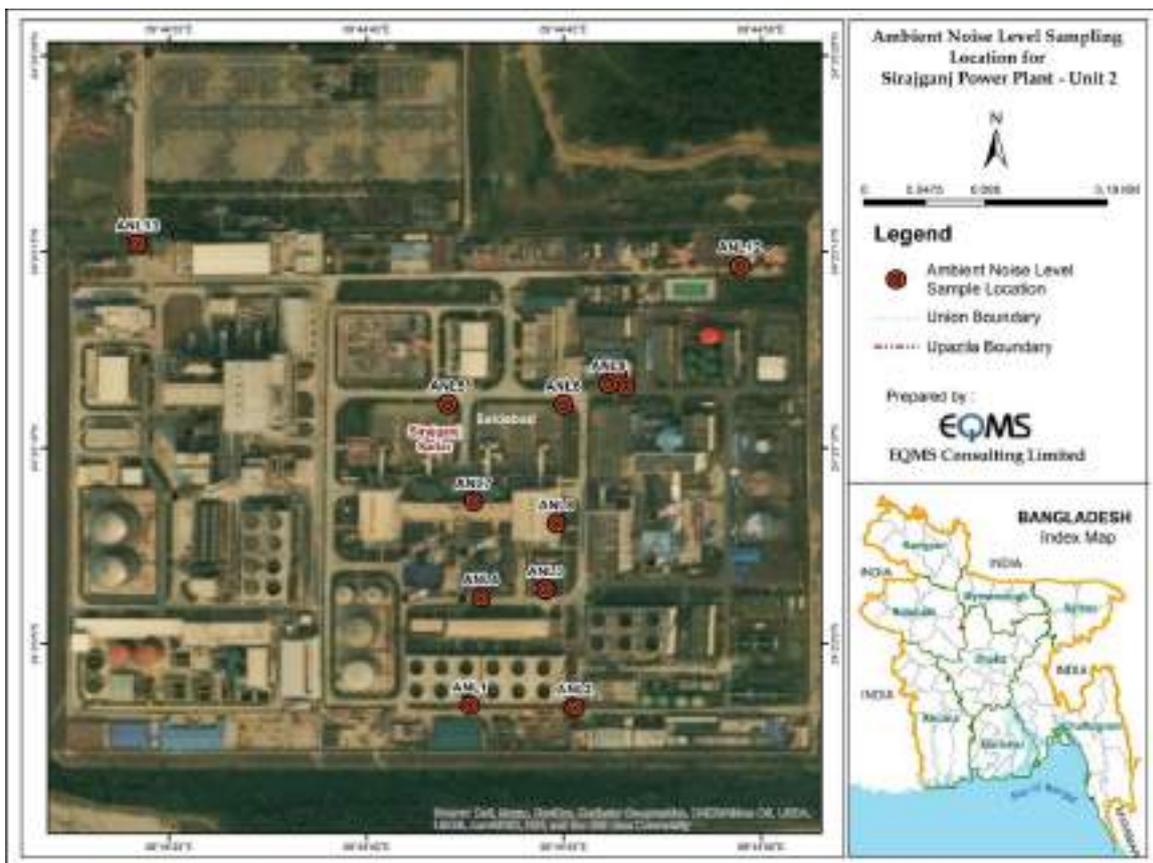
Annex B-10: Soil Quality Sampling Photographs



Annex C: Maps of the Monitoring Locations



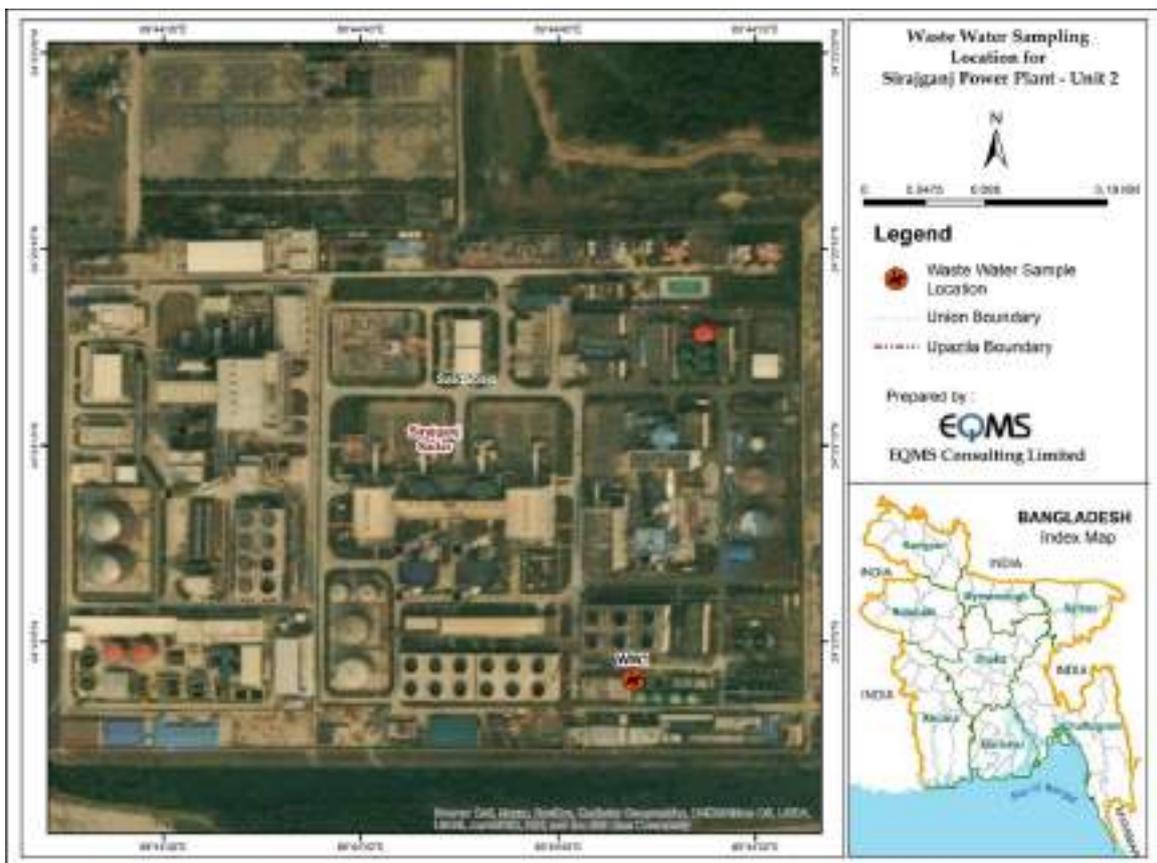
Map 6-1: Monitoring Points of Ambient Air Quality



Map 6-2: Monitoring Points of Ambient Noise Level



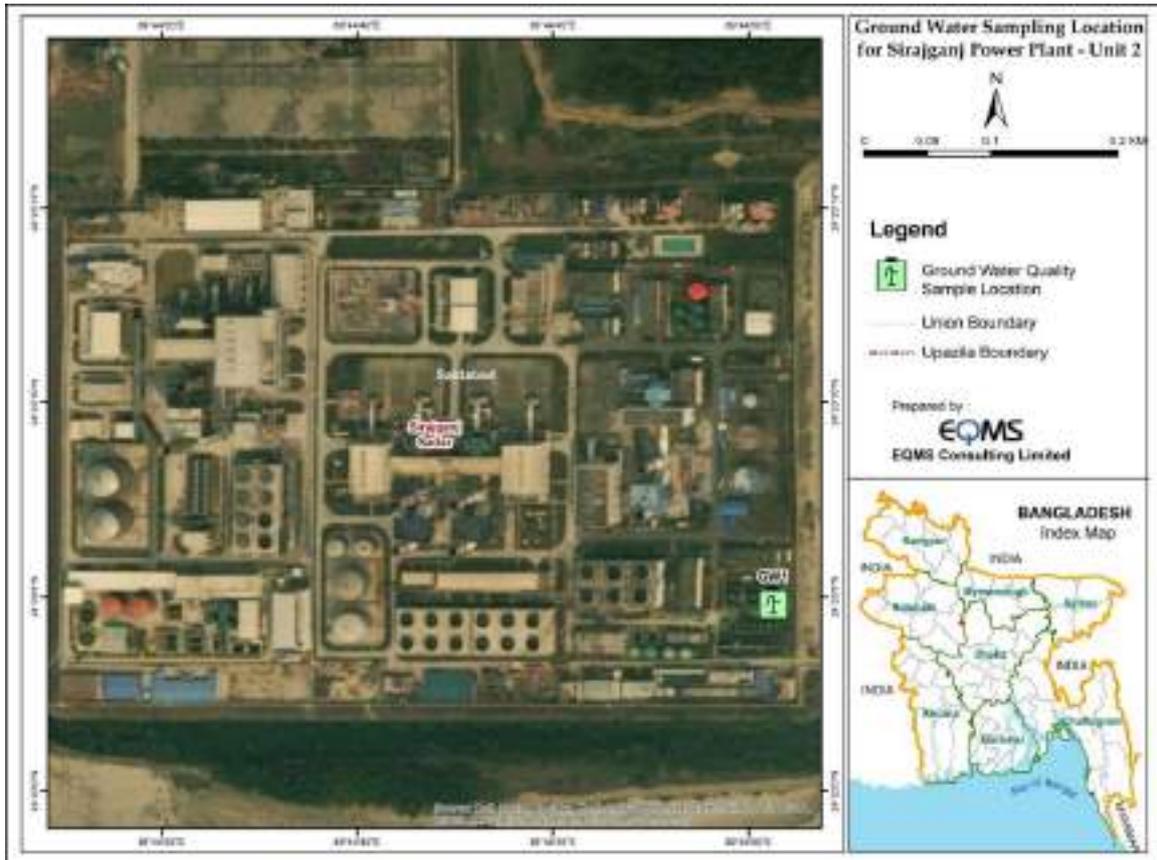
Map 6-3: Sampling Points of Surface Water Quality



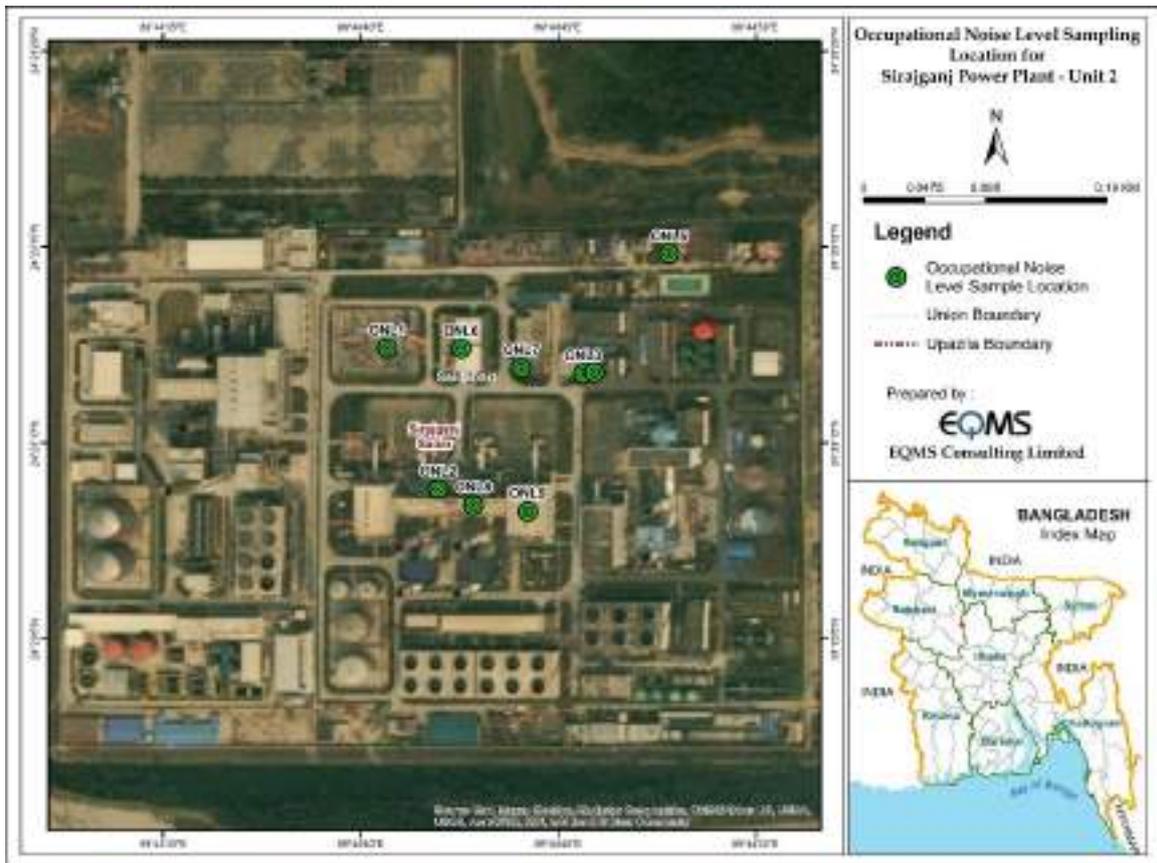
Map 6-4: Sampling Points of Waste Water Quality



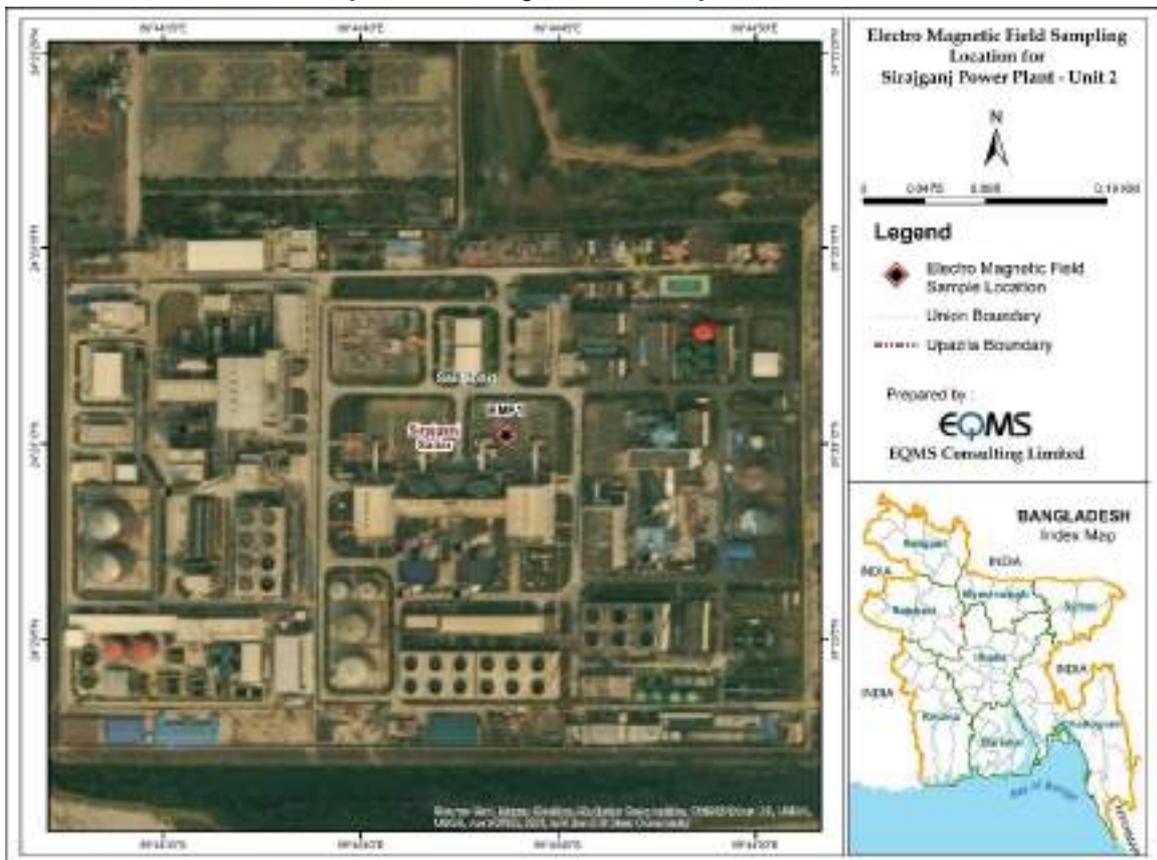
Map 6-5: Sampling Points of Storm Water Quality



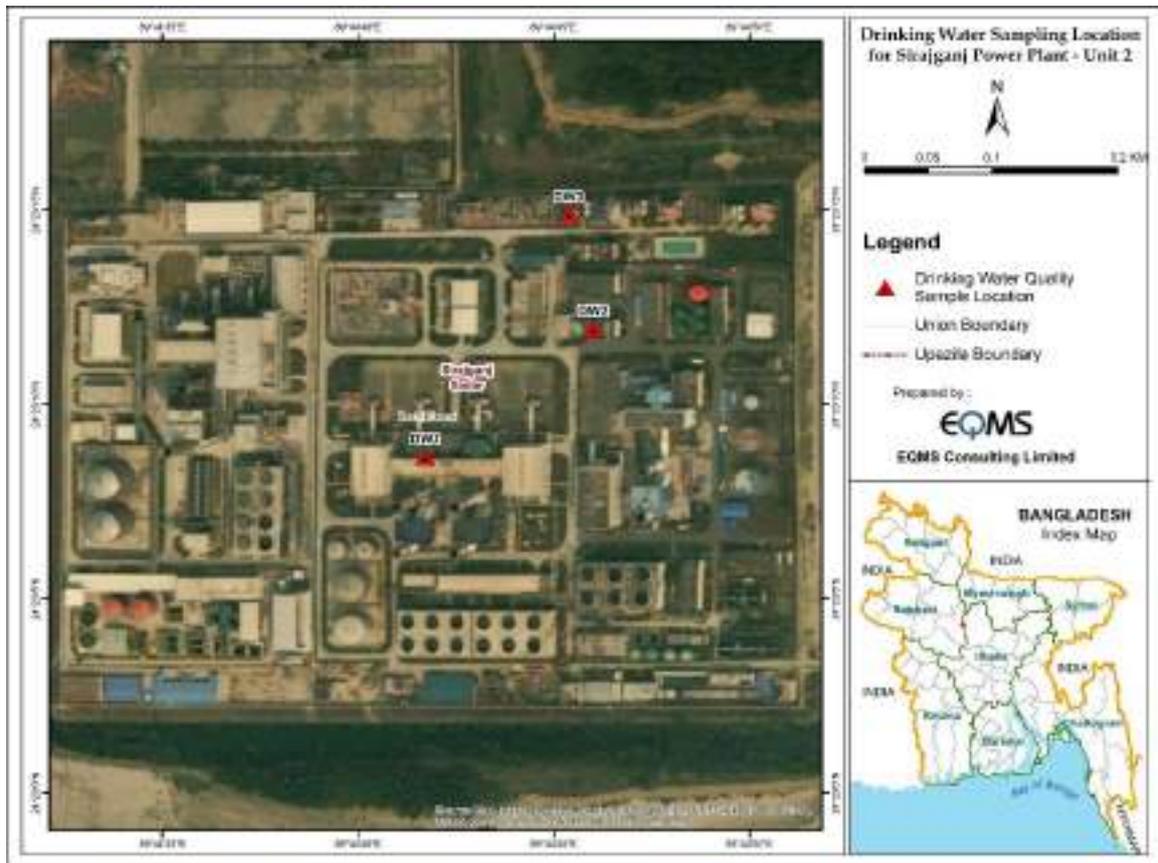
Map 6-6: Sampling Points of Ground Water Quality



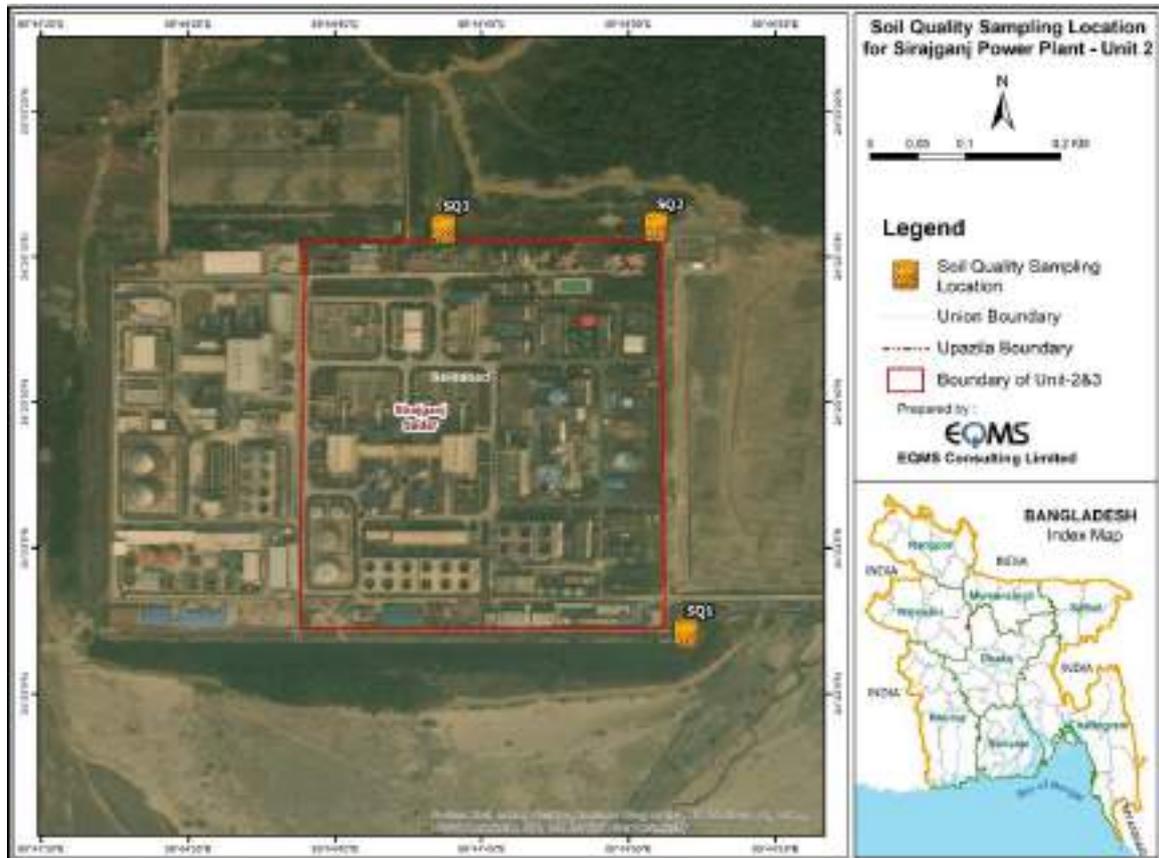
Map 6-7: Monitoring Points of Occupational Noise



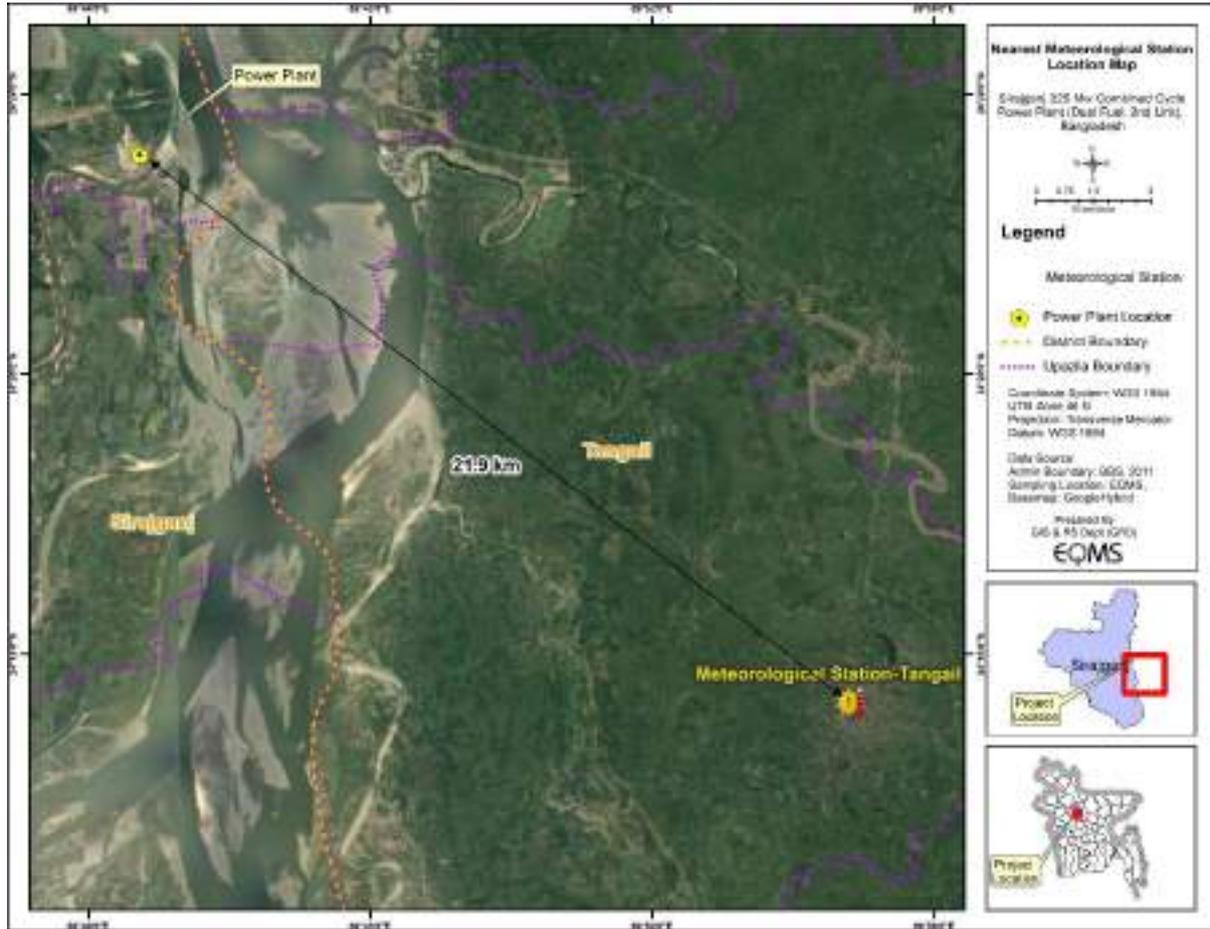
Map 6-8: Monitoring Points of Electro-Magnetic Field



Map 6-9: Sampling Points of Drinking Water Quality



Map 6-10: Sampling Points of Soil Quality



Map 6-11: Nearest Metrological Station Location Map

**Annex D: Sample Records of Stack Emission
Data**

February 2023-April 2023



May 2023-July 2023



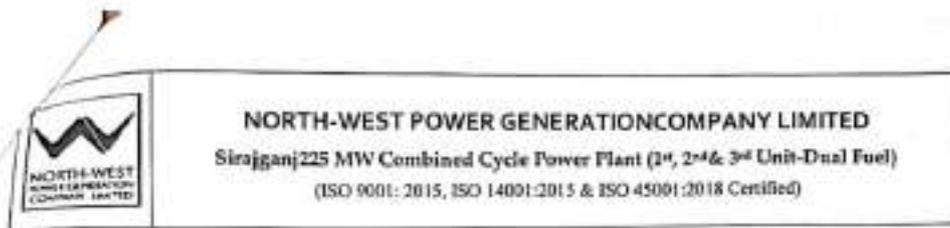
August 2023-October 2023



November 2023-January 2024

Annex E: Records of Leak Detection Data

(1)



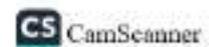
Visual Inspection of Pipeline Route

Date	Remarks	Inspected by	Signature	Signature
17.02.22	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Ahmed Nain</i>	<i>Md. Manirul Islam</i>
20.03.22	No leakage found	Md. Julkar Nain & Shariful Islam	<i>Ahmed Nain</i>	<i>Shariful Islam</i>
12.04.22	No leakage found	Mashhour Mahmud Khan & Md. Manirul Islam	<i>Kamruddin</i>	<i>Md. Manirul Islam</i>
22.05.22	No leakage found	Mashhour Mahmud Khan & Shariful Islam	<i>Kamruddin</i>	<i>Shariful Islam</i>
16.06.22	No leakage found	Mashhour Mahmud Khan & Md. Manirul Islam	<i>Kamruddin</i>	<i>Md. Manirul Islam</i>
17.07.22	No leakage found	Mashhour Mahmud Khan & Shariful Islam	<i>Kamruddin</i>	<i>Shariful Islam</i>
21.08.22	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Ahmed Nain</i>	<i>Md. Manirul Islam</i>
20.09.22	No leakage found	Md. Julkar Nain & Shariful Islam	<i>Ahmed Nain</i>	<i>Shariful Islam</i>
22.10.22	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Ahmed Nain</i>	<i>Md. Manirul Islam</i>
14.11.22	No leakage found	Md. Julkar Nain & Shariful Islam	<i>Ahmed Nain</i>	<i>Shariful Islam</i>
12.12.22	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Ahmed Nain</i>	<i>Md. Manirul Islam</i>
15.01.23	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Ahmed Nain</i>	<i>Md. Manirul Islam</i>
16.02.23	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Ahmed Nain</i>	<i>Md. Manirul Islam</i>

 <p>NORTH-WEST POWER GENERATION COMPANY LIMITED Sirajganj 225 MW Combined Cycle Power Plant (1st, 2nd & 3rd Unit-Dual Fuel) (ISO 9001: 2015, ISO 14001:2015 & ISO 45001:2018 Certified)</p>
--

Visual Inspection of Pipeline Route

Date	Remarks	Inspected by	Signature	Signature
16.03.23	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Abulhasan</i>	<i>20/03/23</i>
12.04.23	No leakage found	Md. Julkar Nain & Shariful Islam	<i>Abulhasan</i>	<i>25</i>
18.05.23	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Abulhasan</i>	<i>27/05/23</i>
13.06.23	No leakage found	Md. Julkar Nain & Shariful Islam	<i>Abulhasan</i>	<i>28</i>
15.07.23	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Abulhasan</i>	<i>27/07/23</i>
14.08.23	No leakage found	Md. Julkar Nain & Shariful Islam	<i>Abulhasan</i>	<i>28</i>
18.09.23	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Abulhasan</i>	<i>27/09/23</i>
16.10.23	No leakage found	Md. Julkar Nain & Shariful Islam	<i>Abulhasan</i>	<i>28</i>
19.11.23	No leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Abulhasan</i>	<i>27/11/23</i>
23.12.23	No Leakage found	Md. Julkar Nain & Md. Manirul Islam	<i>Abulhasan</i>	<i>26/12/23</i>



Annex F: Records of Meteorological Data

“The meteorological data has been embedded in the Annex D”

Annex G: Records of Health Checkup Data

নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোং লিঃ
NORTH-WEST POWER GENERATION CO. LTD.
 ISO 9001: 2008, ISO 14001: 2004 & OHSAS 18001: 2007 Certified
 (An Enterprise of Bangladesh Power Development Board)

১০০০ হাটখোলী বার
 ডিহাঙ্গা নগর, ঢাকা
 www.nwpgcl.com.bd
 E-mail: nwpgcl@nwpgcl.gov.bd

Vision Test: *NO*

History of Past illness: *H/O Sn. Asthma, Acidity, Skin Allergy.*
 (Name and outcome with approximate date of diagnosis, if present):

History of any Surgery: */ FHO Fistula in Ano (operated)*
 (Any disability history)

Drug History: *NO*

Vaccination record in brief: *NO, COVID-19, BPL.*

Allergic History: *NO Food Allergy.*

If any significant findings, please mention in details:

Recommended labs: (if required)..... *NO*

Further Consultancy needed? A. Yes. B. No.

Comments: *need to take Hepatitis-B and influenza vaccine.
 (vaccine নিও ঐক্যক্রম হাসপাতাল থেকে নেওয়া)*

[Signature]
 Medical Assistant

[Signature]
 05.05.2023
 Dr. Md. Golam Hossain
 Senior Medical Officer (General)
 Sirajganj Power Station
 NWPGCL, Sirajganj, Bangladesh



নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোং লিঃ
 NORTH-WEST POWER GENERATION CO. LTD.
 ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007 Certified
 (An Enterprise of Bangladesh Power Development Board)

১৯৭৬-৭৭
 ১৯৭৬-৭৭
 ১৯৭৬-৭৭
 ১৯৭৬-৭৭

Employee Health Record Card

(To be filled up by Employee):

Name of Employee: Md. Shahnur Rahman Sathat
 Date of Birth/Age: 14-09-2002
 Sex: Male / Female
 Designation: Work assistant
 Working Area/Department: operation (U-2) Sinaggarj 225 MW combined cycle Power Plant
 Name of the Office: Office of the CE, Unit: 1/2/3 Solar
 Follow up ID No: G-4, IV-4
 Date of follow-up: 07.09.23
 Blood Group: A+
 Mobile Number: 01899799420

General Examination

(To be filled up by Medical Department):

Appearance: Healthy
 Body Built: Average

BP: 90/60 mm of Hg
 Pulse: 62 bpm

After 1 Minute jumping jog in place	
Peak Pulse	91
Recovery Pulse (After 01 Delay in taking peak pulse)	65
Difference between peak & recovery pulse	26

Anaemia: |
 Jaundice: |
 Edema: |
 Dehydration: Absent
 Clubbing: |
 Koilonychia: |
 Leukonychia: |
 General Skin Condition: Good
 Thyroid: NS

Temp: Normal
 Respiratory Rate: 20/min
 Weight: 67 Kg
 Height: 5'6"
 SpO2: 99%
 R.B.S/ F.B.S: 5.1 mmol/l
 Heart/ Lungs: NAD

নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোং লিঃ
NORTH-WEST POWER GENERATION CO. LTD.
 ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007 Certified
(An Enterprise of Bangladesh Power Development Board)

১৯৯৯ সালে প্রতিষ্ঠিত
 পাওয়ার জেন. কো. লি.
 ১৯৯৯ সালে প্রতিষ্ঠিত, মাস্টার, ইসলামাবাদ
 E-মেইল: info@nwppl.gov.bd | www.nwppl.gov.bd

Lymph Node: *NP*

Vision Test: *Normal*

History of Past illness: *NO*
 (Name and outcome with approximate date of diagnosis, if present):

History of any Surgery: *NO*
 (Any disability history)

Drug History: *NO*

Vaccination record in brief:
COVID-19
Hepatitis - B (2 dose) *B.P.*

Allergic History: *NO*

If any significant findings, please mention in details: *NO*

Recommended labs: (if required)..... *NO*

Further Consultancy needed? A. Yes. B. No.

Comments: *২২০০ সিসি-তে এক্ষুণে প্রসূতকাল-বিহীন।
 প্রসূতকাল দির্ঘ হ্রাসকালে বিশ্রাম লোমসাগ্র কলকাতা*

Medical Assistant
Ayatullah Foyzal
 Medical Assistant
 Sirajganj Power Station
 NWPGCL, Sirajganj, Bangladesh

A
 07.09.2023
 Senior Medical Officer
 Dr. Md. *Abdur Kibriya*
 M.S.B.S (Rad), C.M.A. (Gen)
 Senior Medical Officer (Incharge)
 Sirajganj Power Station
 NWPGCL, Sirajganj, Bangladesh

Annex H: Emergency Preparedness and Responses

Emergency Preparedness Responses are embedded in Annex K.

**Annex I: Community Relationship
Program/Awareness and Training**

 **WELCOME/স্বাগতম**

Community Health Safety and Emergency Preparedness Program 2022
“সামাজিক স্বাস্থ্য নিরাপত্তা ও জরুরি প্রস্তুতিমূলক কার্যক্রম ২০২২”
Date: 19.09.2022 **Time: 12:15 PM**
Venue: Punorbason Graveyard Madrasha, Soydabad Sirajganj

North-West Power Generation Company Limited
Sirajganj 225 MW Combined Cycle Power Plant (Unit 2 and 3)

 1

 **সামাজিক স্বাস্থ্য নিরাপত্তা ও জরুরি প্রস্তুতিমূলক কার্যক্রম ২০২২**

আলোচ্যসূচি

- বন্যা
- গ্যাস নিঃসরণ
- তেল নিঃসরণ
- সড়ক দুর্ঘটনা
- সংক্রামক এবং অসংক্রামক রোগ






 2

 **INTRODUCTION/ভূমিকা**

□ কমিউনিটিতে স্বাস্থ্য হুমকি, রাসায়নিক পদার্থ, ধোঁয়া, ভাইরাস, ব্যাকটেরিয়া, নিম্ন স্তরের বিকিরণ এবং পরিবেশে অন্যান্য সম্ভাব্য ক্ষতিকারক সাধারণ পদার্থ

□ কমিউনিটি হেলথ অ্যান্ড সেফটি বলতে স্থানীয় কমিউনিটিগুলিকে প্রকল্পের কার্যক্রম (বন্যা, ভূমিধস, দূষণ বা অন্যান্য প্রাকৃতিক বা মানবসৃষ্ট বিপদ সহ), রোগ এবং দুর্ঘটনাজনিত পতনের কারণে সৃষ্ট বিপদ থেকে রক্ষা করাকে বোঝায়।

□ কমিউনিটি প্রস্তুতি বলতে নাগরিকদের প্রশিক্ষণ, শিক্ষা এবং সম্পদ প্রদানের জন্য প্রচেষ্টা বোঝায় যা তাদের ব্যক্তিগত এবং সমষ্টিগত স্তরে সম্ভাব্য স্থানীয় দুর্ঘটনের হুমকির বিরুদ্ধে আগাম প্রস্তুতি নিতে সহায়তা করে থাকে।

 3



FLOODS/বন্যা

Floods in Bangladesh/বাংলাদেশে বন্যা

- ❑ বাংলাদেশে প্রতি বছর প্রায় ২৬,০০০ বর্গ কিলোমিটার প্লাবিত হয়
- ❑ ৫০ হাজারেরও বেশি লোক মারা যায় এবং সাত মিলিয়নেরও বেশি বাড়ি ধ্বংস করে
- ❑ এদের অধিকাংশই দেশের উত্তরাঞ্চলে ঘটে



4



FLOODS/বন্যা

Floods in Project Area

- ❑ গত বছর হঠাৎ করে জেলার ৯ টি উপজেলার প্রধান অংশ প্লাবিত হয়েছিল
- ❑ এটি প্রতি বছরের ঘটনা
- ❑ অনেক মানুষ গৃহহীন এবং অনাহারে ছিল
- ❑ উন্নয়নের কারণে, আজকাল কম লোকই ভুক্তভোগী



5



FLOODS/বন্যা

Preparation

- ❑ বন্যা হওয়ার পূর্বে করণীয়
 - ❖ বন্যা সম্পর্কিত উৎসের পূর্বাভাস জানা
 - ❖ কোথায় যেতে হবে তা সম্পর্কে সুস্পষ্ট ধারণা রাখা
 - ❖ বিকল্প পথ সম্পর্কে জানা এবং আলাদা হয়ে গেলে কোথায় গিয়ে মিলিত হবে পূর্বেই আলোচনা করা
 - ❖ গুরুত্বপূর্ণ জিনিস ও গৃহপালিত পশু বিষয়ে পূর্বেই করণীয় সম্পর্কে আলোচনা করা
 - ❖ বৈদ্যুতিক সংযোগ বিচ্ছিন্ন করা
 - ❖ আকস্মিক বন্যার জন্য প্রস্তুত থাকা এবং প্রয়োজনে দ্রুত স্থান ত্যাগ করা



6



FLOODS/বন্যা

During A Flood



□ বন্যার সময় করণীয়

- ◆ স্থানীয় নির্দেশনা অনুযায়ী কোনো পথ চলাচলের জন্য ব্যবহার করা
- ◆ ঘূর্ণয়মান পানির মধ্যে দিয়ে হেটে না যাওয়া এবং প্রয়োজনে লাঠি ব্যবহার করা
- ◆ বৈদ্যুতিক সুইচ বা সংযোগ তার ডিজা অবস্থায় স্পর্শ না করা
- ◆ বন্যার পানি পুরোপুরি সরে না যাওয়া পর্যন্ত নিরাপদ স্থানে থাকা
- ◆ আকস্মিক বন্যা হলে উঁচু স্থানে সরে যাওয়া এবং পৃথকপালিত পশু ছেড়ে দেওয়া



7



FLOODS/বন্যা

After A Flood



□ বন্যা পরবর্তী করণীয়

- ◆ সাপ ও ক্ষতিকর পোকামাকড় থেকে রক্ষা পেতে প্রয়োজনীয় ব্যবস্থা নেয়া
- ◆ বিতঞ্চ পানি পানি করা। সম্ভব হলে দশ মিনিট পানি ফুটিয়ে বা পানি বিতঞ্চকরণ ট্যাবলেট ব্যবহার করা
- ◆ ঘরের ভেতর তাকানোর জন্য দরজা জানালা খুলে আলো বাতাসের ব্যবস্থা করা
- ◆ শিশুদের নিরাপদ খেলার জায়গা তৈরি করে বেড়া দেওয়া



8



গ্যাস এবং তেল পাইপলাইন



9



GAS PIPELINE LEAKAGE/ গ্যাস পাইপলাইনের ছিদ্র

Activities During Gas Leaking



□ গ্যাস নিঃসরণের সময় করণীয়

- ❖ গ্যাস নিঃসরণের স্থান ভাল করে পর্যবেক্ষণ করা
- ❖ গ্যাস নিঃসরণের উপস্থিতি নিশ্চিতের জন্য পাইপ লাইন থেকে অস্বাভাবিক (যেমন হিসিং শব্দ বা কটু গন্ধ) হলে তা পর্যবেক্ষণ করা
- ❖ গ্যাস নিঃসরণের উপস্থিতি নিশ্চিত হওয়া মাত্র স্থানটিকে খালি করতে হবে
- ❖ সংশ্লিষ্ট কর্তৃপক্ষকে অবহিত করে পাইপ লাইনের সংযোগ বন্ধ করতে হবে



10



GAS PIPELINE LEAKAGE/ গ্যাস পাইপলাইনের ছিদ্র

Activities After Gas Leaking



□ গ্যাস নিঃসরণে পরবর্তী করণীয়

- ❖ নিঃসৃত গ্যাস পাইপ লাইন এলাকা থেকে দ্রুত লোকজনকে দূরে সরিয়ে নেয়া
- ❖ কোন ধরনের আগুন বা দাহ্য পদার্থ পাইপ লাইনের সংস্পর্শে না রাখা



11



OIL PIPELINE LEAKAGE/ তেল পাইপলাইনের ছিদ্র

Activities During Oil Leaking



□ তেলের পাইপলাইন ফুটোর সময় করণীয়

- ❖ যতদ্রুত সম্ভব স্থান ত্যাগ করতে হবে
- ❖ তেল জ্বালানী পদার্থ ধরা, ছোঁয়া বা অপসারণ করা যাবে না
- ❖ তেল যেন ছড়িয়ে না পড়ে সেদিকে খেয়াল রাখতে হবে



12



OIL PIPELINE LEAKAGE/তেল পাইপলাইনের ছিদ্র

Activities After Oil Leaking



- ☐ তেলের পাইপলাইন ফুটোর পরবর্তী করণীয়
 - ✦ স্থানটিকে বেঁধে দিয়ে দিতে হবে যাতে কেউ এর সংস্পর্শে না আসে
 - ✦ যতদ্রুত সম্ভব কন্ট্রোল রুমের সাথে যোগাযোগ করতে হবে
 - ✦ ফুটো হওয়া পাইপ লাইনের আশেপাশে কোন ধরনের দাহ্য পদার্থ থাকলে তা সরিয়ে ফেলতে হবে



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TRAFFIC ACCIDENT/সড়ক দুর্ঘটনা

Causes/কারণসমূহ

- অতিরিক্ত গতি
- ফোন ব্যবহার
- ঘুমান
- অতিরিক্ত বোঝা
- সিট বেল্ট ব্যবহার না করা
- না দেখে রাস্তা পারাপার



14



TRAFFIC ACCIDENT/সড়ক দুর্ঘটনা

Prevention/প্রতিরোধ

- সিট বেল্ট ব্যবহার করা
- ফোন ব্যবহার না করা
- গতি সিমীত রাখা
- রাস্তা পারাপারে সতর্ক থাকা



15



TRAFFIC ACCIDENT/ সড়ক দুর্ঘটনা

During An Accident



❑ দুর্ঘটনার সময় করণীয়

- ❖ দুর্ঘটনাকবলিত যানবাহন থেকে যাত্রীদের নিরাপদে সরিয়ে আনতে হবে
- ❖ দুর্ঘটনাকবলিত স্থানে গাড়ি চলাচল সাময়িকভাবে বন্ধ রাখতে হবে
- ❖ প্রাথমিক চিকিৎসা সেবা প্রদানকারী টিমের সাথে যোগাযোগ করতে হবে
- ❖ দুর্ঘটনার মাত্রা বেশি হলে আহত ব্যক্তিদের স্থানীয় যানবাহনে করে চিকিৎসাকেন্দ্রে বা কোম্পানী কর্তৃক নির্ধারিত চিকিৎসাসেবা কেন্দ্রে নিতে হবে
- ❖ নিকটস্থ থানায় দ্রুত যোগাযোগ করতে হবে



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TRAFFIC ACCIDENT/ সড়ক দুর্ঘটনা

After An Accident



❑ দুর্ঘটনা পরবর্তী করণীয়

- ❖ আহত ব্যক্তিদের যতদ্রুত সম্ভব নিকটস্থ স্বাস্থ্যকেন্দ্রে নিয়ে প্রাথমিক চিকিৎসা দিতে হবে
- ❖ দুর্ঘটনাকবলিত এলাকা নিরাপদ ফিতা দিয়ে বেটন করতে হবে
- ❖ দুর্ঘটনা সংক্রান্ত তথ্য সংগ্রহ করতে হবে



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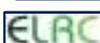


COMMUNICABLE DISEASES/ সংক্রামক রোগ

❑ সংক্রামক রোগ সংক্রামক এজেন্টগুলির (যেমন ভাইরাস, ব্যাকটেরিয়া, ফাংগাস, ইনফেকশন) দ্বারা সৃষ্ট হয় যা সংক্রামিত ব্যক্তি, প্রাণী বা পরিবেশের উৎস থেকে অন্য মানুষের কাছে প্রেরণ করা যেতে পারে।

❑ সংক্রামিত রোগসমূহঃ

- ❖ যক্ষা
- ❖ হেপাটাইটিস
- ❖ ম্যালেরিয়া
- ❖ কলেরা
- ❖ ইনফ্লুয়েঞ্জা
- ❖ এইচআইভি/এইডস



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COMMUNICABLE DISEASES/ সংক্রামক রোগ



Prevention/প্রতিরোধ



- পরিষ্কার - পরিচ্ছন্ন থাকুন
- টিকা দেওয়া
- স্বাস্থ্যকর খাদ্য



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NON-COMMUNICABLE DISEASES/অসংক্রামক রোগ

এমন রোগ যা ব্যক্তি থেকে ব্যক্তির কাছে প্রেরণ করা যায় না - এতে কার্ডিওভাসকুলার রোগ (যেমন হার্ট অ্যাটাক এবং স্ট্রোক), ক্যান্সার, দীর্ঘস্থায়ী শ্বাসযন্ত্রের রোগ (যেমন দীর্ঘস্থায়ী প্রতিরোধী ফুসফুসের রোগ এবং হাঁপানি) এবং ডায়াবেটিস অন্তর্ভুক্ত।

ঝুঁকির কারনসমূহঃ

- ❖ ধূমপান
- ❖ উচ্চ রক্তচাপ
- ❖ স্থূলতা
- ❖ মানসিক দুশ্চিন্তা
- ❖ শারীরিক পরিশ্রম না করা

Non-Communicable Diseases account for 71% of all deaths globally

The 4 major categories of non-communicable diseases



Cardiovascular Diseases



Diabetes



Chronic Respiratory Diseases



Cancer



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NON-COMMUNICABLE DISEASES/অসংক্রামক রোগ

Prevention/প্রতিরোধ



**NO
SMOKING**



- ধূমপান মুক্ত থাকুন
- শারীরিক ব্যায়াম করুন
- নিয়মিত চেকআপ করুন



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CONCLUSIONS/উপসংহার

- ❑ এই কর্মসূচি অনুযায়ী, আমাদের স্বাস্থ্য ও নিরাপত্তা-সংক্রান্ত সতর্কতা মেনে চলা উচিত
- ❑ ব্যক্তিগত বা সম্মিলিতভাবে যে কোন ধরনের কমিউনিটি স্বাস্থ্য সুরক্ষার ব্যাঘাত সম্পর্কে আমাদের আরো সচেতন হওয়া উচিত
- ❑ গ্যাস এবং পাইপলাইন লিকেজের মতো কোন প্রকল্প-ভিত্তিক সমস্যা হলে, অবিলম্বে যথাযথ কর্তৃপক্ষকে জানাতে হবে



Public Consultation Meeting
 Community Health, Safety and Emergency Preparedness Program 2023
 Siraganj 225 MW Combined Cycle Power Plant (Dual Fuel), Saidabad, Sadar, Siraganj
 Organized By: North-West Power Generation Company Limited (NWPGL)
 Supported By: Environmental Laboratory and Research Center (ELRC)
 Date: 04.09.23 Time: 4.39 PM Location: Saidabad, Siraganj

S/N	Participant Name	Profession	Address	Mobile No.	Signature
1.	Mahul Al Rabby	Service Holder	NWPGL	01708152311	
2.	Mohibur Mahmud Khan	Service Holder	NWPGL, SPS	01708152095	
3.		Member	Beranishant	0172824844	
4.	Rezaul Karim	Consultant	ELRC	01711983496	
5.	Suhaim Hossain	Business	Beranishant	—	
✓ 6.	Md. Badolhan	Farmer	Beranishant	—	
7.	Abdul Mutalib	Farmer	Panchasara	01739871488	
8.	Mst. Manira Begum	Housewife	Panchasara	0179304624	
9.	Abu Bakari Ali	Labour	Panchasara	—	
10.	Abu Talab	Farmer	Panchasara	—	
11.	Shahidul	Farmer	Panchasara	—	
12.	Md. Kamal	Farmer	Panchasara	—	
13.	Sorowari	Farmer	Panchasara	—	
14.	Belali	Student	Balkueri	—	
15.	Mozammel	Teacher	Purnbasari	—	

Public Consultation Meeting
 Community Health, Safety and Emergency Preparedness Program 2023
 Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel), Saidabad, Sadar, Sirajganj
 Organized By: North-West Power Generation Company Limited (NWPGL)
 Supported By: Environmental Laboratory and Research Center (ELRC)

Date: 04.09.23 Time: 4:34 PM Location: Saidabad, Sirajganj

SN#	Participant Name	Profession	Address	Mobile No.	Signature
31.	ohab	student	phonechsona	-	ohab
32.	Atik	student	phonechsona	-	অতিক
33.	md. Nuhu	student	Borishimul	-	ইস
34.	md. Al-Amin	student	folbarzi	-	আমিন আলমিন
35.	md. Abdullah	Teacher	phonechsona	01763-98229	আব্দুল্লাহ
36.	md. Jafaria	Teacher	phonechsona	017496698	জাফিয়া
37.	Alom	Farmer	phonechsona	017145025233	আলম
38.	Kamrul	student	phonechsona	01691-912901	কামরুল
39.	Hasan	student	phonechsona	01650-219137	হাসান
40.	mahadi	student	ullapara	01887-336950	
41.	monir	student	mohonpur	-	মনির
42.	Ismail	student	korshimul	-	
43.	Alamin	labor	korshimul	01846-520778	আমিন
44.	shazhan	farmer	phonechsona	-	শাহজাহান
45.	আব্দুল	Farmer	phonechsona	-	আব্দুল

Public Consultation Meeting
 Community Health, Safety and Emergency Preparedness Program 2023
 Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel), Saidabad, Sadar, Sirajganj
 Organized By: North-West Power Generation Company Limited (NWPGL)
 Supported By: Environmental Laboratory and Research Center (ELRC)

Date: 24.02.23, Time: 9:34 PM, Location: Saidabad, Sirajganj

SN#	Participant Name	Profession	Address	Mobile No.	Signature
16.	MD. ARIF	student	Borshimul	01779-70209	ARIF
17.	MD. ASIF	student	Borshimul	0181293582	ASIF
18.	MD. RAJEL	student	panchosona	01848309501	RS
19.	MD. RAJES	student	Borshimul	0193739781	Rajes
20.	MD. NOJON	student	panchosona	01800605053	Nojon
21.	MD. ANOWAR	student	panchosona	01809139091	Anowar
22.	MD. RIMON	student	panchosona	01914101950	Rimon
23.	MD. SHORIFUL	Farmar	Bagbatti	0111926467	Shoriful
24.	MD. YOUSUF	student	panchosona	01819070587	Yousuf
25.	MD. UZZAL	student	Borshimul	01304283574	Uzzal
26.	MD. AYUB	Farmar	panchosona	0172076665	Ayub
27.	KOBIR	Farmar	panchosona	—	Kobir
28.	MD. SUKUR	Farmar	panchosona	—	Sukur
29.	RHAMAN	student	TEUPSHA	01786820678	Rhaman
30.	HASSAN	student	panchosona	—	Hassan



WELCOME

ELECTROMAGNETIC FIELD (EMF) EXPOSURE AWARENESS TRAINING

Date: 20.09.2022
Time: 02:30 PM

North-West Power Generation Company Limited
Sirajganj 225 MW Combined Cycle Power Plant (Unit 2 and 3)


1



ELECTROMAGNETIC FIELD (EMF) EXPOSURE AWARENESS TRAINING

OUTLINE

- Introduction
- Sources
- Health Effect
- Precaution
- Reduction
- Awareness
- Conclusion




2

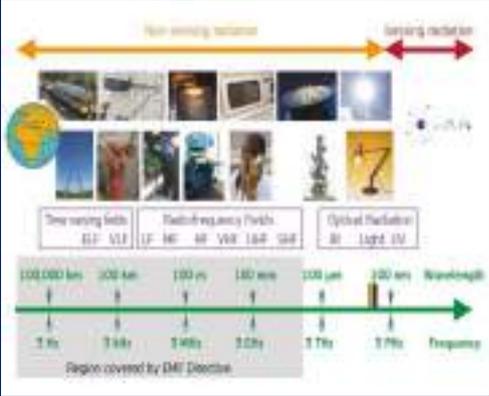


INTRODUCTION

Electromagnetic fields (EMF) are ubiquitous in our daily life

EMFs are **static electric, static magnetic and time-varying electric, magnetic and electromagnetic** (radio wave) fields with frequencies

In certain working environments, the application of **high electric currents** leads to extremely **low frequency magnetic fields** or electric fields with a frequency range of **1 Hz to 100 kHz**



The diagram illustrates the electromagnetic spectrum. It is divided into three main sections: 'Non-ionizing radiation' (left), 'Ionizing radiation' (right), and 'Optical Radiation' (middle-right). Below these, it lists 'Time-varying fields' (ELF, VLF), 'Radiofrequency Fields' (LF, MF, HF, VHF, UHF, SHF), and 'Optical Radiation' (IR, Light, UV). A horizontal axis at the bottom shows wavelength (100,000 km to 100 nm) and frequency (3 Hz to 3 THz). A green arrow at the bottom indicates the 'Region covered by EMF Detection' from 3 Hz to 100 kHz.

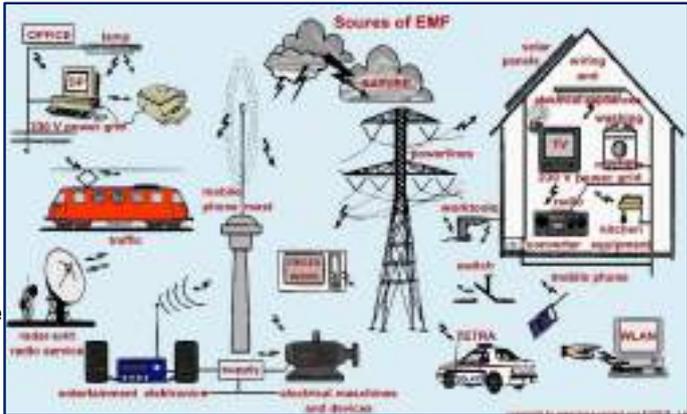

3



SOURCES

Typical Outdoor Sources of Exposure:

- Overhead Powerlines
- High Power Transmission Lines
- Electric Means of Transportation, such as Trams and Trains
- Higher doses of EMF occur in the workplace, for example with MRI scanners, welding equipment, induction heaters, and in power plants



HEALTH IMPACT

Two Categories of health effect:

- **Thermal Effects** – a body absorbs the radiation leading to localized tissue heating
- **Non-thermal Effects** – more subtle effects

Field and frequency range	Effects	Examples of activities and equipment
Static electric and static magnetic fields 0-1 Hz	<p>Indirect effects: Uncontrolled attraction of ferromagnetic objects, is the risk of injury from objects in a large static magnetic field being attracted to magnets in the workplace and hitting anyone in the way.</p> <p>Sensory effects: Nausea, vertigo, metallic taste in the mouth, flickering sensations (magnetophosphenes) in peripheral vision.</p> <p>Health effects: Micro shocks.</p>	<p>MRI scanners (main magnet)</p> <p>Electrochemical processes, eg industrial electrolysis, aluminium extraction</p> <p>Nuclear magnetic resonance spectrometers.</p> <p>Electromagnetic lifting cranes</p> <p>Electric vehicles (cars, underground trains)</p>



HEALTH IMPACT

Field and frequency range	Effects	Examples of activities and equipment
Low frequency magnetic and electric fields 1 Hz-10 MHz	<p>Indirect effects: Interference with active or passive implanted or body-worn medical devices (more information is provided later in this guideline), electric shocks, causing electrocution devices to initiate, is when used in close proximity to employees that have an electrical means of initiation.</p> <p>Sparks caused by induced fields (igniting fire or explosion) where flammable liquids, vapours or gases are present.</p> <p>Sensory effects: Nausea, vertigo, metallic taste in the mouth, flickering sensations (magnetophosphenes).</p> <p>Health effects: Nerve stimulation, effects on the central and peripheral nervous system of the body: tingling, muscle contractions, heart arrhythmias.</p> <p>Contact dermatitis caused by a person touching a conductive object in an EMF where one of them is grounded and the other is not, which can result in shocks or burns.</p>	<p>High voltage power lines</p> <p>Production and distribution of electricity</p> <p>Welding (arc and spot)</p> <p>Electroplating and furnaces</p> <p>Industrial induction heating (eg large coils used around the site of a yard)</p> <p>AM radio</p> <p>Electric hand-held tools</p> <p>Electric vehicles (cars, trains, trams, metro)</p> <p>Magnetic resonance imaging (MRI) (switched gradient fields)</p>





HEALTH IMPACT

<p>Intermediate frequency fields: 100 kHz–10 MHz</p>	<p>The health effects of both high and low frequencies can be experienced as detailed above and below (see also Annex 1)</p>	<p>Surgical diathermy</p> <p>Broadcasting systems and devices (AM radio)</p> <p>Anti-theft devices</p> <p>Military and research radiofrequency systems</p>
<p>High frequency fields: 100 kHz–300 GHz</p>	<p>Indirect effects: Interference with active or passive implanted or body-worn medical devices (more information is provided later in this guidance), electric shocks, causing electro-explosive devices to initiate, is when used in close proximity to explosives that have an electrical means of initiation</p> <p>Sparks caused by induced fields, triggering fires or explosions where flammable fuels, vapours or gases are present</p>	<p>MRI (RF coils)</p> <p>Broadcasting and TV antennas</p> <p>Radar and radio transmitters</p> <p>Diathermy</p> <p>Dielectric heating (eg vulcanising, plastics welding or microwave drying)</p> <p>Anti-theft systems</p>



7



HEALTH IMPACT

Field and frequency range	Effects	Examples of activities & equipment
100 kHz–300 GHz	<p>Sensory effects: Auditory effects such as perception of clicks or buzzing caused by pulsed radar systems</p> <p>Health effects: Thermal stress, heating effects leading to a rise in core body temperature or localised limb heating (eg knees or ankles)</p> <p>Contact with charged conducting bodies can lead to RF shock or deep tissue burns (see also Annex 1)</p>	<p>Broadcasting and TV antennas</p> <p>Radar and radio transmitters</p> <p>Diathermy</p> <p>Dielectric heating (eg vulcanising, plastics welding or microwave drying)</p> <p>Anti-theft systems</p>

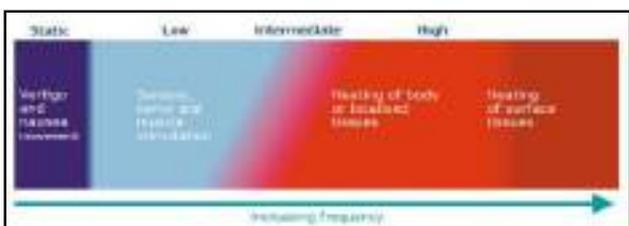


8



HEALTH IMPACT

Direct Effect



- Indirect Effects**
- Interference with **active or passive medical devices**
 - Projectile risks from **ferromagnetic objects**
 - Electric shocks or burns from a **conductive object** in an EMF
 - Ignition of electrical **detonators / fires / explosions**



9



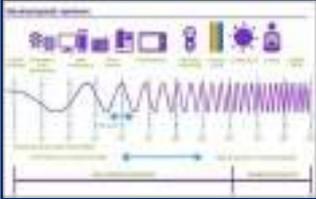
PRECAUTION

- **Warning Signs** Indicating Strong Electromagnetic Fields
- **Fencing** Around the EMF Generating Area
- **Entry Restriction** Signage
- Additional **Warning** Stickers
- Adequate Use of BodyWorn **Medical Devices**
- Proper Use of Full **Covered Safety Gown** or Vest



REDUCTION

- Assess the **Levels of EMFs**
- Ensure that Exposure is Below a Set of ELVs, ' **Exposure Limit Values** '
- Assess the Risks of Employees' **Exposure and Eliminate or Minimize** Those Risks
- **Plantation** Around the EMF Area
- **Displace** Multi EMF Generating Devices
- Initiating **EMF Absorbing** Devices



AWARENESS

- Provide **Information and Training** on the Particular Risks Posed to Employees by EMFs in the Workplace
- The Information should also be Made Available to **Safety Representatives**, as Appropriate
- **Take Action** if Employees are Exposed to EMFs in Excess of the ELVs
- Provide **Health Surveillance** or **Medical Examination**, as Appropriate





CONCLUSIONS

- Precaution, Prevention and Reduction is the best way to control the EMF exposure in work place
- Proper guidance and controlled environment can be important for reducing EMF
- Considering health impact scenario, proper management should be demonstrated for reducing EMF
- Awareness training, knowledge sharing, information exchanging etc. may help to manage the low level EMF exposure in workplace



13



Thank
You



14

Annex J: Grievance Mechanism

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

SL. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

No grievance is found
Atulmani
27/04/2023

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress
					No grievance is found Hullamin 18/02/2023				

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

SL. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress
					<i>No grievance is found Admin 14/02/2023</i>				

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

*No. grievance is found
Admini 18/04/2023*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgement given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

No grievance is found
Adhami 28/06/2023



**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

SL No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgement given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

*No grievance is found
Admin
24/07/2023*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline / Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgment/redress
					<i>No grievance is found Admin 22/02/2023</i>				

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgement given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

No grievances are found
Admin
26/09/2023

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

Sl. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgment given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

*No grievance is found
Authenti
29/10/2023*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

SL No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgement given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

*No grievance is found
Kullamain
30/11/2023*

**NORTH-WEST POWER GENERATION COMPANY LIMITED
SIRAJGANJ POWER STATION (UNIT-1, 2 & 3)
GRIEVANCE REGISTER**

SL. No.	Date of Receipt	Particulars of Complaint				Particulars of Grievance			
		Name	Address	Landline /Mobile	Whether acknowledgement given at the time of receipt	Subject of the Grievance	Office	Brief Description	Date of Acknowledgement/redress

No Grievance is found
Aulhanni
28/12/2023

Annex K: Emergency Response Plan



NW-SPS-HSE-EPP-001
EMERGENCY PREPAREDNESS PLAN

For

Sirajganj Power Station
North-West Power Generation Company Limited
Soydabad, Sirajganj

CONTROLLED COPY

Effective Date: 24.08.2023

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 1
	SECTION 01: FOREWORD	CONTROLLED COPY

Index

Section No.	Title	Page No.
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03	Potential Emergencies	07
04	Firefighting Arrangements	18
05	Communication	55
06	Preventive Support and Post Emergencies	57
07	Medical Emergency Plan	59
08	COVID-19 Mitigation Plan	65

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 2
	SECTION 01: FOREWORD	CONTROLLED COPY

Purpose

To develop a systematic plan for the effective management of an accident/incident situation, with the objective of eliminating environmental impacts and damages to human and property.

This Emergency Preparation Plan details the emergency preparedness of North-West Power Generation Company Limited's Sirajganj Power Station and is relevant to a variety of emergency scenarios that may arise on the plant's premises.

This Emergency Preparedness Plan defines the roles and duties of all parties involved, including management, operational and support services, and department personnel, in order to ensure the efficient handling of on-site emergencies.

Name of the Occupier: Sirajganj Power Station

Location:

Soydabad, Sirajganj.

Contact Numbers: +8801755630032, Control Room (U-1),

+8801708152289, Control Room (U-2),

+8801708152313, Control Room (U-3),

+8801313780670, Control Room (Solar)

Utility Type: Power Generation

Operational Date: November 2012 (U-1),

February 2018 (U-2),

January 2019 (U-3),

March 2021 (Solar)

Regular Employees: 312

Fire Station: Mini Fire Station, Sirajganj Power Station. Mobile No: +8801313425824

	Name	Designation	Signature
Originated by	Mashhour Mammad Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shofiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 3
	SECTION 02: EMERGENCY CONTROL ORGANIZATION	CONTROLLED COPY

RESPONSIBILITIES

1. **Central Control Room (U-1,2,3, Solar)** is the Emergency Control Center. It is provided with Personal Protective Equipment, maps of the facility, and details of fire pump room, dispensary, water reservoir, water line and hydrant locations, siren, as well as emergency phone numbers.
2. The Plant Head shall function as the **Main Controller (U-1,2,3)** in the event of an emergency. **Note:** In the absence of the Plant Head, the Operations Heads (U-1,2,3, Solar) shall take the role of the Main Controller.
3. The Operation Heads shall serve as the **Incident Controller** and is also responsible for arranging for necessary assistance and communicating internally and externally.
4. The respective Head of the Departments/ Area In-charges (of the affected area) shall act as the **Site Controller**.

The structure and responsibilities of various personnel involved in emergency preparedness and responses are given below:

Main Controller

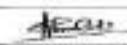
During an on-site emergency, the Plant Head shall serve as the primary controller. He will examine the seriousness of the situation and make a determination regarding the declaration of an emergency. He will provide guidance to all involved staff in order to ensure an effective management of the situation.

Incident Controller

The Operation Head (U-1,2,3, Solar) shall take charge as Incident Controller. He will keep the Main Controller informed of any changes in the situation and direct all operation within the affected area with following priorities:

- 1) Safety of personnel and damage to the environment.
- 2) Minimization of property damage and material loss.

He will also arrange the rescue operation and evacuation. He shall direct the shutdown and other necessary site actions until the arrival of the Main Controller, including the declaration of an emergency as required. He is responsible for communicating with internal personnel and external

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 4
	SECTION 02: EMERGENCY CONTROL ORGANIZATION	CONTROLLED COPY

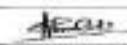
agencies and coordinating the rescue operation.

Site Controller

The concerned Head of the Department(s)/ Area in-charge shall act as the Site Controller. He will report to the Main Controller and Incident Controller and co-ordinate with Safety/Security personnel for relief, rescue operation and movement control.

Safety Section

- To update EMERGENCY PREPAREDNESS PLAN as per requirement.
- To ensure that Emergency Control Centre is well equipped with Personal Protective Equipment, layout of the facility, and information on fire pump room, dispensary, water reservoir, water line and hydrant points. They must also periodically check the healthiness of the equipment kept in Emergency Control Centre.
- To assist all emergency teams for arranging items they may require during an emergency in advance.
- To organize mock drills of Emergency Team activities in consultation with the Plant Head and Head of Human Resources, and to report on their effectiveness.
- To ensure that all safety-related protection and warning systems are functioning properly.
- To guarantee that all new workers get EHS induction training upon their arrival at the facility. This also applies to temporary workers, drivers, helpers, and guests, as well as stack holders.

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 5
	SECTION 02: EMERGENCY CONTROL ORGANIZATION	CONTROLLED COPY

Mini Fire Station

After getting a call from the Control Room (U-1,2,3, Solar), all personnel from the Sirajganj Power Station's Mini Fire Station shall immediately take the initiative to enter the emergency area and take necessary action to mitigate the emergency situation.

Finance Head

The Finance Head shall keep an emergency fund for the contingency situation besides the normal cash. He, on direction of the Main Controller, shall release cash and keep records.

Security Personnel

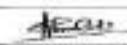
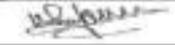
Security Personnel shall communicate & coordinate with incident controller and site controller for relief and rescue operation. At least one of them should be present at the main gate for controlling incoming and outgoing persons and vehicles. One should take charge of the head count in the designated ASSEMBLY AREAS during emergency and tally with the number of persons present inside the premises. If any inconsistency is noticed, he shall inform the Security In-charge. In case of fire hazards, other security personnel shall participate with the fire-fighting team for extinguishing the fire. If required, the Security In-charge shall inform the incident controller about the occurrence of emergency.

Environment Cell

If an Emergency occurs as a result of a Pollution Control Facility malfunctioning, the members should promptly investigate and direct the halting of activities.

Fire Fighters and First Aiders

Fire fighters and First Aiders have been nominated based on different zones (a zone is an area or combination of Departments as shown on the Site map). The Fire Fighters and First Aiders, under the direction of the site controller, shall mitigate the effects of the fire using appropriate media and attend to any injured persons. Section-04 contains a list of fire fighters and first aiders.

	Name	Designation	Signature
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Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

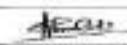
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 6
	SECTION 02: EMERGENCY CONTROL ORGANIZATION	CONTROLLED COPY

All Employees

When an employee observes an accident or emergency, he or she shall immediately notify the corresponding Area In-charge/Concerned HOD via the available means - verbal or telephone; the fire fighters and first aiders on duty in the department shall take the respective charges as described above. Others must try to halt operations, isolate the machine's electrical supply, and securely evacuate with others to the ASSEMBLY AREA for head counting or additional instructions. Additionally, they are responsible for assisting any visitors and contractors present in their region with evacuation. They shall not incite panic or rumor. The injured person(s) shall be quickly attended to by first aiders, who shall also call for medical assistance and specialist assistance, if necessary.

Visitors and Contractors

The contractors shall immediately stop any ongoing work. Visitors and contractors must coordinate their movements with departmental personnel and go to the ASSEMBLY AREA. They should identify themselves to the security personnel stationed at the assembly zones and wait for further instructions.

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Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 7
	SECTION 03: POTENTIAL EMERGENCIES	CONTROLLED COPY

POTENTIAL EMERGENCIES

The potential Environmental Emergencies based on the Aspect Impact Analysis are:

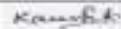
- Fire due to any reason (section-04)
- Earthquake (section-03)
- Lightning/thunder storming (section-03)
- Spillage/exposure to chemicals/gases/tube oil (Use chemical spill kit to neutralizes & remove from spillage area)
- Incident of gas leak in pipe lines(section-03)
- Existence of Chlorine Gas Tank(section-03)
- False operation of Deluge system (section-03)

The potential OHS Emergencies based on the Hazard Identification & Risk Assessment are:

- Any physical injury due to work (Provide first aid)
- Electric shock (section-03)
- Moving parts (Provide first aid & sent to hospital if necessary)
- Drowning, flood(section-03)
- Spill into river
- Fall from Height (Provide proper first aid & sent to hospital if necessary)
- Terrorist attack & Bomb Explosion (section-03)
- Food Poisoning (section-07)
- Working in confined space (section-03)

EARTHQUAKE - BASIC DO'S AND DON'TS

- ✓ Take cover under a desk, table, or other large and stable piece of furniture. Hold on to it or stand in a doorway and brace yourself.
- ✓ Stay away from windows, heavy furniture, appliances, mirrors, pictures, and anything else that could fall and hurt you.

	Name	Designation	Signature
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Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS/HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 8
	SECTION 03: POTENTIAL EMERGENCIES	CONTROLLED COPY

- ✓ If you are driving when an earthquake happens, stop the car if it's safe. Stay inside your car until the earthquake stops, and don't drive near bridges or tunnels. Try not to stop by power lines, light posts, signs, or trees. These could fall and hurt you.
- ✓ Stay alert for falling objects. Most people get injured by falling objects during an earthquake, not by the shaking itself.
- ✓ Do not use lifts. There might be a power outage due to the earthquake, and you could get stuck in the lift.

After the earthquake stops, here's what you should do:

- ✓ Check yourself and others for injuries. Call **Control Room (Unit-1,2,3 & Solar)** if you or someone else needs medical assistance.
- ✓ Stay away from damaged buildings and areas. You could get hurt by broken glass and falling objects.

LIGHTENING/THUNDER STORMING:

Lightning is a sudden electrostatic discharge during an electrical storm between electrically charged regions of a cloud (called intra-cloud lightning or IC), between that cloud and another cloud (CC lightning), or between a cloud and the ground (CG lightning). The charged regions in the atmosphere temporarily equalize themselves through this discharge referred to as a strike if it hits an object on the ground, and a **flash** if it occurs within a cloud. Lightning causes light in the form of plasma, and sound in the form of thunder. Lightning may be seen and not heard when it occurs at a distance too great for the sound to carry as far as the light from the strike or flash.

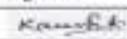
Causes of Lightning:

Two main causes of lightning are provided below:

1. Cutting down trees in a huge scale.
2. Unawareness of general people.

Lightening is dangerous. Here are some **safety rules:**

1. Do not stand **under a tree or electric post, near water, near window and metal made post** during a thunderstorm.

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	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 9
	SECTION 03: POTENTIAL EMERGENCIES	CONTROLLED COPY

2. Stay away from open space and take place inside a building or get as close to the ground as you can.
3. Shut off or unplug all electrical items and do not use phone during thunderstorm.
4. Do not touch earth or ground directly.
5. Stop car and Stay away from metal objects and glass.
6. Do not play cattle in the open field.

CHEMICAL SPILLAGE:

The list identifies locations where the following equipment and supplies must be present and maintained:

- a) spill clean-up kits
- c) eye wash stations
- d) first aid kits

TYPES OF CHEMICAL EXPOSURE: INHALATION

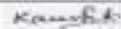
- o Remove the victim from the contaminated area to fresh air
- o Keep the victim quiet and warm
- o If the victim is not breathing, and you have been trained, perform CPR
- o Remove contaminated clothes from the victim and contain the clothes in a plastic bag for decontamination or disposal
- o Rather than pull clothing over the victim's head, cut the clothing off their body

INGESTION or SPLASH TO MUCUS MEMBRANES

- o Do not give the victim anything by mouth
- o Treat them as for inhalation described above
- o Keep the victim quiet and warm

EYE SPLASH

- o Remove glasses and any contaminated clothing on victim and contain the clothes in a plastic bag for decontamination or disposal. Glasses can be decontaminated and returned
- o Flush eyes in eyewash for 15 minutes or until medical assistance arrives

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	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 10
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o If necessary, assist the victim by holding open their eyes

SKIN CONTACT - Remember that skin absorption can occur from liquids, solids or chemical vapor

- o Immediately place the victim under a safety shower while removing any contaminated clothing, including shoes. Collect the clothing in a plastic bag for decontamination or disposal
- o Flush for the skin for at least 15 minutes or until medical assistance arrives

CHEMICAL SPILL OR RELEASE OF VAPOR:

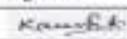
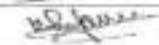
- Small spills (less than 1 liter) can be cleaned up by workers if the material is in a fume hood, the proper spill cleanup equipment is on hand, and they have been trained in the use of the equipment.
- For cleanup of large spills (more than 1 liter), any spills outside fume hood or release of vapors to room,
- Secure the area and post "Do Not Enter" posting.
- Provide emergency dispatcher with the location and size of the spill and the material(s) involved.
- Provide the Emergency Responders with the SDS.
- Contact HSE officer or plant head to inform them of the situation and provide an estimate of time until clean-up is finished.

INCIDENT OF GAS LEAK IN PIPELINE

Natural gas is under pressure when running through pipelines. Because natural gas is lighter than air, it rises when it escapes. A "rotten egg" odor is added to natural gas and propane so the general public can easily detect even the smallest leak. Visual and audible signs may also indicate that a natural gas or propane leak has occurred, including:

▶▶ Hissing sounds near a natural gas appliance or pipeline If you respond to the signs of a potential gas emergency, please follow the procedures outlined in this guide. Be sure to avoid causing sparks (such as switching lights on or off, starting an engine, lighting a match, etc.), which could result in an explosion or fire.

If you smell gas or think you have a gas emergency, please contact Pashchimanchal Gas Company

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	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 11
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Limited immediately.

Control Room's mobile number of Pashchimanchal Gas Company Limited is 01755552858

During Gas escapes

DO NOT

- Operate any electrical switches (on or off)
- Smoke or use a naked flame

DO

- Open doors and/or windows to ventilate the area
- Check your gas appliances and turn them off
- Turn the gas supply off at the main meter/or Emergency Control Valve, unless the meter is located in the cellar/basement

A gas leak refers to a leak of natural gas or other gaseous product from a pipeline or other containment into any area where the gas should not be present. Because a small leak may gradually build up an explosive concentration of gas, leaks are very dangerous. In addition to causing fire and explosion hazards, leaks can kill vegetation, including large trees, and may release powerful greenhouse gases to the atmosphere.

These emergencies will involve one or more of five basic situations:

1. Gas escaping outside
2. Gas burning outside
3. Gas escaping inside
4. Gas burning inside
5. Function of relief valves

1. Gas Escaping Outside

If natural gas is escaping from the ground, an excavation, an open pipe, a manhole, a sewer, or a

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	SECTION 03: POTENTIAL EMERGENCIES	CONTROLLED COPY

vault, clear a safe area around the location and barricade or rope it off. If possible, police and firefighters should check with the gas company employee before advising the public in the immediate vicinity of the emergency and what measures, if any, should be taken. The special knowledge of the gas company employee may help avoid causing undue alarm and unnecessary action by the public in adjacent or removed locations. In most instances, the gas company employee will cut off the gas to adjoining properties and advise the customers of safety precautions to be taken, such as extinguishing all open flames, prohibiting smoking and making certain that electrical switches or similar possible ignition sources are not operated.

Gas company employees will also check for gas in surrounding buildings, particularly in basements. It may be necessary to restrict or reroute all traffic until the gas flow is brought under control. Manholes or vaults can usually be vented by temporarily removing their covers.

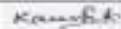
2. Gas Burning Outside

If natural gas is burning outside, the firefighter should make no attempt to extinguish the fire. Burning gas will not explode, but it may ignite surrounding combustibles. Clear the danger area and barricade, or rope, it off. **DO NOT OPERATE GAS VALVES IN THE STREET – HAVE THE GASCOMPANY EMPLOYEE DO IT.** Turning the wrong valve could create another emergency.

Gas company employees, with their special knowledge and information, can avoid this. Spray water mist on any surrounding combustibles if they are in danger of igniting. Do not use water on burning natural gas at its point of escape. If this point is in an excavation, the hole will be filled with mud, making the repair slower and more hazardous.

3. Gas Escaping Inside

If natural gas is escaping inside a building, ventilate the area starting where the gas concentration is strongest. If gas is escaping in quantity, clear the building of its occupants. Shut off open flame devices by operating manual controls, but do not operate electrical switches. The fire officer in charge may determine that it is necessary to shut off the gas to the building at the service valve. The necessity of this action should be weighed against the fact that turning off the gas in commercial or industrial areas might seriously interrupt important production processes and possibly create further hazards. Again, your gas company employee can give you specific information to help evaluate the

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situation. If firefighter or other emergency personnel turns off a valve, leave it off, then immediately tell the gas company employee. After a valve has been shut off, only gas company employees should turn it on again, because they have the experience and training necessary to evaluate the conditions and determine when this action is advisable.

4. Gas Burning Inside

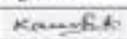
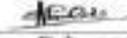
If natural gas is burning inside a building, shut off the gas at the meter, or (when available) at an outside valve. If the gas supply cannot be safely shut off, keep the surrounding combustibles wetted with spray stream until the gas company emergency crews can control the flowing gas. If it appears that inside piping or meter installations are going to be endangered by a non-gas fire in a building, the fire officer in charge can determine if it is necessary to turn off the gas. Again, the gas company employee can help evaluate the situation. If a fire is caused by a gas appliance that is burning out of control, it is usually enough to shut off the gas at the appliance's valve. When this is not practical, or if the valve cannot be located, shut off the gas at the meter supplying the appliance.

5. Function of Relief Valves in Distribution Systems

A relief valve protects gas systems from accidental over-pressuring. Gas company control points with relief valves are sometimes referred to as district regulating stations, city gate stations or town border stations. Each pressure-reducing regulating station has a gas regulator set to maintain a fixed downstream pressure. If, for any reason, there is a malfunction and the regulator fail to properly limit downstream pressure, the relief valve will open to protect the system. When this occurs, gas is vented into the atmosphere, usually accompanied by a loud, high-pitched noise. Natural gas, which is much lighter than air, diffuses upward into the atmosphere.

**A RELIEF VALVE VENTING GAS INTO THE ATMOSPHERE IS PERFORMING ITS PROPER FUNCTION.
IT SHOULD NEVER BE CUT OFF OR RESTRICTED UNTIL A GAS COMPANY EMPLOYEE ARRIVES AND MAKES CORRECTIONS.**

Anyone who sees or hears a relief valve venting gas to the atmosphere should call the gas company at once but take no action which would keep the relief valve from venting gas into the atmosphere.

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Gas Detection

Odors sometimes mistaken for natural gas can come from many sources, such as petroleum products (especially gasoline), marsh gas, sewer gas, industrial gases, and even some batteries being charged are typical examples. There are many types of gas detection instruments, and since the gas company employee is trained in their use, he will be glad to assist you. Natural gas has its odor regulated by the gas company in order to give it a sufficiently distinctive and recognizable odor. It is suggested that emergency personnel familiarize themselves with the odor of the gas distributed in their area.

Press Relations and Publicity

In an emergency involving natural gas, refer inquiries from press representatives and other interested parties to a gas company representative, if available. The gas company representative will be able to clarify technicalities and provide other information necessary for complete and accurate reporting of the emergency.

Proper identification of the type of gas is of vital importance. If the emergency involves natural gas, be sure to identify it as "natural gas." If gasoline, chlorine gas, sewer gas, propane, etc., is involved, always carefully identify the type. The gas company's objective in working with press, TV and radio representatives during an emergency is the same as that of emergency personnel—to be helpful and cooperative in determining the cause of an emergency, and to accurately report the cause to the public.

References: https://en.wikipedia.org/wiki/Gas_leak. Source: Gas Safety Handbook

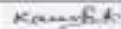
EXISTENCE OF CHLORINE GAS TANK

For operation and maintenance of chlorine Gas tank, supplier has been advised that

A CONSUMER SHOULD NOT MAKE ANY EFFORT TO REPAIR THE AFFECTED PORTION OF THE CYLINDER. AFTER CONTROLLING THE LEAK, THE SUPPLIER SHOULD BE IMMEDIATELY INFORMED TO TAKE SUITABLE ACTION.

In any kind of emergency concerned persons will control the leak and immediately inform the chlorine gas suppliers for further initiative to avoid adverse environmental and occupational safety consequences.

The contact number of Suppliers need to keep for further information.

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FALSE OPERATION OF DELUGE SYSTEM

To avoid the adverse consequences of false operation of deluge system, it is advised to switch off the deluge system during maintenance activities.

GUIDELINES FOR PREVENTING DROWNING, FLOOD

Whenever working on Jetty, tie up with a boat and ensure that the rescue boat with Lifebuoy and an experienced diver is available nearby so that immediately the person falling into the river can be rescued.

GUIDELINES FOR HSD SPILL INTO THE RIVER

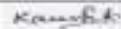
In case of a HSD spill into the river, immediately inform the River authority so that the pollution due to spill can be contained at the earliest.

ELECTRIC SHOCK/ FALL FROM HEIGHT

Immediately call the Doctor at site so that he may start the Cardiopulmonary Resuscitation (CPR) on the patient and make plans to shift the patient to the nearest hospital at the earliest.

TERRORIST ATTACK, BOMB EXPLOSION - BASIC DO'S AND DON'TS

- ✓ Do what you're told. If a fire fighter, police officer, or other official tells you to do something, just do it. Their specific instructions should take precedence over general guidelines such as this one.
- ✓ If you're warned of an explosion, duck and cover. Get away from windows and behind something solid. Then curl up to protect your face and eyes.
- ✓ If you're outside and you hear an explosion, or if you see people choking or collapsing, cover your nose and mouth. The big danger with most toxic substances is inhaling them. Even thin

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fabrics - a handkerchief, scarf, or shirt - will reduce your chance of inhaling radioactive particles, many chemical and biological agents, and the choking dust that ordinary bombs produce.

- ✓ Get inside. Find an intact, sturdy building and go in it.
- ✓ If you're inside and the problem is outside, close up. Closing doors and windows - and turning off air conditioners - will make most modern buildings reasonably airtight. That will keep most toxic substances from drifting in. If the windows are broken (say, by an explosion) or your part of the building is otherwise leaky, find an intact room to shelter in.
- ✓ Move away from windows. Just in case there's a second explosion, or a release of highly penetrating (gamma) radiation, you want to be behind a nice, solid wall.
- ✓ If you're inside and the problem is inside, get out. Because modern buildings are fairly airtight, a dangerous substance released inside one will stay dangerously concentrated. If people inside the building are choking and collapsing, it's time to leave and head for another, safer shelter.

WORKING IN CONFINED SPACES- BASIC DO'S AND DON'TS

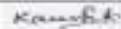
A confined space is one which is both enclosed or largely enclosed, and which also has a reasonably foreseeable risk to workers of fire, explosion, loss of consciousness, asphyxiation or drowning.

It may be small and restrictive for the worker or it could be far larger such as a grain storage silo with hundreds of cubic meter capacity.

WHAT ARE THE HAZARDS?

Working in a confined space is dangerous because of the risks from noxious fumes, reduced oxygen levels, or a risk of fire.

Other dangers may include flooding/drowning or asphyxiation from some other source such as dust, grain or other contaminant.

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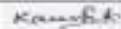
DOS AND DON'TS OF WORKING IN CONFINED SPACES

DO NOT

- work in confined spaces unless it's essential to do so
- ignore the risks - just because a confined space is safe one day doesn't mean it will always be
- let others enter a confined space until you are sure it's safe to do so

DO

- be aware of the risks that may occur within a confined space
- make sure the person doing the work is capable and trained in both the work and the use of any emergency equipment

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FIREFIGHTING ARRANGEMENTS

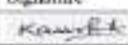
A complete network of firefighting equipment's like portable extinguishers, hydrant network & accessories have been installed within the plant premises. The Type & Number of equipment's and their locations within the premises are given in the format below.

1. FIRE EXTINGUISHERS

The total quantity and types of Portable Fire Extinguishers available in the power station are as follows:

For Unit-1 Premises

SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
Admin building								
1	Ground floor (west)	5 KG					ABC	
2	Ground floor (east)	5 KG					ABC	
3	1st floor (east)	5 KG					ABC	
4	1st floor (west)	5 KG					ABC	
5	2 nd floor (east)	5 Kg					ABC	
6	2 nd floor (west)	5 KG					ABC	
7	Canteen	5 KG					ABC	
Workshop Building								
8	Inside	5 KG					ABC	
9	Inside	5 KG					ABC	
10	Inside	5 KG					CO ₂	
11	Inside	5 KG					ABC	
12	Inside	5 KG					CO ₂	
13	Inside	5 KG					ABC	
Store Building								
14	1 st floor (west)	5 KG					ABC	

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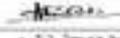
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
15	1 st floor (east)	5 KG					ABC	
16	Ground floor	5 KG					ABC	
17	Ground floor	5 KG					ABC	
WTP Area								
18	Corridor	5 Kg					ABC	
19	Control room	5 Kg					ABC	
20	Inside	5 Kg					ABC	
21	Inside	5 KG					ABC	
22	Inside	5 KG					ABC	
GBC								
23	West	5 KG					ABC	
24	West	5 KG					ABC	
25	West	5 KG					ABC	
26	West	5 KG					ABC	
Natural gas condition station								
27	West	5 Kg					ABC	
28	West	5 Kg					ABC	
29	West	5 Kg					ABC	
30	West	5 Kg					ABC	
Air Compressor Room								
31	Inside	5 KG					ABC	
32	Inside	5 KG					ABC	
GBC PLC Room								
33	Inside	5 KG					ABC	
34	Inside	5 KG					CO ₂	
Raw Water Forwarding Pump House								
35	Inside	5 KG					ABC	
36	Inside	5 KG					ABC	
37	Inside	5 KG					ABC	
Control Building								
38	Ground floor (Entry)	6 KG					CO ₂	
39	Ground floor (Entry)	5 KG					ABC	
40	Ground floor	5 KG					ABC	

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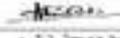
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
	(South)							
41	Ground floor (North)	5 KG					ABC	
42	Battery room	5 KG					ABC	
43	1 st floor (South)	5 KG					ABC	
44	1 st floor (North)	5 KG					ABC	
45	MCC Room	5 KG					ABC	
46	MCC Room	5 KG					CO ₂	
47	UPS Room	5 KG					ABC	
48	UPS Room	5 KG					CO ₂	
49	6.6 KV Room	5 KG					CO ₂	
50	6.6 KV Room	5 KG					CO ₂	
51	Relay Room	5 KG					CO ₂	
Gas Turbine Hall								
52	South-East side	5 KG					ABC	
53	South-East side	5 KG					CO ₂	
54	South-East side	20 KG					ABC	
55	South-East side	20 KG					ABC	
56	South-East side	50 L					Foam	
57	South-East side	50 L					Foam	
58	North-East side	5 KG					ABC	
59	North-East side	5 KG					ABC	
60	North-West side	5 KG					ABC	
61	West side	5 KG					ABC	

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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
62	West side	5 KG					ABC	
63	West Side	10 L					Foam	
64	North-West side	5 KG					CO ₂	
65	North-West side	10 L					Foam	
PCC Room								
66	Inside	6 KG					CO ₂	
67	Inside	6 KG					CO ₂	
In front of Auxiliary Transformer								
68	Inside	5 Kg					ABC	
Beside Main Transformer of STG								
69	Beside	5 KG					ABC	
Condensate Water Storage Tank								
70	West side	5 KG					ABC	
HRSO Area								
71	HRSO	5 KG					ABC	
72	HRSO	5 KG					ABC	
Boiler Room								
73	Inside	5 KG					ABC	
STG Building								
74	Ground floor North-East side	5 KG					ABC	
75	Ground floor North-East side	5 KG					ABC	
76	Ground floor East middle side	5 KG					ABC	
77	Ground floor North-West side	5 KG					ABC	
78	Ground floor North-West	5 KG					ABC	

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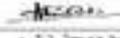
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
	side							
79	Ground floor North-West side	5 KG					ABC	
80	Ground floor South side	5 KG					ABC	
81	Ground floor South side	5 KG					ABC	
82	Ground floor South side	5 KG					CO ₂	
83	Ground floor South side	5 KG					CO ₂	
84	1 st floor South side	5 KG					ABC	
85	1 st floor South side	5 KG					CO ₂	
86	1 st floor South side	5 KG					ABC	
87	1 st floor South side	5 KG					CO ₂	
88	1 st floor North side	5 KG					ABC	
89	1 st floor North side	5 KG					ABC	
90	1 st floor Middle side	5 KG					ABC	
91	2 nd floor North side	5 KG					ABC	
92	2 nd floor North side	5 KG					ABC	
93	2 nd floor North side	5 KG					ABC	
94	2 nd floor East side	5 KG					ABC	
95	2 nd floor	10 L.					Foam	

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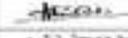
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
	South side							
96	2 nd floor South side	5 KG					CO ₂	
6.6 KV(STG)								
97	Inside	6 KG					CO ₂	
98	Inside	5 KG					ABC	
99	Inside	6 KG					CO ₂	
STG (Chemical Dossing Room)								
100	Inside	5 KG					ABC	
101	Inside	5 KG					ABC	
Diesel Forwarding Pump House								
102	Inside	5 KG					ABC	
103	Inside	5 KG					ABC	
EDG Canopy(STG)								
104	Inside	5 KG					ABC	
105	Inside	5 KG					ABC	
CEMS Room								
106	Inside	5 KG					ABC	
Natural Gas Final Meter and Filter Station								
107	Inside	5 KG					ABC	
108	Inside	5 KG					ABC	
HSD Day Tank								
109	Inside	10 L					Foam	
110	Inside	10 L					Foam	
111	West of HSD Day tank	30 L					Foam	
112	West of HSD Day tank	30 L					Foam	
113	West of HSD Day tank	5 KG					ABC	
HSD Storage Tank								
114	Inside	10 L					Foam	
115	Inside	10 L					Foam	
116	Inside	10 L					Foam	
117	Inside	10 L					Foam	

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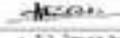
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
118	West of HSD tank	10L					Foam	
119	West of HSD tank	10 L					Foam	
120	West of HSD tank	10 L					Foam	
121	West of HSD tank	10 L					Foam	
122	West of HSD tank	10 L					Foam	
123	West of HSD tank	10 L					Foam	
124	West of HSD tank	10 L					Foam	
125	West of HSD tank	10 L					Foam	
126	West of HSD tank	10 L					Foam	
EDG (GTG)								
127	Inside	6 KG					CO ₂	
128	Inside	5 KG					CO ₂	
129	Inside	3 KG					ABC	
130	Inside	3 KG					ABC	
New Ware House								
131	Inside	5 KG					ABC	
132	Inside	5 KG					ABC	
133	Inside	5 KG					CO ₂	
Hazardous Chemical Room								
134	Inside	5 KG					ABC	
135	Inside	5 KG					ABC	
Dossing House								
136	Inside	5 KG					ABC	
137	Inside	5 KG					ABC	

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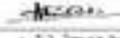
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
CW Pump Room								
138	Inside	5KG					ABC	
139	Inside	5 KG					ABC	
WTP Area (South)								
140	Sand Filter	5 KG					ABC	
141	Clarifier Tank	5 KG					ABC	
Plant Guard Room								
142	Inside	5 KG					ABC	
143	Inside	5 KG					ABC	
144	Inside	5 KG					ABC	
Dormitory Area								
145	Brahmagputra	5 KG					ABC	
146	Brahmagputra	5 KG					ABC	
147	Tista	5 KG					ABC	
148	Tista	5 KG					ABC	
149	Karatoya	5 KG					ABC	
150	Karatoya	5 KG					ABC	
151	Mahananda	5 KG					ABC	
152	Mahananda	5 KG					ABC	
153	Ichaurati	5 KG					ABC	
154	Ichaurati	5 KG					ABC	
155	Atrai	5 KG					ABC	
156	Atrai	5 KG					ABC	
157	Jamuna	5 KG					ABC	
158	Jamuna	5 KG					ABC	
159	Jamuna	5 KG					ABC	
160	Jamuna	5 KG					ABC	
161	Jamuna	5 KG					ABC	
162	Jamuna	5 KG					ABC	
163	Jamuna	5 KG					ABC	
164	Jamuna	5 KG					ABC	
165	Jamuna	5 KG					ABC	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 26
	SECTION 04: FIREFIGHTING ARRANGEMENTS	CONTROLLED COPY

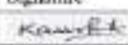
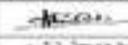
SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
166	Jamuna	5 KG					ABC	
167	Jamuna	5 KG					ABC	
Rest House								
168	Entry	5 Kg					ABC	
169	Entry	5 Kg					ABC	
Main Gate Guard Room								
170	Inside	5 KG					ABC	
171	Inside	5 KG					ABC	
172	Inside	5 KG					ABC	
173	Inside	5 KG					ABC	
Store Container								
174	Inside	5 KG					ABC	
175	Inside	5 KG					CO ₂	
176	Inside	5 KG					ABC	
177	Inside	5 KG					CO ₂	
178	Inside	5 KG					ABC	
179	Inside	5 KG					CO ₂	
180	Inside	5KG					ABC	
181	Inside	5 KG					CO ₂	
Station Pump House								
182	Inside	5 KG					ABC	
183	Inside	10 L					Foam	
184	Inside	10 L					Foam	
185	Inside	6 KG					CO ₂	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 27
	SECTION 04: FIREFIGHTING ARRANGEMENTS	CONTROLLED COPY

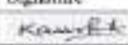
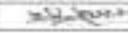
For Unit-2 Premises

Sl. No	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
STG Building (Ground Floor)								
1	North Side	5 KG					ABC	
2	North Side	5 KG					ABC	
3	Middle-East	5 KG					ABC	
4	South Side	5 KG					ABC	
5	South Side	5 KG					ABC	
6	South-West	5 KG					ABC	
7	South-West	5 KG					ABC	
8	North-West	5 KG					ABC	
9	Battery Room	5 KG					ABC	
10	Battery Room	5 KG					CO ₂	
11	6.6 KV	5 KG					ABC	
12	6.6 KV	5 KG					ABC	
13	6.6 KV	6 KG					CO ₂	
14	6.6 KV	6 KG					CO ₂	
STG Building (First Floor)								
15	In front of 415 V Power Distribution Room	6 Kg					CO ₂	
16	In front of 415 V Power Distribution Room	6 Kg					CO ₂	
17	In front of 415 V Power Distribution Room	5 KG					ABC	
18	In front of 415 V Power Distribution Room	5 KG					ABC	
19	Middle-West	5 KG					ABC	
20	Middle-West	5 KG					ABC	
21	North-West	10 L.					Foam	

	Name	Designation	Signature
Originated by	Mashour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

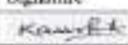
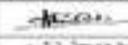
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Sl No	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
22	North-West	5 KG						
STG Building (Second Floor)								
23	South Side	5 KG					ABC	
24	South Side	5 KG					ABC	
25	South Side	5 KG					CO ₂	
26	South Side	5 KG					CO ₂	
27	North-west	5 KG					ABC	
28	North-west	10 L					Foam	
GTG Building								
29	South-West Side	5 KG					ABC	
30	South-West Side	5 KG					ABC	
31	South-West Side	10 L					Foam	
32	South-West Side	10 L					Foam	
33	North-West	5 KG					ABC	
34	North-West	3 KG					ABC	
35	North-West Side	10 L					Foam	
36	North-West Side	10 L					Foam	
37	Middle-East Side	5 KG					ABC	
38	Middle-East Side	5 KG					ABC	
39	Middle-East Side	6 KG					CO ₂	
40	Middle-East Side	6 KG					CO ₂	
41	Middle-East	10 L					Foam	
42	Middle-East	3 KG					ABC	
43	South-East	3 Kg					ABC	
44	South-East	5 KG					ABC	
45	Top of Combustion Chamber-1	3 KG					ABC	

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

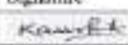
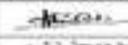
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 29
	SECTION 04: FIREFIGHTING ARRANGEMENTS	CONTROLLED COPY

Sl No	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
46	Top of Combustion Chamber-1	3 KG					ABC	
47	Top of Combustion Chamber-2	5 KG					ABC	
48	Top of Combustion Chamber-2	3 KG					ABC	
Natural Gas Booster								
49	East Side	5 KG					ABC	
50	East Side	5 KG					ABC	
51	Middle side	5 KG					ABC	
52	Middle side	5 KG					ABC	
53	West side	5 KG					ABC	
54	West Side	5 KG					ABC	
55	Natural Gas Condition Station	5 KG					ABC	
Admin Building Extension (Ground Floor)								
56	West	6 KG					CO ₂	
57	West	6 KG					CO ₂	
58	West	5 KG					ABC	
Admin Building Extension (First Floor)								
59	West	5 KG					ABC	
60	West	5 KG					ABC	
Admin Building Extension (Second Floor)								
61	West	5 KG					ABC	
62	West	5 Kg					ABC	
EDG Canopy								
63	South (Outside)	10 L					Foam	
64	South (Outside)	3 KG					ABC	

	Name	Designation	Signature
Originated by	Mashour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

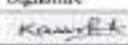
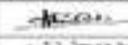
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 30
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Sl No	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
65	Inside (South)	5 KG					ABC	
66	Inside (South)	5 KG					ABC	
67	Inside NE	5 KG					ABC	
68	Inside NE	3 KG					ABC	
69	Inside NW	5 KG					ABC	
70	Inside NW	10 L					Foam	
In front of HRSG								
71	In front of CEMS	5 KG					ABC	
72	In front of CEMS	5 KG					ABC	
73	Top of HRSG	5 KG					ABC	
74	Top of HRSG	5 KG					ABC	
75	Top of HRSG	10 L					Foam	
Chemical Dossing (STG)								
76	Inside East	3 KG					ABC	
77	Inside West	5 KG					ABC	
Air Compressor								
78	East	5 KG					CO ₂	
79	East	5 KG					ABC	
80	West	5 KG					ABC	
81	West	5 KG					ABC	
PCC Room								
82	Outside	6 Kg					CO ₂	
83	Outside	6 Kg					CO ₂	
84	Inside	5 KG					CO ₂	
85	Inside	5 KG					CO ₂	
Store-02								
86	East	5 KG					ABC	
87	East	5 KG					ABC	
88	West	5 KG					ABC	
89	West	5 KG					ABC	

	Name	Designation	Signature
Originated by	Mashour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 31
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SL No	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
Chemical Dossing Room (WTP Area)								
90	Inside (Pack Dossing room)	5 KG					ABC	
91	(Pump room 2&3)	5 KG					ABC	
92	(Pump room 2&3)	5 KG					ABC	
WTP								
93	Ground floor East	5 KG					ABC	
94	Ground floor West	5 KG					ABC	
95	First floor (West)	5 KG					ABC	
96	First floor (West)	5 KG					CO ₂	
97	First floor (East)	5 KG					ABC	
98	First floor (East)	5 KG					ABC	
CEMS Room								
99	Inside	6 KG					CO ₂	
100	Inside	6 KG					CO ₂	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 32
	SECTION 04: FIREFIGHTING ARRANGEMENTS	CONTROLLED COPY

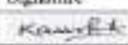
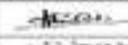
For Unit-3 Premises

SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
STG Building (Ground Floor)								
1	Battery room	6 kg					CO ₂	
2	Battery room	6 kg					CO ₂	
3	South-West	25 kg					ABC	
4	South-West	25 kg					ABC	
5	South-West	25 L.					Foam	
6	North-West	25 L.					Foam	
7	North-West	25 L.					Foam	
8	North-West	25 kg					ABC	
9	North-West	25 kg					ABC	
10	North-gate	5 kg					ABC	
11	North-gate	6 Kg					CO ₂	
12	South	5 kg					ABC	
13	South	5 kg					ABC	
14	Middle-East	5 kg					ABC	
15	Middle-East	5 kg					ABC	
16	North-East	5 kg					ABC	
17	North-East	5 kg					ABC	
STG Building (First Floor)								
18	North-East	25 Kg					ABC	
19	North-East	25 kg					ABC	
20	North-East	25 Kg					ABC	

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

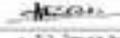
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
21	South-middle	5 Kg					ABC	
22	South-middle	5 kg					ABC	
23	South-middle	5 kg					ABC	
24	South-east	25 L					Foam	
25	South-west	25 L					Foam	
26	South-west	25 kg					ABC	
27	South (In front of 415 V Power distribution Room)	5 kg					ABC	
28	South (In front of 415 V Power distribution Room)	6 kg					CO ₂	
29	South (In front of 415 V Power distribution Room)	6 kg					CO ₂	
STC Building (Second Floor)								
30	South Side (Middle)	5 Kg					ABC	
31	South Side (Middle)	5 kg					ABC	
32	South Side (Middle)	6 kg					CO ₂	
33	South Side (Middle)	6 Kg					CO ₂	
35	South-West	25 kg					ABC	
36	South-West	25 kg					ABC	
37	North-East	25 L					Foam	
38	North-East	25 kg					ABC	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

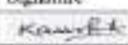
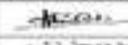
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 34
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
39	North-East	25 kg					ABC	
40	North-East	25 L					Foam	
Switchyard								
41	GT-main transformer	5 kg					ABC	
42	GT-main transformer	5 kg					ABC	
43	ST-main transformer	5 kg					ABC	
44	ST-main transformer	5 kg					ABC	
45	ST transformer	5 kg					ABC	
46	ST transformer	5 kg					ABC	
STG 6.6 KV Switchgear Room								
47	6.6 KV	5 kg					ABC	
48	6.6 KV	5 kg					ABC	
49	6.6 KV	6 kg					CO ₂	
50	6.6 KV	6 kg					CO ₂	
GTG Building								
51	West Side	5 kg					ABC	
52	West Side	5 kg					ABC	
53	Middle-West	10 L					Foam	
54	Middle-West	10 L					Foam	
55	South-West	5 kg					ABC	
56	South-West	10 L					Foam	
57	South-West	10 L					Foam	
58	GT North-West	10 L					Foam	
59	GT North-West	5 kg					ABC	
60	GT North-West	5 kg					ABC	
61	GT North-West	10 L					Foam	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 35
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
62	GT North-West	10 L					Foam	
63	GT Middle-East	5 Kg					ABC	
64	GT Middle-East	6 kg					CO ₂	
65	GT South-East	5 kg					ABC	
66	GT Middle-East	5 kg					ABC	
67	GT Middle-East	5 kg					ABC	
68	GT South-East	10 L					Foam	
69	GT South-East	10 L					Foam	
70	GT South-East	5 kg					ABC	
71	GT South-East	25 kg					ABC	
72	Combustion Chamber	5 kg					ABC	
73	Combustion Chamber	5 kg					ABC	
74	Combustion Chamber	5 kg					ABC	
75	Combustion Chamber	5 kg					ABC	
GT 6.6 KV Switchgear Room								
76	6.6 KV	6 kg					CO ₂	
77	6.6 KV	6 kg					CO ₂	
Natural Gas Booster								
78	SE	5 kg					ABC	
79	SM	5 kg					ABC	
80	SW	5 kg					ABC	
81	NE	5 kg					ABC	
82	NM	5 kg					ABC	
83	NW	5 kg					ABC	
84	West	5 kg					ABC	
GBC PLC Room								
85	GBC PLC	3 kg					ABC	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

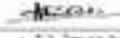
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 36
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
	room							
86	GBC PLC room	3 kg					ABC	
87	GBC PLC room	6 kg					CO ₂	
88	GBC PLC room	6 kg					CO ₂	
Pump House								
89	West corner	3 Kg					ABC	
90	West corner	3 Kg					ABC	
91	Middle of NW	3 kg					ABC	
92	Middle of NW	3 kg					ABC	
93	Middle of NE	5 kg					ABC	
94	Middle of NE	5 kg					ABC	
95	East Side	5 Kg					ABC	
96	East Side	5 kg					ABC	
97	East Side	6 kg					CO ₂	
98	Ground floor	10 L					Foam	
99	Ground floor	10 L					Foam	
100	Ground floor	3 Kg					ABC	
101	Ground floor	3 Kg					ABC	
CW Dossing Room								
102	Inside	3 kg					ABC	
103	Inside	3 kg					ABC	
EDG								
104	South Side	10 L					Foam	
105	North Side	10 L					Foam	
106	South Side	5 kg					ABC	
107	North side	5 kg					ABC	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 37
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
Fuel Forwarding Pump House								
108	South-West Side	10 L					Foam	
109	South side	10 L					Foam	
110	North-Middle	10 L					Foam	
111	North-Middle	10 L					Foam	
112	North-Middle	5 kg					ABC	
STG Chemical Dosing Room								
113	Middle	5 kg					ABC	
114	Middle	5 kg					ABC	
Control Building of U-2 & U-3								
115	Ground floor gate	6 kg					CO ₂	18 KG
116	Ground floor gate	5 Kg					ABC	
117	Ground floor gate	5 kg					ABC	
118	Ground floor	6 kg					CO ₂	
119	In front of Prayer room	6 kg					CO ₂	
120	In front of Prayer room	6 kg					CO ₂	
123	In front of Prayer room	5 kg					ABC	
124	GT Battery room	6 kg					CO ₂	
125	GT Battery room	5 kg					ABC	
126	GT Battery room	6 kg					CO ₂	
First Floor of Control Room								
127	First floor	3 kg					ABC	
128	First floor	6 kg					CO ₂	

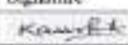
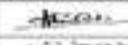
	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 38
	SECTION 04: FIREFIGHTING ARRANGEMENTS	CONTROLLED COPY

SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
129	First floor	6 kg					CO ₂	
130	First floor	6 kg					CO ₂	
131	First floor	6 kg					CO ₂	
132	First floor	5 kg					ABC	
133	First floor	5 kg					ABC	
HRSG								
134	Ground	5 kg					ABC	
135	Upper side	5 kg					ABC	
136	Upper side	5 kg					ABC	
Workshop U-2 & 3								
137	Workshop	5 kg					ABC	
138	Workshop	10 L					Foam	
139	Workshop	5 kg					ABC	
140	Workshop	5 kg					ABC	
Natural Gas Final and Filtering Station								
141	South Side	5 kg					ABC	
142	South Side	5 kg					ABC	
PCC room								
143	PCC	6 kg					CO ₂	
144	PCC	5 kg					ABC	
145	PCC	5 kg					ABC	
146	PCC	5 kg					CO ₂	
CEMS Room								
147	Inside	6 kg					CO ₂	
148	Outside	6 kg					CO ₂	
Air Compressor								
149	West side	5 kg					ABC	
150	West side	5 kg					ABC	

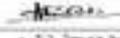
Siraganj 7.6 MWp Grid Connected Solar PV Plant Premises

SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
Control Room								
1	Inside	3 kg					ABC	
2	Inside	3 kg					ABC	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 39
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SL. No.	Position of Fire extinguisher	Weight of Fire extinguisher	Pressure of Fire extinguisher	Condition of nozzle & Safety pin	Date of Inspection	Expire Date	Type	Remarks
3	Inside	5 kg					CO ₂	
4	Inside	5 kg					CO ₂	
5	Inside	3 kg					ABC	
6	Inside	3 kg					ABC	
Corridor (Ground Floor)								
7	West Side	3 kg					ABC	
8	East Side	3 kg					ABC	
Corridor (First Floor)								
9	West Side	3 kg					ABC	
10	East Side	3 kg					ABC	
MV Room								
11	Inside	3 kg					ABC	
12	Inside	5 kg					ABC	
13	Inside	5 kg					ABC	
14	Inside	5 kg					ABC	
15	Inside	5 kg					CO ₂	
Box Transformer								
16	Box Transformer-1	3 Kg					ABC	
17	Box Transformer-1	3 Kg					ABC	
18	Box Transformer-2	5 Kg					ABC	
19	Box Transformer-2	5 Kg					ABC	
20	Box Transformer-3	3 kg					ABC	
21	Box Transformer-3	3 kg					ABC	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

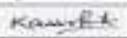
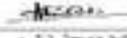
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 40
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2. FIRE HYDRANT

Position & Description of Fire Hydrant Points in the power station

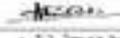
For Unit-1 Premises

SL No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
Admin Building				
1.	East side of Ground Floor	Admin building-FH-001 BS	Hose Pipe (64mm), Hose pipe (38mm), Nozzle (64& 38 mm)	
2.	East side of 1 st Floor	Admin building-FH-002 BS	Hose Pipe (64mm), (38mm) hose pipe Nozzle (64& 38 mm)	
3.	East side of 2 nd Floor	Admin building-FH-003 BS	Hose Pipe (64mm), Hose pipe (38mm), Nozzle (64& 38 mm)	
Store and Workshop Building				
4.	East of workshop building	U1-Workshop-FH-001 BS	Hose Pipe (64mm), Nozzle	
5.	Ground floor of workshop	U1-Workshop-FH-002 BS	Hose Pipe (64mm), Hose pipe (38mm)	
6.	Ground Floor of store	U1-Store-FH-003 BS	Hose Pipe (64mm), Hose pipe (38mm), Nozzle (64& 38 mm)	
7.	1 st floor of store	U1-Store-FH-004 BS	Hose Pipe (64mm), Hose pipe (38mm), Nozzle (64& 38 mm)	
Water Treatment Plant				
8.	North side (Ground floor)	U1-WTP-FH-001 BS	Hose Pipe (64mm), Nozzle	
9.	South side (Ground floor)	U1-WTP-FH-002 BS	Hose Pipe (64mm), Nozzle	
10.	North of WTP building	U1-WTP-FH-003 BS	Hose Pipe (64mm), Nozzle, Key	
11.	North of GBC	U1-WTP-FH-004 BS	Hose Pipe (64mm), Nozzle, Key	
Fuel Forwarding Pump House Area				
12.	East of Fuel Forwarding Pump House	U1-FF-FH-001 BS	Hose Pipe (64mm), Nozzle	
13.	West of Fuel Forwarding Pump House	U1-FF-FH-002 BS	Hose Pipe (64mm), Nozzle, Key	

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

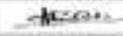
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 41
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Sl. No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
HSD Area				
14.	North of HSD Area	U1-HSD-FH-001 BS	Hose Pipe (64mm), Nozzle	
15.	North-east of HSD Area	U1-HSD-FH-002 BS	Hose Pipe (64mm), Nozzle	
16.	Middle-East of HSD Area	U1-HSD-FH-003 BS	Hose Pipe (64mm), Nozzle	
17.	Middle-East of HSD Area	U1-HSD-FH-004 BS	Hose Pipe (64mm), Nozzle	
18.	South-east of HSD area	U1-HSD-FH-005 BS	Hose Pipe (64mm), Nozzle	
19.	South-west of HSD Area	U1-HSD-FH-006 BS	Hose Pipe (64mm), Nozzle	
20.	West of HSD Area	U1-HSD-FH-007 BS	Hose Pipe (64mm), Nozzle	
Switchyard Area of Unit-1				
21.	North of Auxiliary Transformer	U1-SY-FH-001 BS	Hose Pipe (64mm), Nozzle, Key	
22.	West of switchyard	U1-SY-FH-002 BS	Hose Pipe (64mm), Nozzle, Key	
CCR Building				
23.	Ground Floor of CCR	U1-CCR-FH-001 BS	Hose Pipe (64mm), Nozzle	
24.	1 st Floor of CCR	U1-CCR-FH-002 BS	Hose Pipe (64mm), Nozzle	
GTG Building Ground Floor				
25.	South-east side	U1-GT-FH-001 BS	Hose Pipe (64mm), Nozzle	
26.	Middle	U1-GT-FH-002 BS	Hose Pipe (64mm), Nozzle	
27.	North	U1-GT-FH-003 BS	Hose Pipe (64mm), Nozzle	
28.	Upper side point	U1-GT-FH-004 BS	Hose Pipe (64mm), Nozzle	
29.	West side	U1-GT-FH-005 BS	Hose Pipe (64mm), Nozzle	
STG Building Ground Floor (Thread coupler type)				
30.	North side	U1-ST-FH-001	Hose Pipe (64mm), Nozzle	

	Name	Designation	Signature
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Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 42
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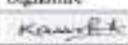
SL No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
		TC		
31.	North-east side	U1-ST-FH-002 TC	Hose Pipe (64mm), Nozzle	
32.	South-east side	U1-ST-FH-003 TC	Hose Pipe (64mm), Nozzle	
33.	South side	U1-ST-FH-004 TC	Hose Pipe (64mm), Nozzle	
34.	South-west side	U1-ST-FH-005 TC	Hose Pipe (64mm), Nozzle	
STG Building 1st Floor				
35.	North side	U1-ST-FH-006 TC	Hose Pipe (64mm), Nozzle	
36.	North-east side	U1-ST-FH-007 TC	Hose Pipe (64mm), Nozzle	
37.	South-east side	U1-ST-FH-008 TC	Hose Pipe (64mm), Nozzle	
38.	South side	U1-ST-FH-009 TC	Hose Pipe (64mm), Nozzle	
39.	South-west side	U1-ST-FH-010 TC	Hose Pipe (64mm), Nozzle	
STG Building 2nd Floor				
40.	North side	U1-ST-FH-011 TC	Hose Pipe (64mm), Nozzle	
41.	North-east side	U1-ST-FH-012 TC	Hose Pipe (64mm), Nozzle	
42.	South-east side	U1-ST-FH-013 TC	Hose Pipe (64mm), Nozzle	
43.	South side	U1-ST-FH-014 TC	Hose Pipe (64mm), Nozzle	
44.	South-west side	U1-ST-FH-015 TC	Hose Pipe (64mm), Nozzle	

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 <p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p>	<p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p> <p>EMERGENCY PREPAREDNESS PLAN</p>	<p>DOC No: NW-SPS-HSE-EPP-001</p> <p>EFFECTIVE DATE: 24.08.2023</p> <p>REVISION NO: 05</p> <p>Page: 43</p>
	<p>SECTION 04: FIREFIGHTING ARRANGEMENTS</p>	<p>CONTROLLED COPY</p>

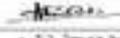
For Unit-2 Premises

Sl. No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
GTG Building				
1.	South East corner	U2-GT-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
2.	Middle-east	U2-GT-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
3.	North	U2-GT-Hydrant-003	Hose Pipe (64mm), Nozzle, Key	
4.	North-upper	U2-GT-Hydrant-004	Hose Pipe (64mm), Nozzle, Key	
5.	West-south	U2-GT-Hydrant-005	Hose Pipe (64mm), Nozzle, Key	
6.	West-north	U2-GT-Hydrant-006	Hose Pipe (64mm), Nozzle, Key	
STG Building (Ground Floor)				
7.	North side	U2-ST-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
8.	North-west side	U2-ST-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
9.	South-west side	U2-ST-Hydrant-003	Hose Pipe (64mm), Nozzle, Key	
10.	South side	U2-ST-Hydrant-004	Hose Pipe (64mm), Nozzle, Key	
STG Building (1st Floor)				
11.	North side	U2-ST-Hydrant-005	Hose Pipe (64mm), Nozzle, Key	
12.	North-west side	U2-ST-Hydrant-006	Hose Pipe (64mm), Nozzle, Key	
13.	South-west side	U2-ST-Hydrant-007	Hose Pipe (64mm), Nozzle, Key	
14.	South side	U2-ST-Hydrant-008	Hose Pipe (64mm), Nozzle, Key	
STG Building (2nd Floor)				
15.	North side	U2-ST-Hydrant-009	Hose Pipe (64mm), Nozzle, Key	
16.	North-west side	U2-ST-Hydrant-010	Hose Pipe (64mm), Nozzle, Key	

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 44
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Sl. No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
17.	South-west Side	U2-ST-Hydrant-011	Hose Pipe (64mm), Nozzle, Key	
18.	South side	U2-ST-Hydrant-012	Hose Pipe (64mm), Nozzle, Key	
Surrounding Area of Unit-2				
19.	South east of STG building	U2-FA-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
20.	East side of STG building	U2-FA-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
21.	East side of switch yard	U2-SY-Hydrant-003	Hose Pipe (64mm), Nozzle, Key	
22.	North of switch yard	U2-SY-Hydrant-004	Hose Pipe (64mm), Nozzle, Key	
23.	West of switch yard	U2-SY-Hydrant-005	Hose Pipe (64mm), Nozzle, Key	
CCR Building				
24.	West side near entrance (Ground Floor)	U2-CCR-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
25.	In front of battery room of U-2 (Ground Floor)	U2-CCR-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
26.	In front of battery room of U-3 (Ground Floor)	U2-CCR-Hydrant-003	Hose Pipe (64mm), Nozzle, Key	
27.	East side (1 st Floor)	U2-CCR-Hydrant-004	Hose Pipe (64mm), Nozzle, Key	
28.	West side (1 st Floor)	U2-CCR-Hydrant-005	Hose Pipe (64mm), Nozzle, Key	
WTP Building				
29.	West side (Ground Floor)	U2-WTP-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
30.	East side (Ground Floor)	U2-WTP-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
31.	West side (1 st Floor)	U2-WTP-Hydrant-003	Hose Pipe (64mm), Nozzle, Key	
32.	East side (1 st Floor)	U2-WTP-Hydrant-004	Hose Pipe (64mm), Nozzle, Key	
33.	North of WT building	U2-WTP-Hydrant-005	Hose Pipe (64mm), Nozzle, Key	

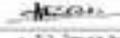
	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 45
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SL No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
34.	North of WTP	U2-WTP-Hydrant-006	Hose Pipe (64mm), Nozzle, Key	
Admin Building				
35.	West side of Ground Floor	U2-Admin building-FH-004 (BS)	Hose Pipe (64mm), Nozzle, Key, Hose Pipe (38mm), Nozzle (38mm)	
36.	West side of 1 st Floor	U2-Admin building-FH-005 (BS)	Hose Pipe (64mm), Nozzle, Key, Hose Pipe (38mm), Nozzle (38mm)	
37.	West side of 2 nd Floor	U2-Admin building-FH-006 (BS)	Hose Pipe (64mm), Nozzle, Key, Hose Pipe (38mm), Nozzle (38mm)	
Dormitory Area				
38.	Near Brahmaputra dormitory	Dormitory-FH-001(BS)	Hose Pipe (64mm), Nozzle	
39.	Near Karatoya Dormitory	Dormitory-FH-002(BS)	Hose Pipe (64mm), Nozzle	
40.	Near Mahananda Dormitory	Dormitory-FH-003(BS)	Hose Pipe (64mm), Nozzle	
41.	Near Indoor Games room	Dormitory-FH-004(BS)	Hose Pipe (64mm), Nozzle	
42.	Near Mosque Area	Dormitory-FH-005(BS)	Hose Pipe (64mm), Nozzle	

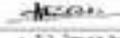
For Unit-3 Premises

SL No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
GTG Building				
1.	North-west side	U3-GT-Hydrant-001	Hose Pipe (64mm), Nozzle	
2.	North-east side	U3-GT-Hydrant-002	Hose Pipe (64mm), Nozzle	
3.	North-upper	U3-GT-Hydrant-003	Hose Pipe (64mm), Nozzle	
4.	South side	U3-GT-Hydrant-004	Hose Pipe (64mm), Nozzle	
5.	South-west side	U3-GT-Hydrant-005	Hose Pipe (64mm), Nozzle	
STG Building (Ground Floor)				
6.	South-east side	U3-ST-Hydrant-001	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

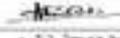
 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 46
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Sl. No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
7.	South side	U3-ST-Hydrant-002	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
8.	South-west side	U3-ST-Hydrant-003	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
9.	North-west side	U3-ST-Hydrant-004	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
10.	North side	U3-ST-Hydrant-005	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
11.	North-east side	U3-ST-Hydrant-006	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
12.	ST Dressing room	U3-ST-Hydrant-007	Hose Pipe (64mm), Nozzle	
STG Building (1st Floor)				
13.	North-east side	U3-ST-Hydrant-008	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
14.	North side	U3-ST-Hydrant-009	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
15.	South-east side	U3-ST-Hydrant-010	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
16.	South Side	U3-ST-Hydrant-011	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
STG Building (2nd Floor)				
17.	South-east side	U3-ST-Hydrant-012	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
18.	North-east side	U3-ST-Hydrant-013	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
19.	North side	U3-ST-Hydrant-014	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
20.	South side	U3-ST-Hydrant-015	Hose Pipe (64mm), Nozzle, 19 mm hose pipe, 19 mm Nozzle	
Surrounding Area of Unit-3				
21.	North of switch yard	U3-SY-Hydrant-001	Hose Pipe (64mm), Nozzle	
22.	West of switch yard	U3-SY-Hydrant-002	Hose Pipe (64mm), Nozzle	
23.	West of STG building	U3-SY-Hydrant-003	Hose Pipe (64mm), Nozzle	
Surrounding Area				
24.	Near RMS Gate	U3-RMS-Hydrant-001	Hose Pipe (64mm), Nozzle	

	Name	Designation	Signature
Originated by	Mashour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 47
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Sl. No.	Location	Hydrant No.	Necessary Equipment in Fire House Cabinet	Remarks
25.	East of Air Compressor Room	U3-A.Com.-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
26.	West of Air Compressor Room	U3-A.Com.-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
27.	West of Store House	U3-GBC-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
28.	Inside Store	U3-Store-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
29.	Inside Store	U3-Store-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
30.	North of fuel forwarding area	U3-PH-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
31.	North of CW Pump House	U3-PH-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
HSD Area				
32.	North of HSD area	U3-HSD-Hydrant-001	Hose Pipe (64mm), Nozzle, Key	
33.	West of HSD area	U3-HSD-Hydrant-002	Hose Pipe (64mm), Nozzle, Key	
34.	South of HSD area	U3-HSD-Hydrant-003	Hose Pipe (64mm), Nozzle, Key	
35.	Middle-east of HSD area	U3-HSD-Hydrant-004	Hose Pipe (64mm), Nozzle, Key	
36.	North of HSD area	U3-HSD- Foam Hydrant-001	Hose Pipes, Coupler & Nozzle	
37.	West of HSD area	U3-HSD- Foam Hydrant-002	Hose Pipes, Coupler & Nozzle	
38.	West of HSD area	U3-HSD- Foam Hydrant-003	Hose Pipes, Coupler & Nozzle	
39.	South of HSD area	U3-HSD- Foam Hydrant-004	Hose Pipes, Coupler & Nozzle	
40.	South east of HSD area	U3-HSD- Foam Hydrant-005	Hose Pipes, Coupler & Nozzle	
41.	North-east of HSD area	U3-HSD- Foam Hydrant-006	Hose Pipes, Coupler & Nozzle	
Mini Fire Station				
42.	Mini Fire Station	Fire Station-001	Hydrant Point	

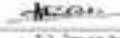
	Name	Designation	Signature
Originated by	Mashour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

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INSTRUCTIONS FOR FIRE PREVENTION & FIREFIGHTING

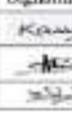
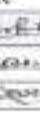
1. Identify all the activities/location where there is a potential for fire/explosion.
2. Do not keep any flammable material near the potential hazardous area and electrical points.
3. Ensure that nobody smokes inside the plant premises as the whole plant is declared as smoking free area.
4. Do not allow any spillage or leakage in working Area; in case any spillage is noticed, immediately wipe off with cloth. Throw the cloth in the designated bin.
5. Make sure that non-compatible materials are not kept together; if required, refer the Material Safety Data Sheet.
6. Ensure availability of adequate number(s) of appropriate type Fire Extinguishers in the fire prone places.
7. Do not allow accumulation of wastes, dry leaves in fire prone areas as they are also a potential fire hazard.
8. Compressed Gas Cylinders shall not be stored near sources of heat or under direct sunlight; they shall also be chained / secured.
9. Never overload electrical points and connect equipment/appliances to correct Socket - check for the Ampere rating also.
10. Keep yourself informed about the type of fire and extinguisher to be used
11. Participate actively in the periodic Mock Drills to ensure emergency preparedness.
12. Never block the fire exits.

Portable / First Aid Fire Extinguishers are to be mounted at a comfortable height for easy access and usage.

	Name	Designation	Signature
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Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 <p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p>	<p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p> <p>EMERGENCY PREPAREDNESS PLAN</p>	<p>DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 49</p>
	<p>SECTION 04: FIREFIGHTING ARRANGEMENTS</p>	<p>CONTROLLED COPY</p>

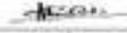


	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 <p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p>	<p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p> <p>EMERGENCY PREPAREDNESS PLAN</p>	<p>DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 50</p>
	<p>SECTION 04: FIREFIGHTING ARRANGEMENTS</p>	<p>CONTROLLED COPY</p>

GUIDELINES FOR USING APPROPRIATE FIRE EXTINGUISHER

EXTINGUISHER		Type of Fire				
Colour	Type	Solids (Wood, Paper, Cloth etc)	Flammable Liquids	Flammable Gasses	Electrical Equipment	Cooking Oils & Fats
	DCP	✓	✓	✓	✓	✗
	CO ₂	✗	✓	✗	✓	✓
	Foam	✓	✓	✗	✗	✓
	Dry Sand Bucket	✓	✓	✓	✗	✗
	Water	✓	✗	✗	✗	✗

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 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 51
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1. CARBON DIOXIDE EXTINGUISHER

Check the cylinder weight after refilling.
 Place the CO₂ extinguisher at appropriate location.
 Check the condition of rubber parts, hose & horn and cylinder weight once in every month. If underweight (less than 10 % of original weight), discard the extinguisher for refilling.

Use CO₂ extinguisher for extinguishing the following types of fire:

- 1) Oil
- 2) Gas
- 3) Electrical

2. DRY CHEMICAL POWDER TYPE

Check the cylinder after refilling and record the observation.

- a) Weight of cartridge.
- b) Condition of powder

Place the extinguisher at appropriate locations.
 Check the extinguisher once in every month.

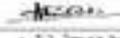
- a) Powder condition: If it is wet, change the powder.
 Check the needle in the gauge, it should be on Green portion of the gauge.
- b) Check the siphon tube. If it is choked, clean the tube.

Use DCP type extinguisher for extinguish the liquid fire, gaseous fire and electrical fire.

3. FOAM TYPE

Check the cylinder after refilling and record the observation.

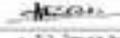
Foam fire extinguishers can be used on Class A and B fires.
 They are most suited to extinguishing liquid fires such as petrol or diesel and are more versatile than water jet extinguishers because they can also be used on solids such as wood and paper.

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Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page 52
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GUIDELINES FOR USING FIRE HYDRANT

- Ensure that the line is charged @ 06 Bar. Ensure allied facilities like emergency pumps, jockey pumps, diesel engines are working satisfactorily. Do not tamper with the fire hydrant hose reels and boxes. Ensure periodic inspection and maintenance is being carried out and records are maintained.
- Do not operate the hydrant if you are not aware of the same as it may lead to serious physical injury. Ensure safety. Fire hydrants shoot out water at over high speeds, making the need for safety absolute. First, rope off the area around the hydrant so people don't stray into its path. Then check the fire hydrant. You should feel it to make sure it is rigid, immovable and doesn't have loose or faulty parts.
- Open the hydrant. Identify the opening valve and use the special, hydrant tool to open the fire hydrants valve. Generally, fire hydrant valves need to be turned counterclockwise to open. It is crucial that you open the valve slowly and fully. Opening the valve partially can cause serious damage to the fire hydrant and carries a risk of injury to you and to bystanders.
- Close the fire hydrant slowly and completely. To close the fire hydrant, use the pentagon shaped socket and turn clockwise. Close the fire hydrants valve slowly and make sure that you close it completely. Keep an eye on the fire hydrant for a minute to make sure that water stops flowing from all parts of the device before you leave

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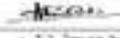
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Fire-fighting team:

SLNo.	By Designation
01	Shift In charge (Operation), Group-01 (U-1,2,3)
02	Shift In charge (Operation), Group-02 (U-1,2,3)
03	Shift In charge (Operation), Group-03 (U-1,2,3)
04	Shift In charge (Operation), Group-04 (U-1,2,3)
05	Water Quality Analyst (IAM), Group-01 (U-1,2,3)
06	Water Quality Analyst (IAM), Group-02 (U-1,2,3)
07	Water Quality Analyst (WQA), Group-03 (U-1,2,3)
08	Water Quality Analyst (IAM), Group-04 (U-1,2,3)
09	SAE-Electrical (Operation), Group-01 (U-1,2,3)
10	SAE- Electrical (Operation), Group-02 (U-1,2,3)
11	SAE- Electrical (Operation), Group-03 (U-1,2,3)
12	SAE-Electrical (Operation), Group-04 (U-1,2,3)
13	Foreman (Mechanical) (U-1,2,3)
14	Electrician (U-1,2,3)
15	Work Assistant (Mechanical) (U-1,2,3)
16	Work Assistant (Mechanical) (U-1,2,3)
17	Work Assistant (I & C) (U-1,2,3)
18	O.S.S (U-1,2,3)
29	O.S.S (Operation), Group-01 (U-1,2,3)
20	O.S.S (Operation), Group - 02 (U-1,2,3)
21	O.S.S (Operation), Group-03 (U-1,2,3)

Rescue team:

SLNo.	By Designation
01	AM (EHS)
02	SAE-Mech (Operation), Group-01 (U-1,2,3)
03	SAE-Mech (Operation), Group -02 (U-1,2,3)
04	SAE-Mech (Operation), Group -03 (U-1,2,3)
05	SAE -Mech (Operation), Group -04 (U-1,2,3)
06	Foreman (Electrical) (U-1,2,3)
07	Chemical Operator (WTP), Group-01 (U-1,2,3)

	Name	Designation	Signature
Originated by	Meshour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

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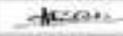
SLNo.	By Designation
08	Chemical Operator (WTP) Group-01 (U-1,2,3)
09	Chemical Operator (WTP) Group -02 (U-1,2,3)
10	Chemical Operator (WTP) Group -03 (U-1,2,3)
11	Chemical Operator (WTP) Group -04 (U-1,2,3)
12	Office Assistant (U-1,2,3)
13	(Operation) Group-01 ,Helper (U-1,2,3)
14	(Operation) Group-02, Helper (U-1,2,3)
15	(Operation) Group-03, Helper (U-1,2,3)
16	(Operation) Group-04, Work Assistant (U-1,2,3)
17	Helper (Store) (U-1,2,3)

First aid team:

SLNo.	By Designation
01	Medical Officer
02	Assistant Engineer (Mech.)(U-1,2,3)
03	AE (Operation shift) Group-01 (U-1,2,3)
04	AE (Operation shift) Group -02 (U-1,2,3)
05	AE (Operation shift) Group -03 (U-1,2,3)
06	AE (Operation shift) Group -04 (U-1,2,3)
07	Assistant Engineer (I& C)(U-1,2,3)
08	Medical assistants

Evacuation/head counting team:

SLNo.	By Designation
01	Assistant Security Officer
02	SAE (Electrical) (U-1,2,3)
03	SAE (7.6 Solar Plant)
04	Office Assistant (U-1,2,3)

	Name	Designation	Signature
Originated by	Mashoor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MES, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 55
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ALARM SYSTEM

In case of emergency, the main / incident controller/s shall declare emergency. The evacuation, head count and other necessary arrangements will be performed under the guidance of Incident Controller/s. Alarm (sirens), PA System will be raised from Central Control Room (U-1,2,3, Solar) after receiving instructions from main / incident controller/s. Besides that, they will inform immediately in control room of Mini Fire Station, SPS for further necessary action to solve the emergency situation.

The Alarm for various emergency situations will be blown as per the following Chart.

Sl. No.	Type	Duration
1.	In case of Fire and other emergencies	30 seconds pitch four times with a gap of 15 seconds.
2.	All Clear Signal	Continuous siren for 180 sec.

Besides, to alert other people during the emergency, people have been instructed to run to various departments to make everybody alert and come to the emergency assembly areas ASAP.

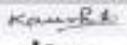
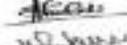
ASSEMBLY AREA

On declaration of emergency and/or sounding of emergency alarm, all employees, workers, visitors, contractors shall assemble in designated assembly area. We have Four assembly areas, one is in front of the administration building, 2nd one is in front of CCR (U-2 & U-3), 3rd one is east side of HRSG of U2 and 4th one is south-west side of Solar Plant's Control building. Head count will be done by the Head counting team. The Assembly Area has been identified by a Display Board.

EMERGENCY CONTROL CENTRE

The Central Control Room has been designated as the Emergency Control Centre. It is manned for 24 hours and is equipped with;

- Site Plan
- Torches
- First aid box
- Clock
- List of all important phone numbers.

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

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In case any briefing is to be given to the press and media regarding the emergency, the same shall be given by SE (Unit-1,2,3) of the plant.

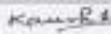
TRANSPORT ARRANGEMENTS

Whenever necessary, ambulance/vehicles are made available to transport affected people, to outside facilities such as Hospitals or Nursing Homes. This is co-ordinated by the Plant Head in consultation with the Medical Officer.

LIASING

The various internal and external contacts for liaising during emergency are given below. Any employee or Security personnel can interact with the internal contacts, but under no circumstances, shall contact the external facilities, which is the sole authority of the Unit Head.

Sl. No.	Name / Description	Address & Contact No.	Remarks
1	Chief Engineer	Shafiqul Islam & 01755630007	
2	Plant Head, PM (SE), U1,2,3	Brojendra Kumar Sarkar & 01777736404 Md. Asad Halim & 01777736402 Shyamal Kumar Das & 01777736401	Main Controller (Unit-1,2,3)
3	Operation Head, U1,2,3 (XEN-Operation)	Shimul Kumar Barman & 01755630011 Md. Shamsur Rahman & 01755630031 Mr Masud Rana & 01777736433	Incident Controller (U1,2,3)
4	Operation Head (Solar)	Muhammed Anwar Rahman & 01755630040	Incident Controller (Solar)
5	DM (Environment, Health & Safety)	Mashhour Mahmud Khan & 01708152395	
6	Doctor / Dispensary Senior Medical Officer	Dr. Md. Golam Kabria & 01708152307	First Aid
7	Mini Fire Station, SP5	01313425824	
8	Sadar Thana Sirajganj	0751-62196	
9	OC Sirajganj Sadar Thana	01320 129590	
10	OC Bonghobondhu Satu West Thana	01320 129824	For Civil Aid
11	Fire Service & Civil Defence, Sirajganj Sadar	02588830092	For Fire Fighting
12	Sadar Hospital, Sirajganj	01715 422502	For treatment and medicines

	Name	Designation	Signature
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Reviewed by	Ashraf Ali	Executive Engineer (MIS, SP5)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 57 CONTROLLED COPY
	SECTION 06: PREVENTIVE SUPPORT AND POST EMERGENCIES	

TRAINING AND AWARENESS

Regular training is given to employees about various potential emergency situations and their roles and responsibilities during any such scenario. Besides, throughout the plant, Notices and Posters are displayed for spreading awareness to the employees and the contractors. The safety personnel/concerned host will apprise visitors to the plant on where to assemble during emergency and their Do's and Don'ts.

Identified personnel are also trained in First Aid and Fire Fighting.

MOCK DRILLS

Mock-drills are carried out at least once in six months to check the effectiveness of the emergency response as per the Emergency Preparedness Plan (After received instruction from our honorable CEO we do mock-drill in every month from February, 2021). In case of any deviation from the procedure described in this Emergency Plan, the Plan shall be revised adequately.

Response Times:

Information after emergency: 2 min

Alarm raised: 1.30 minutes

Fire fighters and first aiders arrival: 4 minutes

FIRST AID BOX

First aid boxes are available at all unit's Store, Mechanical Maintenance Department, Electrical Maintenance Department, I&C Department, Operation Department, WTP, Account & Finance, Security Gate. Medical officer will be responsible to ensure that contents are regularly checked and replaced as necessary. The contents are as per the requirements of the Labor rules.

PERSONNEL PROTECTIVE EQUIPMENT

To handle any chemical and oil splash / hazards or emergency situation, personal protective equipment has been provided

MAINTENANCE AND REPAIR WORKS

Servicing, filling testing & controlling of the complete fire-fighting system (extinguishers and hydrant) are regularly maintained according to good engineering practices and records are maintained by the Safety Officer.

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Approved by	Shafiqul Islam	Chief Engineer	

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	SECTION 06: PREVENTIVE SUPPORT AND POST EMERGENCIES	

CONTINUOUS SURVEILLANCE OF OPERATIONS

All operations are continuously kept under surveillance and the Work Instructions /Do's and Don'ts/Informative Displays are followed for preventing any emergency.

POST-EMERGENCY SITUATION

Fire will be extinguished using the appropriate type of fire extinguisher and the debris shall be sent to the scrap yard for disposal or filled in the Scrap Store.

However, if water is used in substantial quantity for firefighting, then the firewater will be diverted for the horticultural purposes. After the situation is under control, the Main Controller shall give the all-clear signal and the alarm/siren will be sounded again. The people in the assembly area shall also be informed for resuming work and normal Operation.

In case of environmental emergencies, the affected soil/plants shall be separated for treatment, safe disposal as necessary.

When environmental emergencies like failure of Pollution Control facilities happen, the Preventive Maintenance mechanism for the same shall be reviewed.

In case of emergencies involving human injury and/or ill-ness, the concerned person(s) shall be sent for appropriate medical treatment.

Besides, a meeting of the Management Review Committee shall be convened to analyze the actions taken and loss encountered, suggesting/incorporating any corrective and preventive mechanisms and for modifying the Emergency Preparedness Plan. If required, the Environmental Aspect Impact Analysis, OHS Hazard Identification & Risk Assessment shall also be reviewed and updated. Further training shall also be provided to the personnel based on identified needs.

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	SECTION 07: MEDICAL EMERGENCY PLAN	CONTROLLED COPY

FIRST AID

First aid is the initial treatment provided to a victim of an accident or unexpected sickness prior to the arrival of a certified professional. The goal of first aid is to save lives, aid in recovery, prevent aggravation, and limit problems at a later date by utilizing whatsoever material is available.

Artificial Respiration

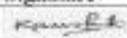
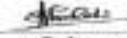
- ✓ Mouth to Mouth: This is appropriate and effective technique for emergency artificial respiration.
- ✓ Keep the head slightly backward and open the jaw.
- ✓ Seal the casualty's nose to prevent escape of air by pinching with thumb and index finger.
- ✓ Take a deep breath, open your mouth widely, place it over the victim's mouth and make a tight seal.
- ✓ Quickly blow the full breath into the mouth of victim.
- ✓ Remove your mouth from the victim and allow him to exhale passively.
- ✓ Repeat the procedure 12 to 15 times per minute, till medical aid is arranged.
- ✓ Arrange immediate medical aid.

CAUTIONARY NOTE

- ✓ Do not give mouth to mouth resuscitation during CPR in the presence of toxins such as cyanide, hydrogen sulphide, corrosives and organo-phosphates. Ventilate the casualty by using a face mask or bag/valve/mask assembly.
- ✓ Avoid mouth to mouth resuscitation if there is possibility of transmission of infection between the victim and the rescuer, such as HIV, Hepatitis-B, Tuberculosis, Shigellosis, Meningococcal meningitis, Herpes simplex virus and Salmonella. Use an interposition airway device which must function effectively in both its resuscitation and protective roles and be immediately available at all times.

Control of Bleeding

- ✓ Apply direct pressure by thumb or finger.
- ✓ Apply dressing - gauze pad and bandage.
- ✓ Apply indirect pressure on pressure points.
- ✓ Apply tourniquet.
- ✓ Remove the injured to the hospital.

	Name	Designation	Signature
Originated by	Mashioor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Asiraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 60
	SECTION 07: MEDICAL EMERGENCY PLAN	CONTROLLED COPY

Fractures

Signs of Fracture: Pain, Tenderness, Swelling, Loss of Power, Deformity

- ✓ Do not move the injured unless the life is endangered from other causes.
- ✓ Deal with the hemorrhage and breathing difficulties. Immobilize the fracture by using suitable splints.
- ✓ Immobilization should include one joint above and one joint below the fracture.
- ✓ Remove the injured to the hospital.

Burns

- ✓ Pour running cold water on the affected part.
- ✓ Do not apply ointments or oils or any other substance.
- ✓ Cover the wound with sterilized cloth.
- ✓ Give artificial respiration, if needed.
- ✓ Prevent shock.
- ✓ Arrange immediate medical aid.

Shock

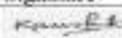
- ✓ Lay the patient on his back.
- ✓ Stop bleeding, if any.
- ✓ Relieve pain by supporting the injured part.
- ✓ Keep the patient comfortable.
- ✓ Do not cause sweating.
- ✓ Fluids may be given by mouth in small amounts, if the patient is conscious.
- ✓ Reassure the patient.
- ✓ Arrange immediate medical aid.

Wounds

- ✓ Stop the bleeding, if any.
- ✓ Avoid touching the wounds.
- ✓ Cover the wound with sterilized cloth.
- ✓ Arrange immediate medical aid.

Eye Injuries

- ✓ Removal of foreign body should not be attempted.
- ✓ Do not apply oil or ointment.
- ✓ Apply sterile pad and loose bandage.
- ✓ Send the patient to the hospital.

	Name	Designation	Signature
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Approved by	Shafiqul Islam	Chief Engineer	

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	SECTION 07: MEDICAL EMERGENCY PLAN	CONTROLLED COPY

Abdominal Wounds

- ✓ No time should be lost in sending the patient to the hospital.
- ✓ Keep the patient flat on his back.
- ✓ Give nothing by mouth.
- ✓ Maintain warmth.
- ✓ If intestines protrude from the wound, do not attempt to touch or replace them.
- ✓ Apply sterile dressing and binder on the wound.
- ✓ Provide immediate transportation to the hospital.

Backbone Fracture

- ✓ Fracture of backbone may lead to paralysis of limbs. Hence, victim should be handled with great care.
- ✓ Transport on a rigid frame, which may be improvised by using available board.
- ✓ The rigid frame is to be placed on a stretcher for transportation.
- ✓ Immediate hospitalization is needed.

Heat Stroke

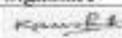
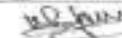
- ✓ Make the patient lie down.
- ✓ Remove all clothing except the underwear.
- ✓ Keep the patient under the fan.
- ✓ Pour cold water on the body repeatedly.
- ✓ Wash the head thoroughly with cold water and dry it with towel.
- ✓ Record body temperature falls up to 38°C stop pouring water.
- ✓ Give plenty of cold water with a pinch of common salt in each glass of water to drink.
- ✓ Send the patient to the hospital.

Bleeding Nose

- ✓ Make the patient sit on a Chair with head downward.
- ✓ Pinch the nose with fingers and thumb.
- ✓ Apply ice or cold compression.
- ✓ Do not plug the nostrils.
- ✓ Do not put water or any medicine through the nostrils.
- ✓ Send for medical aid immediately.

Foreign Body in the Nose

- ✓ Do not try to remove the solid object.
- ✓ Ask the patient to breathe through mouth.
- ✓ Send the patient to the hospital.

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	SECTION 07: MEDICAL EMERGENCY PLAN	CONTROLLED COPY

Bleeding Ear

- ✓ Lay the patient with the head slightly raised.
- ✓ Incline the head to the affected side and apply a dry dressing over the ear with loose bandage.
- ✓ Do not plug the ear.
- ✓ Apply pressure in front of the ear.
- ✓ Send for medical aid immediately.

Foreign Body in the Ear

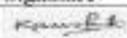
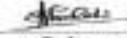
- ✓ Solid – Do not try to remove, scratch or probe it.
- ✓ Insects – Put a few drops of water in the ear and turn the head so that affected ear points upwards.
- ✓ Keep the head in that position for 5 minutes, and then turn the head downwards so that the water flows out.
- ✓ Arrange immediate medical aid.

Snake Bite

- ✓ Reassure the patient.
- ✓ Do not allow the person to run or walk.
- ✓ Apply a ligature above the wound (in between the heart and the wound) if the bite is in the leg or hand.
- ✓ Wash the wound with potassium permanganate solution or with soap and water.
- ✓ Allow free bleeding.
- ✓ Never suck the blood from the wound.
- ✓ Treat for shock.
- ✓ Arrange immediate hospitalization, by transporting the patient in a lying down position.

Dog Bite

- ✓ Clean the wound immediately with water.
- ✓ Then wash with antiseptic soap and water.
- ✓ Do not try to stop bleeding.
- ✓ Do not cover the wound.
- ✓ Send the patient to hospital for treatment.

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 43
	SECTION 07: MEDICAL EMERGENCY PLAN	CONTROLLED COPY

Insect Bite

- ✓ The sting bite should be pulled out.
- ✓ Apply cold compression.
- ✓ Apply vinegar diluted with water.
- ✓ Soda-bicarbonate paste should be applied at the site.
- ✓ Prevent shock.
- ✓ Send for medical aid immediately.

Chemical Burns of the Eyes

- ✓ Immediate washing of the eye with clean water at least for fifteen minute or longer.
- ✓ Apply sterile dressing over the eye.
- ✓ Neutralizing agents or ointments should not be used.
- ✓ Send the patient to the hospital.

Suffocation

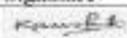
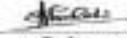
- ✓ Remove the patient from the source.
- ✓ Clean the airways.
- ✓ Restore breathing by artificial respiration.
- ✓ Send the patient to the hospital.

Electric Shock / Injuries

- ✓ Do not touch the casualty while he is still in contact with electricity.
- ✓ Switch off the current at once.
- ✓ Do not attempt first aid until the contact has been broken.
- ✓ Make the air passage clear and clean.
- ✓ Restore breathing Artificial respiration and external cardiac massage, if needed.
- ✓ Call for immediate medical aid.
- ✓ Send the patient to the hospital.

Unconsciousness

- ✓ Make the patient lie down on his belly with head turned to one side.
- ✓ Check breathing and pulse.
- ✓ Loosen tight clothing.
- ✓ Clean the airway.
- ✓ Give artificial respiration and external Cardiac Massage, if needed.
- ✓ Transport the patient to the hospital.

	Name	Designation	Signature
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Reviewed by	Asiraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 84
	SECTION 07: MEDICAL EMERGENCY PLAN	CONTROLLED COPY

Poisoning

- ✓ Find the nature of the poison.
- ✓ Give universal antidote mixture as given below to drink:
 - Charcoal powder - 2 tablespoons*
 - Coffee powder - 2 tablespoons*
 - Clalk powder - 1 tablespoon*
 Add it to a glass of warm water and mix well.
- ✓ Send the patient immediately to the hospital.

EMERGENCY PLANNING FOR FOOD POISONING

Food Poisoning: Food poisoning is the result of eating organisms or toxins in contaminated food.

Causes: Food poisoning can affect one person or it can occur as an outbreak in a group of people who all ate the same contaminated food.

Symptoms: Generally seen within 1 – 6 hours of consuming food.

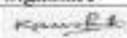
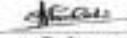
- Abdominal cramps
- Diarrhea (may contain blood)
- Fever and chills
- Headache
- Nausea and vomiting
- Weakness (may be serious and lead to respiratory arrest, as in the case of botulism)

Treatment:

Inform Medical Officer; Call if any of the above symptoms has occurred and / or:

- Bleeding is excessive or your stools are maroon or black.
- You are short of breath or having trouble breathing.

Necessary treatment shall be arranged with the External Hospital after getting proper first-aid from Medical Officer.

	Name	Designation	Signature
Originated by	Mashioor Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Asiraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN SECTION 08- COVID-19 MITIGATION PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 65 CONTROLLED COPY

1. PURPOSE

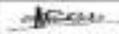
The purpose of the document is to standardize and formalize infection prevention and control procedures in the workplace for the COVID-19 outbreak across Sirajgarh Power Station (SPS), COVID-19. The guideline details the steps taken to enhance personal hygiene throughout the facility.

2. SCOPE

The following guidelines have been developed to ensure a safe return to work for the employees in the context of promoting personal hygiene to limit the spread of the virus.

3. REFERENCES

- World Health Organization's Guidelines
- EHS Policy
- Technical guidelines for prevention and control of COVID-19 social and institutional infections
(Min of Health & Family Welfare)
- Factories Act
- Public Health Act
- COVID-19 Generic guidelines
- National Guideline for Health Care Provider on Infection Prevention and Control of COVID-19 pandemic in Healthcare Setting (Min of Health & Family Welfare)

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Ashraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN SECTION 08: COVID-19 MITIGATION PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 66 CONTROLLED COPY

4. TERMS AND DEFINITIONS

The following definitions will apply:

- Harm - A negative safety and health consequence (e.g. injury, or ill health).
- Exposure - Concentration or amount of an agent that reaches a target organism, system or (sub) population in a specific frequency for a defined duration.
- Hazard - Source, situation, or act with a potential for harm in terms of human injury or ill health, or a combination of these.
- HOD - Head of Department
- MOHFW - Ministry of Health and Family Welfare

5. RESPONSIBILITIES

5.1 Head of Departments

Ensure that adequate and appropriate resources are provided for the contents of this guideline to be applied.

5.2 Line Management

Ensure that the requirements of this procedure are implemented throughout their area of responsibility and engage employees on their responsibilities.

5.3 EHS Department

- Monitor compliance on implementation of the personal hygiene protocol

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Approved by	Shafiqul Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN SECTION 08: COVID-19 MITIGATION PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 67 CONTROLLED COPY

5.4 All employees, Contractors and Visitors

- Follow the guidelines established to prevent the spread of the virus and comply.
- Report any abnormality through the incident reporting procedure

6. Personal Hygiene Procedure

6.1 Use of Safety Masks

All SPS staff, contractors and customers are to continue observing the COVID-19 protocols with respect to prevention of spreading of the virus. The following should be observed at all times:

- Continued use of masks both at work and in public
- Disposable masks should not be reused.

6.2 Social Distancing

The Corporation will continue to enforce the adherence to COVID-19 protocols with respect to Social Distancing.

- Employees are to continue adhering to safe social distancing of at least one (1) meter apart
- The number of employees in offices should be reduced to meet the social distancing requirements depending on the size of the offices/halls.
- Implement social distancing protocols for transport safety.
- Seating arrangements should be re-assigned until the widespread threat of virus transmission has diminished.

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Approved by	Shafiqul Islam	Chief Engineer	

	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 68
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6.3 Use of Sanitizers

- For purposes of promoting personal hygiene, all employees, customers, visitors and contractors will be required to sanitize at any facility or before use of any equipment.
- Approved sanitizers of 70% or more alcohol content will be used as guided by the MOHFW.

6.4 Hand Wash Facilities

- For purposes of promoting personal hygiene, all employees, customers, visitors and contractors will be required to practice hand washing as a most effective way of preventing the spread of the virus.
- Hand wash facilities at all SPS facilities are provided with soap.
- Hand sanitizers are provided to the employees to encourage frequent hand sanitization.

6.5 COVID-19 Information

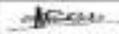
- Employees, customers, contractors and visitors are encouraged to acquaint themselves with basic principles of personal hygiene to ensure that the virus is put at bay.
- Instruction regarding the Do's and Do not's during pandemic period is hanged within the plant premises.

7. SPS COVID-19 SCREENING PROTOCOL

Step 1: The screening will be done for all employees, suppliers or contractors entering the SPS premises or places of work on daily basis.

Step 2: All Officer, Staff members/Suppliers entering premises will be required to wash their hands with soap and or sanitize.

Step 3: All employees/suppliers entering the SPS premises will have their temperatures taken as guided by the personnel at the entrance

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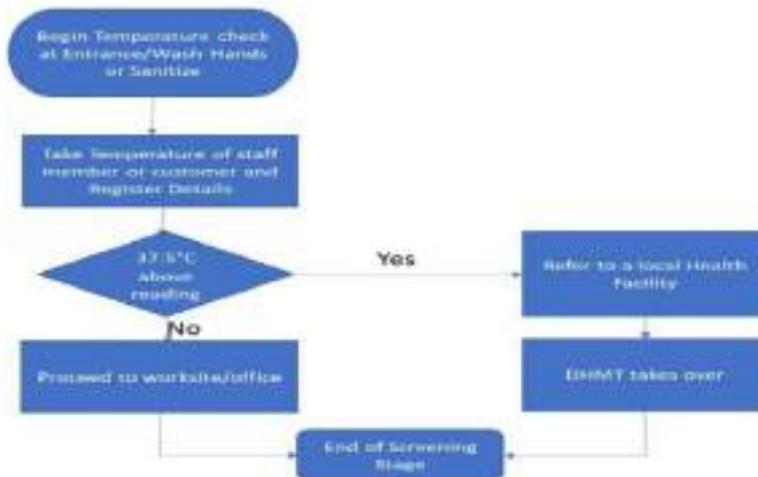
 <p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p>	<p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p> <p>EMERGENCY PREPAREDNESS PLAN</p> <p>SECTION 08: COVID-19 MITIGATION PLAN</p>	<p>DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 69</p> <p style="color: red;">CONTROLLED COPY</p>

Step 4: All screened employees/suppliers with temperatures of 37.5°C will have their details registered by the screening officer.

Step 5: Anyone presenting with high temperature of above 37.5 will be advised to visit the nearest clinic and will not be allowed entry and for suppliers' assistance will be offered outside the office where possible with strict extreme social distancing.

Step 6: In cases where there is flu like symptoms, DHMT will be advised of such. The steps stated above are captured in the flow chart below:

SPS COVID-19 Screening Protocol (Thermometers)



	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Asraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

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8. ENVIRONMENT AND EQUIPMENT DISINFECTION

- Disinfect all Offices, control rooms, passageways, guest houses in accordance with the Environment and equipment procedure.
- Each employee shall disinfect their hands before and after use of any tool, equipment or operating switchgear, control panel, documentation etc.
- Disinfectant trays are provided in front of important buildings (i.e., admin building, control rooms, water treatment plants etc.).

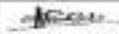
9. TRANSPORT SAFETY AND DISINFECTION

- Mandatory Social Distancing in all SPS vehicles transporting personnel shall be practiced. This will be achieved by limiting the number of persons in specific vehicles as follows:
 - i. A 28-Seater Mini-Bus shall board a maximum of 13 passengers with face masks on.
 - ii. A 10-Seater Microbus shall board a maximum of 7 passengers with face masks on.
- Exterior of all vehicles including tyre, door-hand shall be disinfected at main gate while entering power plant.
- All vehicles carrying personnel shall be disinfected at change of every shift or change of users and or when need arises.

10. TRAININGS, MEETINGS AND INTERVIEWS

Gatherings of groups of people should be avoided as much as possible and the following should be observed for meetings, interviews and inductions or any other situations that require a group of people to meet:

- All meetings/trainings will continue to be held using teleconferencing, or zoom video conferencing to maintain the social distancing requirements.
- ICT department ensures that all employees who require such service are assisted.

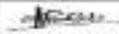
	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Asraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Sarfraz Islam	Chief Engineer	

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED EMERGENCY PREPAREDNESS PLAN SECTION 08: COVID-19 MITIGATION PLAN	DOC No: NW-SPS-HSE-EPP-001 EFFECTIVE DATE: 24.08.2023 REVISION NO: 05 Page: 71 CONTROLLED COPY

11. LEAVE MANAGEMENT

Leave management will continue to be adhered to as per the HR policy Manual; however, supervisors should consider the following in furthering the management of COVID-19:

- Employees should be supported to take leave as and when they require during this period to reduce numbers and minimize contacts.
- Employees will still be required to produce medical certificates for any sick leave taken unless advised as part of COVID-19 Testing.
- When on leave, employees are not supposed to leave his habitant unless it is an emergency. In such cases, employees will be kept minimum 14 (Fourteen) days quarantine in SPS.

	Name	Designation	Signature
Originated by	Mashhour Mahmud Khan	Deputy Manager (EHS)	
Reviewed by	Asraf Ali	Executive Engineer (MIS, SPS)	
Approved by	Shafiqul Islam	Chief Engineer	

Annex L: Health and Safety Preparedness

Annex L-1: Mock Drills and Training Conducted During February 2023 to January 2024

Emergency Mock Drills and Firefighting Trainings: In total 08 (Eight) Drills and 04 (Four) Trainings were conducted during the reporting period. Details are listed below.

- Electric Shock Drill: 23 February 2023
- Chemical Spillage Mock Drill: 22 March 2023
- Firefighting Training: 17 April 2023
- Emergency Evacuation Drill (Earthquake): 25 May 2023
- Fire-fighting Training: 20 June 2023
- Emergency Fire Mock Drill: 19 July 2023
- Electric Shock Drill: 26 August 2023
- Fire-fighting Training: 19 September 2023
- Chemical Spillage Mock Drill: 23 October 2023
- Fire-fighting Training: 25 November 2023
- Emergency Fire Mock Drill: 26 December 2023
- Electric Shock Drill: 24 January 2024

Annex L-2: Emergency Fire Mock Drill

 NORTH-WEST POWER GENERATION COMPANY LIMITED	NORTH-WEST POWER GENERATION COMPANY LIMITED Emergency Mock Drill Records	FORM NO: NW-SPS-HSE-F-008 EFFECTIVE DATE: 06.06.2018 REVISION NO: 03
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Location: South side of workshop area (Unit-1)

1. Drill Information (This drill was conducted for unit-1,2,3 & Solar):

Drill Monitor Designation: DM (EHS)

Title: Fire Mock Drill

Name of Building/Facility: At the South of Workshop (Unit-1), Mr. Joynal (Foreman, MMD, Unit-1) found a fire and he informed the control room and from control room emergency alarm was raised and they informed to Mini fire station.

Date of Drill: 19/07/2023

Time Drill Initiated: 11:00 AM

Time All Occupants Vacated: 11:04 AM

Elapsed Time: 09 Mn

2. Effectiveness of The Preparedness and Response

	Preparedness of the drill	YES	NO	N/A	Remarks / Details. Explain the reason
1.	Fire alarm sounded during the drill	√			
2.	Fire alarm was heard all the people	√			
3.	The performance of ERT team was satisfactory	√			
4.	Personnel were serious about drill	√			
5.	Weather was suitable for the evacuation	√			
6.	There are multiple evacuation locations	√			
7.	All fire exits, doors were open	√			
8.	Emergency light worked properly	√			
9.	Any difficulties with evacuation of disabled, aged personnel, customers or visitors			√	
10.	Evacuation was completed	√			Among 158 employees 108 were present in the assembly point; others were busy with emergency works.
11.	All gathered in assembly points and were counted properly	√			
12.	Noise impeded communication		√		
13.	Any kind of injury during the drill	√			One person was found unconscious on ground floor of the Admin. Building. Rescue team rescued that person immediately.
14.	Fire extinguishers were free from obstruction.	√			
15.	All extinguishers were fully charged and operable	√			
16.	First aids were available during drill.	√			
17.	Personnel of Fire department was notified	√			
18.	Electrical equipment were turned off	√			

	NORTH-WEST POWER GENERATION COMPANY LIMITED Emergency Mock Drill Records	FORM NO: NW-SPS-HSE-F-008 EFFECTIVE DATE: 06.06.2018 REVISION NO: 01
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19.	HVAC system were turned off	√			
20.	Effectiveness of the procedure was satisfactory	√			

3. Correction: (Take Immediate action against NC (non-fulfilment of the requirements))

Elapsed time could be reducing with more quick response of all personnel.

4. Identification of Root cause for unattended issue and NC during drill:

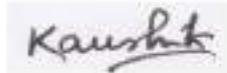
Response of ERT (Emergency Response Team) was satisfactory.

5. Corrective Action (Action to eliminate the cause of the nonconformity)

More awareness and trainings are required for improvement.

6. Any other comments regarding fire drill

Overall, this was an good fire mock drill.



Signature of Drill monitoring officer

Annex L-3: Firefighting Training



নর্থ-ওয়েস্ট পাওয়ার এন্ড এনার্জি কোম্পানি লিমিটেড
(বাংলাদেশ বিদ্যুৎ উন্নয়ন বোর্ডের একটি প্রকিউরার)
এম এফ এম বিভাগ
প্রথম প্রকৌশলীর দপ্তর, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
সম্মেলন, সিরাজগঞ্জ

নম্বর: ২৭/২৭-১৮/১৯, ০০৪/১৭, ০০১/১৯, ৬৪৭

তারিখ: ১- ফেব্রুয়ারি ২০২৩ সন্ধ্যা
১৫ ফেব্রুয়ারি ২০২৩ খ্রিস্টাব্দ

বিষয়: নিরাপত্তা

বিষয়: সিরাজগঞ্জ বিদ্যুৎ কেন্দ্রে অগ্নি নির্বাপন প্রশিক্ষণ সংক্রান্ত।

সিরাজগঞ্জ বিদ্যুৎ কেন্দ্রের কার্যরত সেক্টর নিশ্চিতকরণের লক্ষ্যে, অগ্নি ২৪/১১/২০২৩ ইং তারিখে রোজ শনিবার সকাল ১১:০০ ঘটিকায় সিরাজগঞ্জ বিদ্যুৎ কেন্দ্রের ইউনিট-০১-এর ওয়ার্কশপের ব্যপ্তিতে অগ্নি নির্বাপন প্রশিক্ষণের আয়োজন করা হয়েছে। উক্ত অগ্নি নির্বাপন প্রশিক্ষণ কেন্দ্র ইউনিট-০১, ০২ ও ০৩-এর পরিচালন বিভাগ ও WTP-এর কর্মকর্তা ও কর্মচারীদেরকে (অধিগিয়াস পেশার, মেসার্স ব্লু ও ব্লুইট হোমস্টে পরিচালন আধিকার) বরাদ্দমত উপস্থিত থাকার জন্য নির্দেশ প্রদান করা হলো।



২৩-১১-২০২৩
শফিকুল ইসলাম
প্রথম প্রকৌশলী

বিতরণ জাহাঙ্গীরসাহেব ও কার্যার্থে/স্বাক্ষরিত প্রকল্পের নাম:

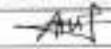
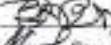
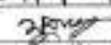
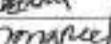
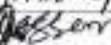
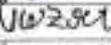
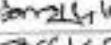
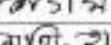
- ১। রাউট আনলোকার (অপারেশন প্রকৌশলী), সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫২৪৩৫৭ ইউনিট);
- ২। নির্বাহী প্রকৌশলী (পরিচালন), পরিচালন বিভাগ, সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫ ইউনিট);
- ৩। নির্বাহী প্রকৌশলী, পরিচালন বিভাগ, সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫ ইউনিট);
- ৪। নির্বাহী প্রকৌশলী, পরিচালন বিভাগ, সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫ ইউনিট);
- ৫। ব্যবস্থাপক (কেমিক্যাল), কেমিক্যাল বিভাগ, সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫ ইউনিট);
- ৬। উপ-ব্যবস্থাপক (কেমিক্যাল), কেমিক্যাল বিভাগ, সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫ ইউনিট);
- ৭। সহকারী ব্যবস্থাপক (কেমিক্যাল), কেমিক্যাল বিভাগ, সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫ ইউনিট) এবং
- ৮। সহকারী ব্যবস্থাপক, কেমিক্যাল বিভাগ, সিরাজগঞ্জ ১১৪ মে.ও. কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (১৫ ইউনিট)।



	NORTH-WEST POWER GENERATION COMPANY LIMITED Training Attendance Sheet	FORM NO: NW-DH-HR-F-005 EFFECTIVE DATE: 23.04.2018 REVISION NO: 00
	Location: Sirajganj Power Station	

Organizer Department	: Admin, Sirajganj Power Station
Course Name and ID	: Effective use of Portable fire Extinguisher Cylinders
Date	: 10/04/2023
Duration	: 10:00 AM to 01:00 PM
Total Man Hour	:
Facilitator(s)	: জনাব মোঃ জুলকার নাইন, সহকারী ব্যবস্থাপক (ইউইএস)

Office: Sirajganj 225 MW Combined Cycle Power Plant (Unit-02)

Sl. No	Name of the Participants	Designation and Department	Participant's Signature
1.	Mohammad Arifur Rahman	Office Assistant	
2.	Sima Khatun	Office Assistant	
3.	Abdur Rahim	Welder	
4.	Md. Mashur Rahman	Welder	
5.	Mukhlesur Rahman	Technician (Electrical)	
6.	Md. Nazmul Islam	Technician (Mechanical)	
7.	Md. Golam Azam Khan	Technician (Mechanical)	
8.	Md. Sabbir Rahman	Technician (Mechanical)	
9.	Md. Alamgir Hossain	Technician (Chemical)	
10.	Golam Azam	Technician (Chemical)	
11.	Ma. Maruf Hossain	Technician (Chemical)	
12.	Md. Anwar Hossain	Technician (Chemical)	
13.	Md. Nazrul Islam	Driver	
14.	Shadat Hosen	Driver	
15.	Sree Sham Kumar	Driver	
16.	Md Nahid Hasan	Work Assistant	
17.	Md Arif Hosen	OSS	
18.	Reaz Parvez	OSS	
19.			
20.			
21.			
22.			
23.			
24.			

Signature of facilitator: 
 Date: 10/04/2023

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শেখ হাসিনার উদ্যোগ, ঘরে ঘরে বিদ্যুৎ



নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোম্পানি লিমিটেড
ISO 9001:2015, ISO 14001:2015 &
ISO 45001:2018 Certified

(বাণেশ্বর বিদ্যুৎ উন্নয়ন বোর্ডের একটি প্রতিষ্ঠান)

এম আই এস বিভাগ

প্রধান প্রকৌশলীর মন্ত্র, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র

নম্বর ১৭.১৮.৮৮৭৮.০০৪.১৮.০০১.১১.১১১

তারিখ: ৬ জানুয়ারি ২০২৩

১৯ ফেব্রুয়ারি ২০২৩

বিজ্ঞপ্তি/নোটিশ

বিষয়: সিরাজগঞ্জ বিদ্যুৎ কেন্দ্রে অগ্নি নির্বাপন প্রশিক্ষণ সংক্রান্ত।

সিরাজগঞ্জ বিদ্যুৎ কেন্দ্রের কার্যের সেক্টর নিশ্চিতকরণের অঙ্গাঙ্গী ২৩/০২/২০২২ ইং তারিখে রোজ বুধবার সকাল ১০:৪৫ ঘটিকায় সিরাজগঞ্জ বিদ্যুৎ কেন্দ্রের ইউনিট-০১-এর ওয়ার্কশপের সম্মুখে অগ্নি নির্বাপন প্রশিক্ষণের আয়োজন করা হয়েছে। উক্ত মহত্মার সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র (প্রধান প্রকৌশলীর মন্ত্র, ইউনিট-০১, ০২ ও ০৩)-এর প্রাপ্ত ম্যানেজারের অফিস, প্রশাসন, হিসাব ও অর্থ, মেডিক্যাল, লিকুইড ফুয়েল ইউনিট, পুরকৌশল, স্টোর, এমআইএস এবং সিকিউরিটি-এর কর্মকর্তা ও কর্মচারীবৃন্দকে যথাসময়ে উপস্থিত থাকার জন্য নির্দেশ প্রদান করা হলো।

২২-২-২০২২

মোঃ হাব্বুল কর রশীদ
প্রধান প্রকৌশলী

সময় অবপতি ও কার্যার্থে প্রেরণ করা হলো (স্বাক্ষরিত ত্রয়ানুসারে নয়):

- ১) প্রাপ্ত ম্যানেজার (তত্ত্বাবধায়ক প্রকৌশলী), সিরাজগঞ্জ ২২৫ মেঃ ওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র(ইউনিট-১)/সিরাজগঞ্জ ২২৫ মেঃ ওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (২য় ইউনিট)/সিরাজগঞ্জ ২২৫ মেঃ ওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (৩য় ইউনিট)
- ২) ব্যবস্থাপক (প্রশাসন), প্রশাসন বিভাগ, প্রধান প্রকৌশলীর মন্ত্র, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
- ৩) উপ-ব্যবস্থাপক (প্রশাসন), সিরাজগঞ্জ ২২৫ মেঃ ওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র(ইউনিট-১)/সিরাজগঞ্জ ২২৫ মেঃ ওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (২য় ইউনিট)/সিরাজগঞ্জ ২২৫ মেঃ ওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (৩য় ইউনিট)
- ৪) উপ-ব্যবস্থাপক (হিসাব ও অর্থ) (সকল), সিরাজগঞ্জ ২২৫ মেঃ ওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (ইউনিট-১,২,৩)
- ৫) নির্মিত মেডিকেল অফিসার (অরপ্রাণ), মেডিক্যাল বিভাগ, প্রধান প্রকৌশলীর মন্ত্র, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
- ৬) নির্বাহী প্রকৌশলী (এমআইএস), এম আই এস বিভাগ, প্রধান প্রকৌশলীর মন্ত্র, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
- ৭) উপ-ব্যবস্থাপক (অইসিটি), এম আই এস বিভাগ, প্রধান প্রকৌশলীর মন্ত্র, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
- ৮) নির্বাহী প্রকৌশলী (পুরকৌশল), পুরকৌশল বিভাগ, প্রধান প্রকৌশলীর মন্ত্র, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র

- ৯) উপ-বিভাগীয় প্রকৌশলী (অতিরিক্ত দায়িত্ব), লিকুইড ফুয়েল ইউনিট, প্রধান প্রকৌশলীর দপ্তর, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
- ১০) নির্বাহী প্রকৌশলী (তৈল), তৈল বিভাগ, প্রধান প্রকৌশলীর দপ্তর, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
- ১১) সিনিয়র সিকিউরিটি অফিসার, সিকিউরিটি বিভাগ, প্রধান প্রকৌশলীর দপ্তর, সিরাজগঞ্জ বিদ্যুৎ কেন্দ্র
- ১২) অফিস কপি।

pictorial evidence







Annex L-4: Electric Shock Mock Drill

 <p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p>	<p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p> <p>Emergency Mock Drill Records</p>	<p>FORM NO: NW-SFS-HSE-F-008 EFFECTIVE DATE: 06.06.2023 REVISION NO: 01</p>
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Location: 1st floor of Admin Building.

1. Drill Information (This drill was conducted for unit-1,2,3):

Drill Monitor Designation: AM (EHS)

Title: Electric Shock Mock Drill with Emergency Response Team (ERT) of Sirajgaj Power Station. Name of Building/Facility: At the east side of Admin Building 1st Floor, Mr. Md. Anisur Rahman (Technician, EMD) & Mr. Rafiqul Islam (Technician, I&C) were checking an electric panel board for some maintenance work. While working, Mr. Rafiqul got injured by electric shock. Then Mr. Anisur quickly informed control room (Unit-1) and they informed first aid team and rescue team to rescue the victim immediately.

Date of Drill: 26/08/2023

Time Drill Initiated: 11:15 AM

Time All Occupants Vacated: N/A

Elapsed Time: 05 Min

2. Effectiveness of the Preparedness and Response

	Preparedness of the drill	YES	NO	N/A	Remarks / Details. Explain the reason
1.	Fire alarm sounded during the drill	√		√	
2.	Fire alarm was heard all the people	√			
3.	The performance of ERT team was satisfactory	√			From ERT team only first aid and rescue team were involved in this drill.
4.	Personnel were serious about drill	√			
5.	Weather was suitable for the evacuation	√			
6.	There are multiple evacuation locations	√			
7.	All fire exits, doors were open	√			
8.	Emergency light worked properly	√			
9.	Any difficulties with evacuation of disabled, aged personnel, customers or visitors			√	
10.	Evacuation was completed		√		
11.	All gathered in assembly points and were counted properly			√	
12.	Noise impeded communication			√	
13.	Any kind of injury during the drill		√		Just one person acted unconscious on the ground inside the Store Building 1 st floor. The rescue team rescued that person immediately and after giving first aid, he was

 <p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p>	<p>NORTH-WEST POWER GENERATION COMPANY LIMITED</p> <p>Emergency Mock Drill Records</p>	<p>FORM NO: NW-SPS-HSE-F-008 EFFECTIVE DATE: 06.06.2018 REVISION NO: 01</p>
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					sent to the nearest hospital for full treatment.
14.	Fire extinguishers were free from obstruction	√			
15.	All extinguishers were fully charged and operable	√			
16.	First aid was available during the drill.	√			
17.	Personnel of Fire department was notified			√	
18.	Electrical equipment was turned off	√			
19.	HVAC system was turned off	√			
20.	Effectiveness of the procedure was satisfactory	√			

3. Correction: Take Immediate action against NC (non-fulfillment of the requirements)

N/A (all activities were done in a good way)

4. Identification of Root cause for unattended issue and NC during drill:

N/A (all activities was done in a good way)

5. Corrective Action (Action to eliminate the cause of the nonconformity)

Regular training and awareness is necessary for improvement.

6. Any other comments regarding fire drill

Overall, this was a satisfactory electric shock mock drill.



Signature of Drill monitoring officer

Pictorial evidence



Annex L-5: Basic Life Support and its Importance

	NORTH-WEST POWER GENERATION COMPANY LIMITED	FORM NO: NW-DH-HR-F-005
	Training Attendance Sheet	EFFECTIVE DATE: 25.04.2023 REVISION NO: 00

Location: Sirajganj Power Station

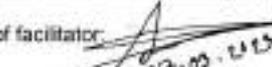
Organizer Department	: Admin, Sirajganj Power Station
Course Name and ID	: Basic Life Support and its importance
Date	: 27/03/2023
Duration	: 11:30 AM to 01:00 PM
Total Man Hour	:
Facilitator(s)	: জনাব ডা. মোঃ বেলাল ফিরিমান, সিনিয়র মেডিকেল অফিসার (কার্পোরেশন)

Office: Sirajganj 225 MW Combined Cycle Power Plant (Unit-02)

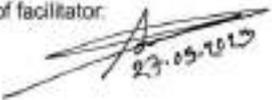
Sl. No	Name of the Participants	Designation and Department	Participant's Signature
1.	Md. Azad Helim	PTI (Unit-02)	
2.	Md. Saiful Islam	XEN (EMD)	
3.	Md. Habibur Rahman	XEN (MMD)	
4.	Nazim Ismail Rayen	JAM (Admin)	
5.	Md. Shaddam Hossain	AE (EMD)	
6.	Tariqueur Rahman	AE (IAC)	
7.	Mithun Chandra Das	AE (EMD)	
8.	Arik Chandra Das	SAE (EMD)	
9.	Md. Rafiqul Islam	AE (MMD)	
10.	Md. Shafiqul Islam	AE (MMD)	
11.	Md. Shariful Islam	SAE (MMD)	
12.	Md. Ismail Hossain	SAE (MMD)	
13.	Fazlul Kabir	SDE (MMD)	
14.	Indrajit K. Ch.	SDE (MMD)	
15.	Maiti Uddin	AM (APP)	
16.	Haridas Saha	SDE	
17.	Mohammed Anwar Rahman	Office Asst	
18.	Firoz Nurunnabi Siddique	TECH (C/O)	
19.	Md. Shakhirul Islam	DM (APP) - U2	
20.	Md. Manir Hossain	SAE (OP ⁿ) - U2	
21.	Md. Rasal	SAE (OP) - U2	
22.	Md. Shamim Hossain	AE (OP)	
23.	Tanjim Ahmad	SDE (OP ⁿ)	
24.	Md. Shamim Hossain	AE (OP EE)	
25.	Md. Niazul Islam Nishat	AE (OP ⁿ)	

Signature of facilitator:

Date:


 27.03.2023

Sl. No	Name of the Participants	Designation and Department	Participant's Signature
26.	Sankar Barua	AE (Operation)	[Signature]
27.	Md. Belal Hossain	SAE (OP)	[Signature]
28.	Md. Shakil Ahmed	SAE (U-2)	[Signature]
29.	Md. Maruf Hossain	SAE (OP)	[Signature]
30.	Masud Rana	AE (OP)	[Signature]
31.	Subrata Kumar Kuri	SDE (OP)	[Signature]
32.	Delower Hossain	AE (OP)	[Signature]
33.	Md. Shahadat Hossain	SAE (OP)	[Signature]
34.	Jahidul Alam	SAE (OP)	[Signature]
35.	Md. Sohanul Jahon	SAE	[Signature]
36.	Md. Shaornom Hossain	SAE (OP)	[Signature]
37.	md. Naved Samkar	SAE (OP)	[Signature]
38.	Md. Rajal	SAE (U-A)	[Signature]
39.	MD. Rubel Hossen	AE (ZGMW Solon)	[Signature]
40.	Md. Arif Hosen	O.S.S (OP)	[Signature]
41.	Md. Raqib Abd-vee	O.S.S	[Signature]
42.	Md. Al Amin	JAM (Chemical)	[Signature]
43.	Fojzal	Tech (Chemical)	[Signature]
44.	Orebin Azom	Tech. (Chemical) 2	[Signature]
45.	MD. Alamgir Hossain	Tech. (Chemical) 2	[Signature]
46.	Md. Kamal Hossain	Tech. (Chemical) 2	[Signature]
47.	MD: Anwar Hossen	Tech (Chemical-2)	[Signature]
48.	MD: Azminur Rahman	JAM-Chem-2	[Signature]
49.	MD: Saman Hossain	JAM-Chem-2	[Signature]
50.	Md. Ribate Hossain	AI (Chemical) 52	[Signature]
51.	Md. Jahedul Islam	AM (Chemical) 52	[Signature]
52.	[Signature]	[Signature]	[Signature]
53.	[Signature]	[Signature]	[Signature]
54.	[Signature]	[Signature]	[Signature]
55.	[Signature]	W/A (EMD)	[Signature]
56.	[Signature]	[Signature]	[Signature]
57.	[Signature]	[Signature]	[Signature]

Signature of facilitator: 
 Date: 23.05.2023

Annex L-6: Primary Management of Incident/Accident (First Aid)

	NORTH-WEST POWER GENERATION COMPANY LIMITED Training Attendance Sheet	FORM NO: NW-DH-HR-F-005 EFFECTIVE DATE: 21.04.2018 REVISION NO: 00
	Location: Sirajganj Power Station	

Organizer Department	: Admin, Sirajganj Power Station
Course Name and ID	: Primary Management of Incident/Accident (First Aid)
Date	: 23/08/2023
Duration	: 02:00PM to 04:00PM
Total Man Hour	: 17 X 2 = 34
Facilitator(s)	: জনাব ডা. মোঃ গোলম কিবরিয়া, সিনিয়র মেডিক্যাল অফিসার (ভারপ্রাপ্ত)

Office: Sirajganj 225 MW Combined Cycle Power Plant (Unit-02)

Sl. No	Name of the Participants	Designation and Department	Participant's Signature
1.	Md. Aeed Hachim	SE (Proc-K)	[Signature]
2.	Md. Abul Kalam Asel	FOURMAN	[Signature]
3.	Md. Shafiqul Islam	AE, MMD	[Signature]
4.	M.H. Sabkier Rahman	Technician (M.M.D)	[Signature]
5.	Abdur Rahim	M.M.D TL-2	[Signature]
6.	[Signature]	SRIT STWB	[Signature]
7.	[Signature]	SRIT STWB	[Signature]
8.	Md. Rafiqul Islam	AE (M.M.D)	[Signature]
9.	Md. Manuj Hossain	Tech (C&E)	[Signature]
10.	Md. Manuj Hossain	Tech	[Signature]
11.	Md. Siddik Hossen	Work Assistant	[Signature]
12.	Mohammed Anujul Rahman	Office Assistant	[Signature]
13.	Sorna Khatoon	Office Assistant	[Signature]
14.	Am. Nurjan Nahididdin	TECH (C&E) - ADMIN-2	[Signature]
15.	Md. Arif Hosen	O.S.S (operation)	[Signature]
16.	REZZ PERVEZ	O.S.S	[Signature]
17.	Md. Shadman Hossain	SDE, EMD, V-L	[Signature]
18.	Mithun Chandra Das	AE (EMD)	[Signature]
19.	Amik Chandra Das	SAE (EMD)	[Signature]
20.	Md. Nahid Hasan	W/A (EMD)	[Signature]
21.	Abdul kader Mirza	Technician (I&C)	[Signature]
22.	Gazi Saibul Ahmmed	JAM Chemical-32	[Signature]
23.	Md. Rubel Hossen	AE (7.6MW solar)	[Signature]
24.	Golam Azam	st. tec. chemical U-2	[Signature]
25.	Foyzal	Tech-chemical-U-2	[Signature]

Signature of facilitator: [Signature]
 Date: 23.08.2023

Annex M: CSR Program

Annex M-1: Cultural Development



North-West Power Generation Company Ltd. (NWPGL)
Sirajganj Power Station
Soydabad, Sirajganj

Community Development Programme

Date: 09.05.2023

Title	Cheque of BDT 3,00,000/- handover to 'Sirajganj Somnilito Sangskritik Jot'
Organizer	Sirajganj Power Station, NWPGL, Soydabad, Sirajganj
Time	07:00 PM-08:00 PM
Venue	Shahid M. Mosur Ali Auditorium, Sirajganj
Participants	President, Secretary, Artists and Staffs of 'Sirajganj Somnilito Sangskritik Jot', Sirajganj District; CE, SPS & Employees of Sirajganj Power Station.

Pictorial Evidence





Annex M-2: Aid to Community

North-West Power Generation Company Ltd. (NWPGL)
 Sirajganj Power Station
 Soydabad, Sirajganj

Community Development Programme

Date: 25.01.2023 & 01.02.2023

Title	Distributed blankets to 1000 helpless and destitute families.
Organizer	Sirajganj Power Station, NWPGL, Soydabad, Sirajganj
Time	11:00 AM-03:00 PM
Venue	Various Sadar Upazilas of Sirajganj District like Chauhali, Kazipur, Belkuchi and surrounding areas of SPS.
Participants	With the co-operation of the local administration of various Sadar Upazilas of Sirajganj District like Chauhali, Kazipur, Belkuchi; CE, SPS & Employees of Sirajganj Power Station.
No of blankets	1000 (One Thousand)

Pictorial Evidence













FINAL REPORT
Environmental and Social Verification in Operation
Phase for Sirajganj 225 MW CCPP
(Dual Fuel-3rd Unit)

JANUARY 2024
5th AUDIT

Prepared for:
North West Power Generation Company Limited (NWPGL)

Prepared by:
EQMS Consulting Limited



Quality Information

Document	:	Environmental and Social Verification in Operation Phase for Sirajganj 225 MW CCPP (Dual Fuel-3 rd Unit)
Client Name	:	North West Power Generation Company Limited (NWPGL)
EQMS Project No.	:	00178200458
Date	:	31 January 2024

Revision History

Revision	Revision Date	Details	Authorized	Remarks
			Name/Position/Organization	
V-I	December 12, 2023	Draft Report: 5 th Audit	EQMS Consulting Limited	
V-II	January 2, 2024	Draft Report: 5 th Audit	EQMS Consulting Limited	
V-III	14 January 2024	Final Report: 5 th Audit	EQMS Consulting Limited	
V-IV	31 January 2024	Final Report: 5 th Audit	EQMS Consulting Limited	

Disclaimer

Prepared by	Sadman Khaled Mansur Environmental Compliance Auditor
	Israt Jahan EHS Expert
Reviewed by:	Md. Zahidul Islam Principal Consultant
Approved By	 Approved by: Abdul Halim Principle Consultant

EQMS Consulting Limited
(ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified)

This report has been prepared and reviewed by EQMS Consulting Limited with all responsible skill, care and diligence within the terms of the Contact with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of

the above.

This report is confidential to the client, and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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ABBREVIATIONS

AoI	Area of Influence
BIWTA	Bangladesh Inland Water Transport Authority
BPDB	Bangladesh Power Development Board
CAP	Corrective Action Plan
CCB	Central Control Building
CCGT	Combined Cycle Gas Technology
CCPP	Combined Cycle Power Plant
CDO	Community Development Officer
CEMS	Continuous Emission Monitoring System
CLO	Community Liaison Officer
PMU	Project Implementation Unit
CO	Carbon Monoxide
COC	Cycles of Concentration
CSR	Corporate Social Responsibility
CW	Cooling Water
CMC	China National Machinery Import & Export Corporation
DLAO	District Land Acquisition Officer
DLN	Dry Low NO _x
DM	Demineralization
DoE	Department of Environment
EHS	Environment, Health and Safety
EHS&S	Environment, Health, Safety and Social
EPC	Engineering, Procurement and Construction
ERM	Environmental Resources Management
ERP	Emergency Response Plan
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
FNTP	Full Notice to Proceed
FY	Financial Year
FEDI	Fujian Electric Power Survey & Design Institute
GE	General Electric
GHG	Greenhouse Gas
GIIP	Good International Industry Practices
GoB	Government of Bangladesh
GRM	Grievance Redress Mechanism
GSA	Gas Supply Agreement
GT	Gas Turbine
GTG	Gas Turbine Generator

HP/IP/LP	High Pressure/Interim Pressure/ Low Pressure
HR	Human Resources
HRSG	Heat Recovery Steam Generator
HSD	High Speed Diesel
IFC	International Finance Corporation
ISO	International Organization for Standardization
L&FS	Life and Fire Safety
LLA	Land Lease Agreement
LOTO	Lock-Out/ Tag-Out
MCB	Miniature Circuit Breaker
MPB	Main Plant Building
NEPC	First Northeast Electrical Power Engineering Co
NOC	No Objection Certification
NOx	Oxides of Nitrogen
NWPGCL	North-West Power Generation Company Limited
O&M	Operation and Maintenance
ODS	Ozone Depleting Substances
OHSAS	Occupational Health and Safety Management System
PAF	Project Affected Family
PAP	Project Affected People
PGCB	Power Grid Company of Bangladesh Limited
PM	Particulate Matter
PPA	Power Purchase Agreement
PPE	Personnel Protective Equipment
PS	Performance Standards
PSMP	Power System Management Plan
QRA	Quantitative Risk Assessment
RFP	Request for Proposal
SEP	Stakeholder Engagement Plan
SOP	Standard Operating Procedure
SPS	Safeguard Policy Statement
ST	Steam Turbine
STG	Steam Turbine Generator
TBT	Tool Box Talk
TSS	Total Suspended Solids
WB	The World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

Sirajganj 225MW Combined Cycle Power Plant (Dual Fuel- Unit 3) is located beside the existing 150MW Peaking Power Plant converted to 225MW CCPP, which is situated on the bank of the Jamuna River near Bangabandhu Bridge at Sirajganj District. The project area is located at Barashimul Mouza of Soydabad Union of Sirajganj Sadar Thana under the District of Sirajganj. This is about 15 km south-east of Sirajganj town. The Bangabandhu Bridge is on the north of the plant site, Khas Barashimul village on the south, Jamuna River on the east and Soydabad is on the west side of the power plant site. The site is about 130 km north- west of the capital city of Dhaka.

Sirajganj 225MW Combined Cycle Power Plant project (Dual Fuel- 3rd Unit) has started its commercial operation on March 2019.

The Engineering, Procurement and Construction (EPC) contractor for the Project is a joint venture comprising the First Consortium of m/s. China National Machinery Import & Export Corporation (CMC) and Fujian Electric Power Survey & Design Institute (FEDI) (herein referred to as “EPC” Contractor). They consortium is also the Operation and Maintenance (O&M) Contractor for first 2 years warranty period of operation phase. As per bidding document clause 28, the contractor shall provide One (1) Competent Operation Engineer who will be in overall in charge of the Plant, one (1) Engineer for Electrical Maintenance & I&C, one (1) Engineer Mechanical Maintenance (BOP), one (1) Engineer Gas Turbine Maintenance and One (1) Engineers for Steam Turbine & HRSG Maintenance for 24 months warranty period for smooth maintenance and operation of the Plant. The contractor has to provide all the spares and service needed for maintenance requirement during the warranty period and will engage required manpower in addition to the above stated personnel. During warranty period the above-mentioned Engineers jointly with NWPGL's Engineers/Staff shall have to perform the operation & daily maintenance of the plant. For this purpose, quarterly progress report of NWPGL Personnel shall have to be submitted to the authority by the above-mentioned Engineers showing the progress of NWPGL Personnel for safe & reliable operation and maintenance of the plant independently.

EQMS Consulting Limited was commissioned by North West Power Generation Company Limited to conduct an independent Environmental and Social Verification in Operational Phase (“the Audit”) for Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel-3rd Unit) (hereafter referred as “the Project”) in Bangladesh which is currently under the operation phase.

The operation phase EHS&S compliance audit of Sirajganj 225 MW Combined Cycle Power Plant (Dual Fuel-3rd Unit) was performed in compliance with IFC Performance Standards and local regulatory requirements to identify gaps and to provide corrective actions in order to comply with the applicable standards.

The gap assessment with respect to applicable standards primarily focuses on the operation

phase environmental and social management plan (ESMP) developed as part of the EIA study, project level environmental, health, safety and social policies, procedures and plans as being developed by NWPGL as well as their implementation on ground. Therefore, the aspects related to the operation phase of the Project and linked management plans have been referred in order to provide the context of project's EHS&S management planning for the operation phase.

In summary, according to the IFC Environmental and Social Compliance Gap Assessment Framework, it has been found that among 68 observations 47 are aligned, 18 are Partially Aligned and 3 clauses are not applicable for operation phase of unit 3 of Sirajganj 225MW CCPP (Dual Fuel) power plant.

All the Legal Register have been found aligned and updated based on review.

In total of 10 Corrective Action Plans (CAP) have been made according to their significance, responsibility and timelines for completion of actions.

Proponent should take all of clauses into consideration in a professional manner.

The gap assessment has been presented in Section 3 and Corrective Action Plan (CAP) in Section 5 to address the identified gaps.

1 INTRODUCTION

1.1 Background

Environmental Quality and Management System (EQMS) was commissioned by North West Power Company Limited (NWPGL) to conduct an independent Environmental and Social Verification in Operational Phase (“the Audit”) for Sirajganj 225 MW Combined Cycle Power Plant Project (Dual Fuel-3rd Unit) (hereafter referred as “the Project”), in Bangladesh, which is currently under operation. The Project is a 225 MW dual fuel combined cycle power plant (CCPP) having one Gas Turbine (GT), One Heat Recovery Steam Generator (HRSG) and One Steam Turbine (ST). This is located at Barashimul Mouza of Soydabad Union of Sirajganj Sadar Thana under the District of Sirajganj. This is about 15 KM south- east of Sirajganj town. The Jamuna Multipurpose Bridge (Bangabandhu Bridge) is on the north of the site, Khas Barashimul village on the south, Jamuna River on the east and Soydabad is on the west side of the power plant site. The site is about 130 km north-west of the capital city of Dhaka.

1.2 Objectives and Scope of Work

The objective of the EHS and Social Compliance Audit during unit 3 operation phases of the Project is provided as follows:

- a) Review of assessment documents to ensure that risk and impact identification is in accordance with the compliance audit evaluation criteria and mitigation plans meet the provisions of the same. If not, identify gaps and recommend corrective measures;
- b) Management of emissions and discharges are in line with and meet the limits specified in the Environmental Conservation Rules of Bangladesh as well as limits specified the WBG EHS General Guidelines and WBG EHS Guideline specific to the industry
- c) Adequacy of Environment, Health, Safety and Social organization and a Review of adequacy and appropriateness of the monitoring, reporting, audit and review plan;
- d) To review the main raw materials, supply chain, quantities and storage of raw materials of hazardous nature;
- e) To review the water quality monitoring data both ground and surface water quality including drinking water;
- f) To review the Sources and quantities of all waste types and their disposal;
- g) To review the sources, content and quality of effluent from production processes, other sources of effluent such as rain runoff from vehicle loading or maintenance area;
- h) To review the work place environment (e.g. housekeeping, temperature/ventilation, odor, dust) accident and incident history, site safety provisions, fire safety and related regulatory compliance, equipment, training);

- i) To review the management of labor camp e.g. nature of accommodation, facilities provided, living conditions etc.
- j) To review the employees HR policies and procedures that includes various elements of non-discrimination and equal opportunity, employment of young person under age 18, wage level, overtime, working hours, trade union presence etc.
- k) To review and of the implementation of social mitigation plans, livelihood restoration plan, grievance mechanism, stakeholder engagement plan etc.
- l) To review other relevant plans, community health and safety plan, security personnel plan, indigenous people's development plan, community development plan, biodiversity management plan, and plans to identify and mitigate impacts on cultural heritage as applicable during operation.
- m) To review of OHS compliance against applicable national and local level regulations;
- n) To Review of facility operations against IFC General EHS Guidelines of Occupational, Health and Safety, Occupational Health and Safety Management Systems (ISO 45001: 2018). This will cover following OHS topics:
 - Occupational Health and Safety policy;
 - Hazard identification and risk assessment;
 - OHS objectives, targets and programs;
 - Competence, training and awareness;
 - Communication and participations;
 - OHS documentation and records;
 - Emergency preparedness and response;
 - Performance measurement and monitoring of existing mechanism;
 - Incident investigation, Non-Conformity, Corrective and preventive Action as well as root cause analysis and implementation plan;
 - The coverage, frequency and status of action plan of internal audit and inspection;
 - Availability of occupational health center, first aid facilities and mechanism of pre-employment and periodical medical examination;
 - General facility available at workspace including housekeeping,
 - Fire safety measures, lighting, ventilation, dust and odor exposure, potable water supply etc.
 - Existing provision of machine guarding, personal protective equipment, electrical safety and work permit system.
- o) To review the OHS specific requirements and mitigation or monitoring measures compliance as mentioned in Environmental and Social Action Plan.
- p) To response any other environmental quarries from NWPGL/AECOM/MIGA/HERMIS.

1.3 Compliance Audit Framework and Evaluation Criteria

The EHS&S compliance assessment was carried out and evaluated against the following criteria:

- Applicable Local and National Environment, Occupational Health and Safety and social legislations;
- The operation phase of unit 3 audit complies with the Bangladesh Labor Law (2006) and Rules (2015).
- IFC Performance Standards on Social and Environmental Sustainability (2012);
- IFC/WB Environment, Health and Safety Guidelines - General and for Thermal Power Plants;
- Good International Industry Practices (GIIP) including elements of ISO 14001, ISO 45001: 2018 Occupational Health and Safety Management System;
- All requirements and mitigating or monitoring measures for operation phase of unit 3 which has been specified in the ESMMP of the EIA report;
- All requirement specified in the Environmental & Social Monitoring Report;
- All requirements and mitigating or monitoring measures specified in the Review of ESIA (Environmental and Social Impact Assessment) dated 29 May 2017.

1.4 Approach to the Compliance Audit

The Audit was broadly divided into four tasks:

- Document review;
- Site visit and consultation with Project Developer;
- Consultation with Power Plant Management;
- Reporting.

1.4.1 Document Review

EQMS has reviewed the provided documentation to evaluate the extent to which the potential EHS&S impacts of the operation phase for the Unit 3 project which have been assessed and management systems developed and the consistency of these assessments with the guidance prescribed in the Applicable Standards. This includes the following key documents:

- Updated Legal Register;
- Corporate Social Responsibility Related Documents;
- Chemical List with MSDS;
- E&S Monitoring Report (both DoE and 3rd Party monitoring report)
- Quarterly Environmental Monitoring Report
- Updated QRA Report
- Section Specific Risk Assessment Documents (e.g., battery room risk assessment, gas booster area risk assessment etc.)
- Updated SEP and Engagement Program with evidence

- Grievance Register status 2023.
- CSR Implementation status (With Evidence) 2023
- Energy Consumption Data (Last 6 Months)
- Improvement Management Program (IMP) Documents
- Energy Consumption Data (Last 6 Months)
- Diesel Consumption Data
- Water Consumption Data (Last 6 Months)
- Monthly/Quarterly Environmental Monitoring Report
- Volume of Sludge generated per day and Monitoring Record of Last 2 months with vendor agreements.
- Storm Water Discharge Monitoring Reports: 2 (Dry Season and Wet Season)
- Fire Safety Plan
- Process Flow Diagram of Oil-Water Separator
- Section Specific Emergency Evacuation Plan; and
- Community Health Safety Security Plan.

Identification and assessment of potential Project impacts during operation phase of unit 3 has been based on an understanding of the components, methods and activities of the Project and considering the environmental and social context of the Project area. As such, EQMS reviewed the description of the Project contained in the documentation and also the assessment of baseline social and environmental conditions for the operation phase of unit 3. (The site visits later provided an opportunity to identify any further environmental or social receptors and sensitivities, understand the context of the site, status of the project activities, implementation of the management plans and mitigation measures and discussion with Project representatives etc.).

EQMS also evaluated the methodology for the assessment of impacts (but did not redo any impact assessment work). The IFC standards require the assessment of potential impacts EQMS also reviewed the management and mitigation measures in the EIA and other supporting documentation for operation phase. The appropriateness of these measures has been evaluated with respect to the extent to which all documented and agreed mitigation measures are in line with the requirements of components of the applicable Standards.

EQMS also reviewed available management plans and evaluated the extent to which they are consistent with international good practice. EQMS evaluated the management plans against the IFC standards to identify gaps and deficiencies.

1.4.2 Site Visit

EQMS conducted the site visit and consultations dated on 20 November 2023 to 22 November 2023. The site visit served several purposes including:

- Allowed the inspection of the current status of the Project and its associated components;
- Enabled EQMS to observe implementation of the mitigation measures and management plans pertaining to environment, health, safety and social aspects as delineated in the EIA and HSE management system;
- Enabled EQMS to observe the Project site, Operation areas and surrounding areas;

The Gap between EIA, ESMS, HSE management system and its implementation with respect to the requirements of the Applicable Standards are identified and described in this report. Recommendations on measures to address these gaps and assist the Project in aligning with the Applicable Standards are also provided in **Section 3**.

Table 1: Site Assessment and Consultations Schedule

Date	Summary of Activities
20 November 2023	<ul style="list-style-type: none"> • Opening meeting with the EHS Team of SPS, Plant Manager of Unit-3; • Safety Induction by the EHS Team of SPS; • Discussion on the last Audit CAP with NWPGCL/ Unit-3 designated persons; • Document collection and review; • Visit to the ETP outlet area; • Review the 4th audit observation/gap to identify the level of compliance of NWPGCL/ Unit-3; • Visit to the entire Unit 3 Plant Area with the EHS team of SPS;
21 November 2023	<ul style="list-style-type: none"> • Document collection and review; • Discussion on the last Audit CAP with NWPGCL/ Unit-3 designated persons; • Review the 4th audit observation/gap to identify the level of compliance of NWPGCL/ Unit-3; • Visit to the Oil unloading area; • Discussion with the Community Liaison Officer (CLO); • Discussion with the Chemical Department Personnel; • Discussion with the Community People;
22 November 2023	<ul style="list-style-type: none"> • Discussion on status on document review and field visit; • Discussion with the Chief Engineer of SPS and Plant Manager to brief about key observations in presence of NWPGCL Management; • Closing meeting with the EHS cell in presence of NWPGCL/Unit-3 Management; • Wrap up Audit Program;

1.5 Limitations

While this assessment has endeavored to provide a comprehensive review against the

requirements of the Applicable Standards, however, there remains certain limitations to the assessment that should be considered:

- This report is based on the site visit and review of information made available to EQMS during operation phase audit for Unit-3. Note that the findings in this report are subject to change depending upon other information that may come up in future.
- We cannot guarantee that these activities will necessarily yield complete information.
- The independent review is a high-level assessment of environmental and social risks/issues and should not be interpreted as a detailed legal compliance review to the conditions stipulated by enforcement agencies in the regulatory approvals and limited to the environmental and social approvals already accorded to the Project and shared with EQMS.

1.6 Uses of the Report

EQMS is not engaged in consulting or reporting for the purpose of advertising, sales promotion, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes. Client acknowledges that this report has been prepared for their exclusive use and agrees that EQMS reports, or correspondence will not be used or reproduced in full or in part for such purposes and may not be used or relied upon in any prospectus or offering circular. Client also agrees that none of its advertising, sales promotion, or other publicity matter containing information obtained from this assessment and report will mention or imply the name of EQMS.

1.7 Layout of the Report

The draft report is structured as under:

<i>Section 1</i>	<i>Introduction and Background (this section)</i>
<i>Section 2</i>	<i>Brief Project Description and Context Setting</i>
<i>Section 3</i>	<i>Gap assessment to the Applicable Reference Framework</i>
<i>Section 4</i>	<i>Corrective Environmental and Social Action Plan</i>
<i>Section 5</i>	<i>Conclusion</i>
<i>ANNEX A</i>	<i>Legal Register</i>
<i>ANNEX B</i>	<i>Photo Documentation</i>

2 PROJECT DESCRIPTION

2.1 The Project

The Government of Bangladesh (GoB) has adopted the Millennium Development Goals and has targeted to provide electricity to all citizens by 2021. As per the assessment of power in FY2012, about 60% (including off Grid Renewable Energy) of the total population of Bangladesh has access to electricity and per capita energy generation is limited to 292 kWh. Present electricity demand growth is 12% per annum and the Government expects that the power demand could be 19,701 MW in 2019 and 24,000 MW in 2030. With a view to reducing the gap of existing and future demand-supply situation and with the aim of providing quality and reliable electricity to people, the Government has given priority to the development of the power sector by increasing the generation capacity and extending the transmission and distribution facilities. To this end, government has formulated a Power System Master Plan 2010 (PSMP 2010). Based on the directives of PSMP 2010, number of steps to increase the power generation in an accelerated manner.

The operation of the Project is being sponsored by North West Power Generation Company Limited (NWPGCL), a state-owned power generation utility that is a 100% wholly owned subsidiary of Bangladesh Power Development Board (BPDB), which was incorporated in 2007. The Sirajganj Unit 3 Project involves the operation of a 225 MW dual fuel CCPP within the Sirajganj Power Complex, comprising a dual-fuel gas turbine, generator, steam turbine and a heat recovery steam generator (HRSG), water treatment and cooling system, as well as the operation of a 230 kV switchyard and an extension of the existing 230 kV switching station within the Sirajganj Power Complex. The Sirajganj Power Complex, which is owned and operated by NWPGCL, was developed in 2007 by in-filling “char land” (i.e., sandy, unconsolidated land that has emerged adjacent to the river through the gradual accumulation of sediment, on the Brahmaputra-Jamuna Floodplain) to create 54 acres for the construction of power stations. In order to prevent flooding, the entire complex area has been built up approximately 10 feet above the surrounding floodplain (based on flood modelling undertaken for construction of the Jamuna Bridge).

The Project is part of the overall government Power Sector Master Plan (PSMP) to increase energy generation in the country to meet growing energy demand. The Project is located in Khas Barashimul Mouza in Sirajganj District (about 15 km south-east of Sirajganj town and 130 km north-west of Dhaka). The closest settlements to the Project site, Barashimul & Ponchosona, are both located approximately 1 km from the Complex. Natural gas, the main fuel for the Project, is supplied by Petro Bangla. Power from the Project has been evacuated to the national grid through existing 230kV switching station beside the Project site. Presently, Engineering, Procurement and Construction contractor (a consortium of China National Machinery Import & Export Corporation (CMC) and Fujian Electric Power Survey & Design Institute (FEDI), also from China) is in charge for operation of the Project, after which, operation of the Project will be handed over to NWPGCL. CMC is the consortium leader and has provided overall project management while FEDI has provided technical expertise, including concept design and basic engineering. The turbines have been supplied by Siemens

AG (GEQMSany). Sirajganj 225MW Combined Cycle Power Plant project (3rd Unit-Dual Fuel) has started its commercial operation on March 2019.

2.2.1 Project site and location

Sirajganj 225MW Combined Cycle Power Plant (3rd Unit-Dual Fuel) is located beside the existing 150MW Peaking Power Plant converted into 225MW CCPP, which is situated on the bank of the Jamuna River near Bangabandhu Bridge at Sirajganj. This site lies between N 24°23'4" and N 24°23'16" and between E 89°44'33" and E 89°44'51".

2.2.2 Major Equipment

The following equipment has been used for the Sirajganj 225MW CCPP (3rd Unit Dual Fuel):

- i. Gas Turbine (GT)
- ii. Heat Recovery Steam Generator (HRSG)
- iii. Steam Turbine (ST)
- iv. Generator
- v. Power Transformer
- vi. Cooling Water System
- vii. Stack (Main/ Bypass)
- viii. Air Compressor

Natural gas or High-Speed Diesel has been used as fuel for Gas turbine which has been coupled with Generator to produce 150MW at 11kV voltage level. The requirement of Natural Gas for this Power Plant is about 35 mm.cfd. Natural Gas has been supplied to the power plant by Pashchimanachal Gas Distribution Co. Ltd. of Petrobangla.

The exhaust temperature of gas turbine is about 500-600 degree Celsius. The exhaust gas with high temperature has been passed through Heat Recovery Steam Generator (HRSG) in which groundwater been fed after treatment (demineralization & desalination) to produce the steam and then the steam has been passed through steam turbine coupled with generator to produce electricity of about 75MW at 11kV voltage level. The temperature of the flue gas is about 90 degrees Celsius. The flue gas has been discharged to the atmosphere through a main stack of adequate height.

The output voltage of the generators has been stepped up to 230 KV through a step-up Transformer, is installed close to generator outlets. This high voltage (230 KV) supply is connected to the existing 230KV Switching Station of PGCBL through 230KV cables of required specifications. In order to cool the steam out from steam turbine, recirculating wet cooling tower is used. Groundwater is used in the cooling tower and steam cycle for makeup water after proper treatment.

3 GAP ASSESSMENT TO THE APPLICABLE REFERENCE FRAMEWORK

Applicable Standards

This section reviews the EHS&S performance of the operation phase of the Project with respect to the Applicable Standards, as defined in Section 1.3. In terms of IFC Performance Standard (PS), EQMS reviewed the following 4 PS standards.

- Performance Standard 1 (PS1): Assessment and Management of Environmental and Social Risks and Impacts;
- Performance Standard 2 (PS2): Labor and Working Conditions;
- Performance Standard 3 (PS3): Resource Efficiency and Pollution Prevention;
- Performance Standard 4 (PS4): Community Health, Safety and Security.

In addition, the WBG EHS General Guidelines and Guidelines for Thermal Power Plants apply to this Project.

The findings are categorized as per the following definitions:

Table 2: Alignment Definitions

Rating	Definition
Aligned	Information available indicates that the Project fulfils the requirement and/or is aligned with intended outcome of the requirement.
Partially Aligned	Information available indicates that the Project partially fulfils the requirement and/or is partially aligned with intended outcome of the requirement.
Not Aligned	Information available indicates that the Project does not fulfil the requirement.
Insufficient Information for the assessment	There is insufficient information to make an assessment of the level of alignment.
Not Applicable	The requirements do not apply to the Project at the current time.

The gap assessment with respect to applicable standards primarily focuses on the operation phase environmental and social management and monitoring plan (ESMMP) is developed as part of the EIA study, Project level environmental, health, safety and social policies, procedures and plans as being developed by NWPGL as well as their implementation on ground.

Table 3: Gap Assessment in compliance with requirements of the IFC Performance Standards (2012)

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
1	<p>IFC PS 1: Assessment and Management of Environmental and Social Risks and Impacts This section provides a high-level assessment of the adequacy of environmental and social management systems that have been put in place by North West Power Generation Company Limited (NWPGL), and reviews any gaps/ conformance aspects to its implementation with respect to the Project and its associated facilities/components. The company is an Enterprise of Power Development Board under the Ministry of Energy and Power, People Republic of Bangladesh. As a government enterprise entity, NWPGL has diversified footprint in energy & power sector here in Bangladesh.</p>			
1.1	<p>Policy: The client has established and maintained an Environmental and Social Management System (ESMS) appropriate to the nature and scale of the project and commensurate with the level of social and environmental risks and impacts. The ESMS has incorporated the following elements:</p> <ul style="list-style-type: none"> • Social and Environmental Assessment (SEA or EIA); • Management program; • Organizational capacity; • Training; • Community engagement; • Monitoring; • Reporting. 	<p>NWPGL established an official ESMS since the inception of the construction phase. A third-party document under the name ‘Environmental and Social Management System for NWPGL’ was made available for review. The document was first generated in September 2015 with revision of control dated in July 2018. On the July 2018, the Review of ESMS and Meeting Minutes of ESMS was done and those documents have been made available. The 3rd revision of ESMS has been done in May 2019. Meeting minutes of ESMS for the 3rd revisions have been generated for review. Also, the 4th ESMS review meeting took place on 8 September 2022. As per the minutes of the meeting, no upgradation was required in the existing ESMS.</p> <p>An internal ESMS Implementation maturity audit has been performed in October 2020. The maturity audit documents have been generated for review.</p> <p>Broadly, the ESMS covers the following components under the following to broader header:</p>	<p>Partially Aligned</p>	<ul style="list-style-type: none"> • ESMS is a live document, and needs to be updated, if required. • ESMS need to be updated because legal paper updated with new certificate from WARPO for Extraction of Ground Water

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		<p>Corporate Control Procedures (CCP)</p> <ul style="list-style-type: none"> • Environment and Social Risk Assessment • Contractor Identification and Management Procedure • Operation Management • Chance Find Procedure • Training and Competency Needs of Employees • Internal and External Audits for projects (Operation Phase) • Reporting • Management Review <p>Each sub-clause also poses more sub- heading as required and relevant for the project implementation and evaluation.</p> <p>Project Level Procedures (PLP)</p> <ul style="list-style-type: none"> • Operation Phase Environment Health and Safety (EHS) Management • Risk Assessment • Emergency Preparedness and Response • Occupational and Community Health and Safety Management • Stakeholder Engagement Procedure • Grievance Redress Mechanism • Addendum to NWPGL's Human Resource Manual <p>Each sub-clause also carries more sub- heading as</p>		

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		<p>required and relevant for the project implementation and evaluation.</p> <p>NWPGCL has obtained NOC for Extraction of Ground Water from WARPO. So, it needs to be updated in the ESMS.</p>		
1.2	<p>Policy: The client will establish an overarching policy defining the environmental and social objectives and principles that guide the project to achieve sound environmental and social performance. The client will communicate the policy to all levels of its organization.</p>	<p>NWPGCL has an Environment, Health & Safety and Social Policy which is generically applied for its all projects. This policy had been signed and adopted by NWPGCL from 17th October 2015. The policy defines the environment, health, and safety objectives of the company, which are focused on commitment to the principle of sustainable development and continuous improvement on health and safety performance with a goal of zero incidents.</p> <p>During the site visit, it has been observed that the EHS&S Policies were displayed at several places onsite.</p>	Aligned	Ongoing
1.3	<p>Identification of Risks and Impacts: The client will conduct a process of Social and Environmental Assessment that will consider in an integrated manner the potential social and environmental (including labor, health, and safety) risks and impacts of the project. The EIA should cover the project area of influence (AOI) across the project lifecycle.</p>	<p>NWPGCL has established and maintained a process for identifying the environmental and social risks and impacts of the project by appointing personnel within with direct responsibility for the project's environmental and social performance who have the knowledge, skills, expertise in this sector.</p> <p>NWPGCL has carried out the EIA study follow the proper approach as stated in the ECR'97 and obtained the Environmental Clearance Certificate (ECC). The renewal of ECC will be valid till 08.10.2024.</p> <p>Environmental and Social Management System (ESMS) of NWPGCL has provided an Environmental and</p>	Aligned	Ongoing

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		<p>Social Management and Monitoring Plan for the Project, covering all the phases of the Project. It further assigns broader level roles and responsibilities of NWPGL for implementation and monitoring of the mitigation measures. NWPGL corporate management office also included under this plan.</p>		
1.4	<p>Establish Legal requirements for both social and environmental parameters Applicable laws and regulations of the jurisdictions in which the project operates that pertain to social and environmental matters, including those laws implementing host country obligations under international law, will also be taken into account.</p>	<p>The EIA and ESMS Report have been provided a detailed policy, legal and administrative framework for the Project to address the requirements of local and national statutory requirements, national policies, and international legal obligations (treaties signed/ratified by Bangladesh) as well as IFC Performance Standards, General EHS guidelines and sector specific guidelines for thermal power plants provided by IFC.</p> <p>During the audit, it has been found that NWPGL has maintained a legal register, and which is updated at regular interval.</p>	Aligned	
1.5	<p><u>Management Programs</u> Management of a programme (with defined desired outcomes as measurable events) to mitigate and implement improvement measures and actions that address identified social and environmental risks and impacts</p>	<p>The ESMS document has provided an Environmental and Social Management Plan for the Project. It further assigns broader level roles and responsibilities of NWPGL/Contractor for implementation and monitoring of the mitigation measures.</p> <p>The consultants who prepared the ESMS document earlier, refers development of specific plans for operation phases of the Project, which include:</p> <ul style="list-style-type: none"> • Operations and Compliances; • Occupational and Community Health and Safety Management Plan; 	Aligned	

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		<ul style="list-style-type: none"> • Contractor Management Plan; • Emergency Preparedness and Response Plan; • Pollution Prevention Plan; • Hazardous Materials Management Plan; • Community Development Plan; • Stakeholder Engagement Plan; • Information Disclosure, Consultation, and Participation; and; • Community Grievance Redress Plan <p>It further states that the ESMS of the project shall have provisions of routine monitoring, training schedules for operational staff, monitoring schedule, implementation schedule as well as follow-up of recommendations of monitoring/ inspection.</p> <p>Moreover, Unit 3 has conducted Hazard Impact and Risk Assessment (HIRA) dated 1 June 2023 was available for review. It was noted that HIRA has been conducted department wise that includes electrical maintenance and mechanical maintenance.</p> <p>A standalone Quantitative Risk Assessment (QRA) report has been prepared and shared for review. QRA was noted to cover risks and impacts and mitigation measures for oil and gas pipelines. Visual checks are conducted for leak detection every month. NWPGCL has prepared a SOP for Fuel Oil transportation through pipeline.</p> <p>Moreover, updated QRA, 20th October 2023 has been made available for review. The QRA includes the turbine area risk associated with assembly point. Additionally,</p>		

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		the assessment considers risk analysis of diesel carrying truck/road tanker and railway oil tanker under its scope of work.		
1.6	Define organizational structure with well-defined roles, responsibilities and authorities	NWPGCL has well defined organization structures with proper roles and responsibilities.	Aligned	
1.7	Training to employees and contractors with direct responsibilities for activities related to the project's social and environmental performance	<p>Training for employees has been conducted based on the annual training calendar of NWPGCL.</p> <p>Electric and Magnetic Field (EMFs) safety related training has been covered under the EHS/OHS training. Photo evidence on training of all has been found as well.</p> <p>During the site assessment, it has been informed that a number of oils carrying truck entering into the project site at the beginning of the year 2023. Moreover, it has been informed that drivers were informed to maintain speed limits, precautions when passing through the communities. Even security guards were informed to check the matter in that regard. The drivers of these trucks have direct responsibility to maintain project sites and associated facility's rules and regulation regarding occupational health and safety, safe driving through the plant premise and the community as well as handling of hazardous material (diesel).</p> <p>Records or proof of such training were shared for review.</p> <p>It was discovered during the audit trial that staff members need to receive training on "Water Governance and Compliance Monitoring" in accordance with WARPO's NOC. No such documents made available for</p>	Partially Aligned	<ul style="list-style-type: none"> It is to include contractor person in training whoever in the premises under general OHS training. NWPGCL to arrange training of the employees on water governance and Compliance monitoring on regular interval for water use and impact of water use.

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		review.		
1.8	<p><u>Emergency Preparedness and Response:</u> Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, the ESMS will establish and maintain an emergency preparedness and response system.</p>	<p>During audit trial, NWPGL provided both on-site and off-site ERP in compliance with ESMS and ESMP with version controlled for review.</p> <p>In accordance with safety record book 30.11.2023, fire extinguishers were fully charged and mounted. However, during audit trial, it has been observed for some location that Fire extinguisher was placed at floor. According to BLR, 2015 section 55-7(d): “(d) <i>In applicable case, supporting wall or cabinet made of wood, metals or plastic should be installed in such a way so that the bottom of the fire extinguisher remains 1000 mm high from the ground level.</i>”</p> <p>Additionally, it has been observed that at some of the areas of Unit-03 leakage of water from hydrant boxes was found.</p> <p>During the audit trial it has been observed that evacuation plan is at administrative building but needs to update and needs to install the evacuation plan at the factory premises. As per BLR, 2015 section 55-8: <i>The arrangement should be made to show evacuation plan of exit/ means of egress in one or more places easily visible in each floor of each floor of the factory.</i> Moreover, the design of the evacuation plan of exit or means of egress details has been given in the BNBC, 2020-part IV, chapter 3 procedure.</p> <p>During audit trail, documents and evidence related with offsite emergency preparedness implementation which are related with adjacent community were made</p>	Partially Aligned	<ul style="list-style-type: none"> • NWPGL to install fire extinguisher in proper manner as sated in BLR, 2015 sec 55 (7d) • Leakage of water from Hydrant box needs to be maintained in proper manner. • NWPGL to install evacuation plan (follow the BNBC, 2020-part IV, chapter 3 procedure) easily visible location in each floor of the factory.

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		available for review.		
1.9	<u>Monitoring and Review:</u> Establish procedures for monitoring and measurement of the effectiveness of the management programme.	The environmental and social monitoring plan (ESMP) developed for the Project during different phases of the Project with institutional level roles and responsibilities and frequency of monitoring. Furthermore, Aspect Impact Assessment (AIA) for several departments specifically register of Environmental Aspect and Impact Assessment report has been provided by the NWPGL to sustain the effectiveness of management program. During the audit trial, it has been informed that an ETP and Chemical warehouse will be set up on the facility premises.	Partially Aligned	<ul style="list-style-type: none"> Periodically reviewing the monitoring plan to avoid potential risk associated with the activities. NWPGL is required to develop aspect impact register for the ETP and Chemical Warehouse during operation phase of the project after development of the ETP and Chemical Warehouse.
1.10	Provision for internal reporting as well as external reporting on action plans. Where appropriate, client will consider involving representatives from Affected Communities to participate in monitoring activities.	NWPGL has conducted Community Health safety and Emergency Preparedness Program.	Aligned	Ongoing
1.11	Stakeholder Engagement: The client will develop and implement a Stakeholder Engagement Plan that is	A well-organized version-controlled stakeholder engagement plan has been made available for review. Also, a Stakeholder Engagement Report, September 2023	Aligned	Ongoing

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	<p>scaled to the project risks and impacts and development stage and be tailored to the characteristics and interests of the Affected Communities.</p> <p>The client will provide Affected Communities with access to relevant information on: “the purpose, nature, and scale of the project; the duration of project activities”</p>	<p>has been provided for review. The report summarizes the key findings and observations from the consultations (public consultation meetings, FGDs and KIIs) conducted in 2023. Implementation of SEP through consultations and other activities were also noted during audit.</p>		
1.12	<p>External Communications Clients will implement and maintain a procedure for external communications that includes methods to:</p> <ul style="list-style-type: none"> i. receive and register external communications from the public; ii. screen and assess the issues raised and determine how to address them; iii. Provide, track, and document responses, if any; and adjust the management program, as appropriate. 	<p>Local people were also pleased for the CSR initiatives taken by the project proponent</p>	Aligned	Ongoing
2	<p>IFC PS 2 Labour and Working Conditions No labour currently works for Unit 3 as the project went on to operation phase. NWPGL has a warranty agreement with CMC as the</p>			

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
O&M contractor for next two years of the operation stage. No of O & M employee engagement is very limited.				
2.1	<p><u>Human Resources Policies and Procedures:</u> A Human Resources policy which sets out its approach to manage employees consistent with the requirement of this PS.</p>	<p>NWPGCL’s employee service rule, 2016. The service rules cover:</p> <ul style="list-style-type: none"> • Recruitment and General Conditions of Service • Fixation of Seniority • Criteria for Promotion • Fixation of Pay • Allowances and Honorarium • Combination of Appointment • Joining Time • Leave • Traveling Allowance • Medical Facility • Residential Accommodation and House Support. • Contributory Provident Fund • Gratuity • Benevolent Fund and Group • General Conduct and Discipline • Punishment and Appeal • Retirement and Release • Advances to Employees • Departmental Examination 	Aligned	Ongoing
2.2	<p>The client will document and communicate to all employees and workers directly contracted, their working conditions and terms of employment, including entitlement to wages and benefits, hours of work,</p>	<p>NWPGCL’s employee service rule, 2016 allowed: CAPTER IV GRATUITY 116. Admissibility-Gratuity shall be admissible to- (a) all regular employees who rendered at least five years' continuous service in the Board, and V) have not</p>	Aligned	

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	<p>overtime arrangements and compensation etc.), where such agreements are respected at the minimum comply with the national law.</p>	<p>been dismissed, discharged or removed from service as a measure of punishment; or have not resigned, left or discontinued the service without permission of the competent Authority; and a regular employee whose service is terminated before completion of five years on the following grounds, namely: (i) the post to which s/he is appointed is abolished or the is retrenched from service for reduction of strength. (ii) S/he is discharged from service due to total or partial disablement; or (iii) s/he. died while in service; (c) The work-charged period of service of an employee shall be counted towards computation of gratuity subject to the conditions that- (i) the work charged period of service may be counted only when it is found to be continuous and immediately followed, without any break, by service on regular basis. (ii) Work charged service for 2 years shall reckoned as regular service for one year for the purpose of calculation of gratuity only. Chapter XV BENEVOLENT FUND AND GROUP INSURANCE 121. Application of this Chapter :-(1) This Chapter shall apply to all regular employees of the Board. (2) The provision of this Chapter' shall not affect the right to receive any provident fund, gratuity or other benefits accruing to the employee on his retirement or invalidation, or on his family upon his death under these rules. CHAPTER-XIII CONTRIBUTORY PROVIDENT FUND</p>		

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		<p>88. Application of the Chapter-This Chapter shall apply to all regular employees, except-</p> <p>(a) the transferred Government employees who hold lien on pensionable Government service; (b) casual employees and the employees who are paid from contingency; (c) Retired Government servants who have been re-employed under the Board; and (d) officers appointed on contract, if so, provided in the contract.</p> <p>89. Constitution and Management of the Fund-(1) There shall be constituted a Fund to be called the NWPGL Contributory Provident Fund. (2) The management of the fund shall vest in the Board and its officers authorized in this behalf.</p> <p>90. Eligibility of being subscribe to the Fund-(1) An employee to whom this Chapter applies shall be eligible to subscribe to the Fund. (Chapter 6) The rules also covered nation standard allowances and honorarium. After discussion with NWPGL, evidence of insurance, PF, GF have been made available for review.</p>		
2.3	The client will identify migrant workers and ensure that they are engaged on substantially equivalent terms and conditions to non-migrant workers carrying out similar work.	Currently, the Unit-3 is in the stage of the operation phase. As a result, there are no migrant and non-migrant workers available on-site.	Not Applicable	
2.4	Where accommodation services are provided to workers covered by the scope of this Performance Standard,	<p>NWPGL Accommodation At present approximately 66 NWPGL employees are accommodated at the site. It serves as the office space,</p>	Aligned	

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	the client will put in place and implement policies on the quality and management of the accommodation and provision of basic services. This also includes the applicable requirements of the IFC Guidelines on Worker Accommodation.	canteen as well as the accommodation space.		
2.5	<u>Worker's Organization</u> Where law recognizes worker's rights to form and join worker organizations of their choice without interference, and collectively bargain, the client will comply with the national law.	There is no collective bargaining agreement or any worker union at the site presently. NWPGL employee service rule 2016 does not allow any trade union or worker organization for collective bargain.	Not Applicable	
2.6	<u>Non-Discrimination and Equal Opportunity</u> Non-discrimination and equal opportunity: Employment decisions will not be made on the basis of personal characteristics unrelated to job requirements. Job opportunities will be provided on the principles of equal opportunity and fair treatment. The principles of nondiscrimination apply to migrant workers.	NWPGL employee service rule 2016 followed Non-Discrimination and Equal Opportunity which was also in practice by the proponent.	Aligned	
2.7	<u>Grievance Mechanism</u> Grievance mechanism for workers	Since the unit 3 is in operation phase, no workers found for the mentioned unit at the project site. During the	Aligned	

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	<p>where they can raise reasonable workplace concerns.</p>	<p>audit trail, it was observed that complaint boxes placed in different division of the site. Even, Grievance Mechanism for NWPGL employee also in place as per service rule, 2016.</p>		
<p>2.8</p>	<p>Protecting the Work Force: <u>Child Labour</u> The client will not employ children in a manner that is economically exploitative or is likely to be hazardous or to interfere with child’s development. All work of persons under the age of 18 will be subject to an appropriate risk assessment and regular monitoring of health, working conditions, and hours of work.</p> <p><u>Effective abolition of child labour</u> The ILO Minimum Age Convention, 1973 (No. 138) and its accompanying Recommendation (No. 146) set the goal of elimination of child labour, and the basic minimum age for employment or work (in developing countries at 14 years of age or the end of compulsory schooling, whichever is higher; and 15 or the end of compulsory schooling for developed countries). The Convention sets a</p>	<p>Since the unit 3 is in operation phase, no workers found for the mentioned unit at the project site. As a result, the mentioned requirements are not applicable. The NWPGL policy also strictly abide by country labor law especially use of child labor/force labor.</p>	<p>Aligned</p>	

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	<p>minimum age of 2 years younger respectively; and a higher minimum age for dangerous or hazardous work (Basically 18 years of age, but 16 in certain circumstances).</p> <p><u>Forced Labour</u> The client will not employ forced labour, which consists of any work or service not voluntarily performed and that is extracted for an individual under threat of force or penalty. The client will not employ trafficked persons. Elimination of all forms of forced or compulsory labour According the Forced Labour Convention, 1930 (No. 29), the ILO defines forced labour for the purposes of international law “all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered him voluntarily.” The other fundamental ILO instrument, the Abolition of Forced Labour</p>			

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	Convention, 1957 (No. 105), specifies that forced labour can never be used for the purpose of economic development or as a means of political education, discrimination, labour discipline, or punishment for having participated in strikes.			
2.9	<p>Occupational Health & Safety The client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, as far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice, as reflected in various internationally recognized sources including the World Bank Group Environmental, Health and Safety Guidelines, the client will address areas that include the</p> <p>(i) Identification of potential hazards to workers, particularly those that may be life threatening; (ii) provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) training of workers; (iv)</p>	<p>The following observations were noted during the site visit:</p> <p>General Facility design and Operation The workplace of the NWPGL employee was organized by workspace and exit, fire safety measures, lavatories and showers, potable water supply, clean eating area, lighting and general housekeeping at facility. NWPGL has a well-established safety committee. And the safety committee meeting held in every three months as per the Bangladesh Labour Rules 2015 (Schedule IV-3). And they also maintained the safety record book on a monthly basis.</p> <p>Training of workers NWPGL provided the training calendar for operation phase of unit 3.</p> <p>Documentation and reporting of Accident & Incident NWPGL developed an incident investigation report format. First Aid center is responsible to carry out accident investigation involving root cause analysis on</p>	<p>Partially Aligned</p>	<ul style="list-style-type: none"> • NWPGL recommended to store chemical drums in proper manner up until they set up the designated chemical warehouse and maintain proper firefighting system besides it. • NWPGL is recommended to restrict all the motor bikes from unauthorized entry into the main plant area.

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	<p>documentation and reporting of occupational accidents, diseases, and incidents; and Emergency prevention, preparedness, and response arrangements.</p>	<p>its own with limited understanding on the safety front. Besides, first aid boxes were found at several locations.</p> <p>Emergency Response Procedures NWPGL provided the operation phase specific Emergency response plan (on-site) and offsite for review. During the site visit it was observed that a full fire safety system is developing the full factory premises. Moreover, a separate fire control room, unit and fire truck properly equipped has been found onsite to avoid the emergency. However, chemical drums were stored haphazardly at several locations. It has been reported that NWPGL is planning to construct a separate chemical storage at the plant premises.</p> <p>Safety Signboard During the audit trail, it was observed that “Beware of Snake” sign was posted in designated places the plant premise for safety purpose. Pest control kit found at several location of the plant as well. Moreover, reflection mirror for onsite traffic control was also observed onsite. In general, good housekeeping was observed all over the plant premise. However, several motor bikes were parked in different locations of the main plant area (see photo documentation).</p>		
2.10	Exposure to Electromagnetic Field (EMF)	Plant health quarterly monitoring has been conducted in the switch yard. The quarterly monitoring report, October 2023 has been provided for review. It is noted	Aligned	

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		<p>that the average EMF reading has been found from 89.6 to 178.8 mv/m which is quite high for the exposure. As the distances increased, the EMF decreased. As per the International Commission on Non-Ionizing Radiation Protection, the standard value is 120 mv/m.</p> <p>Moreover, monthly training record on EMF has been shared for review.</p>		
3	IFC PS 3: Resource Efficiency and Pollution Prevention			
	The Project is currently in the operation phase. The observations related to resource efficiency and pollution prevention are made here based on the available information provided in the EIA report, provided report from the proponent and site inspection.			
3.1	During the design, construction, operation and decommissioning of the project (project life cycle), the client is to consider ambient conditions and apply pollution prevention and control technologies and techniques.	<p>It was reported by the proponent that they are ensuring use of efficient equipment and machines to meet the emission standards applicable in Bangladesh and IFC Emission Standards.</p> <p>NWPGCL ensured that the emissions, ambient conditions as well as pollution prevention as per ESMMP been operationalized complying the Department of Environment (DoE) standards and applicable IFC Emission Standards for operation phase of unit 3.</p> <p>CEMS data was made available for review.</p>	Aligned	Ongoing
3.2	The client will refer to the EHS Guidelines or other internationally recognized sources, as appropriate, when evaluating and selecting resource efficiency and pollution prevention and control techniques for the project.	<p>Proponent has adopted standard policy for sustainability techniques for gaining resource efficiency.</p> <p>The notable pollution prevention technologies are rooftop solar panels on officers' quarters, HRSG that recovers heat, STP etc.</p>	Aligned	Ongoing

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
3.3	<p>Resource Efficiency:</p> <p>The client will implement technically and financially feasible and cost-effective measures for improving efficiency in its consumption of energy, water, as well as other resources and material inputs, with a focus on areas that are considered core business activities.</p>	<p>The Project is based on cleaner fuel natural gas and higher efficiency combined cycle system and alternatively use HSD (Fuel Oil) during unavailability of natural gas.</p> <p>During the site visit, initiative to install delivery line of sampling water at sand filter with achievement target year May 2023 was observed and found functional.</p> <p>Monthly energy consumption data has been shared as well for review.</p> <p>An initiative to Zero Discharge Plan for the consumption of water has been taken by NWPGL under resource efficiency. A separated document on zero discharge plan has been shared for review. However, no documents regarding zero discharge plan along with ETP water calculation has been made available for review.</p>	Aligned	<ul style="list-style-type: none"> NWPGL to share zero discharge plan along with ETP water calculation for review.
3.4	<p>Greenhouse Gases:</p> <p>The client will consider alternatives and implement technically and financially feasible and cost-effective options to reduce project related GHG emissions during the design and operation of the project.</p>	<p>NWPGL estimates yearly GHG emissions for unit 3 using the IFC recommended Carbon Emission Estimation Tool (CEET model – Version February 2014)¹.</p> <p>Since NWPGL owns multiple power plants which are fueled by natural gas, HFO, Coal, solar and wind energy, it has been challenging to adopt a consolidated climate change adaptation policy and require further discussion.</p> <p>Moreover, NWPGL is planning to offset GHG emission</p>	Partially Aligned	<ul style="list-style-type: none"> NWPGL is recommended to share GHG calculation documents regarding emission reduction for review.

¹ http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/CB_Home/Measuring+Reporting/

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		<p>by constructing power plants fueled by renewable energy sources. As per the plan, at present, the project proponent solely owns a Sirajganj 6.55 MW (AC) grid connected solar PV project. Additionally, NWPGL's other joint venture renewable energy projects include: (i) Pabna 60 MW Solar Park, (ii) Sirajganj 68 MW Solar Park Project and (iii) Payra 50 MW Wind Power Project.</p> <p>These existing and proposed renewable energy power projects would substantially aid in reducing the NWPGL's net emissions.</p> <p>Total reduction in GHG emission by offsetting is required to be calculated by NWPGL. As per discussion with the project team calculation regarding the emission reduction has been conducted. However, NWPGL to develop GHG reduction strategy based on annual GHG calculation documents.</p>		
3.5	<p><u>Water Consumption</u> The client shall adopt measures that avoid or reduce water usage so that the project's water consumption does not have significant adverse impacts on others. These measures include, but are not limited to, the use of additional technically feasible water conservation measures within the client's operations, the use of alternative water supplies, water consumption offsets to reduce total</p>	<p>During the audit, it has been observed that NWPGL has adopted measures that avoid or reduce water usage. They are as follows:</p> <p>During site visit, initiative to install delivery line of sampling water at sand filter with achievement target year May 2023 was observed and found functional.</p> <ul style="list-style-type: none"> - IMP, 2023 has been made available for review. - NWPGL has installed cooling tower blowdown water recovery system under zero discharge plan. However, no data of recycled water has been shared. 	Partially Aligned	<ul style="list-style-type: none"> • NWPGL needs to provide the data of recycled water. • NWPGL to comply with the conditions of the NOC of the WARPO.

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	demand for water resources to within the available supply, and evaluation of alternative project locations.			
3.6	<p>Pollution Prevention: To avoid release of pollutants or when avoidance is not feasible minimize or control the intensity or load of the release. To address potential adverse project impacts on existing ambient conditions, the client will consider relevant factors, including, for example.</p> <ul style="list-style-type: none"> • existing ambient conditions; • the finite assimilative capacity of the environment; • existing and future land use • the project’s proximity to areas of importance to biodiversity; and • The potential for cumulative impacts with uncertain and/or irreversible consequences. 	<p>Ambient air quality, noise level, surface water and ground water quarterly monitoring were conducted during operation phase.</p> <p>During the audit trial, third party monitoring report has been reviewed. Intervals of monitoring report are quarterly. Only GHG emission report is annually produced. Reviewed documents for all environmental parameters were found satisfactory according to ECR1997 but need to update according to ECR 2023.</p>	Partially Aligned	<ul style="list-style-type: none"> • NWP GCL need to update third party monitoring report for all environmental parameters in accordance with ECR 2023
3.7	<p>Wastes Management: To avoid and minimize generation of hazardous and non-hazardous waste materials as far as practicable. Where waste generation cannot be avoided,</p>	<p>NWP GCL has engaged third party, M/S Suraya Enterprise for Removal of Waste Materials (household & related other waste) from Sirajganj Power Station to any designated place of Sirajganj Municipality.</p> <p>NWP GCL has done an agreement with Mess Asa</p>	Partially Aligned	<ul style="list-style-type: none"> • NWP GCL needs to develop a sludge management plan according to DOE.

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	<p>but has been minimized, the client will recover and reuse wastes, where wastes cannot be recovered or reused, the client will treat, destroy and dispose of in an environmentally sound manner. If the generated waste is considered hazardous, the client will explore commercially reasonable alternatives for its environmentally sound disposal, considering the limitations applicable to its transboundary movement.</p>	<p>Enterprise for empty drum collection. Moreover, empty drums were stored in proper way. During the audit trail it has been noted that sludge has been generated from the blow down area. As per discussion with the team it has been confirmed that a study will be conducted for disposal of the sludge. Moreover, NWPGCL has engaged Mess Emon Construction for solid waste collection. During the site visit, it was observed that general waste collection and segregation of the site is almost satisfactory.</p>		
3.8	<p><u>Hazardous Materials Management:</u> The client will avoid or, when avoidance is not possible, minimize and control the release of hazardous materials. In this context, the production, transportation, handling, storage, and use of hazardous materials for project activities should be assessed. The client will consider less hazardous substitutes where hazardous materials are intended to be used in manufacturing processes or other operations.</p>	<p>The Project is not involved in manufacturing, trade and use of chemicals and hazardous materials which are subjected to the international bans or phase outs due to their high toxicity to living organisms, environmental persistence and potential for bioaccumulation. NWPGCL maintains the inventory of the all the hazardous material being stored at site and hazardous materials identification, signages and measure tools was found available onsite. However, for e-waste disposal i.e., batteries, no vendor has been selected yet. During site visit it has been observed that at the loading unloading area there was no work going on.so no spillage observed onsite. However, regular monitoring should be in place during the period of unloading. The regular follow up should be focused to prevent spillages and any leakages in the oil pipe. A register/log/checklist</p>	Partially Aligned	<ul style="list-style-type: none"> NWPGCL needs to identify/select any authorized vendor/3rd party for disposal of hazardous waste (i.e., e-waste).

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
		should be maintained for monitoring. Though, general awareness and relevant training has been provided associated in the unloading of diesel for safe transportation and handling of hazardous materials.		
3.9	<u>Pesticide Use and Management:</u> Formulate and implement an integrated pest management (IPM) and or integrated vector management (IVM) approach to pest management.	NWPGCL formulated and implemented an Integrated Pest Management (IPM) Plan and a 3rd party vendor for pest management has been selected. Moreover, Pest control kit found at several location of the plant.	Aligned	Ongoing
4	IFC PS 4: Community Health, Safety and Security			
4.1	The client will evaluate the risks and impacts to the health and safety of the Affected Communities during the project life cycle and will establish preventive and control measures consistent with good international industry practice (GIIP), such as in the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines) or other internationally recognized sources.	To evaluate the risks and impacts to the health and safety of the Affected Communities during the project life cycle, NWPGCL is required to be provided a Community Health and Safety Plan. However, as per EIA report and previous audit, during the site visit, a Community Health and Safety plan was provided by NWPGCL.	Aligned	Ongoing
4.2	Infrastructure and Equipment Design and Safety:	During the audit trail, the Infrastructure and Equipment Design and Safety documents have been provided for	Aligned	Ongoing

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	The client will design, construct, operate, and decommission the structural elements or components of the project in accordance with GIIP, taking into consideration safety risks to third parties or Affected Communities.	review.		
4.3	<p>Hazardous Materials Management and Safety: The client will avoid or minimize the potential for community exposure to hazardous materials and substances that may be released by the project.</p>	<p>NWPGCL provided Hazard Identification and Risk Assessment (HIRA) and Aspect-Impact Register of unit 3 for review.</p> <p>During the site assessment, it has been informed that a number oil carrying truck entering into the project site at the beginning of the year 2023. Moreover, it has been informed that drivers were informed to maintain speed limit, precautions when passing through the communities. Even security guards were informed to check the matter in that regard. The drivers of these trucks have direct responsibility to maintain project sites and associated facility's rules and regulation in regard to occupational health and safety, safe driving through the plant premise and the community as well as handling of hazardous material (diesel).</p> <p>Records or proof of such training has been made available for review.</p>	Aligned	
4.4	<p>Community Exposure to Disease: The client will avoid or minimize the potential for community exposure to water-borne, water- based, water related, and vector- borne diseases,</p>	As per shared stakeholder engagement report, NWPGCL already conducted consultation with Ministry of Health and Family Welfare personnel. As per discussion, there is no record available regarding community exposure to disease. To know the real	Aligned	Ongoing

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
	and communicable diseases that could result from project activities. The client will avoid or minimize transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor.	scenario, this type of consultation should be continued periodically.		
4.5	Security Personnel: <ul style="list-style-type: none"> • Client to assess risks to those within and outside the project site from the security arrangements provided; • Providing training on rules of conduct, handling of security equipment to all the security personnel; • Provide a grievance mechanism for the community to raise concerns about security arrangements; • Ensure that any unlawful or abusive acts by the security are investigated appropriately. 	NWPGL provided training to security personnel. A grievance mechanism for the community to raise concerns about security arrangements also been developed.	Aligned	Ongoing
5	IFC PS 5: Land Acquisition and Involuntary Resettlement The components of the overall project that have resulted in land acquisition comprise: <ul style="list-style-type: none"> ✓ NWPGL Power Plant unit 3; ✓ A 230KV Switching Station for the installation of an Electrical Sub-station (constructed by PGCB); Transmission line and approached road. 			

SL. No	Requirements	Observations/Gaps	Level of Compliance	Recommendations
5.1	The project will consider feasible alternative project designs to avoid or at least minimize physical or economic displacement, while balancing environmental, social, and financial costs and benefits, paying particular attention to impacts on the poor and vulnerable.	The EIA report mentions that there is no need for land acquisition (page 163, para 361). Additionally, there is no settlement in this designated area. Therefore, no residents were displaced, and no resettlement was required for the construction of the power plant unit 3. The land lease agreement is made between BPDB and NWPGL on 8 January 2015 with a tenure of 25 years next. The total land is appx 7.5 acres (7.5x43560) square feet. As per lease agreement NWPGL has to pay taka 21.82 per square feet/year to BPDB.	Not Applicable	
6	IFC PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources ✓ PS 6 is not applicable for the project as per the MIGA's "Environmental and Social Review Summary (ESRS), February 23, 2015.			
7	IFC PS 7: Indigenous Peoples ✓ The EIA does not indicate any form of social sensitiveness or project associates' impact on the indigenous peoples or ethnic groups' part of the community as a result of the project.			
8	IFC PS 8: Cultural Heritage ✓ The EIA does not indicate any form of impact on the cultural heritage as a result of the project.			

Table 4: Gap Assessment in compliance with the requirements of the IFC General EHS Guidelines for Thermal Power Plants

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
1	Environmental				
1.1	Air Emissions & Ambient Air Quality				
1.1.1	<p>Projects with significant sources of air emissions should prevent or minimize impacts by ensuring that:</p> <ul style="list-style-type: none"> Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legislated standards, or WHO Air Quality Guidelines Guideline suggests emission at 25 percent of ambient quality guidelines and standards to allow additional, future sustainable development in the same air shed Estimate by the use of baseline air quality assessments and atmospheric dispersion models 	<p>Emissions Offsets Approach Projects should minimize incremental impacts by achieving emissions values outlined in the EHS Guidelines for Thermal Power (or national requirements depending on which is more stringent). Where these emissions values result nonetheless in excessive ambient impacts relative to local ambient air quality regulatory standards (or in their absence, other international recognized standards or guidelines, including World Health Organization guidelines), the project should explore and implement site-specific offsets that result in no net increase in the total emissions of those pollutants.</p>	Same as Table 3, S. No. 3.6.	Partially Aligned	
1.1.2	Projects located within or next to		As per project data, the unit	Aligned	

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
	<p>areas established as ecologically sensitive (e.g. national parks), should ensure that any increase in pollution levels is as small as feasible, and amounts to a fraction of the applicable and annual average air quality guidelines or standards as established in the project specific environmental assessment.</p>		<p>3 is not located within or next to areas established as ecologically sensitive (e.g. national parks).</p>		
<p>1.1.3</p>	<p>Emissions from point sources should be avoided and controlled according to good international industry practice (GIIP) applicable to the relevant industry sector.</p>	<ul style="list-style-type: none"> The primary emissions to air from the combustion of fossil fuels or biomass are Sulphur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO), and greenhouse gases, such as carbon dioxide (CO₂). Depending on the fuel type and quality, mainly waste fuels or solid fuels, other substances such as heavy metals (i.e., mercury, arsenic, cadmium, vanadium, nickel, etc.), halide compounds (including hydrogen 	<ul style="list-style-type: none"> Emissions from point sources of the Project has been from the main stack of combined cycle power plant, which have the stack height as 60 m for better dispersion of pollutants. Basic Environmental Design document of the Project mentions that the Plant have a continuous emission monitoring system (CEMS) for monitoring of NO_x, O₂, SO_x, CO, particulate, Temperature & pressure, Humidity, Pressure and 	<p>Aligned</p>	

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
		fluoride), unburned hydrocarbons and other volatile organic compounds (VOCs) may be emitted in smaller quantities.	flue gas flow. Data was made available for review and no adverse impact was found. All the emitted items were found below of the country threshold.		
1.1.4	Stack Height The stack height for all point sources of emissions, whether “significant” or not should be designed according to GIIP.		Stack height for the main stack and bypass stack have been provided higher than the DoE Guidelines for stack height which is 60 meters.	Aligned	
1.1.5	Greenhouse Gases (GHGs) GHGs may be generated from direct emissions from facilities within the physical project boundary and indirect emissions associated with the off-site production of power used by the project. Recommendations for reduction and control of greenhouse gases include carbon financing and host of other approaches in the guideline.	Carbon dioxide is emitted from the combustion of fossil fuels. Recommendations to avoid, minimize, and offset emissions of carbon dioxide from new and existing thermal power plants include: <ul style="list-style-type: none"> • Use of less carbon intensive fossil fuels (i.e., less carbon containing fuel per unit of calorific value -- gas is less than oil and oil is less than coal) or co-firing with carbon neutral fuels (i.e., biomass); • Use of combined heat and 	Same as Table 3 SL. 3.4	Partially Aligned	Same as Table 3 SL. 3.4

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
		<p>power plants (CHP) where feasible.</p> <ul style="list-style-type: none"> • Use of higher energy conversion efficiency technology of the same fuel type / power plant size than that of the country/region average. • Consider efficiency-relevant trade-offs between capital and operating costs involved in the use of different technologies. • Use of high-performance monitoring and process control techniques, good design and maintenance of the combustion system so that initially designed efficiency performance can be maintained; • Where feasible, arrangement of emissions offsets including reforestation, afforestation, or capture and storage of CO₂ or other currently experimental 			

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
		options ² . • Where feasible, include transmission and distribution loss reduction and demand side measures. Consider fuel cycle emissions and off-site factors (e.g., fuel, supply, proximity to load centers, potential for off-site use of waste heat, or use of nearby waste gases (blast furnace gases or coal bed methane) as fuel etc.).			
1.1.6	Monitoring Emissions and air quality monitoring programs provide information that can be used to assess the effectiveness of emissions management strategies. The air quality monitoring program should consider the following elements: <ul style="list-style-type: none"> • Monitoring parameters • Baseline calculations 	Emissions levels for the design and operation of each project should be established through the EA process on the basis of country legislation and the recommendations provided in this guidance document, as applied to local conditions. Emissions from a single project should not contribute more than 25% of the applicable	Same as Table-3, SL. 3.6	Aligned	

² The application of carbon capture and storage (CCS) from thermal power projects is still in experimental stages worldwide although consideration has started to be given to CCS-ready design. Several options are currently under evaluation including CO₂ storage in coal seams or deep aquifers and oil reservoir injection for enhanced oil recovery.

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
	<ul style="list-style-type: none"> Monitoring type and frequency Monitoring locations Sampling and analysis methods 	ambient air quality standards to allow additional, future sustainable development in the same air shed.			
1.2	Energy Conservation				
1.2.1	Applicability and Approach <ul style="list-style-type: none"> Energy Management Program Energy Efficiency Process heating Process cooling Compressed air systems 	Energy Conservation and Efficiency Use of higher energy conversion efficiency technology of the same fuel type/power plant size than that of the country/region average. New facilities should be aimed to be in top quartile of the country/ region average of the same fuel type and power plant size.	Same as Table 3 SL. 3.3	Aligned	Same as Table 3 SL. 3.3
1.3	Wastewater and Ambient Water Quality				
1.3.1	Wastewater Management <ul style="list-style-type: none"> Industrial Wastewater Sanitary Wastewater Emissions from Wastewater Treatment Operations Residuals from Wastewater Treatment 	Effluents from thermal power plants include thermal discharges, wastewater effluents, and sanitary wastewater. Recommended water treatment and wastewater conservation methods are discussed in Sections 1.3 and 1.4,	Same as Table 3 SL. 3.6	Partially Aligned	Same as Table 3 SL. 3.6

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
	<ul style="list-style-type: none"> Occupational Health and Safety Issues in Wastewater Treatment 	respectively of the General EHS Guidelines. In addition, recommended measures to prevent minimize, and control wastewater effluents from thermal power plants are provided in the guidelines. Sewage and other wastewater generated from washrooms, etc. are similar to domestic wastewater. Impacts and management of sanitary wastewater is addressed in Section 1.3 of the General EHS Guidelines.			
1.3.2	<p>Monitoring: A wastewater and water quality monitoring program with adequate resources and management oversight should be developed and implemented to meet the objective(s) of the monitoring program. The wastewater and water quality monitoring program should consider the following elements:</p> <ul style="list-style-type: none"> Monitoring parameters 	Effluent guidelines are applicable for direct discharges of treated effluents to surface waters for general use. Guideline values include pH = 6-9; TSS = 50 mg/l; O&G = 10 mg/l; Total residual chlorine = 0.2 mg/l; Total Chromium = 0.5 mg/l; Copper = 0.5 mg/l; Iron = 1.0 mg/l; Zinc = 1.0 mg/l; Lead = 0.5 mg/l; Cadmium = 0.1 mg/l; Mercury = 0.005, mg/l;	Same as Table 3 SL. 3.6	Partially Aligned	Same as Table 3 SL. 3.6

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
	<ul style="list-style-type: none"> Monitoring type and frequency Monitoring locations Data quality 	Arsenic = 0.5 mg/l			
1.4 Water Conservation					
1.4.1	Water conservation programs should be implemented commensurate with the magnitude and cost of water use. These programs should promote the continuous reduction in water consumption and achieve savings in the water pumping, treatment and disposal costs.	Water conservation measures may include water monitoring/ management techniques; process and cooling/heating water recycling, reuse, and other techniques; and sanitary water conservation techniques.	Same as Table 3 SL. 3.5;	Partially Aligned	Same as Table 3 SL. 3.5.
1.4.2	The essential elements of a water management program involve: <ul style="list-style-type: none"> Identification, regular measurement, and recording of principal flows within a facility; Definition and regular review of performance targets, which are adjusted to account for changes in major factors Affecting water use (e.g. industrial production rate); Regular comparison of water flows with performance 		Same as Table 3 SL. 3.5;	Partially Aligned	Same as Table 3 SL. 3.5

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
	<p>targets to identify where action should be taken to reduce water use.</p> <ul style="list-style-type: none"> Water measurement (metering) should emphasize areas of greatest water use based on review of metering data. “Uncounted” use indicating major leaks at industrial facilities could be identified. 				
1.5	Hazardous Materials and Waste Management				
1.5.1	<p>Applicability and Approach:</p> <ul style="list-style-type: none"> General Waste Management Waste Management Planning Waste Prevention Treatment and Disposal <p>Hazardous Waste Management</p> <ul style="list-style-type: none"> Waste Storage Transportation Treatment and Disposal Commercial or Government Waste Contractors Small Quantities of Hazardous Waste Monitoring 	<p>Hazardous materials stored and used at combustion facilities include solid, liquid, and gaseous waste-based fuels; air, water, and wastewater treatment chemicals; and equipment and facility maintenance chemicals (e.g., paint certain types of lubricants, and cleaners). Spill prevention and response guidance is addressed in Sections 1.5 and 3.7 of the General EHS Guidelines. In addition, recommended measures to prevent,</p>	<p>Same as Table 3 SL. 3.8</p>	<p>Partially Aligned</p>	<p>Same as Table 3 SL. 3.8</p>

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
		minimize, and control hazards associated with hazardous materials storage and handling at thermal power plants include the use of double-walled containers for fuel oil storage etc.			
1.6	Noise Level Management and Monitoring				
1.6.1	<ul style="list-style-type: none"> • Applicability • Prevention and Control • Noise Level Guidelines • Monitoring 	Principal sources of noise in thermal power plants include the turbine generators and auxiliaries; boilers and auxiliaries, such as reciprocating engines; fans and ductwork; pumps; compressors; condensers; precipitators, including rappers and plate vibrators; piping and valves; motors; transformers; circuit breakers; and cooling towers. Thermal power plants used for base load operation may operate continually while smaller plants may operate less frequently but still pose a significant source of noise if located in urban areas. Noise	Same as Table 3 SL. 3.6	Partially Aligned	Same as Table 3 SL. 3.6

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
		impacts, control measures, and recommended ambient noise levels are presented in Section 1.7 of the General EHS Guidelines. Additional recommended measures are presented in the guideline. Noise propagation models may be effective tools to help evaluate noise management options such as alternative plant locations, general arrangement of the plant and auxiliary equipment, building enclosure design, and, together with the results of a baseline noise assessment, expected compliance with the applicable community noise requirements.			
1.7	Contaminated Land				
1.7.1	<ul style="list-style-type: none"> • Applicability and Approach • Risk Screening • Interim Risk Management • Detailed Risk Assessment • Permanent Risk Reduction Measures 	Management approaches for land contamination due to anthropogenic releases of hazardous materials, wastes, or oil, including naturally occurring substances. Releases of these materials may be the		Aligned	

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
	<ul style="list-style-type: none"> Occupational Health and Safety Considerations 	<p>result of historic or current site activities, including, but not limited to, accidents during their handling and storage, or due to their poor management or disposal.</p> <p>Land is considered contaminated when it contains hazardous materials or oil concentrations above background or naturally occurring levels.</p> <p>Contaminated lands may involve surficial soils or subsurface soils that, through leaching and transport, may affect groundwater, surface water, and adjacent sites.</p> <p>Where subsurface contaminant sources include volatile substances, soil vapor may also become a transport and exposure medium and create potential for contaminant infiltration of indoor air spaces of buildings.</p>			

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
2	Occupational Health and Safety (OHS)				
2.1	<ul style="list-style-type: none"> • Integrity of Workplace Structures • Severe Weather and Facility Shutdown • Workspace and Exit • Fire Precautions • Lavatories and Showers • Potable Water Supply • Clean Eating Area • Lighting • Safe Access • First Aid • Air Supply/ventilation • Work Environment • Temperature 	The following Occupational health and safety impacts are of particular concern during operation of thermal power plants: <ul style="list-style-type: none"> • Non-ionizing radiation • Heat • Noise • Confined spaces • Electrical hazards 	Same as table 3, SL 2.9	Partially Aligned	Same as table 3, SL 2.9
2.2	Communication and Training <ul style="list-style-type: none"> • OHS Training • Visitor Orientation • New Task Employee and Contractor Training • Basic OHS Training • Area Signages • Labelling of Equipment • Communicate Hazard Codes 		Same as table 3, SL 2.9	Aligned	
2.3	Physical Hazards	Heat Hazard Occupational exposure to heat	Same as table 3, SL 2.9	Aligned	Same as table 3, SL 2.9

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
	<ul style="list-style-type: none"> Rotating and Moving Equipment Noise and Vibration Electrical Hazards Eye Hazards Welding / Hot Work Industrial Vehicle Driving and Site Traffic Working Environment Temperature Ergonomics, Repetitive Motion, Manual Handling Working at Heights Illumination 	<p>occurs during operation and maintenance of combustion units, pipes, and related hot equipment.</p> <p>Recommended prevention and control measures to address heat exposure at thermal power plants are presented in the guidelines.</p> <p>Noise Hazards</p> <p>Noise sources in combustion facilities include the turbine generators and auxiliaries; boilers and auxiliaries, such as diesel engines; fans and ductwork; pumps; compressors; condensers; precipitators, including rappers and plate.</p>			
2.4	<p>Chemical and Fire Hazards</p> <ul style="list-style-type: none"> Air Quality Fire and Explosions Corrosive, oxidizing, and reactive chemicals. Asbestos Containing Materials (ACM) 	<p>Fire and Explosion Hazard</p> <p>Thermal power plants store, transfer, and use large quantities of fuels; therefore, careful handling is necessary to mitigate fire and explosion risks. In particular, fire and explosion hazards increase as the particle size of coal is</p>	Same as table 3, SL 2.9	Aligned	Same as table 3, SL 2.9

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
		<p>reduced. Fire and explosion prevention management guidance is provided in section 2.1 and 2.4 of the General EHS Guidelines.</p> <p>Chemical Hazards Thermal power plants utilize hazardous materials, including ammonia for NOX control systems, and chlorine gas for treatment of cooling tower and boiler water. Guidance on chemical hazards management is provided in Section 2.4 of the General EHS Guidelines.</p>			
2.5	Personal Protective Equipment (PPE)		Same as table 3, SL 2.9	Aligned	
3	Community Health and Safety				
3.1	Water Availability and Community Exposure to Diseases		Same as table 3, SL 4.4	Aligned	Same as table 3, SL 4.4
4	Traffic Safety				
4.1	<ul style="list-style-type: none"> • Impact Assessment • General Hazardous Materials Transport • Major Transportation Hazards 	Operation of a thermal power plant will increase traffic volume, in particular for facilities with fuels transported via land and sea, including heavy trucks	The power plant complex comprises of 4 units that use HSD as fuel. Since the existing access road from the highway is the only way to the 4 units, an initial	Aligned	

SL	Requirement under IFC General EHS Guideline	Requirement under IFC Thermal Power Plants Guideline	Observation/Gap	Level of Compliance	Recommendation
		carrying fuel, additives, etc. The increased traffic can be especially significant in sparsely populated areas where some thermal power plants are located. Prevention and control of traffic related injuries are discussed in Section 3.4 of the General EHS Guidelines.	Traffic Impact Assessment (TIA)/Traffic Safety Assessment is in place under ESMS.		

4 UPDATE OF LEGAL REGISTER

Table 5: Key Regulatory Compliance and Gap Assessment

SL. No	Regulatory Requirement	Finding/Observation Compliance	Compliance Rating	Implication
1	ECC Approval under Environmental Conservation Rules, 1997			
1.1	Environmental Clearance	<ul style="list-style-type: none"> Site clearance certificate was obtained from the DoE EIA was approved by DoE. ECC has been obtained by DoE. 	Aligned	Issuing Date: 27.11.2022 Valid Till: 08.10.2024
2	Bangladesh Energy Regulatory Commission (BERC)			
2.1	Power Generation	<ul style="list-style-type: none"> License has been obtained from BERC 	Aligned	Issuing Date: 22.12.2022 Valid Till: 21.12.2024
3	License for HSD Storage by Department of Explosive			
3.1	<p>License for HSD Storage: Section 7 of Petroleum Act, 1934: No license is required for transport or storage class II petroleum if the total quantity in his possession at any one place does not exceed 2000 liters and none of it contained in a receptacle exceeding in capacity Rule 90 of The Petroleum Rules, 1937; as amended till 1989. Same as provided in section 7, 8 and 9 of the Act and by Rule 109 no one shall store any petroleum except under a license granted underneath these rules.</p>	<ul style="list-style-type: none"> License for HSD Storage has been obtained from Department of Explosive. 	Aligned	Issuing Date: 01/12/2022 Valid Till: 31/12/2025
4	THE BOILERS ACT, 1923			
4.1	Boiler Registration/Certificate:	It was observed during site inspection that Unit 3 has	Aligned	Issuing Date: 11/10/2023

SL. No	Regulatory Requirement	Finding/Observation Compliance	Compliance Rating	Implication
	Rule 7 (1) of Boiler Act, 1923: The owner of any boiler which is not registered under the provisions of this Act may apply to the Inspector to have the boiler registered. Every such application shall be accompanied by the prescribed fee.	valid Boiler Registration/Certificate obtained from the Chief Inspector of Boiler. The Registration document is attached in the ANNEX A of this document.		Valid Till: 18/10/2024
5	Fire Service and Civil Defense License			
5.1	Legislation to form rules and regulations for Fire Prevention and Extinction and Rescue Work from the Fire Combustion, 2003 and amendments 2013. According to the FSCD Act No 7 (2) (b) "Operational activities" such as fire prevention, fire extinction, rescue work from the fire combustion, operation of ambulance service, repair and maintenance of fire extinction equipment, inquiry, inspections, supervision, communication activities should be conducted in a standard manner after obtaining an NOC from FSCD.	During site visit, it was observed that fire extinguishers, fire sprinklers along with all the fire preventive equipment were stored and managed in a standard manner. The unit 3 has obtained the License from Fire Service and Civil Defense (FSCD) authority which is attached in the ANNEX A.	Aligned	Issuing Date: 01/08/2023 Valid Till: 30/06/2024

SL. No	Regulatory Requirement	Finding/Observation Compliance	Compliance Rating	Implication
6	Permission of Acid/Alkali Storage			
6.1	Permission of Acid/Alkali Storage	<ul style="list-style-type: none"> Obtained from DC Office, Sirajganj No license found of usage of Citric Acid and Sulfuric Acid 	Aligned	Issuing Date: 29/06/2023 Valid Till: 30/06/2024
7	Trade License for Power Generation			
7.1	Trade License for Power Generation from Dhaka City Corporation	<ul style="list-style-type: none"> Trade License for Power Generation have been obtained by NWPGL from Dhaka City Corporation 	Aligned	Issuing Date:14/08/2023 Valid Till: 30/06/2024
7.2	Trade License for Power Generation from Local Authority	<ul style="list-style-type: none"> Trade License for Power Generation have been obtained by NWPGL from 10 No. Soydabad UP Office 	Aligned	Issuing Date: 11/07/2023 Valid Till: 30/06/2023
8	Factory License			
8.1	Factory License from relevant regulatory body	<ul style="list-style-type: none"> Factory License has been obtained from DIFE (Department of Inspection for Factories and Establishments), Sirajganj District. 	Aligned	Issuing Date: 16/08/2023 Valid Till: 17/06/2024
9	NOC for Extraction of Groundwater			
9.1	NOC for Extraction of Ground Water from WARPO	<ul style="list-style-type: none"> NOC has been obtained from Water Resource and Planning Organization NOC has been issued subject to certain conditions. 	Aligned	Issuing Date: 22/05/2023 Valid Till: 22/05/2025

5 CORRECTIVE ACTION PLAN

Based on the independent EHS&S Compliance Audit of Sirajganj 225 MW Combined Cycle Power Plant Unit 3, during the operation phase, a Corrective Action Plan (CAP) (**Table 6**) has been prepared by prioritizing the key issues and recommendations from the gap assessment.

The CAP has been organized to include the following:

- Measure and corrective actions;
- Reference to the findings in the report;
- Significance;
- Responsibilities;
- Deliverables; and recommendation;
- Timelines for completion.

Table 6: Corrective Action Plan for Operation Phase for Sirajganj 225MW CCPP (Dual Fuel-3rd Unit)

SL#	Measures and/or Corrective Actions	Reference in the report	Significance	Responsibility	Deliverables and Recommendation	Suggested Timelines for Completion
PS 1: Assessment and Management of Environmental and Social Risks and Impacts						
1.	ESMS review and Implementation for operation phase of unit 3	Table 3; S. No. 1.1	Medium	NWPGCL	<ul style="list-style-type: none"> • ESMS is a live document, and needs to be updated, if required. • ESMS need to be updated because legal paper updated with new certificate from WARPO for Extraction of Ground Water 	8 Months
2.	Training to employees and contractors	Table 3; S. No. 1.7	Medium	NWPGCL	<ul style="list-style-type: none"> • It is recommended to include contractor person in training whoever in the premises under general OHS training. • NWPGCL to arrange training of the employees on water governance and Compliance monitoring on regular interval. 	6 Months

SL#	Measures and/or Corrective Actions	Reference in the report	Significance	Responsibility	Deliverables and Recommendation	Suggested Timelines for Completion
3.	Emergency Preparedness and Response	Table 3; S. No. 1.8	Medium	NWPGCL	<ul style="list-style-type: none"> • NWPGCL to install fire extinguisher in proper manner as sated in BLR, 2015 sec 55 (7d) • Leakage of water from Hydrant box needs to be maintained in proper manner. • NWPGCL to install evacuation plan (follow the BNBC, 2020-part IV, chapter 3 procedure) easily visible location in each floor of the factory. 	2 Months
4.	Monitoring and Review	Table 3, S.No.1.9	Medium	NWPGCL	<ul style="list-style-type: none"> • NWPGCL recommended to periodically reviewing the monitoring plan to avoid potential risk associated 	3 Months

SL#	Measures and/or Corrective Actions	Reference in the report	Significance	Responsibility	Deliverables and Recommendation	Suggested Timelines for Completion
					with the activities	
PS 2: Labour and Working Conditions						
5.	Identification of potential OHS hazards to workers, particularly those that may be life threatening	Table 3; S. No. 2.9	Medium	NWPGCL	<ul style="list-style-type: none"> NWPGCL is recommended to restrict all the motor bikes from unauthorized entry into the main plant area. 	6 Months
PS 3: Resource Efficiency and Pollution Prevention						
6.	Annual Calculation of Greenhouse Gases and climate adaptation policy for Operation phase.	Table 3; S. No. 3.4 Table 4; S. No. 1.1.5 and 1.1.6	Medium	NWPGCL	<ul style="list-style-type: none"> NWPGCL is Recommended to develop GHG reduction strategy based on annual GHG calculation documents. 	8 Months
7.	Water Consumption	Table 3; S. No. 3.5	Medium	NWPGCL	<ul style="list-style-type: none"> NWPGCL to comply with the conditions of the NOC of the WARPO. 	8 Months
8.	Pollution Prevention	Table 3, S. No. 3.6	Medium	Table 3, S. No. 3.6	<ul style="list-style-type: none"> NWPGCL need to update third party monitoring report for all environmental 	8 Months

SL#	Measures and/or Corrective Actions	Reference in the report	Significance	Responsibility	Deliverables and Recommendation	Suggested Timelines for Completion
					parameters in accordance with ECR 2023	
9.	Wastes Management:	Table 3, S. No. 3.7	Medium	Table 3, S. No. 3.7	<ul style="list-style-type: none"> NWPGCL needs to develop a sludge management plan according to DOE. 	8 Months
10.	Hazardous Materials Management.	Table 3, S. No. 3.8	Medium	NWPGCL	<ul style="list-style-type: none"> NWPGCL needs to identify/select any authorized vendor/3rd party for disposal of hazardous waste (i.e., e-waste). NWPGCL is recommended to check the leakages in the pipe that connects the fuel truck and the diesel tank and keep record of them. 	8 Months

6 CONCLUSION

In summary, according to the IFC Environmental and Social Compliance Gap Assessment Framework, it has been found that among 68 observations 47 are aligned, 18 are Partially Aligned and 3 clauses are not applicable for operation phase of unit 3 of Sirajganj 225MW CCPP (Dual Fuel) power plant.

All the Legal Register have been found aligned and updated based on review.

In total of 10 Corrective Action Plans (CAP) have been made according to their significance, responsibility and timelines for completion of actions.

Proponent should take all of clauses into consideration in a professional manner.

ANNEX A: LEGAL REGISTER

ঢাকা উত্তর সিটি কর্পোরেশন

www.dncc.gov.bd



নথীকৃত ইস্যুর ফিবার

ইস্যুর তারিখ : 14/08/2023
ইস্যুর সময় : 14/53/04



ই-ট্রেড লাইসেন্স

লাইসেন্স নং : TRAD/DNCC/856878/2022



হুগিও মতায় (সিটি কর্পোরেশন) আইন, ২০০৯ (২০০৯ খ্রিঃ ৬০ নং আইন) এর ধারা ১৯-০৫ প্রকৃত ফরমেতে সনাক্ত প্রীতি-পাল্প কর প্রদান, ২০১৯ এর ১০ অনুচ্ছেদ অনুযায়ী কর, ভূমি, পেশা বা বিত্ত প্রতিষ্ঠানের উপর আরোপিত কর আনয়নে লোক নিযুক্ত করিতে বাহিনী প্রতিষ্ঠানের অন্তর্ভুক্ত আন ট্রেড লাইসেন্সটি ইস্যু করা হইবে।

১। ব্যবসা প্রতিষ্ঠানের নাম	:	নর্ভ-ওয়েস্ট প্যাম্পার জেনারেশন কোম্পানি	
২। ব্যবসা প্রতিষ্ঠানের বসতিস্থল নাম	:	প্রাক্টিক কাপড়ী জামনার উদ্ভিদ অধ্যয়ন (বেসাম্পার) পরিচালক	
৩। পিতা / মাতার নাম	:	কাজী আবদুল উম্মীদ আহমেদ	
৪। পিতার বাস	:	কাজীপুর জেলা	
৫। ব্যবসার প্রকৃতি	:	বিভিন্ন প্রকারের পাম্পার	
৬। ব্যবসার ধরন	:	বিস্তৃত উৎপাদন কারখানা	
৭। ব্যবসা প্রতিষ্ঠানের ঠিকানা	:	৬-পেট্রোল, ইমি টি সি জামনা-০২, কাজীপুর নগর-০২, জেলা-৬০, ঢাকা	
৮। অফিস/উৎপাদন/বিক্রয় বিভাগ সংক্রান্ত	:	৬-কাজীপুর জামনা	০১৪৮: ২৪

৯। মোট/প্রতি/সাপ্তাহিক/বছর নিয়ন্ত্রণ নং	:	৯৯৯৯৯৯৯৯৯৯	সিআইএন/সিআইএন নং:
সেইদিন নং	:	৯১৯৯৯৯৯৯৯৯	ই-সেই:

১০। ভবন নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	বাসনা নং/তারিখ:
১১। মালিকের বর্তমান ঠিকানা	:		মালিকের স্থায়ী ঠিকানা

১২। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
১৩। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
১৪। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
১৫। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
১৬। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
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১৮। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
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২১। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
২২। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
২৩। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
২৪। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
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২৬। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
২৭। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
২৮। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
২৯। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	
৩০। ভাড়া নং	:	৯৯৯৯৯৯৯৯৯৯৯৯	

অন্য ট্রেড লাইসেন্স এর মেয়াদ ৩০ মে মাস, ৯৯৯৯ পর্যন্ত

লাইসেন্স ও নিয়ন্ত্রণ সুপারভাইজার



কর কর্মকর্তা

Trade License: 2023-2024



Trade License (Local)

শেখ হাসিনা সরকার
জেলা ম্যাজিস্ট্রেটের কার্যালয়, সিরাজগঞ্জ।
"৪৮" ফর্ম
[বিবি ২৩(১)(ক) প্রটো]।
এসিড ব্যবহারের লাইসেন্স



(সরকারী/আধা-সরকারী/অনুশাসিত প্রতিষ্ঠান/সেত্রে/সরকারী ও বেসরকারী শিক্ষা প্রতিষ্ঠানের ক্ষেত্রে প্রযোজ্য)

প্রত্যক্ষ বা এসিড নিয়ন্ত্রণ আইন, ২০০২ (২০০২ সনের ১ম আইন) এবং জলবায়ু আইন, ২০০৯ (আসামা উৎপাদন, মজুদ, পরিবহন, বিক্রয় ও ব্যবহার) নিয়ন্ত্রণ বিধিমালা, ২০০৪ এর বিধিমালা এবং এই লাইসেন্সে উল্লিখিত শর্তাবলী সাপেক্ষে নিম্নবর্ণিত ব্যক্তি/প্রতিষ্ঠান/সেত্রে/এসিড ব্যবহারের জন্য লাইসেন্স প্রদান করা হলো।
এই লাইসেন্স ০১ জুলাই ২০১৯ খ্রিষ্টাব্দ তারিখ পর্যন্ত মাসিক কার্যকর।

১। লাইসেন্স নম্বর-	১। ৬৪/২০১৮-২০১৯, তারিখ ২৪/১০/২০১৮
২। প্রতিষ্ঠানের নাম-	২। " সিরাজগঞ্জ ২২৫ মেগাওয়াট কয়লাইলেক্ট্রিক প্লান্ট কেন্দ্র (২৩ ও ৩৯ ইউনিট)"
৩। (ক) প্রতিষ্ঠান প্রধানের নাম ও পদবী-	৩। জনাব প্রকৌশলী মোঃ হোসেন আবু বশীম, প্রাক্তি ম্যানেজার (প্রধান প্রকৌশলী)।
(খ) ঠিকানা-	৩। সিরাজগঞ্জ ২২৫ মেগাওয়াট কয়লাইলেক্ট্রিক প্লান্ট কেন্দ্র (২৩ ও ৩৯ ইউনিট), গ্রাম ও ত্রাকমার- ময়মনসিংহ, উপজেলা- সিরাজগঞ্জ সদর, জেলা- সিরাজগঞ্জ।
৪। (ক) এসিডের নাম-	৪। হাইড্রোক্লোরিক এসিড, হাইড্রোক্সিজেন ক্লোরাইড।
(খ) কার্যিক জেটার পরিমাণ-	৪। ১০০.১ (এক হাজার এক) লিটারের উর্ধ্ব।
৫। এসিড ব্যবহারের উদ্দেশ্য-	৫। জাতীয় ট্রিটমেন্ট প্রাক্ট, সিরাজগঞ্জ ২২৫ মেগাওয়াট কয়লাইলেক্ট্রিক প্লান্ট কেন্দ্র (২৩ ও ৩৯ ইউনিট), গ্রাম ও ত্রাকমার- ময়মনসিংহ, উপজেলা- সিরাজগঞ্জ সদর, জেলা- সিরাজগঞ্জ।
৬। প্রতিষ্ঠানের স্টোরের অবস্থান-	৬। পলি পরিবেশন পদ্ধতিতে সিলভারসেলন করে রাখার।
৭। এসিড ব্যবহারের কাজে নিয়োজিত থাকবে এইরূপ ব্যক্তিবর্গের নাম এবং পদবী(সরকারী/আধা-সরকারী/অনুশাসিত প্রতিষ্ঠান/সেত্রে/এসিড ব্যবহারের ক্ষেত্রে প্রযোজ্য)।	৭। জনাব মোঃ শফিকুল ইসলামসহ আরও ৪২ জন।
৮। এসিড ব্যবহারের কাজে নিয়োজিত থাকবে এইরূপ ব্যক্তিবর্গের নাম এবং পদবী (ছাত্র ও পাবনা/বর্তমানের ক্ষেত্রে প্রযোজ্য) এবং সোল নম্বর উল্লেখ করতে হবে(সরকারী ও বেসরকারী শিক্ষা প্রতিষ্ঠানের ক্ষেত্রে প্রযোজ্য)।	৮। জায়েদা নম্বর

২০১৮-২০২০
বিজ্ঞান/স্বাস্থ্য/পরিবেশের সচিব
১৫/১০/১৮
২০১৮-২০১৯
বিজ্ঞান/স্বাস্থ্য/পরিবেশের সচিব
১৫/১০/১৮
২০১৯-২০২০
বিজ্ঞান/স্বাস্থ্য/পরিবেশের সচিব
১৫/১০/১৮

Acid/Alkali Storage License



License from BERC (2023-2024)


গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
সিরাজগঞ্জ জেলা কার্যালয়
সপ্তর্ষি হাউস, হোল্ডিং নং-১৭৫, হোসেনপুর (দক্ষিণ)
সি. ও. রোড, সদর, সিরাজগঞ্জ-৬৭০০
www.doe.gov.bd

পরিবেশগত ছাড়পত্র নবায়ন
ছাড়পত্র নং: ২০-১১১৩০৪

পরিবেশগত ব্যবস্থাপনা নিশ্চিতকরণ সাপেক্ষে সংযুক্ত শর্তে নিম্নবর্ণিত প্রতিষ্ঠান/প্রকল্পের অনুকূলে পরিবেশগত ছাড়পত্র নবায়ন প্রদান করা হলো :

প্রতিষ্ঠান/প্রকল্পের নাম	: সিরাজগঞ্জ ২২৫ মেগাওয়াট সিসিপিপি (ডুয়াল ফ্যুয়েল ৩য় ইউনিট)
উদ্যোক্তার নাম	: ব্যবস্থাপনা পরিচালক
সনাক্তকরণ নং	: ১০১১০
প্রতিষ্ঠান/প্রকল্পের কার্যক্রম	: ২২৫ মেগাওয়াট বিদ্যুৎ উৎপাদন
প্রতিষ্ঠান/প্রকল্পের শ্রেণী	: Red
প্রতিষ্ঠান/প্রকল্পের ঠিকানা	: সদরবাস, সদর, সিরাজগঞ্জ
প্রদানের তারিখ	: ২৭ নভেম্বর, ২০২৩ খ্রি:
মেয়াদ উত্তীর্ণের তারিখ	: ০৮ অক্টোবর, ২০২৪ খ্রি.



এ ছাড়পত্র সনদের সাথে পৃথকভাবে সংযুক্ত প্রদত্ত শর্তাবলী অবশ্যভাবে প্রতিপালন করতে হবে, অন্যথায় ছাড়পত্র বাতিল/অসিদ্ধপূর্ণ আদায়িত হতে কোন আইনমূল্য ব্যবস্থা গ্রহণ করা হবে।

সিদ্ধান্ত: এটি একটি সিস্টেম জেনারেটেড ছাড়পত্র এবং এতে কোনোরূপ স্বাক্ষরের প্রয়োজন নেই।

পরিবেশগত ছাড়পত্র নবায়ন এর জন্য প্রযোজ্য শর্তাবলী:

ছাড়পত্রটি যাচাই করতে ভিজিট করুন: https://ecc.doe.gov.bd/certificate_verification

Page 1 of 2

ECC from DoE-Unit 3



Bureau Veritas Certification

NORTH-WEST POWER GENERATION COMPANY LIMITED



**HEAD OFFICE: UNIQUE TRADE CENTER (LEVEL- 03 AND 04), 8 PANTHAPATH,
KAWRANBAZAR, DHAKA-1215, BANGLADESH**

This is a multi-site certificate, additional site(s) are listed on the next page(s)

*Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System
of the above organization has been audited and found to be in accordance with the
requirements of the Management System Standards detailed below.*

Standards

ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018

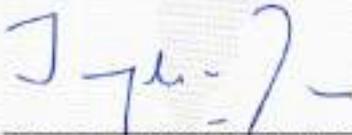
Scope of certification

CORPORATE MANAGEMENT OF POWER PLANTS, POWER GENERATION & SUPPLY TO THE NATIONAL GRID.

Original cycle start date for ISO 9001 & ISO 14001: **14 October 2016**
Original cycle start date for ISO 45001: **28 August 2018**
Expiry date of previous cycle: **13 October 2022**
Recertification Audit date: **07 August 2022**
Recertification cycle start date: **11 October 2022**

Subject to the continued satisfactory operation of the organization's Management System,
this certificate expires on: **13 October 2025**

Certificate No. **IND.22.8649/IM/U** Version: **1** Issue date: **11 October 2022**



Signed on behalf of BVCH SAS UK Branch
Jagdish N. MANIAN
Director – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division



0006

Certification body address: 5th Floor, 66 Finsbury Street, London, E1 2JQ, United Kingdom.

Local office: Bureau Veritas (Bangladesh) Pvt. Ltd.
Symphony (5th Floor), Plot- SE/718, Road-142
South Avenue, Gulshan-1, Dhaka-1212, Bangladesh.

Pg 1 of 2

Further clarifications regarding the scope of this certificate and the applicability of the
management system requirements may be obtained by consulting the organization.
To check this certificate validity please call + 44 (0) 8836265.





ISO Certificate

ক্রমিক নং

অনিক্রম ০০৩
প্রথম সংস্করণ ২০১২
V-09, P-35

ফায়ার লাইসেন্স

লাইসেন্স নম্বর: এডি/পাবনা-৩৮ ৪১/২০২১-২০২২

এতদ্বারা অগ্নি প্রতিরোধ ও নির্বাণ আইন ২০০৩ এর ৪ খারা অনুযায়ী এবং উল্লিখিত শর্তাবলী সাপেক্ষে ফায়ার লাইসেন্স ইস্যু করা হইল।

১। মালিকানা/কারখানার মালিক/ব্যবহারকারী/কর্তৃপক্ষের নাম, পদবী ও ঠিকানা :

প্রতিষ্ঠানের নাম : সিরাজগঞ্জ ২২৫ মেগাওয়াট সার্বজনীন কেন্দ্র (১ম, ২য়, ৩য়) ইউনিট ও ৭.৬ মেগাওয়াট সোলার প্রান্ট
মালিকের নাম : প্রধান প্রকৌশলী।
গ্রাম/রাস্তা: মন্ডলগাতী, ডাকঘর: ভৈকুটিয়া-৭৪০০, যশোর সদর, যশোর।

ফোন : _____ ফ্যাক্স _____ ই-মেইল :

২। মালিকানা/কারখানার অবস্থান :

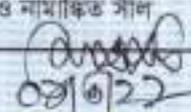
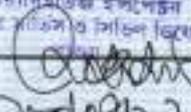
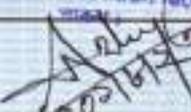
(ক) প্লট নং/হোল্ডিং নং: বড়শিমুল পঞ্চসোনা
(খ) দাগ নং: _____ (গ) বক্তিরান নং: _____ (ঘ) জে এল নং: _____
(ঙ) মৌজা: _____ (চ) রোড নং: _____ (ছ) ডাকঘর: সয়দাবাদ
(জ) থানা: সিরাজগঞ্জ (ঝ) উপজেলা: সিরাজগঞ্জ (ঞ) জেলা: সিরাজগঞ্জ

৩। ভবনের ব্যবহার শ্রেণী :

৪। ভবনের নির্মাণ শ্রেণী ও পরিমাপ : পাকা ভবন

শ্রেণী-১	শ্রেণী-২	শ্রেণী-৩	দৈর্ঘ্য	প্রস্থ	উচ্চতা	মোট মেপের ক্ষেত্রফল (বর্গ মিটার)
						৩,৪৯,৩৫০ বর্গফুট।

License of Fire Service and Civil Defense and Renewal

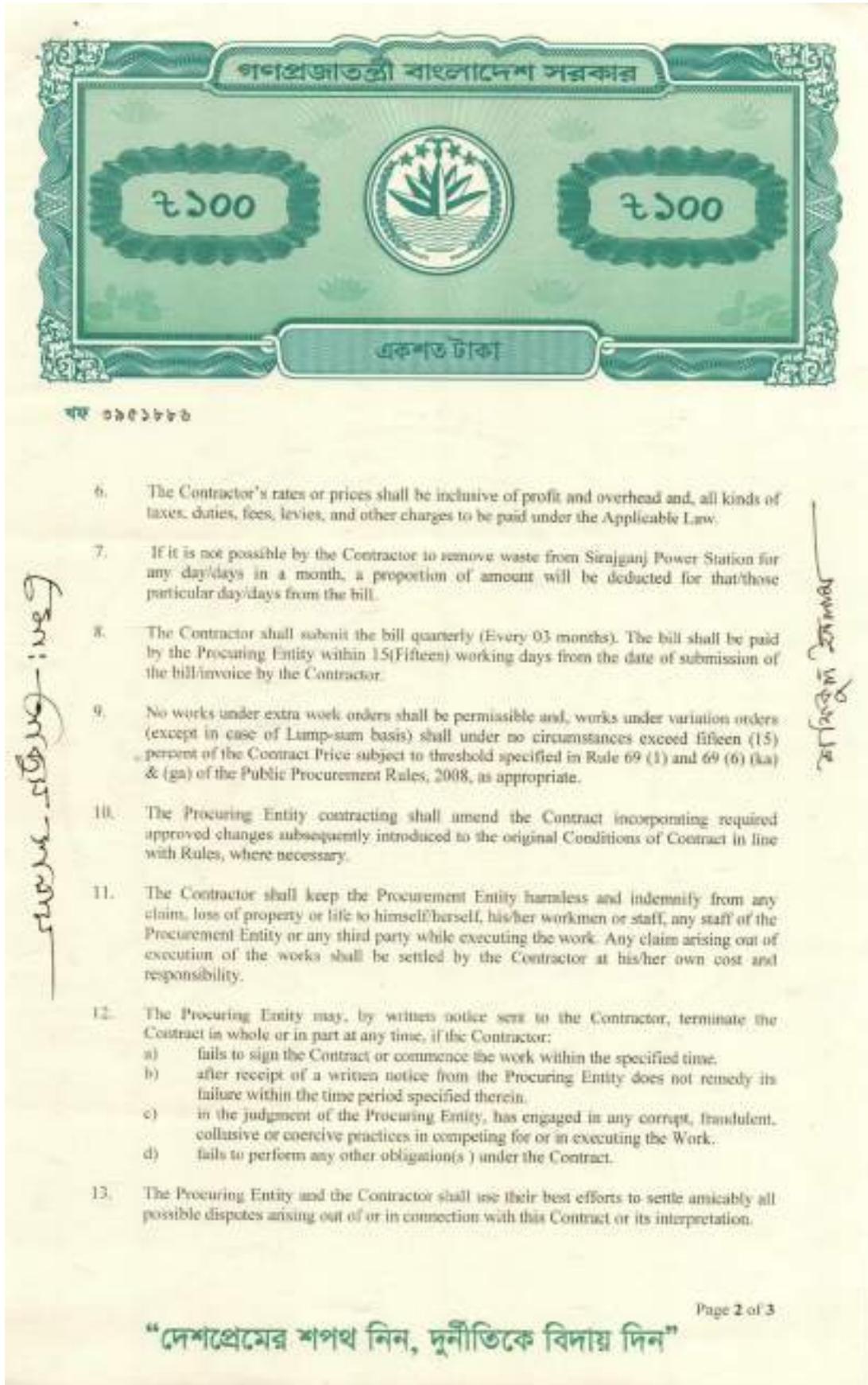
তারিখ	চালান নং	মাসলের পরিমাণ	অর্থ বছর (১ জুলাই-৩০ জুন)	নবায়নকারীর স্বাক্ষর ও নামাক্রিত সীল
২৫/২/২২	৫৫, ৫৬	= ২২০০/- vat: ২৫০/-	২০২১-২০২২	 ০৯/০২/২২ মোঃ আব্দুল হাশেম ওয়ারকার্স ইমপোর্টর ফার্মার সার্ভিস ও মিলিটারি ডিভিশন কাজনা।
২৫/৬/২২	৩২৬ ৩২৭	= ২,২০০/- vat: ২৫০/-	২০২২-২০২৩	 ২৩/০৬/২২ মোঃ আব্দুল হাশেম ওয়ারকার্স ইমপোর্টর ফার্মার সার্ভিস ও মিলিটারি ডিভিশন কাজনা।
২৫/৬/২৩	৪৩০ ৪৩১	২২০০/- vat: ২৫০/-	২০২৩-২০২৪	 ০৯/০৬/২৩ মোঃ আব্দুল হাশেম ওয়ারকার্স ইমপোর্টর ফার্মার সার্ভিস ও মিলিটারি ডিভিশন কাজনা।

License of Fire Service and Civil Defense and Renewal



Boiler Certificate/License







Contract Agreement between NWPGL and 3rd Party Waste Collector

EQMS

Building Safety Certificate

This is to certify that the officer's Dormitory Building-01, officer's Dormitory Building-02, Staff Dormitory Building, G.M residence Building and Rest House (All three Storied Building) of NWPGL (North West Power Generation Company limited) located at Shirajganj Power Station, Bangladesh, Has accomplished the requirement of initial Structural inspection report.

Therefore it can be said that aforementioned buildings could be considered structurally safe with the limitations of-

1. 2 KN/m^2 Live load are recommended to be strictly followed;
2. The periodic maintenance works are recommended to be strictly followed;
3. Any types of hazards material/liquid should be kept away from the building;
4. No more modifications or extension works will be carried out without written permission from the consultants.

Guni



Engr.Md.Osman Guni
Structural Engineer
MIEB-31.9967
DMINB-CE/CR-0505
EQMS Consulting Ltd

EQMS Consulting Ltd.

Apt: House: 53, Road: 4, Block: C, Banani, Dhaka -1213, Bangladesh
Phone: +88-029878282; Mobile: +88-01911702074
Email: info@eqmsbd.com, eqmsbd@gmail.com
Web: www.eqms.com.bd

Building Safety Certificate

Government of the People's Republic of Bangladesh
Ministry of Water Resources
Water Resources Planning Organization
www.warpo.gov.bd



Memo.No: 42.02.0000.010.36.017.22-784

Date: 22/05/2023

Sub: No Objection Certificate (NOC) for abstraction of groundwater by 'North-West Power Generation Company Limited', Soidabad, Sirajganj.

In reference to your application to grant permission for abstraction of Groundwater by your Company as per Bangladesh Water Act, 2013 and Bangladesh Water Rules, 2018; Water Resources Planning Organization (WARPO) has reviewed your application, data and information regarding water resources availability (groundwater & surface water) on the surrounding areas of the proposed project and agreed to allow using groundwater water on certain conditions.

The 'No Objection Clearance (NOC)' hereby issued subject to the following conditions.

1. Permit for abstraction of Ground Water of maximum amount 400 m³/hour by submersible pumps for the 'North-West Power Generation Company Limited', Soidabad, Sirajganj.
2. Two or more pumps shouldn't be operated concurrently. Maximum operation of per pump should be limited to ten hours /day. If the aquifer water level decline and doesn't recover, ground water abstraction should be stopped.
3. The permit would be valid for 2 (two) years from the date of issue and will require renewal before 30 days of the end period.
4. The Water will not be used in other purposes except the approved case i.e. Company's manufacturing, daily uses for the employees etc.
5. To reduce the pressure on ground water, it is strongly encouraged to use of Surface Water from nearby River and other Water Sources.
6. A detailed study on "water resources availability and impact due to abstraction, use and discharge to the project area and surroundings considering the shallow and deep aquifer, EIA, SIA and model simulation" has to be submitted to WARPO within next six months.
7. Monitoring well has to be installed on project side to measure the groundwater level.
8. The daily measured or collected groundwater level data of the monitoring well, volume and quality of abstracted Water, Water demand by the industry have to be provided to WARPO on quarterly basis.
9. The Depth of Deep Tube well, Diameter of Pipe, Horse power (HP) of Pump cannot be changed without permission of WARPO Authority.
10. The Distance between the two Deep Tube wells will have to be followed as per condition no 5 of Togsil-1 of "Groundwater Management Rules for Agricultural Purposes 2019".
11. The project will not pollute the nearby water body and will not deteriorate bio-diversity and freshwater ecosystems dependent upon the water body concerned and will not hamper water security and water right of nearby community.
12. The project will not change the natural flow of water as per Bangladesh Water Act, 2013, article 34.

13. The treated discharge water might be reserved in a pond excavated by the Authority within the boundary of the Project area and the discharge water will not do any harm to the aquatic bionetwork. It is strongly discouraged to discharge treated the waste water in the natural Channel or River. However, There should have a mechanism of "3Rs" (reduce, reuse and recycle) policy for management of waste water.
14. There should have a rainwater harvesting system and the harvested water can be used for different purposes.
15. In case of any adverse impact on the nearby community due to groundwater abstraction by company, immediate mitigation measures and compensation must be ensured and be reported to WARPO.
16. There should have adequate green space with vegetation around the plant area. It is recommended to build a water reservoir for recharge to Groundwater. However, it is strictly prohibited to inject the contaminated water or wastewater to the underground aquifer.
17. The Company will arrange the Training Programme regarding 'Water Governance and Compliance Monitoring' time to time to their employees.
18. Extensive awareness need to be built regarding water use and impact to the employees of the company and the nearby community of project area.
19. The NOC is not transferable/exchangeable without the prior approval.
20. Within the validity period of the NoC, any decision (imposition of water charges, issuance/renewal fee or service charge for NoC/ Clearing Certificate, levy of penalty for violation of enforcement or protection order, etc.) taken by the Government under the Bangladesh Water Act, 2013 and Bangladesh Water Rules, 2018 shall be applicable.
21. WARPO authority can change the existing conditions or add new conditions if necessary within the clearance time period. Moreover, the Authority reserve the power to cancel the 'NOC' if any condition of 'NOC' or Provision of Bangladesh Water Act, 2013 and Bangladesh Water Rules, 2018 is violated.
22. 'Clearance Certificate' will have to be taken from 'Department of Environment (DoE).

BH
22/05/2023
(Md. Rezaul Maksud Jabedi)
Director General, WARPO
Phone: 44819006
E-mail: dg@warpo.gov.bd

Chief Engineer
North-West Power Generation Company Limited,
Soidabad, Sirajganj.

Copy for kind information:

1. Director General, Department of Environment (DoE), Agargaon, Dhaka
2. Deputy Commissioner & Chairman, District Integrated Water Resources Management Committee, Sirajganj.
3. PS to Secretary (for kind information to Secretary), Ministry of Water Resources.
4. PS to DG, WARPO (For kind information of DG, WARPO)
5. Office Copy.

NOC form WARPO

ANNEX B: PHOTO DOCUMENTATION



Opening meeting with NWPGL management



Proper safety cautions board on the way to premise



Proper safety cautions on the way to premises



Good house keeping observed at the premise



Fire Extinguisher found on the ground at some locations



Fire Extinguisher were found hanging on the wall at some locations



Speed limit signage properly display



Convex Traffic Mirrors for Traffic Control



Eye wash basin observed at the chemical storage



Good housekeeping observed at chemical storage



Segregated waste bins observed at the plant premise



Good condition of the hose pipe



Proper Caution Signage



Inappropriate motorcycle parking in whole plant area



Signages of assembly point displayed in several visible locations at the premise



Fuel unloading area



Proper safety instruction and signage observed



Grievance box at entry point of the plant



Properly segregated used oil drum



Consultation with the community people



Proper safety cautions on the way to premises



Consultation with the community people



Water Leakage in Fire Hydrant System



Water Leakage in Fire Hydrant System



Demarcation of Assembly Point



Pillar Hydrant System at Project Area



Emergency Contact Number at project site



Toilet are found with good condition



Dedicated parking area



Worker with proper PPE



Fire service vehicles at project area

Tree plantation at whole project area



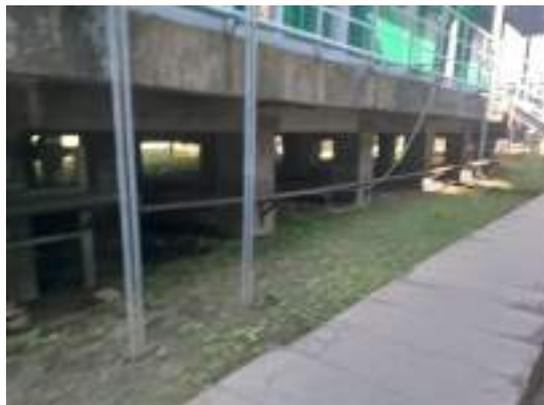
Chemical storage in open area

Chemical storage in open area



MSDS at Chemical storage

Precaution from Snake

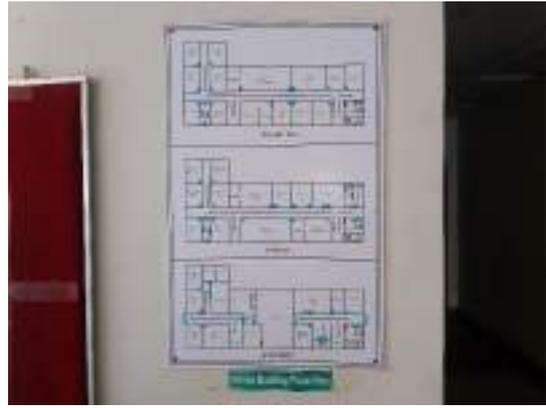


Oil and grease was found on the floor from crane

Water leakage maintain by reusing water at WTP



Waste dumping area are found cleaned



Emergency Evacuation Plan at Admin Building
