Orion Power Unit-2 Dhaka Ltd.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR 635 MW COAL BASED THERMAL POWER PLANT AT MATARBARI, MAHESHKHALI, COX'S BAZAR

VOLUME II: APPENDIXES

SEPTEMBER 2023

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19 September 2023

APPENDIXES OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR 635 MW COAL BASED THERMAL POWER PLANT AT MATARBARI, MAHESHKHALI, COX'S BAZAR

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Principal Consultant

Approved by:

Kazi Farhed Iqubal
Executive Director

LIST OF APPENDIXES

APPENDIX

Appendix A: Approved TOR of the Study

শেখ হাসিনার বাংলাদেশ
পরিচ্ছন্ন পরিবেশ

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Sher-e-Bangla Nagar, Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.0000.018.72.129.22.186 Date: 12 October, 2021

Subject: Exemption from IEE and approval of Terms of Reference (ToR) for Environmental Impact Assessment (EIA) for 635 MW Coal based Thermal Power Plant, Orion Power Unit-2 Dhaka Limited at Matarbari, Maheshkhali, Cox's Bazar.

Ref: Yours letter No. OPDL2_DOE_2022_17; Dated: 17.09.2022

With reference to your letter received on 19.09.2022 for the subject mentioned above, the Department of Environment hereby gives exemption from IEE and approval of Terms of Reference for Environmental Impact Assessment (EIA) for **635 MW Coal based Thermal Power Plant, Orion Power Unit-2 Dhaka Limited at Matarbari, Maheshkhali, Cox's Bazar** subject to fulfilling the following terms and conditions:

I. The project authority shall submit a comprehensive Environmental Impact Assessment (EIA) considering the overall activity of the said project in accordance with the TOR submitted to the Department of Environment (DOE) and additional suggestions provided herein.

II. The EIA report should be prepared in accordance with following indicative outlines:

1. Introduction:
This chapter should cover purpose of the project, project proponent, brief description of the project name, nature, size, location of the project and its importance to the region/country. This character should also include methodology of the study, policy and regulatory background.

2. **Executive Summary:**
A brief description of the proposed project in clear and non-technical language including:
- The objective and need for the project;
- Total area of the proposed site, summary of key findings and recommendation of the assessment, including the main environmental, social issues and economic impacts and benefits encompassing cumulative impacts and proposed mitigation and enhancement measures;
- A brief description on how the public was consulted and stating the issues raised, resolved and pending;
- Studies on alternative to the project and the proposed sites of the projects and its ancillary components such as approach road, coal storage & transportation, labour camps, crushing plants and others with proper justification on their feasibility considering technical, environmental, social and economic concerns;
- Make use of maps, tables and figures wherever possible to make the report clear and understandable to the reader/reviewer. Highlight the technical and procedural aspects that need to be addressed so that they do not hamper the work progress during implementation and the recommended strategies to circumvent such risks;
- Project financial statement and the project activity schedule;
- A declaration stating that the information disclose in the EIA report is correct.

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3. Project Description

The chapter contains the broader details of the basic activities, location, lay out and implementation schedule of the project.

- Location of the project (Longitude, Latitude, village, Mouzas, Upazillas, nearest Seaport, airport, and KPI);
- Objective of the project;
- Project Layout and land requirement;
- Fuel and water requirement (availability and quality);
- Technology Selection and Process Description;
- Description of Major Systems
- Utility for the proposed plant operation
- Other plant facilities
- Significance and relevance of the project highlighting the benefit to surrounding area and economic development of the local and national;
- Location of Wildlife sanctuary, Ecologically Critical Area (ECA), migratory routs of wild animals etc. within 10 km of the project area.

3.1. Study area map:

A topographical map 1:25,000 scale (if not available in 1:50000) of the study area (core zone and 10 km area of the buffer zone from boundary of the core zone) delineating the major topographical features such as land use, drainage, locations of habitats, major constructions including roads, railways, pipelines, major industries if any in the area are to be mentioned.

A topographical map, covering aerial distance of 10 km from the proposed project location and delineating environmental sensitive areas. In the same map the details of environmental sensitive areas present within a radial distance of 1 km from the project boundary should be specifically shown.

In addition to study area map, a location map of the proposed power plant and a location map of the project site shall be incorporated.

4. Description of the Environment/ Baseline Environmental Status:

Environmental data to be collected in relation to proposed project would be: (a) land (b) water (c) air (d) biological (e) noise and vibration (f) socio economic (g) health environment etc.

Study area for the projects should be defined as follows:

- Study Area (10 Km. radius)
- Hydrogeology
- Meteorology
- Ambient Air Quality
- Ambient Noise Quality
- Surface & Ground Water Quality
- Aquatic Monitoring
- Soil characteristics
- Ecology
- Forests
- Flora
- Fauna
- Demography Profile and Occupational Pattern

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- Land Use and Cropping Pattern
- Socio-economic Scenario
- Distance to Urban and Rural Communities (proximity to sensitive receptors)
- Transmission Capacity/Options for Linking to Grid
- Distance to Existing Infrastructure Such as Roads, Ports, Rail, etc.

Baseline information is required to be collected by field survey, monitoring etc. Secondary data with source should be clearly mentioned. Normally, one season monitoring data (excluding monsoon) are to be collected. However, specify collection of baseline data for a longer period base on the nature, size and location of the project.

5. Environmental Impacts:

5.1 Identification of Impact;

5.2 Construction Stage Impact:

- 5.2.1 Impact on Landuse
- 5.2.2 Impact on Natural Resources
- 5.2.3 Impact on Ambient Air
- 5.2.4 Impact on Ambient Noise
- 5.2.5 Impact on Water Bodies
- 5.2.6 Impact on Soil
- 5.2.7 Impact on Workers Health, Sanitation and Safety
- 5.2.8 Impact on Key Point Installations & Others
- 5.2.9 Solid Waste Disposal
- 5.2.10 Social Impact due to industrial set up
- 5.2.11 Impact due to transportation of raw materials

5.3 Operation Stage Impact:

- 5.3.1 Impact on Natural Resource
- 5.3.2 Impact due to collection of Resources from Local Sources within the Country (if any)
- 5.3.3 Impact on Ambient Air
- 5.3.4 Impact on Ambient Noise
- 5.3.5 Impact on Water Bodies (both surface & ground)
- 5.3.6 Solid Waste Disposal
- 5.3.7 Soil and Agriculture
- 5.3.8 Impact on Ground Water
- 5.3.9 Impact due to Ash Disposal
- 5.3.10 Ecology (Flora and Fauna)
- 5.3.11 Impact on Occupational Health
- 5.3.12 Impact on Public Health and Safety
- 5.3.13 Impact on Traffic Movement
- 5.3.14 Social Impact
- 5.3.15 Impact due to transportation of primary fuels

6. Evaluation of Impacts:

The impacts should be evaluated in terms of their local, regional and national importance. The impact should be assessed in terms of the magnitude, significance, frequency of the occurrence, duration and probability. The confidence level in the prediction must be stated. The judgment of significance of impacts can be based on one or more of the following, depending on the environmental factor being evaluated. These are:

- Comparison with laws, regulation or accepted national or international standards;
- Reference to pre-set criteria such as conservation or protected status of a site, feature or species;

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- Consistency with pre-set policy objectives;
- Consultation and acceptability with the relevant decision makers, civil society, local community or the general public.

7. **Mitigation of Impacts:**
Mitigation measures which may be of the following categories and coverage:
- Changing project layout, transport routes, disposal routes or locations, timing or engineering design;
- Introducing pollution controls, waste treatment, phased implementation and construction, engineering measures, monitoring, landscaping, social services or public education;
- Rehabilitation, compensation to restore, relocate or provision of concession for damage.

8. **Analysis of Alternatives for Technology and Project site:**
8.1 Analysis of alternative Technology
8.2 Analysis of alternative site for location of power plant

9. **Environmental Management Plan:**
9.1 EMP during Preparation Phase-
9.1.1 Land Development;
9.1.2 Location and Sources of Soil and other Material for Development;
9.1.3 Transport of Soil and other Material;
9.1.4 Method and Equipment for Collection of Soil and Other Material;
9.1.5 Closing of Sites of Sources of Soil and Other Material.

9.2 EMP during Construction Phase-
9.2.1 Site Preparation;
9.2.2 Infrastructure Services;
9.2.3 Construction Equipment;
9.2.4 Safety Measures.

9.3 EMP during Operation Phase-
9.3.1 Air Pollution Management
8.3.1.1 Transportation and Handling of Raw Materials
8.3.1.2 Operation Stage
9.3.2 Waste Water Management
9.3.3 Noise Management
9.3.4 Solid Waste Management
8.3.4.1 Fly Ash Utilization
8.3.4.2 Ash Utilization
9.3.5 House Keeping
9.3.6 Safety and Occupational Health

9.4 Greenbelt Development
9.5 Rain Water Harvesting Plan
9.6 Rehabilitation and Resettlement Plan
9.7 Thermal Pollution Management
9.8 Coal washery (if any)
9.9 Coal Yard Management
9.10 CDM Intent
9.11 Budget for EMP
9.12 Contingency Plans

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The project authority shall:

a) Provide a conceptual contingency plan that considers environmental effects associated with operational upset conditions such as serious malfunctions or accidents;

b) Describe the flexibility built into the plant design and layout to accommodate future modifications required by any change in emission standards, limits and guidelines.

10. Environment Monitoring Plan:

10.1 Monitoring Plan:
- 10.1.1 Stack Emission Monitoring
- 10.1.2 Ambient Air Monitoring
- 10.1.3 Meteorological Monitoring
- 10.1.4 Equipment and Ambient Noise
- 10.1.5 Surface Water & Waste Water Monitoring
- 10.1.5 Ground Water Monitoring
- 10.1.6 Solid & Hazardous Waste Monitoring
- 10.1.7 Flora and Fauna Monitoring
- 10.1.8 Workers Health and Safety Monitoring
- 10.1.9 Community Health Monitoring
- 10.1.10 Monitoring and CSR Activities

10.2 Action during abnormal operating conditions
10.3 Budgets for monitoring
10.4 Reporting

11. Work Plan:

12. Public Consultation:

Public Consultation both in Local and National Level should be carried out. Public Consultation ensures that consultation with interested parties and the general public will take place and their views taken into account in the planning and execution of the project. Some of the authorities to be engaged include: Department of Environment, Forest Department, Water Development Board, BIWTA, Port Authority, RHD, PWD, DPHE, Bangladesh Parjatan Corporation, Department of Fisheries, LGED, other national/local departments where deemed necessary, Local Administrations (DC, UNO, UP Chairman & Members), Local Communities, Non-Governmental Organizations, etc.

The project authority must provide a detailed Public Participation Plan, which shall include, but not be limited to the following: A timetable for communication, detailing who will be consulted and why; as a minimum, one public meeting should be held during the Scoping phase and one public meeting during the impact assessment phase (although this number might be increased due to the width of the study area). The timing of these meetings would be decided upon in conjunction with relevant stakeholders; ensure that the public participation process complies with the relevant EIA regulations; compile minutes of the meetings and send to all participants and organize appropriate feedback mechanisms for public comment.

13. Response to Comments:

A response to each comment received on the environment assessment should be included in a separate append, unless this section clearly explains the location and response to each comment.

14. Disclosure of consultants engaged:

The team of consultants engaged in this project is to be given.

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15. Enclosures:
Feasibility Report /Questionnaire / Photos and plate of the Project Site.

III. The project authority shall submit the EIA report along with an application for Environmental Clearance in prescribed form, the applicable fee in a treasury Chalan, the applicable VAT on clearance fee in a separate treasury Chalan, the No Objection Certificates (NOC) from local authority, NOC from Forest Department (in case of cutting any forested plant, private or public) and NOCs from other relevant agencies for operational activity etc. to the Cox's Bazar District Office of DOE at Cox's Bazar.

IV. Without approval of EIA report by the Department of Environment, the project authority shall not undertake land and infrastructural development and open L/C in favor of importable machineries.

V. Without obtaining Environmental Clearance, the project authority shall not start operation of the project.

12.10.22

(Masud Iqbal Md. Shameem)
Director (Environmental Clearance)
Phone # 02-8181673

Managing Director
635 MW Coal based Thermal Power Plant, Orion Power Unit-2 Dhaka Limited
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Copy Forwarded to:
1. Director, Department of Environment, Cox's Bazar District Office, Cox's Bazar.
2. Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

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Appendix B: Applicable Standards

Appendix B-1: Standards for Water Quality in Bangladesh

A. Standards for Inland Surface Water

S/N	Best Practice-Based Classification	Parameters											
		pH	DO	BOD	NO_3-N	NH_4-N	PO_4-P	Total Cr	Pb	Hg	Total Coliform	TDS	COD
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L
1	Source of drinking water for supply only after disinfecting	6.5 - 8.5	≥ 6	≤ 2	7.0	0.1	0.1	0.02	0.03	0.001	≤ 100	1000	10
2	Water usable for recreational activity	6.5 - 8.5	≥ 5	≤ 3	7.0	0.3	0.5	0.2	0.05	0.001	≤ 50	1000	10
3	Source of drinking water for supply after conventional treatment	6.0 - 9.0	≥ 5	≤ 3	7.0	0.3	0.5	0.02	0.03	0.001	≤ 5000	1000	25
4	Water usable by fisheries	6.0 - 9.0	≥ 5	≤ 6	7.0	0.3	0.5	0.05	0.1	0.004	≤ 5000	1000	50
5	Water usable by various process and cooling industries	6.5 - 8.5	≥ 1	12	-	2.7	-	0.1	0.1	0.05	-	1000	100
6	Water usable for irrigation	6.5 - 8.5	-	≤ 12	5.0	1.5	2.0	0.1	0.1	0.002	≤ 50000	1000	100

Notes:

1. In water used for irrigation water, electrical conductivity is 2250 µS/cm (at a temperature of 25°C); Sodium is less than 26%; boron is less than 0.2%.

Source: The Environment Conservation Rules, 2023: Schedule-2 A (1)

B. Standards for Coastal Water

Category		Conservation		Recreation		Fisheries	Industry
Class		Coral Community	Natural Area[1]	Direct Contact[2]	Indirect Contact[3]	Aquaculture and shellfish Culture	Industries and Others
Parameters	Unit						
pH	-	7.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 9.0
Suspended Solids	mg/L	2	25	5	10	50	100
Dissolved Oxygen (DO)	mg/L	≥ 5	≥ 5	-	-	≥ 5	≥ 4
COD	mg/L	2	8	-	-	5	5
Total Coliform	CFU/100 mL	1000	1000	1000	5000	1000	-
Fecal Coliform	CFU/100 mL	200	200	200	1000	200	-
Nitrate-Nitrogen (NO_3^--N)	mg/L	0.2	0.3	0.8	0.8	0.8	1.0
Phosphate (PO_4^{3-})	mg/L	0.04	0.05	0.08	0.08	0.08	0.1
Oil and Grease	mg/L	0.01		-	-	0.14	5.0
Phenols	mg/L	0.05		-	-	0.05	0.05
Arsenic (As)	mg/L	0.001		-	-	0.003	0.003
Cadmium (Cd)	mg/L	0.005		-	-	0.005	0.005
Cyanide (Cn)	mg/L	0.002		-	-	0.007	0.0014
Chromium (Hexavalent Cr)	mg/L	0.05		-	-	0.05	0.1
Lead (Pb)	mg/L	0.05		-	-	0.05	-
Mercury (Hg)	mg/L	0.0001		-	-	0.0001	0.0001

Note:

1. Conservation of natural area i.e., mangrove, sea grass, wildlife habitat and marine spawning, nursing and feeding ground.
2. Water sports i.e., swimming, diving, surfing where there is direct contact with water.
3. Water sports i.e., sailing, fishing, and other activities where the possibility of contact with water is minimal.

Source: The Environment Conservation Rules, 2023: Schedule-2 A (2)

C. Standards for Drinking Water

S/N	Parameters	Unit	Bangladesh Standards
1	Aldrin/Dieldrin	µg/L	0.03
2	Aluminum (Al)	mg/L	0.20
3	Ammonia (NH_3)	mg/L	1.50
4	Anionic Detergent	mg/L	0.20
5	Arsenic (As)	mg/L	0.05
6	Barium (Ba)	mg/L	0.70
7	Benzene (C_6H_6)	mg/L	0.01
8	Boron (B)	mg/L	1.0
9	Cadmium (Cd)	mg/L	0.003
10	Calcium (Ca)	mg/L	75
11	Chloride	mg/L	250[a]
	Chlorinated Alkanes		
12	Carbon Tetrachloride (CCl_4)	mg/L	0.005
13	1,1 Dichloroethane (1,1 $C_2H_4Cl_2$)	mg/L	0.03
14	1,2 Dichloroethane (1,1 $C_2H_4Cl_2$)	mg/L	0.03
15	Tetrachloroethane ($C_2H_2Cl_2$)	mg/L	0.04
16	Trichloroethane ($C_2H_3Cl_3$)	mg/L	0.02
	Chlorinated Phenols		
17	Pentachlorophenol	mg/L	0.009
18	2,4,6 Trichlorophenol	mg/L	0.20
19	Chlorine (Free Residual)	mg/L	0.20
20	Chloroform ($CHCl_3$)	mg/L	0.09
21	Chromium (Total Cr)	mg/L	0.05
22	Coliform (Fecal)	CFU/100 mL	0
23	Coliform (Total)	CFU/100 mL	0
24	Color	Hazen unit	15
25	Copper (Cu)	mg/L	1.5
26	Cyanide (CN)	mg/L	0.05
27	Fluoride	mg/L	1.0
28	Hardness (as $CaCO_3$)	mg/L	500
29	Iron (Fe)	mg/L	0.3–1.0
30	Kjeldhl Nitrogen (Total)	mg/L	1.0
31	Lead (Pb)	mg/L	0.01
32	Magnesium (Mg)	mg/L	30–35
33	Manganese (Mn)	mg/L	0.40
34	Mercury (Hg)	mg/L	0.001
35	Nickel (Ni)	mg/L	0.05
36	Nitrate (NO_3^-)	mg/L	45
37	Nitrite (NO_2^-)	mg/L	1.0
38	Odor	-	Odorless
39	Oil and Grease	mg/L	0.01
40	pH	-	6.5 - 8.5
41	Phenolic Compounds (Phenols)	mg/L	0.002
42	Potassium (K)	mg/L	12
43	Radioactive Materials (Gross Alpha Activity)	Bq/L	0.1
44	Radioactive Materials (Gross Beta Activity)	Bq/L	1.0

S/N	Parameters	Unit	Bangladesh Standards
45	Selenium (Se)	mg/L	0.01
46	Silver (Ag)	mg/L	0.02
47	Sodium (Na)	mg/L	200
48	Suspended Particulate Matters	mg/L	10
49	Sulfide as Hydrogen Sulfide (Sulfide as H_2S)	mg/L	0.05
50	Sulfate (SO_4^{-2})	mg/L	250
51	Total Dissolved Solids (TDS)	mg/L	1,000
52	Temperature	°C	20 - 30
53	Tin (Sn)	mg/L	2.0
54	Turbidity	NTU	5.0
55	Zinc (Zn)	mg/L	5.0

Note: In coastal area, the standard for chlorine is 1000 mg/L.

Source: The Environment Conservation Rules, 2023: Schedule-2 (b)

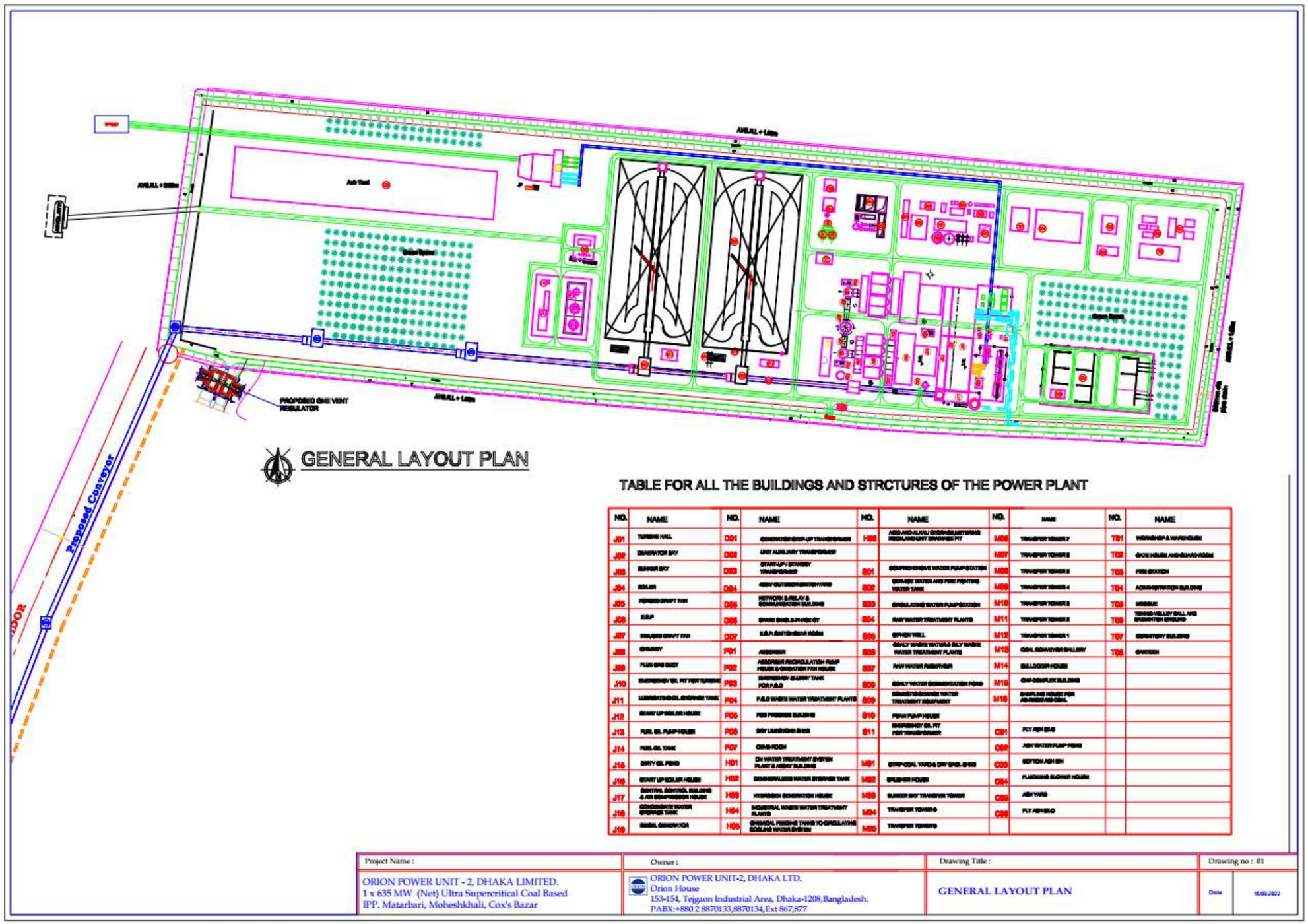
Appendix B-2: Standards for Odor in Bangladesh

S/N	Parameter	Unit	Standard Limit
1.	Acetaldehyde	ppm	0.5–5
2.	Ammonia	ppm	1–5
3.	Hydrogen Sulfide	ppm	0.02–0.2
4.	Methyl Disulfide	ppm	0.009–0.1
5.	Methyl Mercaptan	ppm	0.02–0.2
6.	Methyl Sulfide	ppm	0.01–0.2
7.	Styrene	ppm	0.4–2.0
8.	Trimethylamine	ppm	0.005–0.07

Source: Air Pollution Control Rules 2022 (Schedule-4)

Appendix C: Project Drawings

Appendix C-1: Project Layout



Appendix C-2: Project Layout with Conveyer belt

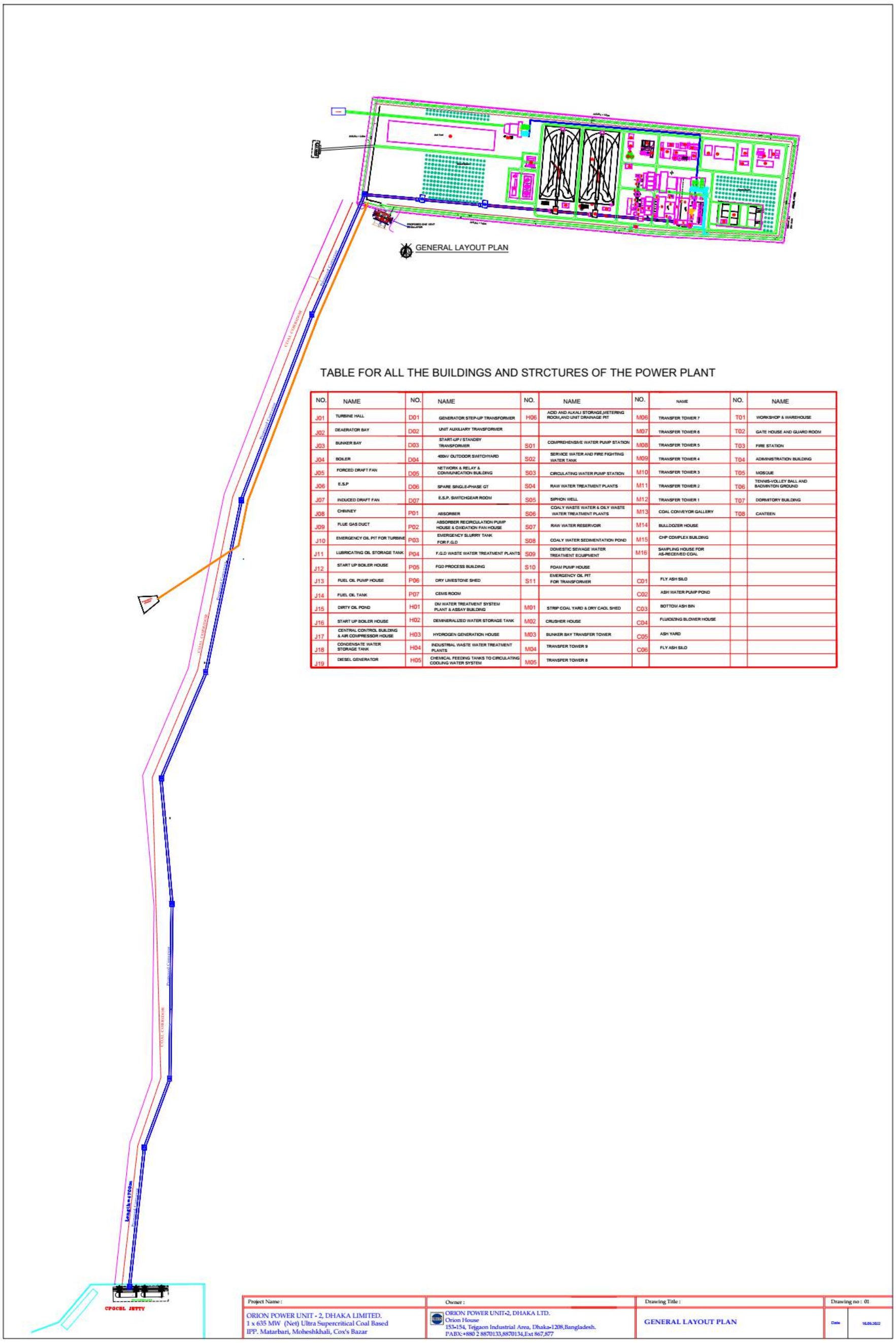
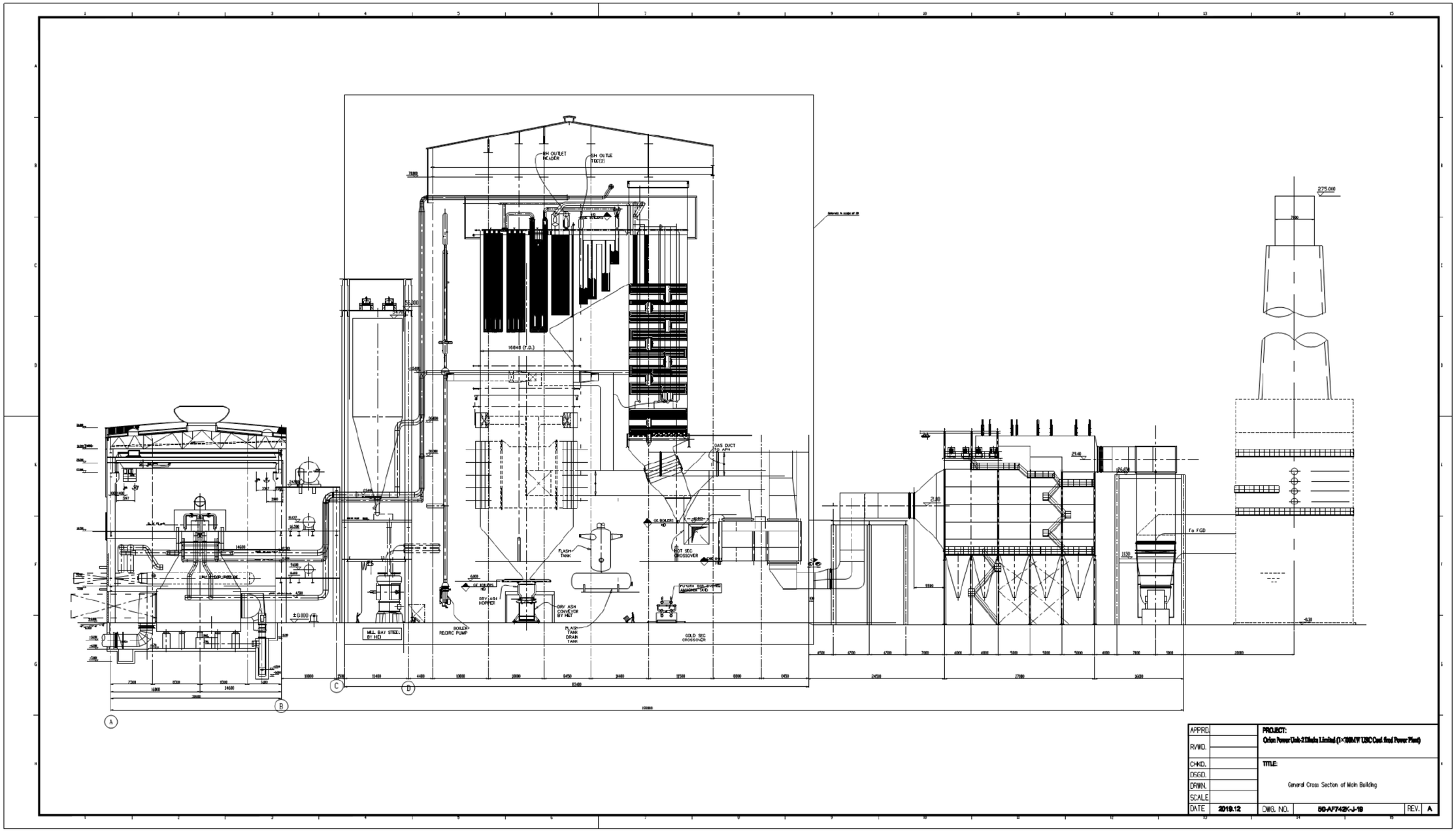


TABLE FOR ALL THE BUILDINGS AND STRCTURES OF THE POWER PLANT

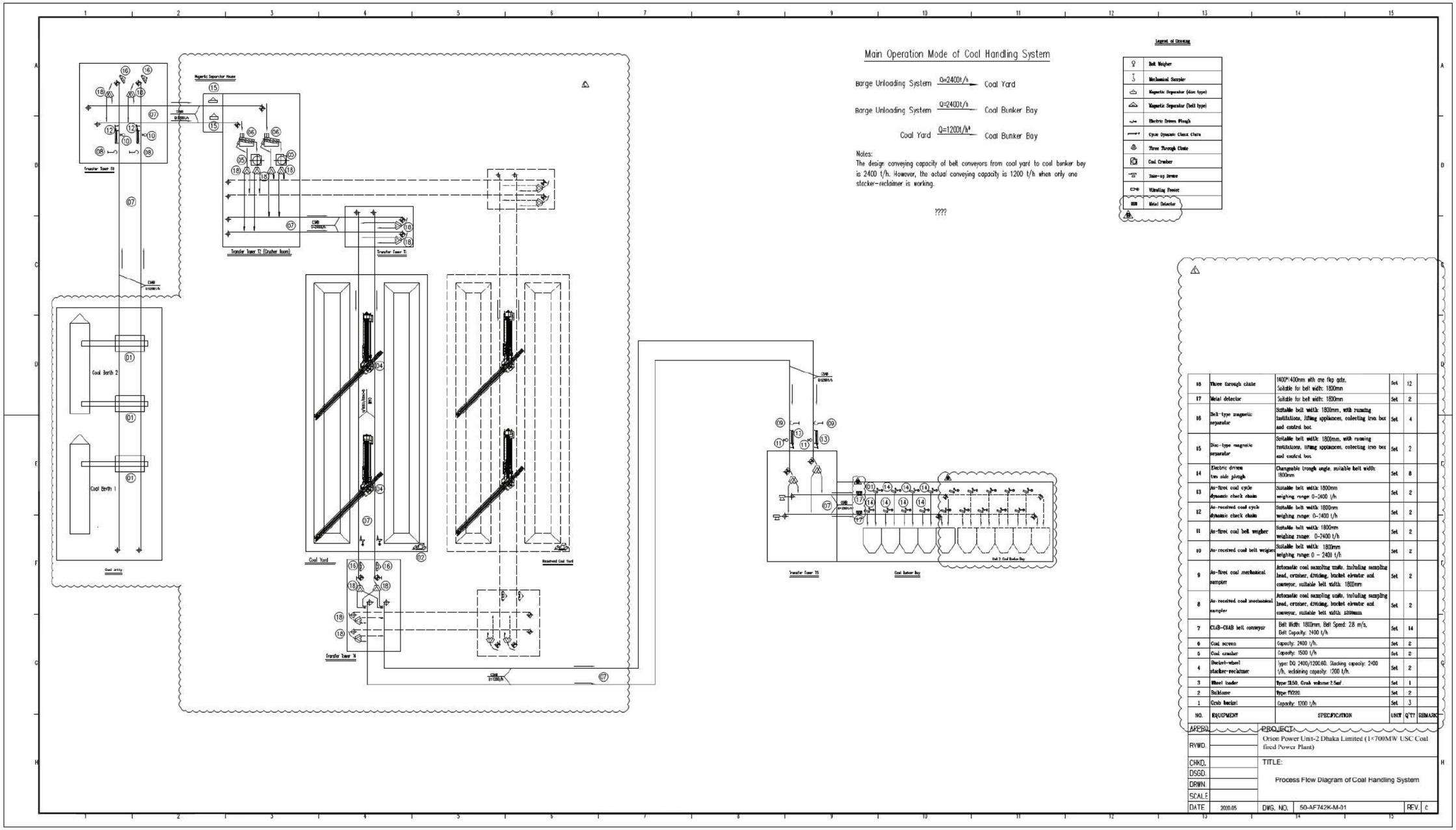
NO.	NAME	NO.	NAME	NO.	NAME	NO.	NAME	NO.	NAME
J01	TURBINE HALL	D01	GENERATOR STEP-UP TRANSFORMER	H06	ACID AND ALKALI STORAGE,METERING ROOM,AND UNIT DRAINAGE PIT	M06	TRANSFER TOWER 7	T01	WORKSHOP & WAREHOUSE
J02	DEAERATOR BAY	D02	UNIT AUXILIARY TRANSFORMER			M07	TRANSFER TOWER 6	T02	GATE HOUSE AND GUARD ROOM
J03	BUNKER BAY	D03	START-UP / STANDBY TRANSFORMER	S01	COMPREHENSIVE WATER PUMP STATION	M08	TRANSFER TOWER 5	T03	FIRE STATION
J04	BOILER	D04	400kV OUTDOOR SWITCHYARD	S02	SERVICE WATER AND FIRE FIGHTING WATER TANK	M09	TRANSFER TOWER 4	T04	ADMINISTRATION BUILDING
J05	FORCED DRAFT FAN	D05	NETWORK & RELAY & COMMUNICATION BUILDING	S03	CIRCULATING WATER PUMP STATION	M10	TRANSFER TOWER 3	T05	MOSQUE
J06	E.S.P	D06	SPARE SINGLE-PHASE GT	S04	RAW WATER TREATMENT PLANTS	M11	TRANSFER TOWER 2	T06	TENNIS-VOLLEY BALL AND BADMINTON GROUND
J07	INDUCED DRAFT FAN	D07	E.S.P. SWITCHGEAR ROOM	S05	SIPHON WELL	M12	TRANSFER TOWER 1	T07	DORMITORY BUILDING
J08	CHIMNEY	P01	ABSORBER	S06	COALY WASTE WATER & OILY WASTE WATER TREATMENT PLANTS	M13	COAL CONVEYOR GALLERY	T08	CANTEEN
J09	FLUE GAS DUCT	P02	ABSORBER RECIRCULATION PUMP HOUSE & OXIDATION FAN HOUSE	S07	RAW WATER RESERVOIR	M14	BULLDOZER HOUSE		
J10	EMERGENCY OIL PIT FOR TURBINE	P03	EMERGENCY SLURRY TANK FOR F.G.D	S08	COALY WATER SEDIMENTATION POND	M15	CHP COMPLEX BUILDING		
J11	LUBRICATING OIL STORAGE TANK	P04	F.G.D WASTE WATER TREATMENT PLANTS	S09	DOMESTIC SEWAGE WATER TREATMENT EQUIPMENT	M16	SAMPLING HOUSE FOR AS-RECEIVED COAL		
J12	START UP BOILER HOUSE	P05	FGD PROCESS BUILDING	S10	FOAM PUMP HOUSE				
J13	FUEL OIL PUMP HOUSE	P06	DRY LIMESTONE SHED	S11	EMERGENCY OIL PIT FOR TRANSFORMER	C01	FLY ASH SILO		
J14	FUEL OIL TANK	P07	CEMS ROOM			C02	ASH WATER PUMP POND		
J15	DIRTY OIL POND	H01	DM WATER TREATMENT SYSTEM PLANT & ASSAY BUILDING	M01	STRIP COAL YARD & DRY CAOL SHED	C03	BOTTOM ASH BIN		
J16	START UP BOILER HOUSE	H02	DEMINERALIZED WATER STORAGE TANK	M02	CRUSHER HOUSE	C04	FLUIDIZING BLOWER HOUSE		
J17	CENTRAL CONTROL BUILDING & AIR COMPRESSOR HOUSE	H03	HYDROGEN GENERATION HOUSE	M03	BUNKER BAY TRANSFER TOWER	C05	ASH YARD		
J18	CONDENSATE WATER STORAGE TANK	H04	INDUSTRIAL WASTE WATER TREATMENT PLANTS	M04	TRANSFER TOWER 9	C06	FLY ASH SILO		
J19	DIESEL GENERATOR	H05	CHEMICAL FEEDING TANKS TO CIRCULATING COOLING WATER SYSTEM	M05	TRANSFER TOWER 8				

Project Name :	Owner :	Drawing Title :	Drawing no : 01
ORION POWER UNIT - 2, DHAKA LIMITED. 1 x 635 MW (Net) Ultra Supercritical Coal Based IPP. Matarbari, Moheshkhali, Cox's Bazar	ORION POWER UNIT-2, DHAKA LTD. Orion House 153-154, Tejgaon Industrial Area, Dhaka-1208,Bangladesh. PABX:+880 2 8870133,8870134,Ext 867,877	GENERAL LAYOUT PLAN	Date 16.09.2022

Appendix C-3: General Cross Section of Main Building



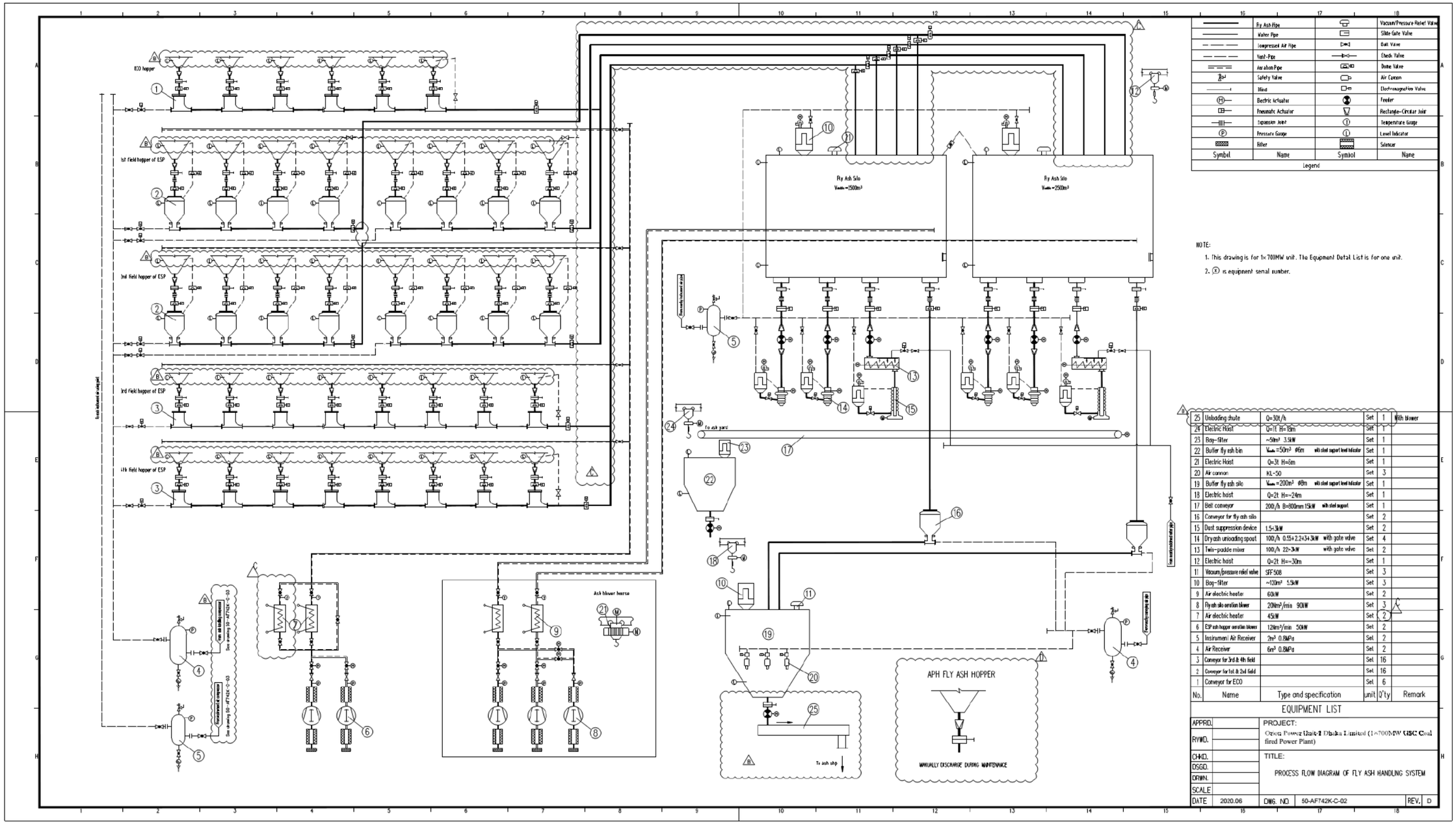
Appendix C-4: Process Flow of Coal Handling System



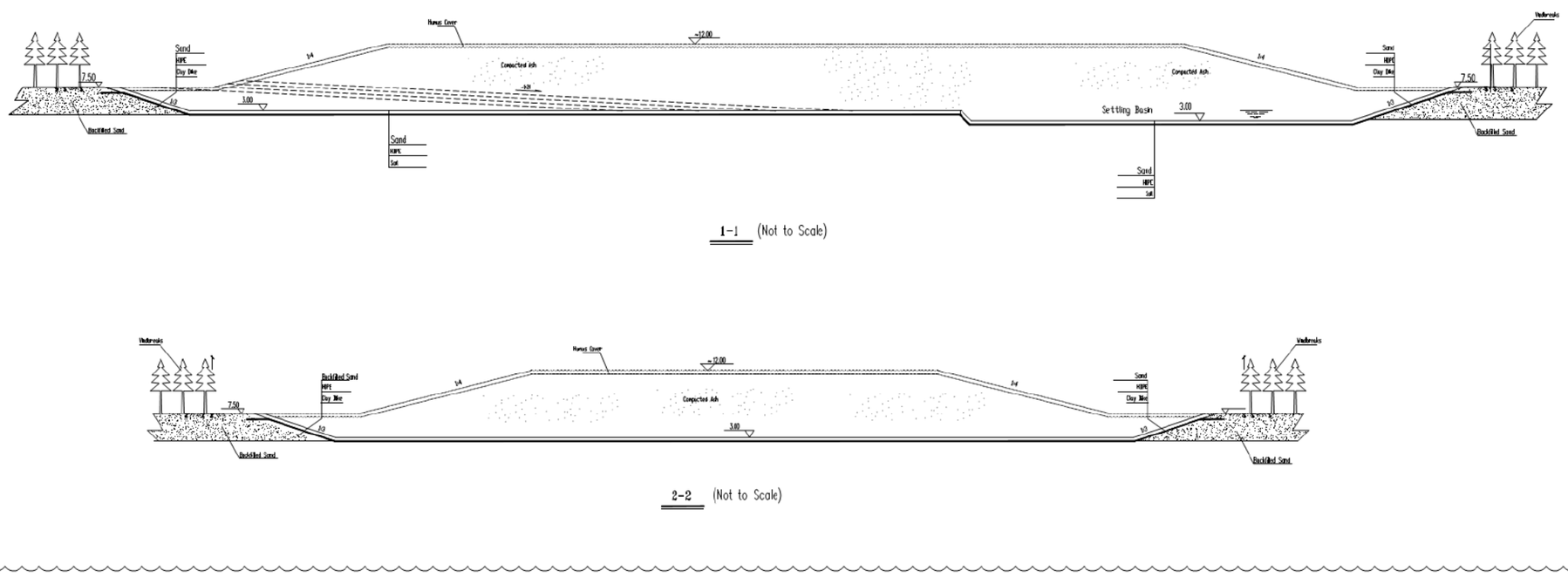
NO.	EQUIPMENT	SPECIFICATION	UNIT	Q'TY	REMARK
16	Three through chute	1400*1400mm with one flap gate, Suitable for belt width: 1800mm	Set	12	
17	Metal detector	Suitable for belt width: 1800mm	Set	2	
16	Belt-type magnetic separator	Suitable belt width: 1800mm, with running institutions, lifting appliances, collecting iron box and control box.	Set	4	
15	Disc-type magnetic separator	Suitable belt width: 1800mm, with running institutions, lifting appliances, collecting iron box and control box.	Set	2	
14	Electric driven two side plough	Changeable trough angle, suitable belt width: 1800mm	Set	8	
13	Ar-fired coal cycle dynamic check chain	Suitable belt width: 1800mm weighing range: 0-2400 t/h	Set	2	
12	As-received coal cycle dynamic check chain	Suitable belt width: 1800mm weighing range: 0-1400 t/h	Set	2	
11	Ar-fired coal belt weigher	Suitable belt width: 1800mm weighing range: 0-2400 t/h	Set	2	
10	As-received coal belt weigher	Suitable belt width: 1800mm weighing range: 0 - 2400 t/h	Set	2	
9	Ar-fired coal mechanical sampler	Automatic coal sampling units, including sampling head, crusher, dividing, bucket elevator and conveyor, suitable belt width: 1800mm	Set	2	
8	As-received coal mechanical sampler	Automatic coal sampling units, including sampling head, crusher, dividing, bucket elevator and conveyor, suitable belt width: 1200mm	Set	2	
7	C1B-C4B belt conveyor	Belt Width: 1800mm, Belt Speed: 2.8 m/s, Belt Capacity: 2400 t/h	Set	14	
6	Coal screen	Capacity: 2400 t/h.	Set	2	
5	Coal crusher	Capacity: 1500 t/h	Set	2	
4	Bucket-wheel stacker-reclaimer	Type: DQ 2400/1200/60. Stacking capacity: 2400 t/h, reclaiming capacity: 1200 t/h.	Set	2	
3	Wheel loader	Type: ZL50, Grab volume: 3.5m³.	Set	1	
2	Bulldozer	Type: TY220	Set	2	
1	Grab bucket	Capacity: 1200 t/h	Set	3	

APPRD.		PROJECT: Orion Power Unit-2 Dhaka Limited (1×700MW USC Coal fired Power Plant)
RVWD.		
CHKD.		TITLE: Process Flow Diagram of Coal Handling System
DSGD.		
DRWN.		
SCALE		
DATE	2020.05	DWG. NO. 50-AF742K-M-01 REV. C

Appendix C-5: Fly Ash Handling System



Appendix C-6: Section of Ash Pond



1-1 (Not to Scale)

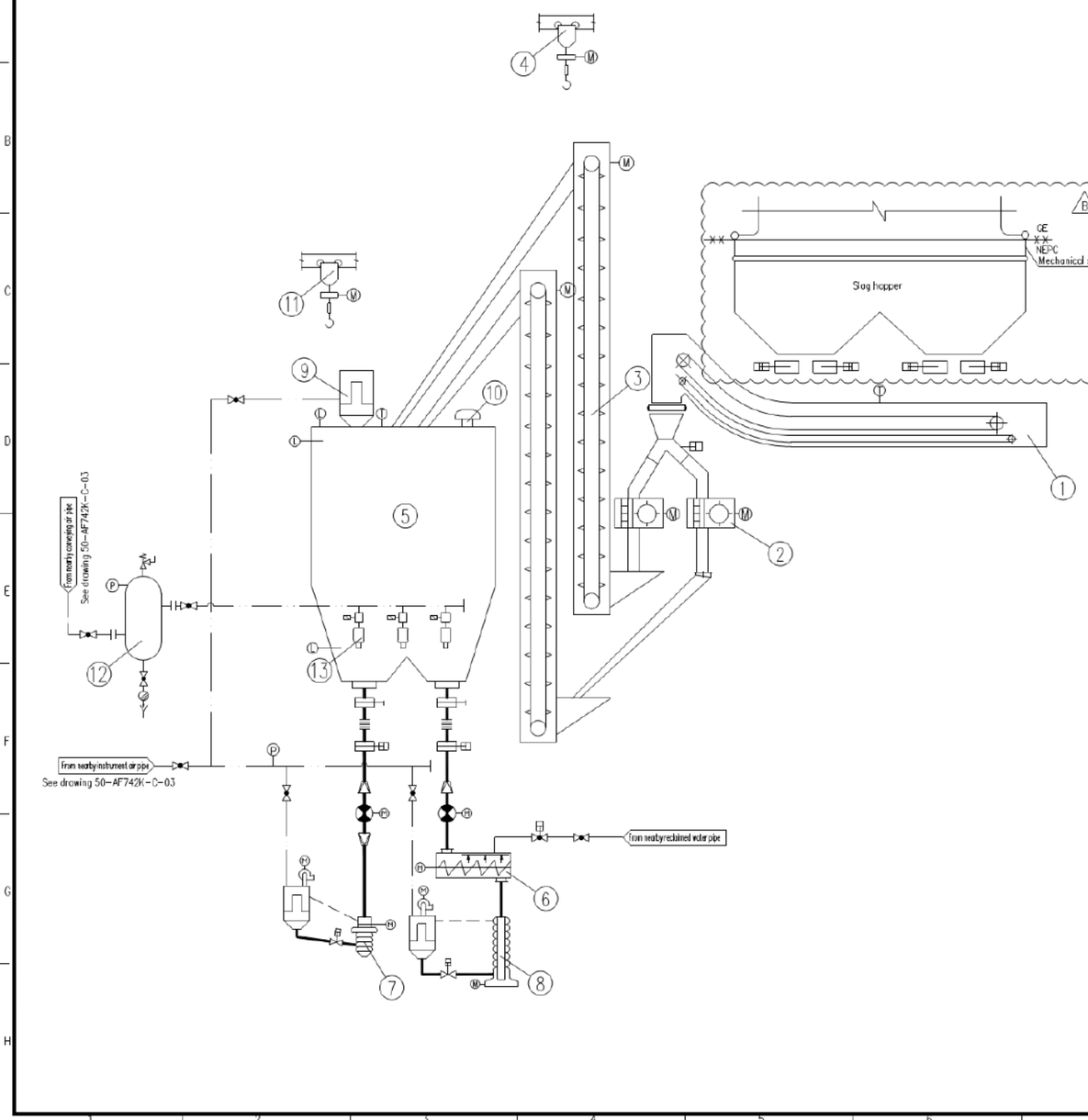
2-2 (Not to Scale)

Notes:

1. Elevation is in m

APPRD.		PROJECT: Orion Power Unit-2 Dhaka Limited (1×700MW USC Coal fired Power Plant)
RVWD.		
CHKD.		TITLE: SECTION OF ASH YARD
DSGD.		
DRWN.		
SCALE		
DATE	2020.05	DWG. NO. 50-AF742K-S-07 REV. 0

Appendix C-7: Bottom Ash Handling System



Symbol	Name	Symbol	Name
	Bottom Ash Pipe		Vacuum/Pressure Relief Valve
	Water Pipe		Slide Gate Valve
	Compressed Air Pipe		Ball Valve
	Vent-Pipe		Air Cannon
	Blind		Electromagnetism Valve
M	Electric Actuator		Feeder
	Pneumatic Actuator		Rectangle-Circular Joint
	Expansion Joint	T	Temperature Gauge
P	Pressure Gauge	L	Level Indicator
B	Hydraulic Actuator		Design Interface Line

Legend

NOTE:

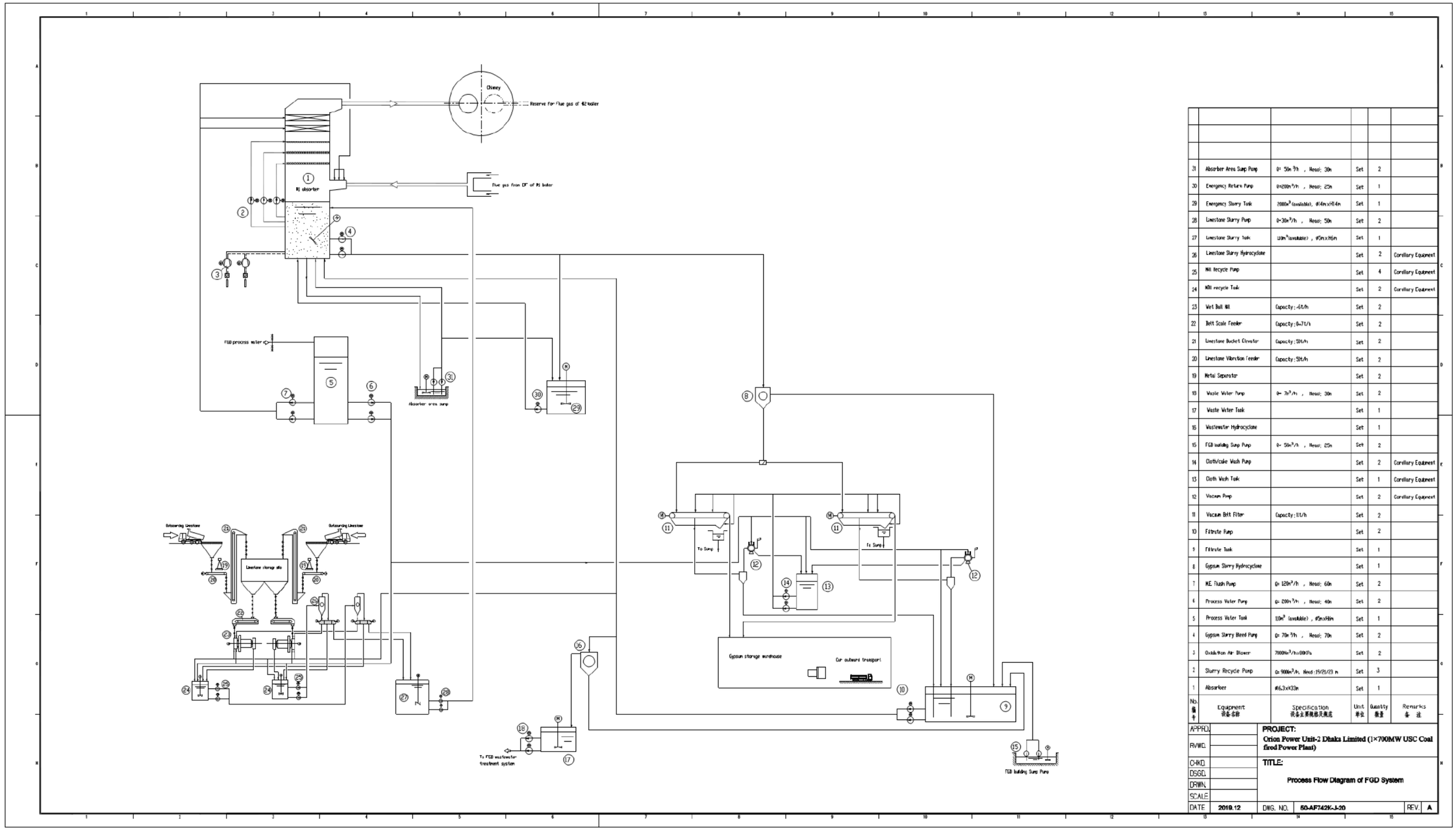
1. This drawing is for 1×700MW unit. The Equipment Detail List is for one unit.
2. ⓧ is equipment serial number.

No.	Name	Type and specification	unit	Q'ty	Remark
13	Air cannon	KL-50	Set	3	
12	Air receiver	2m³	Set	1	
11	Electric hoist	Q=2t H=~20m	Set	1	
10	Vacuum/pressure relief valve	SFF 508	Set	1	
9	Bag-filter	30m² 3kW	Set	1	
	Electricmotor	1.5+3kW	Set	1	
8	Dust suppression device		Set	1	
	Electricmotor	0.55+2.2+3+3kW	Set	1	
7	Dry ash unloading spout	100t/h with gate valve	Set	1	
	Electricmotor	22+3kW	Set	1	
6	Twin-paddle mixer	100t/h with gate valve	Set	1	
5	Bottom ash silo	$V_{useable}$=600m³ φ10m with steel support level indicator	Set	1	
4	Electric hoist	Q=2t H=~24m B	Set	1	
	Electricmotor	11kW	Set	2	
3	Bucket elevator	20t/h B	Set	2	
	Electricmotor	15kW	Set	2	
2	Single roll crusher	20t/h B	Set	2	Size after crush:30×30mm
	Slag hopper	50m³ With slag extrusion device	Set	1	
	Electricmotor	25kW	Set	1	
1	Dry slag conveyor	5~20t/h max 20t/h B	Set	1	

EQUIPMENT LIST

APPRD.		PROJECT: Orion Power Unit-2 Dhaka Limited (1×700MW USC Coal fired Power Plant)		
RVWD.				
CHKD.		TITLE: PROCESS FLOW DIAGRAM OF BOTTOM ASH HANDLING SYSTEM		
DSGD.				
DRWN.				
SCALE				
DATE	2020.01	DWG. NO. 50-AF742K-C-01	REV.	B

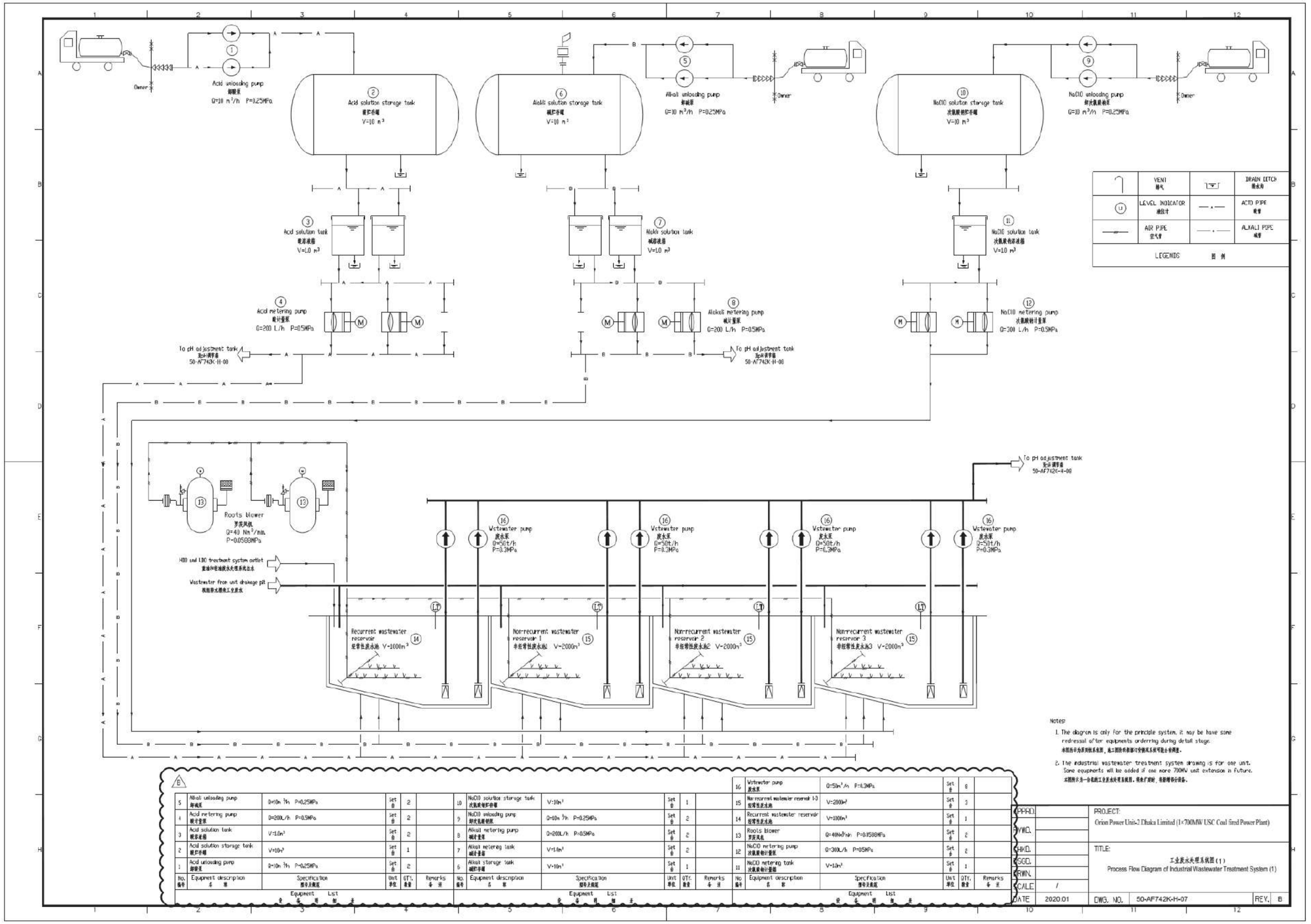
Appendix C-8: Process Flow Diagram of FGD System



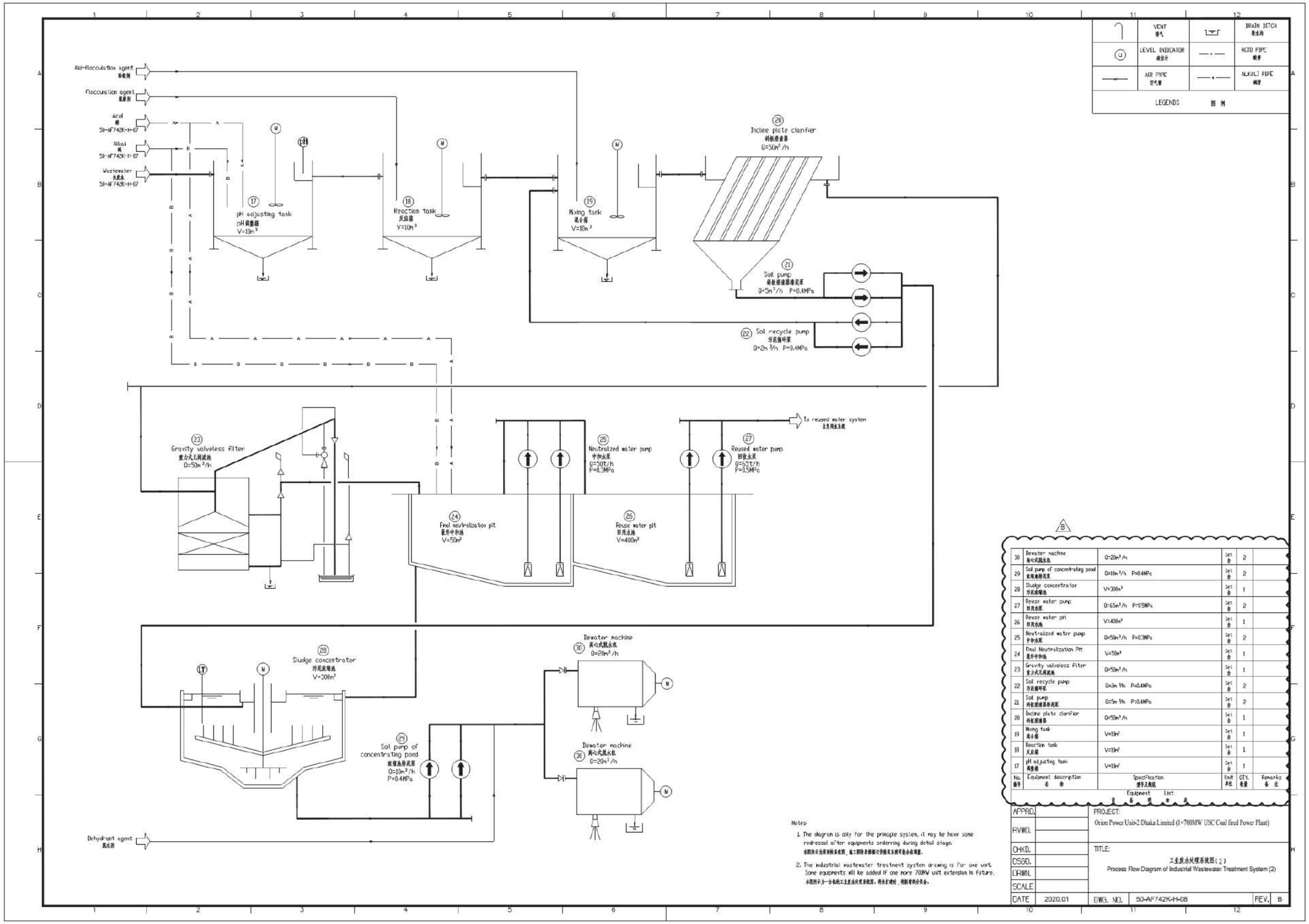
No. 编号	Equipment 设备名称	Specification 设备主要规格及规范	Unit 单位	Quantity 数量	Remarks 备 注
31	Absorber Area Sump Pump	Q= 50m³/h , Head: 30m	Set	2	
30	Emergency Return Pump	Q=250m³/h , Head: 25m	Set	1	
29	Emergency Slurry Tank	2000m³ (available), Φ14m×H14m	Set	1	
28	Limestone Slurry Pump	Q=30m³/h , Head: 50m	Set	2	
27	Limestone Slurry Tank	120m³(available) , Φ5m×H6m	Set	1	
26	Limestone Slurry Hydrocyclone		Set	2	Corollary Equipment
25	Mill Recycle Pump		Set	4	Corollary Equipment
24	Mill recycle Tank		Set	2	Corollary Equipment
23	Wet Ball Mill	Capacity: 45t/h	Set	2	
22	Belt Scale Feeder	Capacity: 0-7t/h	Set	2	
21	Limestone Bucket Elevator	Capacity: 50t/h	Set	2	
20	Limestone Vibration Feeder	Capacity: 50t/h	Set	2	
19	Metal Separator		Set	2	
18	Waste Water Pump	Q= 7m³/h , Head: 30m	Set	2	
17	Waste Water Tank		Set	1	
16	Wastewater Hydrocyclone		Set	1	
15	FGD building Sump Pump	Q= 50m³/h , Head: 25m	Set	2	
14	Cloth/cake Wash Pump		Set	2	Corollary Equipment
13	Cloth Wash Tank		Set	1	Corollary Equipment
12	Vacuum Pump		Set	2	Corollary Equipment
11	Vacuum Belt Filter	Capacity: 11t/h	Set	2	
10	Filtrate Pump		Set	2	
9	Filtrate Tank		Set	1	
8	Gypsum Slurry Hydrocyclone		Set	1	
7	ME Flush Pump	Q= 120m³/h , Head: 60m	Set	2	
6	Process Water Pump	Q= 200m³/h , Head: 40m	Set	2	
5	Process Water Tank	1100m³ (available) , Φ9m×H8m	Set	1	
4	Gypsum Slurry Bleed Pump	Q= 70m³/h , Head: 70m	Set	2	
3	Oxidation Air Blower	7000Nm³/h×0.08Mpa	Set	2	
2	Slurry Recycle Pump	Q=900m³/h, Head:19/21/23 m	Set	3	
1	Absorber	Φ6.3×H33m	Set	1	

APPRO.		PROJECT: Orion Power Unit-2 Dhaka Limited (1×700MW USC Coal fired Power Plant)	
REVIS.			
CHKD.		TITLE: Process Flow Diagram of FGD System	
DSGD.			
DRWN.			
SCALE			
DATE	2019.12	DWG. NO. 50-AF742K-J-20	REV. A

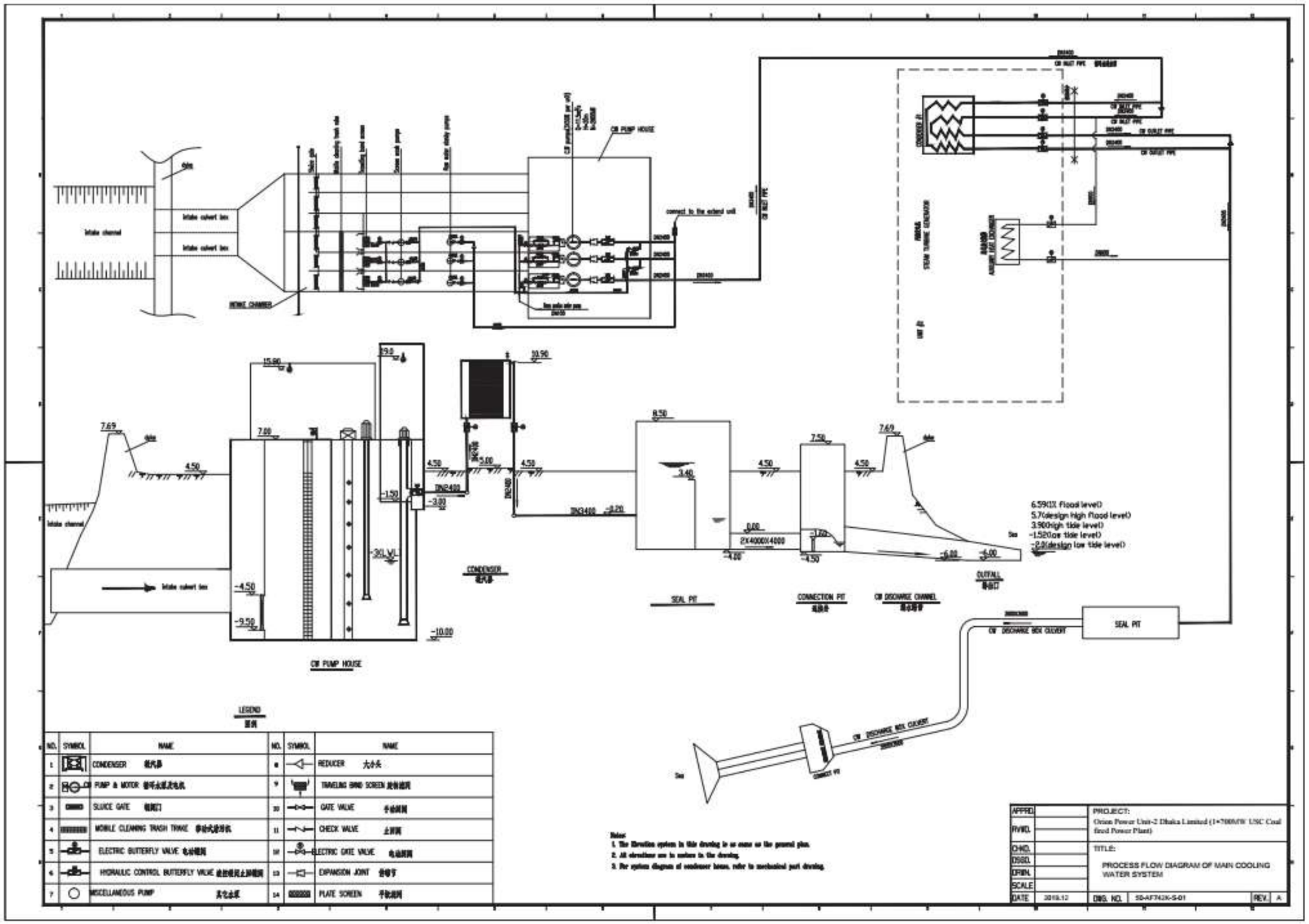
Appendix C-9: Process Flow Diagram of Industrial Wastewater Treatment System-1



Appendix C-10: Process Flow Diagram of Industrial Wastewater Treatment System-2



Appendix C-11: Process Flow Diagram of Main Cooling Water System



Appendix D: Laboratory Test Report

Appendix D-1: Air Quality

Ref: EQMS/Ambient Air Quality/ 2023012166

EQMS ENVIRONMENTAL LABORATORY

Monitoring Results of Ambient Air Quality

Project Name	:	635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity	:	Ambient Air Quality
Monitoring Personnel	:	EQMS Monitoring Inspector; Abdur Rab
Monitoring Location	:	

Code	Monitoring Locations	Coordinates	Distance and direction from the Plant
AAQ-1	Project Site	21°44'51.7" N 91°53'59.2" E	Within the project boundary

Reporting Date : 10.01.2023

P.T.O

Head Office: H # 53, R # 04, B # C, Banani, Dhaka -1213, Bangladesh
Lab Office: Flat # F1, House # Ta-134/A, Baishakhi Sarani, Gulshan-Badda Link Road, Dhaka – 1212
Toronto Office: 7 Arnot Street, Scarborough Ontario, M1K4B5 Canada

Ref: EQMS/Ambient Air Quality/ 2023012166

Season	Date	Concentration in (µg/m³)					
		SPM*	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
Wet	18-Oct-2022	50.3	27.3	16.5	6.8	9.2	123
	24-Oct-2022	57.0	23.0	19.0	5.6	10.2	130
	Maximum	57.0	27.3	19.0	6.8	10.2	130
	Minimum	50.3	23.0	16.5	5.6	9.2	123
	Average	53.7	25.2	17.8	6.2	9.7	126.5
Dry	7-Dec-2022	56.0	22.6	16.52	7.2	12.7	95
	13-Dec-2022	62.3	27.3	19.0	11.2	13.5	118
	19-Dec-2022	73.6	32.9	20.8	6.1	9.5	80
	26-Dec-2022	80.3	34.7	25.6	7.5	9.8	90
	1-Jan-2023	75.6	27.5	20.7	6.5	10.2	100
	7-Jan-2023	69.5	28.5	19.5	7.8	14.5	80
	Maximum	80.3	34.7	25.6	11.2	14.5	118
	Minimum	56.0	22.6	16.5	6.1	9.5	80
	Average	69.6	28.9	20.4	7.7	11.7	93.8
Standard							
Bangladesh**	**8-hourly**	**200**	**-**	**-**	**-**	**-**	**5000**
	24-hourly	**-**	**150**	**65**	**80**	**80**	**-**
	Annual	**-**	**50**	**35**	**-**	**40**	**-**
WHO***	**24-hourly**	**-**	**45**	**15**	**40**	**25**	**4**
	Annual	**-**	**15**	**5**	**-**	**10**	**-**

Description of Analysis:

Note: Regular Checkup and calibration of the equipment are done by the manufacturers and EQMS Consulting Limited personnel to avoid any error. 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, BDL – Below Detection Limit

Received By:
Shihabuddin Ahmed
Consultant
EQMS Consulting Limited

Analyzed By:
Ahmed Jubaer
Technical Manager
EQMS Consulting Limited

Checked By:
Md. Jahidul Islam
Quality Manager
EQMS Consulting Limited

Head Office: H # 53, R # 04, B # C, Banani, Dhaka -1213, Bangladesh
Lab Office: Flat # F1, House # Ta-134/A, Bolshakhi Sarani, Gulshan-Badda Link Road, Dhaka – 1212
Toronto Office: 7 Arnot Street, Scarborough Ontario, M1K4B5 Canada

Ref: EQMS/Ambient Air Quality/ 2023012167

EQMS ENVIRONMENTAL LABORATORY

Monitoring Results of Ambient Air Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar

Monitoring Activity : Ambient Air Quality

Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab

Monitoring Location :

Code	Monitoring Locations	Coordinates	Distance and direction from the Plant
AAQ-2	Near West Ujantia Govt: Primary School, Ujantia	21°45'54.5" N 91°54'18.0" E	1.8 km north from project boundary

Reporting Date : 10.01.2023

P.T.O

Ref: EQMS/Ambient Air Quality/ 2023012167

Season	Date	Concentration in (µg/m³)					
		SPM*	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
Wet	17-Oct-2022	59.0	24.0	19.0	8.3	12.4	110
	23-Oct-2022	67.2	32.7	18.8	9.8	15.2	110
	Maximum	67.2	32.7	19.0	9.8	15.2	110
	Minimum	59.0	24.0	18.8	8.3	12.4	110
	Average	63.1	28.4	18.9	9.1	13.8	110
Dry	9-Dec-2022	85.4	41.5	25.7	13.5	17.6	100
	15-Dec-2022	60.9	25.0	19.9	9.6	12.6	380
	21-Dec-2022	93.0	42.3	31.5	10.5	16.8	90
	28-Dec-2022	86.4	40.5	28.7	8.6	14.7	85
	3-Jan-2023	85.6	36.8	25.4	7.9	16.4	86
	9-Jan-2023	76.5	37.5	22.6	11.5	13.9	95
	Maximum	93.0	42.3	31.5	13.5	17.6	380
	Minimum	60.9	25.0	19.9	7.9	12.6	85
	Average	81.3	37.3	25.6	10.3	15.3	139.3
Standard							
Bangladesh**	**8-hourly**	**200**	**-**	**-**	**-**	**-**	**5000**
	24-hourly	**-**	**150**	**65**	**80**	**80**	**-**
	Annual	**-**	**50**	**35**	**-**	**40**	**-**
WHO***	**24-hourly**	**-**	**45**	**15**	**40**	**25**	**4**
	Annual	**-**	**15**	**5**	**-**	**10**	**-**

Description of Analysis:

Note: Regular Checkup and calibration of the equipment are done by the manufacturers and EQMS Consulting Limited personnel to avoid any error. 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, BDL – Below Detection Limit

Received By:
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Lab Office: Flat # F1, House # Ta-134/A, Baishakhi Sarani, Gulshan-Badda Link Road, Dhaka – 1212
Toronto Office: 7 Arnot Street, Scarborough Ontario, M1K4B5 Canada

Ref: EQMS/Ambient Air Quality/ 2023012168

EQMS ENVIRONMENTAL LABORATORY

Monitoring Results of Ambient Air Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar

Monitoring Activity : Ambient Air Quality

Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab

Monitoring Location :

Code	Monitoring Locations	Coordinates	Distance and direction from the Plant
AAQ-3	Behind Hasem House, Bedarbill Para, New Market, Mognama	21°47'51.2" N 91°54'57.4" E	5.6 km north from project boundary

Reporting Date : 10.01.2023

P.T.O

Ref: EQMS/Ambient Air Quality/ 2023012168

Season	Date	Concentration in (µg/m³)					
		SPM*	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
Wet	19-Oct-2022	59.7	24.8	18.9	9.8	14.2	100
	16-Oct-2022	68.2	30.8	20.1	11.6	17.8	74
	Maximum	68.2	30.8	20.1	11.6	17.8	100
	Minimum	59.7	24.8	18.9	9.8	14.2	74
	Average	64.0	27.8	19.5	10.7	16.0	87
Dry	10-Dec-2022	88.7	32.0	20.6	8.7	13.8	100
	6-Dec-2022	73.9	34.0	29.3	9.8	16.8	83
	8-Dec-2022	86.7	35.3	28.0	12.8	18.4	95
	13-Dec-2022	92.8	39.7	27.2	10.7	16.3	100
	15-Dec-2022	82.6	30.1	26.7	8.5	12.3	95
	16-Dec-2022	82.3	38.5	24.6	12.4	18.7	110
	Maximum	92.8	39.7	29.3	12.8	18.7	110
	Minimum	73.9	30.1	20.6	8.5	12.3	83
	Average	84.5	34.9	26.1	10.5	16.1	97.2
Standard							
Bangladesh**	**8-hourly**	**200**	**-**	**-**	**-**	**-**	**5000**
	24-hourly	**-**	**150**	**65**	**80**	**80**	**-**
	Annual	**-**	**50**	**35**	**-**	**40**	**-**
WHO***	**24-hourly**	**-**	**45**	**15**	**40**	**25**	**4**
	Annual	**-**	**15**	**5**	**-**	**10**	**-**

Description of Analysis:

Note: Regular Checkup and calibration of the equipment are done by the manufacturers and EQMS Consulting Limited personnel to avoid any error. 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, BDL – Below Detection Limit

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Head Office: H # 53, R # 04, B # C, Banani, Dhaka -1213, Bangladesh
Lab Office: Flat # F1, House # Ta-134/A, Baishakhi Sarani, Gulshan-Badda Link Road, Dhaka – 1212
Toronto Office: 7 Arnot Street, Scarborough Ontario, M1K4B5 Canada

Ref: EQMS/Ambient Air Quality/ 2023012169

EQMS ENVIRONMENTAL LABORATORY

Monitoring Results of Ambient Air Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar

Monitoring Activity : Ambient Air Quality

Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab

Monitoring Location :

Code	Monitoring Locations	Coordinates	Distance and direction from the Plant
AAQ-4	Near Anamul Haque House, South Sikdarpara, 2 No: Ward, Matarbari	21°44'30.9" N 91°54'08.2" E	355 m south from project boundary

Reporting Date : 10.01.2023

P.T.O

Ref: EQMS/Ambient Air Quality/ 2023012169

Season	Date	Concentration in (µg/m³)					
		SPM*	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
Wet	16-Oct-2022	66.9	30.0	19.0	8.7	16.7	80
	20-Oct-2022	64.2	27.2	20.2	7.9	13.4	65
	Maximum	66.9	30	20.2	8.7	16.7	80
	Minimum	64.2	27.2	19	7.9	13.4	65
	Average	65.55	28.6	19.6	8.3	15.05	72.5
Dry	6-Dec-2022	75.3	38.3	19.9	5.8	12.0	80
	8-Dec-2022	59.5	23.0	19.9	6.4	10.2	110
	13-Dec-2022	90.4	40.5	29.8	8.7	12.7	80
	15-Dec-2022	81.5	34.7	22.6	9.8	11.7	90
	16-Dec-2022	78.4	32.5	20.5	7.6	11.8	80
	12-Dec-2022	70.5	36.4	25.6	8.3	14.6	95
	Maximum	90.4	40.5	29.8	9.8	14.6	110
	Minimum	59.5	23.0	19.9	5.8	10.2	80
	Average	75.9	34.2	23.1	7.8	12.2	89.2
Standard							
Bangladesh**	**8-hourly**	**200**	**-**	**-**	**-**	**-**	**5000**
	24-hourly	**-**	**150**	**65**	**80**	**80**	**-**
	Annual	**-**	**50**	**35**	**-**	**40**	**-**
WHO***	**24-hourly**	**-**	**45**	**15**	**40**	**25**	**4**
	Annual	**-**	**15**	**5**	**-**	**10**	**-**

Description of Analysis:

Note: Regular Checkup and calibration of the equipment are done by the manufacturers and EQMS Consulting Limited personnel to avoid any error. 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, BDL – Below Detection Limit

Received By:
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Ref: EQMS/Ambient Air Quality/2023012170

EQMS ENVIRONMENTAL LABORATORY

Monitoring Results of Ambient Air Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar

Monitoring Activity : Ambient Air Quality

Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab

Monitoring Location :

Code	Monitoring Locations	Coordinates	Distance and direction from the Plant
AAQ-5	Joynal Abedin House, Notun Ghuna Para, 1 No: Ward, Badarkhali	21°44'52.5" N 91°56'50.0" E	4.5 km east from project boundary

Reporting Date : 10.01.2023

P.T.O

Ref: EQMS/Ambient Air Quality/ 2023012170

Season	Date	Concentration in (µg/m³)					
		SPM*	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
Wet	20-Oct-2022	55.5	22.0	18.7	6.7	11.9	97
	24-Oct-2022	68.1	30.6	19.5	9.6	16.1	106
	Maximum	68.1	30.6	19.5	9.6	16.1	106
	Minimum	55.5	22.0	18.7	6.7	11.9	97
	Average	61.8	26.3	19.1	8.15	14	101.5
Dry	8-Dec-2022	65.2	32.6	17.8	7.4	9.5	153
	13-Dec-2022	62.8	27.2	19.8	10.6	14.7	103
	15-Dec-2022	78.4	29.3	24.6	9.8	15.2	64
	16-Dec-2022	92.4	44.5	32.8	12.4	17.8	110
	12-Dec-2022	88.5	40.1	23.6	10.2	17.9	100
	14-Dec-2022	76.2	39.5	27.4	9.1	18.7	120
	Maximum	92.4	44.5	32.8	12.4	18.7	153
	Minimum	62.8	27.2	17.8	7.4	9.5	64
	Average	77.3	35.5	24.3	9.9	15.6	108.3
Standard							
Bangladesh**	**8-hourly**	**200**	**-**	**-**	**-**	**-**	**5000**
	24-hourly	**-**	**150**	**65**	**80**	**80**	**-**
	Annual	**-**	**50**	**35**	**-**	**40**	**-**
WHO***	**24-hourly**	**-**	**45**	**15**	**40**	**25**	**4**
	Annual	**-**	**15**	**5**	**-**	**10**	**-**

Description of Analysis:

Note: Regular Checkup and calibration of the equipment are done by the manufacturers and EQMS Consulting Limited personnel to avoid any error. 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, BDL – Below Detection Limit

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Appendix D-2: Noise Level

Ref: EQMS/Noise Level/2023012171

EQMS ENVIRONMENTAL LABORATORY

Monitoring Results of Noise Level

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity : Noise Level Measurement
Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab
Monitoring Location :

Code	Location	GPS Coordinate	Monitoring Date
NL-1	Project Site	21°44'44.8" N 91°53'58.9" E	17-10-2022
NL-2	Near Aminullah House, Baniakata, 2 no. Ward, Matarbari	21°44'44.3" N 91°54'19.5" E	16-10-2022
NL-3	Near Anamul Haque House, South Sikdarpara, 2 no. Ward, Matarbari	21°44'30.9" N 91°54'08.2" E	16-10-2022
NL-4	Near Fokir Miyazee Jame Mosque, Miyazeepara, Matarbari	21°44'00.7" N 91°53'33.4" E	17-10-2022
NL-5	Near West Ujantia Govt: Primary School, Ujantia	21°45'54.38"N 91°54'18.98"E	17-10-2022

Reporting Date : 13.11.2022

P.T.O

Ref: EQMS/Noise Level/2023012171

Analysis Description:

Location	Noise Level in dB(A)				Location Setting	Bangladesh Standard*	
	Leq_{day}	Leq_{night}	L_{max}	L_{min}		Day	Night
ANL-1	47.6	38.2	65.1	30.5	Open Field	55	45
ANL-2	53.2	39.8	72.5	31.3	Residential Area	55	45
ANL-3	52.1	40.6	75.7	33.6		55	45
ANL-4	54.6	44.7	79.6	36.8	Mixed Area	60	50
ANL-5	52.9	42.5	74.9	31.9		60	50

*Noise Pollution (Control) Rules, 2006	Day [dB (A)]	Night [dB (A)]
Silent Area	50	40
Residential Area	55	45
Mixed Area	60	50
Commercial Area	70	60
Industrial Area	75	70

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Appendix D-3: Surface Water Quality

Ref: EQMS/Water Quality/2023012172

EQMS WET LABORATORY

Test Results of Surface Water Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity : Surface Water Quality
Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location : SW1, Ujantia Ghat, Matamuhuri River
Coordinate : 21°45'50.5" N 91°54'15.6" E
Sampling Date : 18.10.2022
Reporting Date : 20.11.2022
Analysis Description :

Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW1	a	b	c	d	e	f
1.	Ammonia	mg/L	Nessler	0.24	--	--	--	--	--	--
2.	Arsenic (As)	ppm	Modified Gutzeit Method	<0.005	--	--	--	--	--	--
3.	BOD_5	mg/L	5 Days Incubation	1.0	2 or less	3 or less	3 or less	6 or less	10 or less	10 or less
4.	Cd	mg/L	AAS	0.0026	--	--	--	--	--	--
5.	COD	mg/L	USEPA 410.4	11	--	--	--	--	--	--
6.	Chloride (Cl)	mg/L	Mercury (II) Thiocyanate	2300	--	--	--	--	--	--
7.	Cr+6	mg/L	ASTM D1687-92	0.53	--	--	--	--	--	--
8.	Coliform (fecal)	n/100 ml	AFNOR Approved	4	0	200 or less	5000 or less	-	5000 or less	1000 or less
9.	Coliform (total)			8	--	--	--	--	--	--
10.	Color	PCU	Photometric	15	--	--	--	--	--	--
11.	Copper (Cu)	mg/L	Bicinchoninate	0.04	--	--	--	--	--	--
12.	Dissolved Oxygen (DO)	mg/L	Ion Electron	6.1	6 or more	5 or more	6 or more	5 or more	5 or more	5 or more
13.	Electric Conductivity	µS/cm	Ion Electron	6670	--	--	--	--	--	--
14.	Fluoride	mg/L	Photometric ion selective	1.9	--	--	--	--	--	--

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Sl	Parameter	Unit	Method	Concentration SW1	Standard for Inland Surface Water (ECR 97) *					
					a	b	c	d	e	f
15.	Iron (Fe)	mg/L	Diphenyl carbohydrazide	<0.01	--	--	--	--	--	--
16.	Pb	mg/L	AAS	<0.005	--	--	--	--	--	--
17.	Mn	mg/L	Photometric	0.04	--	--	--	--	--	--
18.	Hg	mg/L	AAS	<0.001	--	--	--	--	--	--
19.	Ni	mg/L	AAS	0.008	--	--	--	--	--	--
20.	Nitrate	mg/L	Cadmium Reduction	2.2	--	--	--	--	--	--
21.	Odor	TON	2150 B.	0/L	--	--	--	--	--	--
22.	Oil & Grease	mg/L	Gravimetric	1.13	--	--	--	--	--	--
23.	pH	--	Ion Electron	7.45	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
24.	Phosphate	mg/L	Photometric	4.1	--	--	--	--	--	--
25.	Potassium	mg/L	Turbidimetric	600	--	--	--	--	--	--
26.	Sulphate	mg/L	Turbidimetric	950	--	--	--	--	--	--
27.	Temperature (T)	°C	Ion Electron	28.3	--	--	--	--	--	--
28.	Total Alkalinity	mg/L	Colorimetric	91	--	--	--	--	--	--
29.	TDS	mg/L	Ion Electron	3340	--	--	--	--	--	--
30.	Total Hardness	mg/L	Titrometric	540	--	--	--	--	--	--
31.	TSS	mg/L	Gravimetric	108	--	--	--	--	--	--
32.	Turbidity	NTU	Turbidimetric	4.1	--	--	--	--	--	--
33.	Zinc (Zn)	mg/L	Zincon Method	0.05	--	--	--	--	--	--

*Note: a- Source of drinking water for supply only after disinfecting, b- Water usable for recreational activity, c- Source of drinking water for supply after conventional treatment, d- Water usable by fisheries, e- Water usable by various process and cooling industries, f- Water usable for irrigation, AAS - Atomic Absorption Spectroscopy

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Ref: EQMS/Water Quality/2023012173

EQMS WET LABORATORY

Test Results of Surface Water Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity : Surface Water Quality
Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location : SW2, Sadar Khal, Matamuhuri River
Coordinate : 21°44'14.0" N 91°54'31.3" E
Sampling Date : 18.10.2022
Reporting Date : 20.11.2022
Analysis Description :

Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW2	a	b	c	d	e	f
1.	Ammonia	mg/L	Nessler	0.27	--	--	--	--	--	--
2.	Arsenic (As)	ppm	Modified Gutzeit Method	<0.005	--	--	--	--	--	--
3.	BOD_5	mg/L	5 Days Incubation	1.1	2 or less	3 or less	3 or less	6 or less	10 or less	10 or less
4.	Cd	mg/L	AAS	0.001	--	--	--	--	--	--
5.	COD	mg/L	USEPA 410.4	14	--	--	--	--	--	--
6.	Chloride (Cl)	mg/L	Mercury (II) Thiocyanate	2400	--	--	--	--	--	--
7.	Cr+6	mg/L	ASTM D1687-92	0.62	--	--	--	--	--	--
8.	Coliform (fecal)	n/100 ml	AFNOR Approved	6	0	200 or less	5000 or less	-	5000 or less	1000 or less
9.	Coliform (total)			10	--	--	--	--	--	--
10.	Color	PCU	Photometric	17	--	--	--	--	--	--
11.	Copper (Cu)	mg/L	Bicinchoninate	0.02	--	--	--	--	--	--
12.	Dissolved Oxygen (DO)	mg/L	Ion Electron	6.1	6 or more	5 or more	6 or more	5 or more	5 or more	5 or more
13.	Electric Conductivity	µS/cm	Ion Electron	1148	--	--	--	--	--	--
14.	Fluoride	mg/L	Photometric ion selective	2.0	--	--	--	--	--	--

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Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW2	a	b	c	d	e	f
15.	Iron (Fe)	mg/L	Diphenyl carbohydrazide	<0.01	--	--	--	--	--	--
16.	Pb	mg/L	AAS	<0.005	--	--	--	--	--	--
17.	Mn	mg/L	Photometric	0.03	--	--	--	--	--	--
18.	Hg	mg/L	AAS	<0.001	--	--	--	--	--	--
19.	Ni	mg/L	AAS	0.001	--	--	--	--	--	--
20.	Nitrate	mg/L	Cadmium Reduction	1.7	--	--	--	--	--	--
21.	Odor	TON	2150 B.	O/L	--	--	--	--	--	--
22.	Oil & Grease	mg/L	Gravimetric	1.01	--	--	--	--	--	--
23.	pH	--	Ion Electron	7.84	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
24.	Phosphate	mg/L	Photometric	0.4	--	--	--	--	--	--
25.	Potassium	mg/L	Turbidimetric	610	--	--	--	--	--	--
26.	Sulphate	mg/L	Turbidimetric	900	--	--	--	--	--	--
27.	Temperature (T)	°C	Ion Electron	28.4	--	--	--	--	--	--
28.	Total Alkalinity	mg/L	Colorimetric	96	--	--	--	--	--	--
29.	TDS	mg/L	Ion Electron	5720	--	--	--	--	--	--
30.	Total Hardness	mg/L	Titrometric	570	--	--	--	--	--	--
31.	TSS	mg/L	Gravimetric	117	--	--	--	--	--	--
32.	Turbidity	NTU	Turbidimetric	4.0	--	--	--	--	--	--
33.	Zinc (Zn)	mg/L	Zincon Method	0.08	--	--	--	--	--	--

*Note: a- Source of drinking water for supply only after disinfecting, b- Water usable for recreational activity, c- Source of drinking water for supply after conventional treatment, d- Water usable by fisheries, e- Water usable by various process and cooling industries, f- Water usable for irrigation, AAS - Atomic Absorption Spectroscopy

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Ref: EQMS/Water Quality/2023012174

EQMS WET LABORATORY

Test Results of Surface Water Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity : Surface Water Quality
Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location : SW3, Misbah Uddin House Pond, Sikdarpar, Matarbari
Coordinate : 21°44'28.7" N 91°54'07.5" E
Sampling Date : 20.10.2022
Reporting Date : 20.11.2022
Analysis Description :

Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW3	a	b	c	d	e	f
1.	Ammonia	mg/L	Nessler	0.35	--	--	--	--	--	--
2.	Arsenic (As)	ppm	Modified Gutzeit Method	<0.005	--	--	--	--	--	--
3.	BOD_5	mg/L	5 Days Incubation	3.8	2 or less	3 or less	3 or less	6 or less	10 or less	10 or less
4.	Cd	mg/L	AAS	0.0001	--	--	--	--	--	--
5.	COD	mg/L	USEPA 410.4	24	--	--	--	--	--	--
6.	Chloride (Cl)	mg/L	Mercury (II) Thiocyanate	2400	--	--	--	--	--	--
7.	Cr+6	mg/L	ASTM D1687-92	<0.01	--	--	--	--	--	--
8.	Coliform (fecal)	n/100 ml	AFNOR Approved	900	0	200 or less	5000 or less	-	5000 or less	1000 or less
9.	Coliform (total)			3000	--	--	--	--	--	--
10.	Color	PCU	Photometric	82	--	--	--	--	--	--
11.	Copper (Cu)	mg/L	Bicinchoninate	0.04	--	--	--	--	--	--
12.	Dissolved Oxygen (DO)	mg/L	Ion Electron	5.8	6 or more	5 or more	6 or more	5 or more	5 or more	5 or more
13.	Electric Conductivity	µS/cm	Ion Electron	4490	--	--	--	--	--	--
14.	Fluoride	mg/L	Photometric ion selective	1.7	--	--	--	--	--	--

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Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW3	a	b	c	d	e	f
15.	Iron (Fe)	mg/L	Diphenyl carbohydrazide	<0.01	--	--	--	--	--	--
16.	Pb	mg/L	AAS	<0.005	--	--	--	--	--	--
17.	Mn	mg/L	Photometric	<0.01	--	--	--	--	--	--
18.	Hg	mg/L	AAS	<0.001	--	--	--	--	--	--
19.	Ni	mg/L	AAS	0.001	--	--	--	--	--	--
20.	Nitrate	mg/L	Cadmium Reduction	1.9	--	--	--	--	--	--
21.	Odor	TON	2150 B.	Slight Odorous	--	--	--	--	--	--
22.	Oil & Grease	mg/L	Gravimetric	2.37	--	--	--	--	--	--
23.	pH	--	Ion Electron	7.67	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
24.	Phosphate	mg/L	Photometric	0.6	--	--	--	--	--	--
25.	Potassium	mg/L	Turbidimetric	1950	--	--	--	--	--	--
26.	Sulphate	mg/L	Turbidimetric	124	--	--	--	--	--	--
27.	Temperature (T)	°C	Ion Electron	28.3	--	--	--	--	--	--
28.	Total Alkalinity	mg/L	Colorimetric	76	--	--	--	--	--	--
29.	TDS	mg/L	Ion Electron	2250	--	--	--	--	--	--
30.	Total Hardness	mg/L	Titrometric	300	--	--	--	--	--	--
31.	TSS	mg/L	Gravimetric	121	--	--	--	--	--	--
32.	Turbidity	NTU	Turbidimetric	5.2	--	--	--	--	--	--
33.	Zinc (Zn)	mg/L	Zincon Method	0.03	--	--	--	--	--	--

*Note: a- Source of drinking water for supply only after disinfecting, b- Water usable for recreational activity, c- Source of drinking water for supply after conventional treatment, d- Water usable by fisheries, e- Water usable by various process and cooling industries, f- Water usable for irrigation, AAS - Atomic Absorption Spectroscopy

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Ref: EQMS/Water Quality/2023012175

EQMS WET LABORATORY

Test Results of Surface Water Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity : Surface Water Quality
Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location : SW4, Kutubdia Channel
Coordinate : 21°45'02.9" N 91°52'40.5" E
Sampling Date : 18.10.2022
Reporting Date : 20.11.2022
Analysis Description :

Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW4	a	b	c	d	e	f
1.	Ammonia	mg/L	Nessler	0.15	--	--	--	--	--	--
2.	Arsenic (As)	ppm	Modified Gutzeit Method	<0.005	--	--	--	--	--	--
3.	BOD_5	mg/L	5 Days Incubation	1.2	2 or less	3 or less	3 or less	6 or less	10 or less	10 or less
4.	Cd	mg/L	AAS	0.0002	--	--	--	--	--	--
5.	COD	mg/L	USEPA 410.4	11	--	--	--	--	--	--
6.	Chloride (Cl)	mg/L	Mercury (II) Thiocyanate	2800	--	--	--	--	--	--
7.	Cr+6	mg/L	ASTM D1687-92	0.05	--	--	--	--	--	--
8.	Coliform (fecal)	n/100 ml	AFNOR Approved	4	0	200 or less	5000 or less	-	5000 or less	1000 or less
9.	Coliform (total)			8	--	--	--	--	--	--
10.	Color	PCU	Photometric	20	--	--	--	--	--	--
11.	Copper (Cu)	mg/L	Bicinchoninate	<0.01	--	--	--	--	--	--
12.	Dissolved Oxygen (DO)	mg/L	Ion Electron	6.0	6 or more	5 or more	6 or more	5 or more	5 or more	5 or more
13.	Electric Conductivity	µS/cm	Ion Electron	28600	--	--	--	--	--	--
14.	Fluoride	mg/L	Photometric ion selective	1.8	--	--	--	--	--	--

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Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW4	a	b	c	d	e	f
15.	Iron (Fe)	mg/L	Diphenyl carbohydrazide	<0.01	--	--	--	--	--	--
16.	Pb	mg/L	AAS	<0.005	--	--	--	--	--	--
17.	Mn	mg/L	Photometric	0.04	--	--	--	--	--	--
18.	Hg	mg/L	AAS	<0.001	--	--	--	--	--	--
19.	Ni	mg/L	AAS	0.05	--	--	--	--	--	--
20.	Nitrate	mg/L	Cadmium Reduction	3.8	--	--	--	--	--	--
21.	Odor	TON	2150 B.	O/L	--	--	--	--	--	--
22.	Oil & Grease	mg/L	Gravimetric	0.9	--	--	--	--	--	--
23.	pH	--	Ion Electron	8.01	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
24.	Phosphate	mg/L	Photometric	1.4	--	--	--	--	--	--
25.	Potassium	mg/L	Turbidimetric	625	--	--	--	--	--	--
26.	Sulphate	mg/L	Turbidimetric	955	--	--	--	--	--	--
27.	Temperature (T)	°C	Ion Electron	28.2	--	--	--	--	--	--
28.	Total Alkalinity	mg/L	Colorimetric	81	--	--	--	--	--	--
29.	TDS	mg/L	Ion Electron	14300	--	--	--	--	--	--
30.	Total Hardness	mg/L	Titrometric	540	--	--	--	--	--	--
31.	TSS	mg/L	Gravimetric	121	--	--	--	--	--	--
32.	Turbidity	NTU	Turbidimetric	4.1	--	--	--	--	--	--
33.	Zinc (Zn)	mg/L	Zincon Method	0.09	--	--	--	--	--	--

*Note: a- Source of drinking water for supply only after disinfecting, b- Water usable for recreational activity, c- Source of drinking water for supply after conventional treatment, d- Water usable by fisheries, e- Water usable by various process and cooling industries, f- Water usable for irrigation, AAS - Atomic Absorption Spectroscopy

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Ref: EQMS/Water Quality/2023012176

EQMS WET LABORATORY

Test Results of Surface Water Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity : Surface Water Quality
Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location : SW5, Kutubdia Channel
Coordinate : 21°46'54.2" N 91°53'26.7" E
Sampling Date : 18.10.2022
Reporting Date : 20.11.2022
Analysis Description :

Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW5	a	b	c	d	e	f
1.	Ammonia	mg/L	Nessler	0.20	--	--	--	--	--	--
2.	Arsenic (As)	ppm	Modified Gutzeit Method	<0.005	--	--	--	--	--	--
3.	BOD_5	mg/L	5 Days Incubation	1.3	2 or less	3 or less	3 or less	6 or less	10 or less	10 or less
4.	Cd	mg/L	AAS	0.00015	--	--	--	--	--	--
5.	COD	mg/L	USEPA 410.4	9	--	--	--	--	--	--
6.	Chloride (Cl)	mg/L	Mercury (II) Thiocyanate	4500	--	--	--	--	--	--
7.	Cr+6	mg/L	ASTM D1687-92	0.025	--	--	--	--	--	--
8.	Coliform (fecal)	n/100 ml	AFNOR Approved	6	0	200 or less	5000 or less	-	5000 or less	1000 or less
9.	Coliform (total)			11	--	--	--	--	--	--
10.	Color	PCU	Photometric	19	--	--	--	--	--	--
11.	Copper (Cu)	mg/L	Bicinchoninate	<0.01	--	--	--	--	--	--
12.	Dissolved Oxygen (DO)	mg/L	Ion Electron	6.1	6 or more	5 or more	6 or more	5 or more	5 or more	5 or more
13.	Electric Conductivity	µS/cm	Ion Electron	17730	--	--	--	--	--	--
14.	Fluoride	mg/L	Photometric ion selective	2.0	--	--	--	--	--	--

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Sl	Parameter	Unit	Method	Concentration SW5	Standard for Inland Surface Water (ECR 97) * a	b	c	d	e	f
15.	Iron (Fe)	mg/L	Diphenyl carbohydrazide	<0.01	--	--	--	--	--	--
16.	Pb	mg/L	AAS	<0.005	--	--	--	--	--	--
17.	Mn	mg/L	Photometric	0.03	--	--	--	--	--	--
18.	Hg	mg/L	AAS	<0.001	--	--	--	--	--	--
19.	Ni	mg/L	AAS	0.05	--	--	--	--	--	--
20.	Nitrate	mg/L	Cadmium Reduction	3.2	--	--	--	--	--	--
21.	Odor	TON	2150 B.	O/L	--	--	--	--	--	--
22.	Oil & Grease	mg/L	Gravimetric	0.8	--	--	--	--	--	--
23.	pH	--	Ion Electron	8.27	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
24.	Phosphate	mg/L	Photometric	3.1	--	--	--	--	--	--
25.	Potassium	mg/L	Turbidimetric	630	--	--	--	--	--	--
26.	Sulphate	mg/L	Turbidimetric	900	--	--	--	--	--	--
27.	Temperature (T)	°C	Ion Electron	28.5	--	--	--	--	--	--
28.	Total Alkalinity	mg/L	Colorimetric	76	--	--	--	--	--	--
29.	TDS	mg/L	Ion Electron	8860	--	--	--	--	--	--
30.	Total Hardness	mg/L	Titrometric	546	--	--	--	--	--	--
31.	TSS	mg/L	Gravimetric	128	--	--	--	--	--	--
32.	Turbidity	NTU	Turbidimetric	4.2	--	--	--	--	--	--
33.	Zinc (Zn)	mg/L	Zincon Method	0.07	--	--	--	--	--	--

*Note: a- Source of drinking water for supply only after disinfecting, b- Water usable for recreational activity, c- Source of drinking water for supply after conventional treatment, d- Water usable by fisheries, e- Water usable by various process and cooling industries, f- Water usable for irrigation, AAS - Atomic Absorption Spectroscopy

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Ref: EQMS/Water Quality/2023012177

EQMS WET LABORATORY

Test Results of Surface Water Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Monitoring Activity : Surface Water Quality
Monitoring Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location : SW6, Near Matarbari Deep Sea Port, Kutubdia Channel
Coordinate : 21°43'07.3" N 91°52'04.5" E
Sampling Date : 18.10.2022
Reporting Date : 20.11.2022
Analysis Description :

Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW6	a	b	c	d	e	f
1.	Ammonia	mg/L	Nessler	0.21	--	--	--	--	--	--
2.	Arsenic (As)	ppm	Modified Gutzeit Method	<0.005	--	--	--	--	--	--
3.	BOD_5	mg/L	5 Days Incubation	1.2	2 or less	3 or less	3 or less	6 or less	10 or less	10 or less
4.	Cd	mg/L	AAS	0.00017	--	--	--	--	--	--
5.	COD	mg/L	USEPA 410.4	13	--	--	--	--	--	--
6.	Chloride (Cl)	mg/L	Mercury (II) Thiocyanate	5100	--	--	--	--	--	--
7.	Cr+6	mg/L	ASTM D1687-92	0.030	--	--	--	--	--	--
8.	Coliform (fecal)	n/100 ml	AFNOR Approved	4	0	200 or less	5000 or less	-	5000 or less	1000 or less
9.	Coliform (total)			10	--	--	--	--	--	--
10.	Color	PCU	Photometric	17	--	--	--	--	--	--
11.	Copper (Cu)	mg/L	Bicinchoninate	<0.01	--	--	--	--	--	--
12.	Dissolved Oxygen (DO)	mg/L	Ion Electron	6.0	6 or more	5 or more	6 or more	5 or more	5 or more	5 or more
13.	Electric Conductivity	µS/cm	Ion Electron	3140	--	--	--	--	--	--
14.	Fluoride	mg/L	Photometric ion selective	2.1	--	--	--	--	--	--

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Sl	Parameter	Unit	Method	Concentration	Standard for Inland Surface Water (ECR 97) *					
				SW6	a	b	c	d	e	f
15.	Iron (Fe)	mg/L	Diphenyl carbohydrazide	<0.01	--	--	--	--	--	--
16.	Pb	mg/L	AAS	<0.005	--	--	--	--	--	--
17.	Mn	mg/L	Photometric	0.04	--	--	--	--	--	--
18.	Hg	mg/L	AAS	<0.001	--	--	--	--	--	--
19.	Ni	mg/L	AAS	0.05	--	--	--	--	--	--
20.	Nitrate	mg/L	Cadmium Reduction	3.5	--	--	--	--	--	--
21.	Odor	TON	2150 B.	O/L	--	--	--	--	--	--
22.	Oil & Grease	mg/L	Gravimetric	0.7	--	--	--	--	--	--
23.	pH	--	Ion Electron	8.30	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
24.	Phosphate	mg/L	Photometric	2.6	--	--	--	--	--	--
25.	Potassium	mg/L	Turbidimetric	650	--	--	--	--	--	--
26.	Sulphate	mg/L	Turbidimetric	1000	--	--	--	--	--	--
27.	Temperature (T)	°C	Ion Electron	28.5	--	--	--	--	--	--
28.	Total Alkalinity	mg/L	Colorimetric	77	--	--	--	--	--	--
29.	TDS	mg/L	Ion Electron	1570	--	--	--	--	--	--
30.	Total Hardness	mg/L	Titrometric	549	--	--	--	--	--	--
31.	TSS	mg/L	Gravimetric	121	--	--	--	--	--	--
32.	Turbidity	NTU	Turbidimetric	4.2	--	--	--	--	--	--
33.	Zinc (Zn)	mg/L	Zincon Method	0.08	--	--	--	--	--	--

*Note: a- Source of drinking water for supply only after disinfecting, b- Water usable for recreational activity, c- Source of drinking water for supply after conventional treatment, d- Water usable by fisheries, e- Water usable by various process and cooling industries, f- Water usable for irrigation, AAS - Atomic Absorption Spectroscopy

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Appendix D-4: Groundwater Quality

Ref: EQMS/Water Quality/2023012178

EQMS WET LABORATORY

Test Results of Ground Water Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Sampling Activity : Ground Water Quality
Sampling Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location :

Code	Location	GPS Coordinate	Sampling Date
GWQ-1	Kankadi Ghuna Jame Mosque, Matarbari	21°45'23.8" N 91°53'15.9" E	20.10.2022
GWQ-2	Nadir Hossain House, Banti Shikdarpara, Matarbari	21°44'41.2" N 91°54'22.0" E	20.10.2022
GWQ-3	Abu Taher House, South Sikdarpara, Matarbari	21°44'31.4" N 91°53'58.4" E	20.10.2022
GWQ-4	Monhajipara Jame Mosque, Monhajipara, 4 No: Ward, Matarbari	21°44'10.2" N 91°53'43.4" E	20.10.2022

Reporting Date : 26.11.2022
Description of Analysis :

Parameters	Method	Unit	Groundwater Quality				
			GWQ-1	GWQ-2	GWQ-3	GWQ-4	Bangladesh Standard
Aluminum	Aluminon	mg/L	0.01	<0.001	<0.001	0.01	0.2
Ammonia	D1426-92 Nessler	mg/L	<0.001	<0.001	<0.001	<0.001	0.5
Arsenic	Modified Gutzeit	mg/L	<0.001	<0.001	<0.001	<0.001	0.05
Barium	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.01
Benzene	Chromatographic	mg/L	<0.001	<0.001	<0.001	<0.001	0.01
BOD_5	5 days incubation	mg/L	0.1	0.1	0.1	0.1	0.2
Boron	UVS	mg/L	0.2	0.2	0.4	0.1	1.0
Cadmium	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.005
Calcium	Colorimetric	mg/L	21	17	29	22	75
Chloride	Mercury (II) thiocyanate	mg/L	<0.02	<0.02	<0.02	<0.02	150 – 600*
Chlorine (residual)	Photometric	mg/L	<0.001	<0.001	<0.001	<0.001	0.2
Chloroform	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.09

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Parameters	Method	Unit	Groundwater Quality				Bangladesh Standard
			GWQ-1	GWQ-2	GWQ-3	GWQ-4	
Chromium (hexavalent)	Diphenylcarbohydrazide	mg/L	<0.001	<0.001	<0.001	<0.001	0.05
Chromium (total)	Photometric	mg/L	<0.001	<0.001	<0.001	<0.001	0.05
COD	USEPA 410.4	mg/L	BDL	BDL	BDL	BDL	4
Coliform (Fecal)	AFNOR approved	N/100	0	0	0	0	0
Coliform (Total)	AFNOR approved	N/100	0	0	0	0	0
Color	Adaptation of the Standard	Haz en	8	8	3	2	15
Copper	Bicinchoninate	mg/L	0.02	0.01	0.02	0.03	1
DO	Ion Electrode	mg/L	5.0	5.2	5.4	5.1	6
EC	Ion Electrode	µS/cm	360	380	360	350	-
Fluoride	Photometric ion selective	mg/L	0.4	0.2	0.1	0.3	1
Hardness (as $CaCO_3$)	Titrimetric	mg/L	57	54	55	51	200 – 500
Iron (Fe)	Phhenantroline	mg/L	0.01	0.01	0.01	0.02	0.3-1.0
Kjeldahl Nitrogen (total)	Spectroscopic	mg/L	0.2	0.1	0.2	0.4	1
Lead	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.05
Magnesium	Photometric	mg/L	4	7	8	1	30-35
Mercury	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.001
Nickel	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.1

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Parameters	Method	Unit	Groundwater Quality				Bangladesh Standard
			GWQ-1	GWQ-2	GWQ-3	GWQ-4	
Nitrate	Cadmium Reduction	mg/L	1.1	1.0	1.2	1.0	10
Nitrite	Photometric	mg/L	0.4	0.3	0.1	0.2	<1
Odour	2150 B. Threshold Odor Test	--	Odorless	Odorless	Odorless	Odorless	Odorless
Oil & Grease	Gravimetric	mg/L	<0.001	<0.001	<0.001	<0.001	0.01
pH	Ion electrode	--	8.06	7.83	7.85	7.90	6.5 – 8.5
Phosphate	Amino acid	mg/L	0.9	0.4	0.5	0.4	6
Phosphorus	Amino acid	mg/L	<0.001	<0.001	<0.001	<0.001	0
Potassium	Turbidimetric	mg/L	11.1	7.8	8.1	10.2	12
Selenium	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.01
Silver	AAS	mg/L	<0.001	<0.001	<0.001	<0.001	0.02
Sodium	Flame Photometer	mg/L	18.4	11.2	13.6	9.8	200
Suspended Particulate Matters	Dry and filtration	mg/L	4	5	6	3	10
Sulfide	Spectrophotometric	mg/L	<0.001	<0.001	<0.001	<0.001	0
Sulfate	Turbidimetric	mg/L	2.0	2.1	2.1	2.0	400
TDS	Ion electrode	mg/L	180	190	180	180	1000
Total Hardness	Titrimetric	mg/L	57	54	57	51	200-500

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Parameters	Method	Unit	Groundwater Quality				Bangladesh Standard
			GWQ-1	GWQ-2	GWQ-3	GWQ-4	
Total Alkalinity	Photometric	mg/L	41	38	40	35	-
Temperature	Ion electrode method	°C	29.4	28.5	28.6	28.7	20-30
Turbidity	Turbidimetric Photoelectric	NTU	0.02	0.05	0.03	0.02	10
Zinc	Zincon	mg/L	0.01	0.01	0.02	0.02	5

***According to ECR 1997, Schedule 3(B), AAS- Atomic Absorption Spectrophotometric, BDL- Below Detection Limit , AAS - Atomic Absorption Spectroscopy*

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Appendix D-5: Soil Quality

Ref: EQMS/Soil Quality/2023012179

EQMS WET LABORATORY

Test Results of Soil Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar
Sampling Activity : Soil Quality
Sampling Personnel : EQMS Monitoring Inspector; Abdur Rab
Sampling Location :

Code	Location	GPS Coordinate	Sampling Date
SQ-1	North-West Corner of Project Site	21°45'01.4" N 91°53'12.7" E	20.10.2022
SQ-2	Middle East of the Project Site	21°44'53.0" N 91°54'01.8" E	20.10.2022
SQ-3	South Side of the Project Site	21°44'38.8" N 91°53'47.4" E	20.10.2022
SQ-4	East Side of the Project Location	21°44'38.6" N 91°54'21.6" E	20.10.2022

Reporting Date : 27.11.2022
Description of Analysis :

Parameter	Unit	SQ-1	SQ-2	SQ-3	SQ-4
Boron	ppm	1.32	1.15	0.63	1.12
Bulk Density	gcm^{-3}	1.05	1.14	1.13	1.24
Cadmium (Cd)	ppm	Nil	Nil	Nil	Nil
Calcium (Ca)	meq /100g soil	2.32	2.45	2.68	2.85
Carbonate	ppm	0.0012	0.0015	0.00	0.00
Cation Exchange Capacity	%	0.357	0.295	0.252	0.278
Chloride	ppm	5720.5	5231.2	3214.6	6173.4
Copper (Cu)	ppm	0.21	0.28	0.27	0.46
EC	DS/m	6.1	4.7	4.4	6.3
Iron (Fe)	ppm	54.35	58.27	84.60	125.32
Lead (Pb)	ppm	Nil	Nil	Nil	Nil
Manganese (Mg)	meq /100g soil	0.82	0.90	0.85	1.05
Mercury (Hg)	ppm	Nil	Nil	Nil	Nil
Moisture Content	%	2.1	2.3	2.6	2.4
Organic Carbon	%	0.84	0.87	1.2	1.7
pH	-	4.7	5.2	5.0	5.9

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Parameter	Unit	SQ-1	SQ-2	SQ-3	SQ-4
Particle Size Distribution	%	Sand: 5.9 Silt: 64.3 Clay: 29.8	Sand: 5.3 Silt: 65.5 Clay: 29.2	Sand: 3.2 Silt: 61.8 Clay: 35	Sand: 11.3 Silt: 63.2 Clay: 25.5
Permeability	cm/hour	0.21	0.18	0.32	0.25
Phosphorous	ppm	3.20	3.35	2.90	2.75
Porosity	%	58.50	59.58	56.00	62.31
Potassium	mg/100g	1.50	1.38	0.45	1.62
Salinity	-	Slightly Saline	Slightly Saline	Slightly Saline	Slightly Saline
Sodium (Na)	meq/100g soil	8.52	7.58	6.21	8.92
Sodium Adsorption Ration (SAR)	-	11	09	11	10
Sulphur	ppm	212.5	230.8	208.3	218.6
Texture	-	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silt Loam
Total Nitrogen	%	0.025	0.021	0.095	0.018
Zinc (Zn)	ppm	4.92	4.57	3.64	3.35

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Appendix D-6: Sediment Quality

Ref: EQMS/Sediment Quality/2023012180

EQMS WET LABORATORY

Test Results of Sediment Quality

Project Name : 635 MW Coal based Thermal Power Plant at Matarbari, Maheshkhali, Cox's Bazar

Sampling Activity : Sediment Quality

Sampling Personnel : EQMS Monitoring Inspector; Abdur Rab

Sampling Location :

Code	Location	GPS Coordinate	Sampling Date
SeQ-1	Ujantia Ghat, Matamuhuri River	21°45'50.5"N 91°54'15.6"E	18.10.2022
SeQ-2	Sadar Khal, Matamuhuri River	21°44'14.0"N 91°54'31.3" E	18.10.2022
SeQ-3	Misbah Uddin House Pond, Sikdarpar, Matarbari	21°45'11.1"N 91°55'02.6" E	20.10.2022
SeQ-4	Near proposed water intake point, Kutubdia Channel	21°45'02.9"N 91°52'40.5" E	18.10.2022
SeQ-5	Upstream of Kutubdia Channel	21°46'54.2"N 91°53'26.7" E	18.10.2022
SeQ-6	Downstream of water discharge point, Kutubdia Channel	21°43'07.3"N 91°52'04.5" E	18.10.2022

Reporting Date : 27.11.2022

Head Office: H # 53, R # 04, B # C, Banani, Dhaka -1213, Bangladesh
Lab Office: Flat # F1, House # Ta-134/A, Bolshakhi Sarani, Gulshan-Badda Link Road, Dhaka – 1212
Toronto Office: 7 Arnot Street, Scarborough Ontario, M1K4B5 Canada

:

Description of Analysis

Parameter	Unit	SeQ-1	SeQ-2	SeQ-3	SeQ-4	SeQ-5	SeQ-6	Dutch Intervention Value 2013
Acidity	ppm	Nil	Nil	Nil	Nil	Nil	Nil	-
Alkalinity	ppm	157	161	152	142	148	139	-
Arsenic (As)	ppm	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-
Cadmium (Cd)	ppm	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	13.0
Cation Exchange Capacity	meq/ 100 gm	42	40	38	34	38	36	-
Chromium (Cr+6)	ppm	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-
Cobalt (Co)	ppm	19.0	15.0	17.0	18.0	20.0	18.0	-
Copper (Cu)	ppm	34.8	27.5	24.6	34.7	34.2	30.5	190
Electrical Conductivity	uS/cm	22982	23028	22467	12125	12745	12360	-
Lead (Pb)	ppm	26.5	34.2	29.5	21.3	23.6	19.7	530
Manganese (Mn)	ppm	587.3	531.8	540.6	455.2	478.5	418.4	-
Mercury (inorganic)	ppm	<0.1	0.31	0.24	<0.1	<0.1	<0.1	-
Mercury (organic)	ppm	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
Nickel (Ni)	ppm	58.6	53.4	51.7	47.2	57.1	46.7	100
pH	-	7.61	7.48	7.60	7.23	7.52	7.12	-
Silica	%	48	44	41	47	43	50	-
Texture	-	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	Clay loam	-
Total Organic Carbon	%	0.76	0.72	0.80	0.63	0.58	0.50	-
Zinc (Zn)	ppm	73.2	63.7	67.4	72.6	70.1	51.7	720

Received By:
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Toronto Office: 7 Arnot Street, Scarborough Ontario, M1K4B5 Canada

Appendix E: Checklist of Flora and Fauna Species

Appendix E-1: Tree Species recorded from Quadrant Sampling

Sl No	Local Name	Common Name	Scientific name	Family	Use	Abundance*
1.	Aam	Mango	*Mangifera indica*	Anacardiaceae	Fruit	C
2.	Akashmoni	Acacia	*Acacia auriculiformis*	Fabaceae	Timber	VC
3.	Amra	Hog Plum	*Spondias mombin*	Anacardiaceae	Fruit	C
4.	Arjun	Arjun tree	*Terminalia arjuna*	Combretaceae	Timber	C
5.	Boroi	Indian Jujube	*Ziziphus mauritiana*	Rhamnaceae	Medicinal	VC
6.	Eucalyptus	Eucalyptus	*Eucalyptus citriodora*	Myrtaceae	Timber	VC
7.	Jam	Java Plum	*Syzygium cumini*	Myrtaceae	Fruit, Timber	C
8.	Kala Koroi	Shirish	*Albizia lebbeck*	Fabaceae	Timber	VC
9.	Kathal	Jackfruit	*Artocarpus heterophyllus*	Moraceae	Fruit	C
10.	Kodom	Burflower-tree	*Neolamarckia cadamba*	Rubiaceae	Aesthetic	C
11.	Krishnochura	Royal poinciana	*Delonix regia*	Fabaceae	Aesthetic	C
12.	Mahogony	Mahogoni	*Swietenia mahagoni*	Meliaceae	Timber	VC
13.	Mangium	Mangium	*Acacia mangium*	Fabaceae	Timber	VC
14.	Narikel	Coconut	*Cocos nucifera*	Arecaceae	Fruit	VC
15.	Peyara	Guava	*Psidium guajava*	Myrtaceae	Fruit	C
16.	Raintree	Raintree	*Samanea saman*	Fabaceae	Timber	VC
17.	Sada Koroi	White Siris	*Albizia procera*	Fabaceae	Timber	VC
18.	Segun	Teak	*Tectona grandis*	Verbenaceae	Timber	VC
19.	Supari	Areca palm	*Areca catechu*	Arecaceae	Fruit	VC
20.	Tetul	Tamarind tree	*Tamarindus indica*	Fabaceae	Fruit	C
21.	Tal	Tal palm	*Borassus flabellifer*	Arecaceae	Fruit	VC
22.	Chalta	Elephant Apple	*Dillenia indica*	Dilleniaceae	Fruit	C
23.	Shimul	Cotton tree	*Bombax ceiba*	Malvaceae	Timber	R
24.	Sishu	Indian rosewood	*Dalbergia sissoo*	Fabaceae	Timber	C
25.	Minjiri	Cassod tree	*Cassia siamea*	Fabaceae	Medicinal	R
26.	Porosh Pipul	Portia tree	*Thespesia populnea*	Malvaceae	Aesthetic	R
27.	Amloki	Indian gooseberry	*Phyllanthus emblica*	Phyllanthaceae	Fruit	C
28.	Jibon	Indian Charcoal Tree	*Trema orientalis*	Cannabaeae	Medicinal	R
29.	Khejur	Date palm	*Phoenix sylvestris*	Arecaceae	Fruit	VC
30.	Kath Badam	Indian Almond	*Terminalia catappa*	Combretaceae	Fruit	C

Source: EQMS Field Survey, October 2022

* VC = Very Common, C= Common, R= R

Appendix E-2: Herb and Shrub Species recorded from Quadrant Sampling

Sl No	Local Name	Common Name	Scientific name	Family	Type
1.	Bansh	Bamboo	*Bambusa sp.*	Poaceae	Herb
2.	Berela	Cuban jute	*Sida rhombifolia*	Malvaceae	Herb
3.	Bon chakunda	Sickle Senna	*Senna tora*	Fabaceae	Shrub
4.	Bon Jui	Wild Jasmine	*Clerodendrum inerme*	Verbenaceae	Shrub
5.	Chagol kuri	Beach morning glory	*Ipomoea pes-caprae*	Convolvulaceae	Herb
6.	Chorakata	lesser spear grass	*Andropogon aciculatus*	Gramineae	Herb
7.	Dhupkamini	Water hyssop	*Bacopa monnieri*	Plantaginaceae	Herb
8.	Durba	Bermuda Grass	*Cynodon dactylon*	Poaceae	Herb
9.	Holud hurhuria	Yellow spider flower	*Cleome viscosa*	Capparaceae	Herb
10.	Holud Keyakata	Screw pine	*Pandanus foetidus*	Pandanaceae	Shrub
11.	Jadu palang	shoreline purslane	*Sesuvium portulacastrum*	Aizoaceae	Herb
12.	Joba	China Rose	*Hibiscus Rosa Sinensis*	Malvaceae	Shrub
13.	Kashful	Wild Sugarcane	*Saccharum spontaneum*	Poaceae	Herb
14.	Khurakata	spiny amaranth	*Amaranthus spinosus*	Amaranthaceae	Herb
15.	Kochu	Taro	*Colocasia esculenta*	Araceae	Herb
16.	Kolkesunda	Coffee weed	*Cassia occidentalis*	Caesalpiniaceae	Herb
17.	Lojjaboti	Mimosa plant	*Mimosa pudica*	Fabaceae	Herb
18.	Lonthon ful	Sage	*Lantana camara*	Verbenaceae	Shrub
19.	Mati Konduri	Sessile Joy weed	*Alternanthera sessilis*	Amaranthaceae	Herb
20.	Mukta Juri	Indian Nettle	*Acalypha indica*	Euphorbiaceae	Herb
21.	Mutha	Java Grass	*Cyperus rotundus*	Cyperaceae	Herb
22.	Nisinda	Chinese chaste tree	*Vitex negundo*	Lamiaceae	Shrub
23.	Nol khagra	Tall Reed	*Phragmites karka*	Poaceae	Herb
24.	Opango ful	Prickly Chaff Flower	*Achyranthes aspera*	Amaranthaceae	Herb
25.	Pepe	Papaya	*Carica papaya*	Caricaceae	Shrub
26.	Pitkorobi	Yellow Oleander	*Thevetia peruviana*	Apocynaceae	Shrub
27.	Thankuni	Indian pennywort	*Centella asiatica*	Mackinlayaceae	Herb
28.	Venna	castor oil plant	*Ricinus communis*	Euphorbiaceae	Shrub

Source: EQMS Field Survey, October 2022

Appendix E-3: Checklist of all Recorded Avian Species

Sl No	Common Name	Local Name	Scientific name	Family	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-1**
1.	Ashy woodswallow	Mete Bon ababil	*Artamus fuscus*	Artamidae	LC	LC
2.	Asian koel	Kokil, Koel	*Eudynamys scolopacea*	Cuculidae	LC	LC
3.	Asian palm swift	Ashio Talbatashi	*Cypsiurus balasiensis*	Apodidae	LC	LC
4.	Asian pied starling	Pakra/Gubra shalik	*Sturnus contra*	Sturnidae	LC	LC
5.	Barn owl	Lokkhi pecha	*Tyto alba*	Tytonidae	LC	LC
6.	Barn swallow	Choto Ababil	*Hirundo rustica*	Hirundinidae	LC	LC
7.	Baya weaver	Babui Pakhi	*Ploceus philippinus*	Ploceidae	LC	LC
8.	Black drongo	Kala Fingey	*Dicrurus macrocercus*	Dicruridiae	LC	LC
9.	Black-hooded oriole	Kalamatha Benebou/Holdey Pakhi	*Oriolus xanthornus*	Oriolidae	LC	LC
10.	Black-rumped flameback	Sonali kaththokra	*Dinopium benghalense*	Picidae	LC	LC
11.	Rock dove	Gola Paira/Jalali Kabutor	*Columba livia*	Columbidae	LC	LC
12.	Blue-throated flycatcher	Nilgola Pakhi	*Cyornis rubeculoides*	Muscicapidae	LC	LC
13.	Brown shrike	Khoira Latora, Kosai	Lanius cristatus	Laniidae	LC	LC
14.	Cattle egret	Go Boga	*Bubulcus ibis*	Ardeidae	LC	LC
15.	Chestnut-tailed starling	Khoiralej Kathshalik	*Sturnia malabarica*	Ciconiidae	LC	LC
16.	Choto gulinda	Whimbrel	*Numenius phaeopus*	Scolopacidae	LC	LC
17.	Citrine wagtail	Holde-matha Khanjana	*Motacilla citreola*	Motacillidae	LC	LC
18.	Common hoopoe	Hudhud	*Upupa epops*	Upupidae	LC	LC
19.	Common iora	Fotikjol	*Aegithina tiphia*	Aegithinidae	LC	LC
20.	Common kingfisher	Chhoto Maachranga	*Alcedo atthis*	Alcedinidae	LC	LC
21.	Common myna	Bhat Salik	*Acridotheres tristis*	Sturnidae	LC	LC
22.	Common redshank	Kada Khocha	*Tringa totanus*	Scolopacidae	LC	LC
23.	Common sandpiper	Pati Batan	*Actitis hypoleucos*	Scolopacidae	LC	LC
24.	Common tailor bird	Tuntuni	*Orthotomus sutorius*	Sylviidae	LC	LC
25.	Coppersmith barbet	Chhoto Basanta Bauri	*Megalaima haemacepala*	Megalaimid ae	LC	LC

Sl No	Common Name	Local Name	Scientific name	Family	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-1**
26.	Eurasian Curlew	Eureshio gulinda	*Numenius arquata*	Scolopacidae	NT	NT
27.	Great egret	Boro Boga	*Casmerodius albus*	Ardeidae	LC	LC
28.	Green bee-eater	Suichora	*Merops philippinus*	Meropidae	LC	LC
29.	Grey heron	Dhupni Bok	*Ardea cinerea*	Ardeidae	LC	LC
30.	Grey-capped pygmy woodpecker	Metetoopi Batkurali	*Dendrocopos canicapillus*	Picidae	LC	LC
31.	House crow	Pati Kak	*Corvus splendens*	Corvidae	LC	LC
32.	House sparrow	Pati choroi	*Passer domesticus*	Passeridae	LC	LC
33.	House swift	Ghor Batashi	*Apus affinis*	Apodidea	LC	LC
34.	Indian pond heron	Kani Bok	*Ardeola grayii*	Ardidae	LC	LC
35.	Intermediate egret	Majhari Bok	*Ardea intermedia*	Ardeidae	LC	LC
36.	Jungle myna	Jhuti Shalik	*Acridotheres fuscus*	Sturnidae	LC	LC
37.	Large-billed crow /Jungle crow	Dar kak	*Corvus macrorhynchos*	Corvidae	LC	LC
38.	Lesser sand plover	Choto Dhul jhiria	*Charadrius mongolus*	Charadriidae	LC	LC
39.	Little cormorant	Choto Pankowri	*Microcarbo niger*	Phalacrocoracidae	LC	LC
40.	Little egret	Choto boga	*Egretta garzetta*	Ardeidae	LC	LC
41.	Long-tailed shrike	Lenja Latora	*Lanius schach*	Laniidae	LC	LC
42.	Marsh sandpiper	Bali Batan	*Tringa stagnatilis*	Scolopacidae	LC	LC
43.	Oriental magpie robin	Doel	*Copsychus saularis*	Muscicapidae	LC	LC
44.	Paddyfield pipit	Dhani Tulika	*Anthus rufulus*	Motacillidae	LC	LC
45.	Pale-bellied Myna	Dholatola Shalik	*Acridotheres cinereus*	Sturnidae	LC	LC
46.	Pied kingfisher	Pakra Machranga	*Ceryle rudis*	Alcedinidae	LC	LC
47.	Purple sunbird	Niltuni	*Cinnyris asiaticus*	Nectarinidae	LC	LC
48.	Purple-rumped sunbird	Moutusi	*Leptocoma zeylonica*	Nectarinidae	LC	LC
49.	Red turtle dove	Lal Ghugu	*Streptopelia tranquebarica*	Columbidae	LC	LC
50.	Red-vented bulbul	Bangla bulbul	*Pycnonotus cafer*	Pycnonotidae	LC	LC
51.	Rufous treepie	Khoira Harichacha	*Dendrocitta vagabunda*	Corvidae	LC	LC

Sl No	Common Name	Local Name	Scientific name	Family	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-1**
52.	Shobuj tia	Rose-ringed Parakeet	*Psittacula krameri*	Psittaculidae	LC	LC
53.	Small minivet	Choto Soheli	*Pericrocotus cinnamomeus*	Campephagidae	LC	LC
54.	Spotted dove	Tila Ghughu	*Streptopelia chinensis*	Rallidae	LC	LC
55.	White wagtail	Dhola Khonjon	*Motacilla alba*	Passeride	LC	LC
56.	White-breasted kingfisher	Dhola gola Machranga	*Halcyon smyrnensis*	Alcedinidae	LC	LC
57.	White-browed wagtail	Sada-vuru Khanjan	*Motacilla maderaspatensis*	Motacillidae	LC	LC
58.	White-throated kingfisher	Dhola gola Machranga	*Halcyon smyrnensis*	Alcedinidae	LC	LC
59.	Wood sandpiper	Bon Batan	*Tringa glareola*	Scolopacidae	LC	LC

Source: EQMS Field Survey, October 2022

*IUCN Bangladesh. 2015. Red List of Bangladesh Volume 3: Birds; LC=Least Concern

**IUCN 2022. The IUCN Red List of Threatened Species. Version 2022-1. (https://www.iucnredlist.org/)

Appendix E-4: Observed Shore Bird Species in AOI

Sl No	Family	Common Name	Local Name	Scientific name	Migratory Status	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-1**
1.	Scolopacidae	Choto Gulinda	Whimbrel	*Numenius phaeopus*	Winter Visitor	LC	LC
2.		Common redshank	Kada Khocha	*Tringa totanus*	Winter Visitor	LC	LC
3.		Common sandpiper	Pati Batan	*Actitis hypoleucos*	Winter Visitor	LC	LC
4.		Eureshio Gulinda	Eurasian Curlew	*Numenius arquata*	Winter Visitor	NT	NT
5.		Marsh sandpiper	Bali Batan	*Tringa stagnatilis*	Winter Visitor	LC	LC
6.		Wood Sandpiper	Bon Batan	*Tringa glareola*	Winter Visitor	LC	LC
7.	Ardeidae	Great Egret	Boro Boga	*Casmerodius albus*	Resident	LC	LC
8.		Grey heron	Dhupni Bok	*Ardea cinerea*	Resident	LC	LC
9.	Charadriidae	Lesser Sand plover	Choto Dhul jhiria	*Charadrius mongolus*	Winter Visitor	LC	LC

Source: EQMS Field Survey, October 2022

*IUCN Bangladesh. 2015. Red List of Bangladesh Volume 3: Birds; LC=Least Concern, NT= Near Threatened

**IUCN 2022. The IUCN Red List of Threatened Species. Version 2022-1. (https://www.iucnredlist.org/)

Appendix E-5: Checklist of Herpetofauna in the AOI

Sl No	Family	Common Name	Local Name	Scientific Name	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-1**	Wildlife conservation and security Act, 2012
Amphibians							
1.	Bufonidae	Southeast Asian toad	Kuno bang	*Duttaphrynus melanostictus*	LC	LC	Schedule II
2.	Dicroglossidae	Indian Bull frog	Kola bang	*Hoplobatrachus tigerinus*	LC	LC	Schedule II
3.		Indian skipper frog	Kotkoti bang	*Euphlyctis cyanophlyctis*	LC	LC	Schedule II
4.		Indian Green Pond Frog	Sobuj bang	Euphlyctis hexadactylus	LC	LC	Schedule II
5.	Microhylidae	Ornate Narrow-mouthed Frog	China bang	Microhyla ornata	LC	LC	Schedule II
6.	Rhacophoridae	Spotted Tree Frog	Chitra Gecho bang	Polypedates maculatus	LC	LC	Schedule II
7.		Common Tree Frog	Dorakata Gecho bang	Polypedates leucomystax	LC	LC	Schedule II
Reptiles							
1.	Varanidae	Bengal monitor	Gui shap	*Varanus bengalensis*	NT	LC	Schedule II
2.	Gekkonidae	House gecko	Tiktiki	*Hemidactylus frenatus*	LC	LC	Schedule II
3.	Agamidae	Common Garden lizard	Roktochosa	*Calotes versicolor*	LC	LC	Schedule II
4.	Scincidae	Indian Mabuya	Achil	*Eutropis carinata*	LC	LC	Schedule II
5.		Bronze Grass Skink	Tamatey Anjon	Eutropis macularia	LC	LC	Schedule II
6.	Colubridae	Checkered keel back	Dora shaap	*Xenochrophis piscator*	LC	NE	Schedule I
7.		Striped Keelback	Dora Shap	Amphiesma stolatum	LC	LC	Schedule I
8.		Asian Vine Snake	Laodoga Shap	Ahaetulla prasina	LC	LC	Schedule I
9.		Indian rat snake	Daraj shaap	*Ptyas mucosa*	LC	LC	Schedule I

Sl No	Family	Common Name	Local Name	Scientific Name	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-1**	Wildlife conservation and security Act, 2012
10.	Homalopsidae	Common smooth water snake	Painna Shap	*Enhydris enhydris*	LC	LC	Schedule I
11.		Dog-faced water snake	Jol bora Shap	*Cerberus rynchops*	LC	LC	Schedule I
12.	Elapidae	Banded Krait	Shangkhini	*Bungarus fasciatus*	LC	LC	Schedule II

Source: EQMS Field Survey, October 2022

*IUCN Bangladesh. 2015. Red List of Bangladesh Volume 4: Reptiles and Amphibians; LC=Least Concern; NT=Near Threatened; NE=Not Evaluated

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

Appendix E-6: Checklist of Terrestrial Mammals of the AOI

Sl No	Common Name	Local Name	Scientific Name	Family	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-2**	Wildlife Conservation and Security Act, 2012
1.	Common Indian Field Mouse	Metho Idur	*Mus booduga*	Muridae	LC	LC	Schedule III
2.	Common House Rat	Idur	*Rattus rattus*		LC	LC	-
3.	Small Indian Mongoose	Choto beji	*Urva auropunctata*	Herpestidae	LC	LC	Schedule I
4.	Indian Fruit Bat	Badur	*Pteropus giganteus*	Pteropodidae	LC	LC	Schedule I
5.	Irrawaddy Squirrel	Kathbirali	*Callosciurus pygerythrus*	Sciuridae	LC	LC	Schedule I
6.	Indian pipistrelle	Chamchika	*Pipistrellus coromandra*	Vespertilionidae	LC	LC	Schedule I
7.	House shrew	Chika	*Suncus murinus*	Soricidae	LC	LC	-
8.	Jungle Cat	Choto Ban Biral	*Felis chaus*	Felidae	LC	LC	Schedule I
9.	Golden Jackal	Pati-Siyal	*Canis aureus*	Canidae	LC	LC	Schedule I

Source: EQMS Field Survey, October 2022

*IUCN Bangladesh. 2015. Red List of Bangladesh Volume 2: Mammals; LC=Least Concern, NT= Near Threatened

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

Appendix E-7: Checklist of Recorded Fish Species in the Study Area

Sl No	Local Name	Common Name	Scientific Name	Family	Culture Species	Capture Species	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-2**
1.	Ailla	Indian mackerel	*Rastrelliger kanagurta*	Scombridae		✓	NE	DD
2.	Bacha	Batchwa vacha	*Eutropiichthys vacha*	Schilbeidae		✓	LC	LC
3.	Bajari Tengra	Tengra catfish	*Arius maculatus*	Bagridae	✓	✓	LC	LC
4.	Bighead carp	Bighead	*Hypophthalmichthys nobilis*	Cyprinidae	✓		NE	DD
5.	Baila	Tank goby	*Glossogobius giuris*	Gobiidae	✓	✓	LC	LC
6.	Bhangan bata	Flathead grey mullet	*Mugil cephalus*	Mugilidae		✓	LC	LC
7.	Bishtara	spotted scate	*Scatophagus argus*	Scatophagidae		✓	NE	LC
8.	Chapila	Indian River Shad	*Gudusia chapra*	Clupeidae		✓	VU	LC
9.	Chiring	Ray-finned fish	*Apocryptes bato*	Gobiidae		✓	LC	NE
10.	Choikka bata	Grey Mullet	*Rhimugil corsula*	Mugilide		✓	LC	LC
11.	Chowkha	Coromandel ilisha	*Ilisha filligera*	Pristigasteridae		✓	LC	DD
12.	Churi	Largehead Hairtail	*Trichiurus lepturus*	Trichiuridae		✓	NE	LC
13.	Dahuk mach	Blue-spotted Mudskipper	*Boleophthalmus boddarti*	Gobiidae		✓	NE	LC
14.	Darkuta	Obtuse barracuda	*Sphyraena obtusata*	Sphyraenidae		✓	NE	NE
15.	Datina	Yellowfin sea bream	*Acanthopagrus morrisoni*	Sparidae		✓	NE	LC
16.	Dom mach	Threadfin Silver belly	*Gerres filamentosus*	Gerreidae		✓	NE	LC
17.	Faisha	Gangetic hairfin anchovy	*Setipinna phasha*	Engraulidae		✓	NE	LC
18.	Gogani	crescent grunter	*Terapon jarbua*	Terapontidae		✓	NE	LC
19.	Guchi baim	Striped spinyeel	*Macrognathus pancalus*	Mastacembelidae		✓	LC	LC
20.	Gulsha Tengra	Long Whiskers Catfish	*Mystus gulio*	Bagridae		✓	NT	LC
21.	Hilsha	Hilsa shad	*Tenualosa ilisha*	Clupeidae		✓	LC	LC
22.	Kakila	Freshwater garfish	*Xenentodon cancila*	Belonidae		✓	LC	LC
23.	Kamila	Indian pike conger	*Congresox talabonoides*	Muraenesocidae		✓	NE	NE
24.	Katol	Catla	*Catla catla*	Cyprinidae	✓		LC	LC
25.	Koi	Gangetic koi	*Anabas cobojius*	Anabantidae		✓	DD	DD
26.	Koi mach	Climbing Perch	*Anabas testudineus*	Anabantidae	✓		LC	LC

Sl No	Local Name	Common Name	Scientific Name	Family	Culture Species	Capture Species	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-2**
27.	Koi Puti	Chacunda gizzard shad	*Anodontostoma chacunda*	Clupeidae		✓	LC	LC
28.	Koral	Asian sea bass	*Lates calcarifer*	Latidae		✓	NE	LC
29.	Korati chela	Tenpounder	*Elops machnata*	Elopidae		✓	NE	NE
30.	Lal chewa	Eel goby	*Odontamblyopus rubicundus*	Gobiidae		✓	NE	LC
31.	Lal Poa	Croaker	*Johnius argentatus*	Sciaenidae		✓	NE	LC
32.	Loitta	Bombay-duck	*Harpadon nehereus*	Synodontidae		✓	NE	NT
33.	Mola	Mola carplet	*Amblypharyngodon mola*	Cyprinidae		✓	LC	LC
34.	Nancil koral	Indo-Pacific tarpon	*Megalops cyprinoides*	Megalopidae		✓	NE	DD
35.	Nuna Bele	Bumblebee goby	*Brachygobius nunus*	Gobiidae		✓	LC	NE
36.	Olua	Neglected grenadier	*Coilia sp.*	Engraulidae		✓	NE	LC
37.	Pabda	Pabda Catfish	*Ompok pabda*	Siluridae	✓	✓	EN	NT
38.	Parshe	Giant-scaled mullet	*Liza parmata*	Mugilidae		✓	NE	NE
39.	Poa	Amoy croaker	*Argyrosomus amoyensis*	Sciaenidae		✓	NE	LC
40.	Potka	Milkspotted puffer	*Chelonodon patoca*	Tetraodontidae		✓	DD	LC
41.	Puti	Spotted barb	*Barbodes binotatus*	Cyprinidae		✓	NE	LC
42.	Rui	Ruhu carp	*Labeo rohia*	Cyprinidae	✓		LC	LC
43.	Rupban	Japanese threadfin	*Nemipterus japonicus*	Nemipteridae		✓	NE	LC
44.	Rupchada	White pomfret	*Pampus argenteus*	Stromateidae		✓	NE	LC
45.	Shol	Snakehead	*Channa striatas*	Channidae		✓	LC	LC
46.	Silver carp	Silver Carp	*Hypophthalmichthys molitrix*	Cyprinidae	✓		NE	LC
47.	Somudra Aor	Sea catfishes	*Netuma bilineata*	Ariidae		✓	NE	NE
48.	Surma	Atlantic Spanish mackerel	*Scomberomorus maculatus*	Scombridae		✓	NE	LC
49.	Tailla	Threadfins	*Elutheronema tetradactylum*	Polynemidae		✓	NE	NE
50.	Tak Chanda	Ponyfishes	*Leiognathus decorus*	Leiognathidae		✓	NE	NE
51.	Taki	Spotted Snakehead	*Channa punctatus*	Channidae		✓	LC	LC
52.	Tilapia	Nile tilapia	*Oreochromis niloticus*	Cichlidae	✓		NE	LC
53.	Topshe	Paradise threadfin	*Polynemus paradiseus*	Polynemidae		✓	NE	LC

Sl No	Local Name	Common Name	Scientific Name	Family	Culture Species	Capture Species	IUCN Red List of Bangladesh, 2015*	IUCN Red List Version 2022-2**
54.	Tular dandi	Flathead sillago	*Sillago domina*	Sillaginidae		✓	NE	NE

Source: EQMS Field Survey, October 2022

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

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

Appendix E-8: Checklist of crustacean Species recorded in the study Area

SL#	Local Name	Common Name	Scientific Name	Family	Culture Species	Capture Species	IUCN Red List of Bangladesh, 2015**	IUCN Red List Version 2022-2**
1.	Bagda chingri	Giant Tiger Shrimp	*Penaeus monodon*	Penaeidae	✓	✓	LC	NE
2.	Baghtara chingri	Green Tiger Shrimp	*Penaeus semisulcatus*	Penaeidae	✓		LC	NE
3.	Chatka chingri	Monsoon river prawn	*Macrobrachium malcolmsonii*	Palaemonidae	✓	✓	LC	LC
4.	Dhaina Icha	Jawla Paste Shrimp	*Acetes indicus*	Sergestidae		✓	LC	NE
5.	Dimua Icha	Dimua River Prawn	*Macrobrachium villosimanus*	Palaemonidae		✓	LC	LC
6.	Ghoda Icha	Birma River Prawn	*Macrobrachium birmanicum*	Palaemonidae		✓	LC	LC
7.	Golda chingri	Giant river prawn	*Macrobrachium rosenbergii*	Palaemonidae	✓	✓	LC	LC
8.	Harina Chingri	Brown Shrimp	*Metapenaeus monoceros*	Penaeidae	✓	✓	LC	NE
9.	Kalo Chingri	Banana Shrimp	*Fenneropenaeus merguiensis*	Penaeidae		✓	LC	NE
10.	Chaka Chingri	Red-tailed Prawn	*Penaeus indicus*	Penaeidae	✓	✓	LC	NE
11.	Saga Chingri	Yellow Shrimp	*Metapenaeus brevicornis*	Penaeidae		✓	LC	NE
12.	Shila Kakra	Mud crab	*Scylla serrata*	Portunidae	✓	✓	LC	NE
13.	Lal Kakra	Ghost crab	*Ocypode macrocera*	Ocypodidae		✓	LC	NE

Source: EQMS Field Survey, October 2022

*IUCN Bangladesh. 2015. Red List of Bangladesh Volume 6: Crustaceans; LC=Least Concern, NE=Not Evaluated

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

Appendix F: Photo Plates of Flora and Fauna Species

Appendix F-1: Photographs of Tree Species Recorded From the AOI

		
Mango (*Mangifera indica*)	Jackfruit (*Artocarpus heterophyllus*)	Mahogoni (*Swietenia mahagoni)*
		
Areca palm (*Areca catechu*)	Coconut (*Cocos nucifera*)	Tal Palm (*Borassus flabellifer*)
		
White siris (*Albizia procera*)	Siris (*Albizia lebbeck*)	Cotton tree (*Gossypium arboretum*)
		
Eucalyptus (*Eucalyptus citriodora*)	Date palm (*Phoenix dactylifera*)	Banyan Tree (*Ficus benghalensis*)

		
Teak (*Tectona grandis*)	Indian gooseberry (*Phyllanthus emblica)*	Tamarind (*Tamarindus indica*)
		
Acacia (*Acacia auriculiformis*)	Indian coral tree (*Erythrina variegata*)	Elephant apple (*Dillenia indica*)
		
Indian Almond (*Terminalia catappa*)	Mangrove apple (*Sonneratia apetala*)	Pomelo (*Citrus maxima*)
		
Raintree (*Samanea saman*)	Indian Jujube (*Ziziphus mauritiana)*	Arjun tree (*Terminalia arjuna*)

Source: EQMS Field Survey, October 2022

Appendix F-2: Photo Plate of Observed Bird Species Recorded from AOI

		
Ashy Woodswallow (*Artamus fuscus*)	Chestnut-tailed starling (*Sturnia malabarica*)	Long-tailed Shrike (*Lanius schach*)
		
Brown shrike (*Lanius cristatus*)	Purple sunbird (*Cinnyris asiaticus*)	Black-hooded Oriole (*Oriolus xanthornus*)
		
Fulvous-breasted woodpecker (*Dendrocopos macei*)	Barn swallow (*Hirundo rustica*)	Spotted Dove (Streptopelia chinensis)
		
Oriental Magpie Robin (*Copsychus saularis*)	Rose-ringed parakeet (*Psittacula krameri*)	House Sparrow (*Passer domesticus*)

		
White-Throated Kingfisher (*Halcyon smyrnensis*)	Pied kingfisher (*Ceryle rudis*)	Common kingfisher (*Alcedo atthis*)
		
Citrine wagtail (*Motacilla citreola*)	Little Cormorant (*Microcarbo niger*)	White-browed Wagtail (*Motacilla alba*)
		
Indian Pond Heron (*Ardeola grayii*)	Cattle Egret (*Bubulcus ibis*)	White wagtail (*Motacilla alba*)

Source: EQMS Field Survey, October 2022

Appendix F-3: Different Aquatic Habitat of the AOI

		
Kohelia River	Ujantia Canal	Kutubdia Channel
		
Maheshkhali Channel	Pond	Shrimp culture Gher
		
Sandy beach of Matarbari (West side of Project AOI)	Mudflat in AOI (North-western side)	Mudflat (East coast of Kutubdia)
		
Salt pans (adjacent to project site)	Salt pans (Project site)	Saltpans (east coast of Kutubdia)

Source: EQMS Field Survey, October 2022

Appendix F-4: Photo plate of Observed Fish, Prawn, and Shrimp Species in the Project AOI

		
Western yellowfin seabream (*Acanthopagrus morrisoni*)	Asian sea bass (*Lates calcarifer*)	Tenpounder (*Elops machnata*)
		
Spotted Sea catfish (*Arius maculatus*)	Flathead grey mullet (*Mugil cephalus*)	Threadfin silver belly (*Gerres filamentosus*)
		
Crescent grunter (*Terapon jarbua*)	Tank goby (*Glossogobius giuris*)	Spotted barb (*Barbodes binotatus*)
		
Mola carplet (*Amblypharyngodon mola*)	Barred spiny eel (*Macrognathus pancalus*)	Rubicusdus eel goby (*Odontamblyopus rubicundus*)

		
Obtuse barracuda (*Sphyraena obtusata*)	Rohu carp (*Labeo rohita*)	Climbing perch (*Anabas testudineus*)
		
Green tiger prawn (*Penaeus semisulcatus*)	Indian prawn (*Fenneropenaeus merguiensis*)	Speckled shrimp (*Metapenaeus monoceros*)
		
Red Ghost Crab (*Ocypode macrocera)*	Giant Mud crab (*Scylla serrata*)	

Source: EQMS Field Survey, October 2022

Appendix F-5: Pictorial presentation of plankton Sampling and Microscopic Observation

		
Dragging of Planktonic net at Kohelia River (PZ1)	Dragging of Planktonic net at Ujantia canal (PZ2)	Collection of samples in a sample bottle
		
Addition of preservatives in sample bottle	Addition of Glycerol in the collected Samples	Identification of Plankton species in EQMS Lab

Source: EQMS Field Survey, October 2022

Appendix F-6: Pictorial presentation of benthos sample Collection and Microscopic identification

		
Sample collection by Ekman grab sampler	The sample was transferred to a bucket	Sieving by 0.5 mm mesh-sized hand sieve
		
Collection of sieved Sample	Adding 10% buffered formalin in a sample jar	Identification of macrobenthos in EQMS Lab

Source: EQMS Field Survey, October 2022

Appendix G: Socio-economic Survey Questionnaire

Environmental Impact Assessment for the proposed 635 MW Coal Based Thermal Power Plant Project of Orion Power Unit-2 Dhaka Ltd. at Matarbari, Cox's Bazar

প্রকল্প এলাকার মধ্যে অবস্থিত ব্যক্তিবর্গের আর্থ-সামাজিক ও ক্ষতিগ্রস্থতার জরীপ

N*	
E*	

*Document code**	
*Area Code **	
*Form No.**	

সাক্ষাৎ গ্রহণকারীর নাম ঃ	স্বাক্ষরঃ	মোবাইল নংঃ	তারিখঃ
মাঠ সমন্বয়কারীর নাম ঃ	স্বাক্ষরঃ	মোবাইল নংঃ	তারিখঃ

০১. খানার (Household) পরিচিতি ঃ

১.১ মোবাইল নং *	

১.২	খানা প্রধান / সামাজিক প্রতিষ্ঠানের নাম*	ঃ	
	ইংরেজীতে (ব্লক অক্ষরে)	ঃ	
১.৩	পিতার/স্বামীর নাম*	ঃ	
১.৪	মাতার নাম*	ঃ	
১.৫	গ্রাম/রোড নাম্বার*	ঃ	
১.৬	ইউনিয়ন/ওয়ার্ড	ঃ	
১.৭	থানা	ঃ	
১.৮	জেলা	ঃ	
১.৯	প্রধান পেশা*	ঃ	
১.১০	ধর্ম*	ঃ	১. মুসলিম ২. হিন্দু ৩. খ্রিষ্টান ৪. বৌদ্ধ ৫. অন্যান্য
১.১১	আদিবাসী (শ্রেনী উল্লেখ করুন)*	ঃ	
১.১২	পরিবারের মাসিক আয়*	ঃ	
১.১৩	পরিবারের মাসিক ব্যয়*	ঃ	
১.১৪	পরিবারের মাসিক সঞ্চয় *		
১.১৫	ওয়ার্ড সদস্যের নামঃ	ঃ	

১

EQMS Consulting Limited — Orion Power Unit-2 Dhaka Ltd.

০২. খানার (Household) তথ্যাবলী * ঃ

ক্রমিক নং	খানার সদস্য/সদস্যাদের নাম (খানা প্রধান দিয়ে শুরু)	খানা প্রধানের সাথে সম্পর্ক	লিঙ্গ* পু=১ ম=২	বয়স*	বৈবাহিক অবস্থা*	শিক্ষাগত যোগ্যতা*	প্রতিবন্ধী কিনা?* হ্যাঁ=১/না=২	প্রধান পেশা*	দ্বিতীয় পেশা*	বর্তমান মোট মাসিক আয় (টাকা)*	বর্তমান পেশা ব্যতিত অন্য কোন কাজের দক্ষতা যদি থাকে*
০	২.১	২.২	২.৩	২.৪	২.৫	২.৬	২.৭	২.৮	২.৯	২.১০	২.১১
১											
২											
৩											
৪											
৫											
৬											
৭											
৮											
৯											
১০											

খানা প্রধানের সাথে সম্পর্ক কোডঃ নিজ=১, স্বামী=২ স্ত্রী=৩, ছেলে=৪, মেয়ে=৫, বাবা=৬, মা=৭, ভাই=৮, বোন=৯, ভাবী=১০, বোনের জামাই/মেয়ের জামাই=১১, ছেলের বউ=১২, নাতি =১৩, নাতনী=১৪, শশুর/চাচা/মামা/খালু=১৫, শাশুরী/চাচী/মামী/খালা=১৬, ভাতিজা/ভাগিনা =১৭, ভাতিজী/ভাগ্নী=১৮, নানা/দাদা=১৯, নানী/দাদী =২০, অন্যান্য= (উল্লেখ করুন).

বৈবাহিক কোডঃ বিবাহিত =১, অবিবাহিত =২ বিধবা/বিপত্নিক=৩, স্বামী পরিত্যাক্ত/ স্ত্রী পরিত্যাক্তা=৪, তালাকপ্রাপ্ত=৫

পেশা কোডঃ কৃষি = ১, শিক্ষক =২, গ্রবাসী =৩, চাকুরী =৪, গৃহিনী =৫, জেলে =৬, ব্যবসা =৭, দিনমজুর =৮, রিক্সা/ভ্যানচালক =৯, রাজমিস্ত্রী =১০, বেকার =১১, দর্জি =১২, ডাক্তার =১৩, কবিরাজ=১৪, ড্রাইভার =১৫, মাঝি =১৬, শিশু =১৭, ছাত্র/ছাত্রী=১৮, বৃদ্ধ/ বৃদ্ধা=১৯, প্রতিবন্ধি=২০, অন্যান্য (উল্লেখ করুন)

শিক্ষাগত যোগ্যতাঃ প্রাইমারী= ১০, এস,এস,সি বা সমমানের=১১, এইচ,এস,সি বা সমমানের=১২, বি.এ বা সমমানের=১৩ এম,এ বা সমমানের=১৪, শিশু=১৭, হাফেজ=১৮,স্বাক্ষর =৯৮, নিরক্ষর=৯৯

অন্য কোন কাজের দক্ষতাঃ অতিরিক্ত দক্ষতা নেই=১, কারিগরী=২, বৈদ্যুতিক=৩, মেকানিক=৪, সেলাই=৫, ক্রাফট, ব্লক/ লুমিং=৬, ড্রাইভিং=৭, রাজমিস্ত্রি=৮, অন্যান্য= (উলেখ করুন)

৩. পরিবারের প্রয়োজনীয় আলো ও জ্বালানি উৎস এবং বসতবাড়ির গঠন কাঠামো * ঃ

প্রশ্ন	আলোর ধরন	টিক দিন				মাস প্রতি খরচ
৩.১ আপনার বাড়ির আলোর উৎস কি?	বিদ্যুৎ	১				
	সোলার	২				
	কেরোসিন	৩				
	জ্বালানীর ধরন	**উৎস**				**মাস প্রতি খরচ**
৩.২ রান্নার জন্য জ্বালানীর উৎস কি?	জ্বালানী কাঠ, ফসলের অবশিষ্টাংশ, গরুর গোবর	১				
	এলপিজি গ্যাস	২				
	কেরোসিন	৩				
	বিদ্যুৎ	৪				
	গ্যাস	৫				
৩.৩ কাঠামোর ধরন	**সংখ্যা**	**ব্যবহার** ১. বসবাস, ২. রান্না করা, ৩. গবাদি পশুর ঘর, ৪. টয়লেট				**মালিকানার ধরণ** ১. নিজ , ২। ভাড়া, ৩। অন্যান্য
		১	২	৩	৪	
ইটের মেঝে + ইটের প্রাচীর +ইটের ছাদ (বিল্ডিং/পাকা)						
ইটের মেঝে + ইটের প্রাচীর + টিনের ছাদ (সেমি বিল্ডিং/আধা পাকা)						
ইটের মেঝে + টীনের প্রাচীর + টিনের ছাদ (টিনের বাড়ি)						
মাটির মেঝে + টিনের প্রাচীর + টিনের ছাদ (টিনের বাড়ি)						
মাটির মেঝে + খড়ের প্রাচীর + টিনের ছাদ (টিনের বাড়ি)						
মাটির মেঝে + খড়ের প্রাচীর + খড়ের ছাদ (ঝুপড়ি)						
অন্যান্যঃ						

৪. সরকারি অথবা সামাজিক সেবা প্রতিষ্ঠানে প্রবেশ গম্যতার বিবরণ* ঃ

সম্পদ এক্সেস	সম্পদ এক্সেসের নাম	দূরত্ব		
প্রধান বাজার		১. ১ কিমির কম	২. ১-৩ কিমি	৩. ৩ কিমির বেশি
প্রাথমিক বিদ্যালয়		১. ১ কিমির কম	২. ১-৩ কিমি	৩. ৩ কিমির বেশি
হাসপাতাল		১. ১ কিমির কম	২. ১-৩ কিমি	৩. ৩ কিমির বেশি
মসজিদ/মন্দির		১. ১ কিমির কম	২. ১-৩ কিমি	৩. ৩ কিমির বেশি
পানির উৎস (নদী/পুকুর)		১. ১ কিমির কম	২. ১-৩ কিমি	৩. ৩ কিমির বেশি

৫. পরিবারের প্রয়োজনীয় পানি ও স্যানিটেশন সুবিধা

৫.১ পানি উৎস কি?*

ক্রমিক নং	পানির ব্যবহার	পানির উৎসের নাম (টিক চিহ্ন দিন)				
		টিউবওয়েল	ডিপ টিউবওয়েল	সাপ্লাই	বৃষ্টির পানি	অন্যান্য
		১	২	৩	৪	৫
০১	পান করার জন্য					
০২	রান্না করার জন্য					
০৩	পরিবারের অন্যান্য কাজের জন্য					

৫.২. স্যানিটেশন সুবিধা*

স্যানিটেশন সুবিধা	টিক চিহ্ন দিন
স্যানিটারি (ওয়াটার সীল সহ)	১
স্যানিটারি (ওয়াটার সীল ছাড়া)	২
নন- স্যানিটারি	৩
খোলা	৪

৬. চিকিৎসা সম্পর্কিত তথ্যের বিবরণ* ঃ

আপনি/ আপনারা কোথায় চিকিৎসার জন্য যান	স্থানের নাম	আপনি কিভাবে সেখানে যান? (টিক √ চিহ্ন দিন)
৬.১ সাধারণ চিকিৎসার জন্য		১) এম্বুলেন্স) ২) বাস ৩) সিএনজি/টেম্পু ৪) রিক্সা/ভ্যান ৫) পায়ে হেঁটে
৬.২ জরুরী চিকিৎসার জন্য		১) এম্বুলেন্স) ২) বাস ৩) সিএনজি/টেম্পু ৪) রিক্সা/ভ্যান ৫) পায়ে হেঁটে

৭. গৃহস্থলী সম্পদ ও পশুসম্পদ সমূহ* ঃ

সম্পদসমূহ	সংখ্যা	পশু সম্পদ	সংখ্যা
সাইকেল		মুরগি	
মোটরসাইকেল		হাঁস	
খাট		কবুতর	
টেবিল		গরু	
চেয়ার		ছাগল	
যানবাহন		ভেড়া	
ফ্রিজ		অন্যান্য	
টেলিভিশন			
কম্পিউটার			
মোবাইল			
নৌকা			
পাওয়ার টিলার			
টিউবওয়েল			
অন্যান্য			

৮. ব্যাংক/এনজিও ঋণ গ্রহণ সংক্রান্ত ঃ

৮.১ আপনি কি কোন প্রতিষ্ঠান থেকে ঋণ গ্রহণ করেছেন? হ্যাঁ =১ না =২

৮.২ উত্তর হ্যাঁ হলে

ক্রমিক নং	প্রতিষ্ঠানের নাম	ঋণের টাকার পরিমাণ	ঋণ গ্রহণের বছর (সাল)	কত বছরের জন্য ঋণ নিয়েছেন
০	১	২	৩	৪
০১				
০২				
০৩				

৯. প্রকল্প সম্পর্কিত ধারণা

৯.১ প্রকল্প সম্পর্কে সচেতনতাঃ

আপনি এই প্রকল্প বিষয়ে জানেন কি?	১. হ্যাঁ	২. না
যদি হ্যাঁ হয় কোথা থেকে জেনেছেন?		
প্রকল্প বিষয়ে আপনার দৃষ্টিভঙ্গি কী?	১. ইতিবাচক	২. নেতিবাচক
যদি ইতিবাচক হয়, আপনি প্রকল্প এবং সংশ্লিষ্ট কর্যক্রম থেকে কি সুবিধা আশা করেন?		
যদি নেতিবাচক হয়, তাহলে কি ধরনের নেতিবাচক প্রভাব হবে বলে আপনি মনে করেন?		

৯.২ এই এলাকায় বর্তমানে কি ধরনের সামাজিক সমস্যা আছে বলে আপনি মনে করেন?

ক্রমিক নং	সমস্যা	মাত্রা			
		১. বেশি	২. মোটামুটি	৩. কম	৪. কোন সমস্যা নয়
০১	নিরাপত্তা ব্যবস্থা				
০২	যাতায়াতে সমস্যা				
০৩	প্রধান সড়কে দূর্ঘটনা				
০৪	স্বাস্থ্যঝুকি				
০৫	অন্যান্যঃ				

৯.৩ এই এলাকায় বর্তমানে কি ধরনের পরিবেশগত সমস্যা আছে বলে আপনি মনে করেন?

ক্রমিক নং	সমস্যা	মাত্রা			
		১. বেশি	২. মোটামুটি	৩. কম	৪. কোন সমস্যা নয়
০১	পানি দুষণ				
০২	শব্দ দূষণ				

ক্রমিক নং	সমস্যা	মাত্রা			
		১. বেশি	২. মোটামুটি	৩. কম	৪. কোন সমস্যা নয়
০৩	বায়ু দূষণ				
০৪	শিল্প কারখানার দূষণ				
০৫	অধিক জনসংখ্যা				
০৬	বন নিধন				
০৭	জলাবদ্ধতা (ড্রেনেজ) ব্যবস্থাপনা				
০৮	অন্যান্যঃ				

১০.১ চাহিদা নিরুপণঃ

এলাকার উন্নয়নের জন্য নীচে উল্লেখিত প্রতিটি বিষয়ে প্রয়োজনীয়তার ভিত্তি করে রেটিং করুন। উল্লেখিত বিষয় ছাড়া যদি অন্য কোন গুরুত্বপূর্ণ বিষয় তথ্যে উঠে আসে তবে সেগুলো লিপিবদ্ধ করুন।

বিষয়	মাত্রা			বিষয়	মাত্রা		
	৩	২	১		৩	২	১
রাস্তা মেরামত	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ	কৃষিক্ষেত্রে উন্নয়ন	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ
পানি এবং স্যানিটেশন	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ	স্থানীয় বাজার ব্যবস্থার উন্নয়ন	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ
স্বাস্থ্য সুবিধা	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ	কমক্ষেত্রের সুযোগ	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ
শিক্ষা সুবিধা/কারিগরি শিক্ষা	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ	নারীর ক্ষমতায়ন	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ
বিদ্যুৎ সুবিধা	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ	অনান্যঃ	খুব গুরুত্বপূর্ণ	গুরুত্বপূর্ণ	কম গুরুত্বপূর্ণ

১০.২ অত্র প্রকল্প এলাকায় কর্মসংস্থানের কি ধরনের সুবিধা আছে বলে আপনি মনে করেন*?

ক. ----------

খ. ----------

গ. ----------

১০.৩ নতুন পেশা বা দক্ষতা বৃদ্ধির জন্য, আপনার/ খানা সদস্যগণের কোন প্রশিক্ষণের প্রয়োজন আছে কি?*

হ্যাঁ =১ না=২

১০.৪ উত্তর, 'হ্যা' হলে প্রয়োজনীয় প্রশিক্ষণের নামঃ

১. হাঁস মুরগি পালন ২. গরু মোটাতাজা করণ ৩. সেলাই, ৪. বুটিক ৫. কম্পিউটার

৫. মৎস চাষ ৬. মেকানিক্যাল ৭. টেকনিক্যাল ৮. অন্যান্য (উল্লেখ করুন)ঃ

সাক্ষাৎ প্রদানকারীর স্বাক্ষর :

সাক্ষাৎ প্রদানকারীর নাম : **তারিখঃ** ------/------/২০২২

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EQMS Consulting Limited Orion Power Unit-2 Dhaka Ltd.

Appendix H: Pollution Concentration on Sensitive Receptors

Appendix H-1: NO_2 Concentration on Sensitive Receptors

ID	Sensitive Receptors Name	Coordinates		NO_2 Concentration (µg/m^3)							
		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR1	Tabelarchor Government Primary School	380979.1	2408080	2.26	1.27	1.66	0.22	6.50	2.68	3.73	1.08
SR2	Purbo Tabalerchar Government Primary School	381544.9	2408413	2.78	1.27	2.51	0.27	5.53	2.75	3.60	1.18
SR3	Blooming Bud Grammar School	380971	2409649	2.55	1.05	2.55	0.27	5.13	2.24	3.59	1.08
SR4	Kabi Jashim Uddin High School	380711.4	2409676	2.57	0.99	2.57	0.25	4.91	2.19	3.72	1.04
SR5	Bornomala Kinder Garten School	380650.4	2409645	2.57	0.98	2.57	0.25	4.96	2.19	3.75	1.03
SR6	Ali Akbar Deil Govt Primary School Cum Cyclone Shelter	380714.5	2409735	2.56	0.99	2.56	0.26	4.90	2.18	3.70	1.04
SR7	Tekpara Government Primary School	380504.8	2410731	2.35	0.96	2.35	0.27	4.52	1.93	3.44	1.01
SR8	Kutubawlia Government Primary School	380658.5	2411272	2.23	0.96	2.14	0.28	4.67	1.85	3.06	1.02
SR9	Merit Plus Kindergarten	380845.8	2411710	1.96	0.95	1.90	0.30	4.97	1.79	2.98	1.04
SR10	Moddha Aliakber Deil Government School	380907.8	2411885	1.99	0.95	1.80	0.30	5.00	1.77	2.95	1.04
SR11	Boroghop Ershad Govt. Primary School	380797	2412406	2.00	0.9	1.71	0.30	4.82	1.69	2.84	1.01
SR12	ABC Model Kindergarten School	380985.6	2412705	2.21	0.88	1.55	0.31	4.54	1.66	2.78	1.02
SR13	Kutubdia Government Girl's High School	381275.7	2412920	2.42	0.87	1.49	0.32	4.48	1.65	2.70	1.03
SR14	Kutubdia Adarsha High School	381391.4	2412770	2.47	0.89	1.51	0.32	4.54	1.68	2.72	1.05
SR15	Kutubdia Model Govt Primary School Cum Cyclone Shelters	381451.6	2412789	2.50	0.89	1.51	0.33	4.58	1.68	2.71	1.05
SR16	Baroghop Islamia Fajil (Degree) Madrassa	381384.7	2413070	2.46	0.86	1.46	0.32	4.52	1.64	2.65	1.03
SR17	Kutubdia Hospital	381481.1	2413182	2.46	0.84	1.42	0.32	4.51	1.63	2.65	1.03
SR18	Uttor Baroghop Government Primany School	381581.5	2413677	2.31	0.79	1.27	0.32	4.34	1.57	2.70	1.02
SR19	Kutubdia Women College	381599.4	2413685	2.30	0.79	1.26	0.32	4.33	1.57	2.70	1.02
SR20	K S Red Crescent Government Primary School	381645.8	2414905	2.05	0.67	1.21	0.31	4.28	1.42	2.63	0.96
SR21	Koiyerbill Ideal High School	381560.4	2415982	1.85	0.59	1.15	0.29	4.15	1.31	2.44	0.91
SR22	North Kaiyerbill Primary School	381156	2416872	1.79	0.55	1.08	0.27	3.86	1.23	2.35	0.85
SR23	Dakkhin Dhurung Government Primary School	380913.4	2418600	1.44	0.46	0.94	0.24	3.66	1.1	2.15	0.78
SR24	Paschim Dhurung Government Primary School	381342	2421865	1.23	0.33	0.75	0.21	3.66	1.09	2.54	0.68

ID	Sensitive Receptors Name	Coordinates		NO_2 Concentration (µg/m^3)							
		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR25	Uttar Dhurung N Hossain Government Primary School	381679.1	2422501	1.43	0.32	0.72	0.21	3.59	1.14	2.77	0.67
SR26	Char Dhurung Government Primary School	382556.5	2422736	1.47	0.32	0.92	0.21	4.09	1.24	3.14	0.68
SR27	Azgaria Government Primary School	383172.2	2423444	1.15	0.35	0.93	0.20	4.47	1.24	2.95	0.68
SR28	M. Rahman Government Primary School	383723	2422232	1.26	0.39	1.03	0.22	4.38	1.3	2.91	0.74
SR29	Jumma Para Government Primary School	384851.7	2421999	1.67	0.41	1.08	0.24	4.64	1.25	4.64	0.82
SR30	Foyzanir Para Government Primary School	385587.2	2421424	1.73	0.4	1.49	0.26	5.93	1.18	5.50	0.89
SR31	Bakkhali Government Primary School	383911.1	2421371	1.37	0.41	1.08	0.23	4.29	1.35	3.16	0.78
SR32	Bangakata Government Primary School	383222	2421033	1.44	0.37	1.03	0.23	4.35	1.36	3.32	0.75
SR33	Uttoron Biddaya Niketon	382225.8	2421715	1.58	0.33	0.87	0.22	3.61	1.25	3.10	0.70
SR34	Uttar Dhurrung Union Health and Family Welfare Centre	382122.8	2421244	1.57	0.34	0.83	0.22	3.74	1.25	3.06	0.71
SR35	Samadia Government Primary School	381972.6	2421267	1.52	0.34	0.78	0.22	3.77	1.22	2.96	0.71
SR36	Teliakata Government Primary School	383422.5	2420149	1.47	0.4	1.08	0.24	4.34	1.41	3.41	0.79
SR37	Jalal Uddin Government Primary School	382935.1	2419574	1.74	0.38	1.05	0.25	3.96	1.42	3.53	0.79
SR38	Dhurung Ideal High School Stadium	382088.4	2419686	1.50	0.37	0.83	0.24	4.01	1.28	3.03	0.76
SR39	Friendship Static Clinic	382286.7	2419061	1.58	0.39	0.86	0.25	4.10	1.34	3.17	0.78
SR40	Rajakhali Government Primary School	383131	2418824	1.80	0.4	1.12	0.26	4.04	1.48	3.67	0.82
SR41	Jalilia Government Primary School	381937.2	2418617	1.24	0.41	0.91	0.25	4.09	1.26	2.87	0.79
SR42	Kutubdia Technical & BM College	382246	2417746	1.36	0.44	0.96	0.27	4.25	1.36	3.11	0.83
SR43	Lemsikhali Piarakata Government Primary School	384292.8	2417751	1.65	0.5	1.31	0.29	4.79	1.57	3.97	0.94
SR44	Al faruq Madrasha	383978.5	2417444	1.58	0.48	1.29	0.29	4.56	1.61	3.75	0.94
SR45	Lemshikhaki High School	384104	2417397	1.49	0.49	1.32	0.29	4.64	1.61	3.79	0.95
SR46	Purbo Lemsikhali Government Primary School	385216.1	2417993	2.04	0.51	1.43	0.31	5.75	1.46	5.64	1.02
SR47	Dakkhin Dhupipara Government Primary School	384306.2	2419033	1.65	0.47	1.22	0.27	4.63	1.48	3.81	0.89
SR48	Satar Uddin Government Primary School	385817.1	2420203	1.90	0.42	1.65	0.29	6.97	1.27	5.80	0.96
SR49	M Rahman Government Primary School	385146.3	2417384	2.10	0.53	1.46	0.32	5.83	1.52	5.63	1.05
SR50	Union Health and Family Welfare Center	383889	2417039	1.73	0.48	1.31	0.30	4.58	1.65	3.91	0.95

ID	Sensitive Receptors Name	Coordinates		NO_2 Concentration (µg/m^3)							
		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR51	Paschim Lemshikhali Darussunnah Hafezia Madrasha	383157.6	2416653	1.97	0.47	1.13	0.30	4.43	1.62	3.85	0.92
SR52	Koiloyssaghona Government Primary School	382283.2	2416393	1.37	0.52	1.05	0.29	4.41	1.37	3.10	0.90
SR53	Kayerbill G M Government Primary School	381968.5	2415616	1.70	0.6	1.14	0.30	4.38	1.35	2.76	0.94
SR54	Dakshin Lemshikhali Govt Primary School	384011.9	2415685	1.93	0.51	1.44	0.33	4.93	1.77	4.17	1.04
SR55	Ahmadia Faizul Ulum Madrasha	383934.6	2415810	1.96	0.5	1.43	0.33	4.84	1.75	4.17	1.02
SR56	Khadiartek Government Primary School, Kutubdia, Cox's Bazar	381250.7	2409496	2.55	1.11	2.55	0.29	5.28	2.34	3.55	1.13
SR57	Ali Akbar Deil High School Cum Cyclone Shelter	381074.1	2410792	2.29	1.04	2.23	0.30	4.81	1.99	3.19	1.09
SR58	Flight Lieutenant Qaimul Huda Government Primary School	381426.1	2410752	2.16	1.09	2.16	0.33	5.23	2.04	3.20	1.14
SR59	Amjakhali Govt. Primary School & Cyclone Center	382707	2411722	2.74	1.01	1.50	0.41	5.17	1.94	3.45	1.23
SR60	Community Clinic	382953.7	2411815	2.41	0.98	1.53	0.42	5.28	1.93	3.73	1.25
SR61	M H Grammar School	381808.7	2411672	2.62	1.02	1.69	0.35	4.90	1.89	2.93	1.15
SR62	Pilotkata Government Primary School	382962	2412743	1.96	0.83	1.42	0.39	5.10	1.74	3.70	1.17
SR63	Nor Badshar Forkania Madrasha	382463.6	2413524	2.02	0.77	1.37	0.36	4.85	1.61	3.20	1.08
SR64	Kutubdia Government Collage	381919	2413241	2.36	0.83	1.29	0.34	4.51	1.64	2.78	1.07
SR65	Kutubdia Island High School	381552.5	2413286	2.44	0.83	1.38	0.33	4.49	1.62	2.68	1.04
SR66	Monohor Khali Govt. Primary School	382352.6	2414004	1.95	0.72	1.32	0.34	4.75	1.54	3.10	1.05
SR67	Alhaz Anower Ali Government Primary School	383459.2	2414324	1.97	0.6	1.18	0.36	4.93	1.84	4.14	1.08
SR68	Kayerbill Government Primary School	381268.3	2415723	1.99	0.62	1.14	0.28	3.98	1.34	2.54	0.91
SR69	Alhaz Fakir Muhammad Nurani Madrasha	382933.5	2415971	1.74	0.51	1.07	0.31	4.61	1.61	3.68	0.94
SR70	Dingabhanga Government Primary School	381528.6	2417351	1.42	0.5	0.98	0.26	4.02	1.19	2.44	0.84
SR71	Dharul Hikmah al Malekia Dakhil Maddrasah	382235.6	2417671	1.35	0.45	0.97	0.27	4.28	1.36	3.11	0.84
SR72	Purbo Dhurung Government Primary School	382742.7	2417842	1.78	0.43	0.96	0.27	4.28	1.48	3.53	0.85
SR73	Holy child island school	383944.2	2417679	1.56	0.47	1.27	0.29	4.50	1.59	3.71	0.92
SR74	Jamiria Madrasha Hifzkhana and Etimkhana	384782	2418063	1.96	0.51	1.26	0.29	5.26	1.52	4.84	0.98
SR76	Noapara Government Primary School	387920.7	2424731	2.23	0.31	1.43	0.25	7.29	1.33	4.46	0.83
SR77	Sekherkhil Ideal Kindergarten	389882.9	2424994	1.82	0.34	1.23	0.25	6.22	1.52	3.79	0.79

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				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR78	Shekherkhil Darussalam Adarsha Senior Alim Madrasha	389943.2	2425117	1.80	0.41	1.54	0.25	6.17	1.93	4.06	0.79
SR79	Sekherkhil Darussalam Adarsha Senior Madrasha	390389.1	2425129	1.65	0.41	1.54	0.24	5.70	1.92	4.06	0.78
SR80	Master Nazir Ahmed College	392624	2425021	1.70	0.47	1.60	0.24	5.05	1.98	4.23	0.77
SR81	Master Nazir Ahmed Degree College	392639.4	2424961	1.70	0.71	1.37	0.24	5.06	1.95	4.79	0.77
SR82	Ambia Khatun Dakhil Madrasha	392764.6	2424923	1.70	0.71	1.37	0.24	5.07	1.94	4.77	0.77
SR83	Master Nazir Ahmad Government Primary School	392798.4	2424866	1.70	0.72	1.35	0.24	5.08	1.93	4.69	0.77
SR84	Chunati Wildlife Sanctuary	399820.6	2423655	1.85	0.72	1.35	0.23	5.84	1.92	4.66	0.74
SR85	2 No. Dhambi Government Primary School	403881	2423153	2.05	0.9	1.85	0.20	5.76	2.72	5.84	0.66
SR86	Islampur B Alam Govt. Primary School	404511.7	2421891	2.11	0.85	2.05	0.19	6.07	2.82	5.76	0.65
SR87	Tamiri E Millat Islamia Dakhil Madrasah	404318.4	2422145	2.07	0.71	2.11	0.19	6.06	2.57	6.07	0.66
SR88	Health Centre	403575	2422159	1.99	0.74	2.07	0.20	6.06	2.64	6.06	0.67
SR89	Allama Saydul Amin Education Centre	403549.2	2421960	2.02	0.82	1.99	0.20	6.11	2.81	6.06	0.68
SR90	Aziznagar Girl's School	403398.6	2422280	2.06	0.81	2.02	0.20	6.00	2.8	6.11	0.68
SR91	Dhambi Government Primary School	403344.9	2422400	2.08	0.84	2.06	0.20	5.96	2.85	6.00	0.68
SR92	Chanua Government Primary School	388406.1	2423768	2.05	0.86	2.08	0.26	6.66	2.87	5.96	0.85
SR93	Noapara Government Primary School	387588.7	2423702	2.32	0.38	1.11	0.27	7.67	1.76	3.44	0.86
SR94	Totakkhali Govt. Primary School	389001.7	2422964	2.08	0.35	1.35	0.27	6.97	1.53	4.14	0.86
SR95	Haji Kala Mia Para Community Primary School Cyclone Shelter	389459	2423586	1.97	0.41	1.50	0.26	6.65	2.01	3.96	0.84
SR96	Poichari Ijjatia Government Primary School	390954.1	2423175	1.70	0.43	1.60	0.27	5.14	2.03	4.17	0.84
SR97	Poichari Moksuda Khatun Government Primary School	392169.6	2423100	1.83	0.68	1.69	0.26	5.42	2.22	5.14	0.83
SR98	Purba Poichari Government Primary School	393412	2423251	1.69	0.79	1.46	0.26	5.13	2.1	4.77	0.82
SR99	Puichari Quaderia Government Primary School	392231.6	2422376	1.84	0.78	1.69	0.27	5.52	1.83	4.68	0.86
SR100	Digital Hospital Coxbazar pvt ltd	405353.1	2418832	1.49	0.84	1.46	0.18	6.51	2.12	4.77	0.65
SR101	Harbang Union High School	402382.9	2416059	1.68	0.53	1.49	0.21	7.16	2.06	6.51	0.75

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SR102	Amtalipara Master Muhammed Abdul Hai Primary School	405307.5	2413766	2.01	0.6	1.68	0.18	5.17	2.31	7.16	0.63
SR103	Uttar Paschim Baraitali Govt. Primary School	402742.7	2413995	2.33	0.51	2.01	0.21	5.88	1.58	5.17	0.74
SR104	Chainus Hazrat Fatema Islami Academi Madrasha and Hifzkhana	390138	2422109	1.82	0.56	2.33	0.28	5.60	1.98	5.88	0.88
SR105	Hazrat Abubakkar Siddik (Rah.) Nurani Madrasha	391588.9	2421950	1.93	0.64	1.82	0.28	5.63	2.32	5.02	0.88
SR106	Uttar Harbang Government Primary School	402813	2418249	2.05	0.84	1.58	0.21	6.54	2.26	5.05	0.73
SR107	Toitong Alhera Model Academy	393662.2	2418977	3.26	0.66	2.05	0.32	8.54	2.52	6.54	0.98
SR108	Sayadul Mursalin Talimul Quran Noorani Madrash hefjkhana & Atimkhanaa	392430.8	2419162	2.77	1	3.26	0.32	6.66	2.41	8.54	0.98
SR109	Jamal Meher Government Primary School	389055	2418184	2.19	0.89	2.77	0.35	6.81	2.35	6.66	1.08
SR110	Faraz Ali Adarsha Dakhil Madrasha	392087.8	2417267	3.52	0.82	2.19	0.37	8.37	2.85	5.69	1.09
SR111	Abul hossain Shikder Govt. Primary School	392544.6	2417878	3.43	0.91	3.52	0.35	8.33	2.62	8.37	1.05
SR112	10 Number West Sonaichhari Government Primary School	393288.5	2417925	3.39	0.92	3.43	0.35	9.08	2.53	8.33	1.04
SR113	Maulvibazar Farukia Madrasha	393182.4	2417618	3.42	1.09	3.39	0.35	9.24	2.68	9.08	1.06
SR114	Uttar Barabakia Government Primary School	393107.7	2416804	3.28	1.12	3.42	0.37	9.69	2.76	9.24	1.11
SR115	Sonaichari Government Primary School	394623.8	2416858	2.74	1.21	3.28	0.35	8.70	3.14	9.69	1.07
SR116	Baitun-ter Islamia Darul Ulum Madrasha Hifzkhana and Etimkhana	395767.5	2416833	3.06	1.37	2.74	0.32	7.61	3.64	8.70	1.03
SR117	Harabang Adarsha Academy	403026.5	2416877	1.65	1.49	3.06	0.21	7.00	3.7	7.61	0.73
SR118	Kala Shikdar Para Nurani Madrasa	401980.4	2415495	1.69	0.59	1.65	0.22	7.26	2.25	7.00	0.77
SR119	Kacharimura Primary School	395766.1	2414506	3.15	0.6	1.69	0.34	8.13	2.34	7.26	1.10
SR120	Hosneara Girl High School	395217.3	2415277	3.52	1.38	3.15	0.35	8.27	4.46	8.13	1.11
SR121	Barabakia Model High School	394805.9	2415379	3.48	1.59	3.52	0.36	8.22	4.24	8.27	1.13
SR122	Pekua Anowarul Ulum Islamia Alim Madrasha	393901.2	2414328	3.79	1.65	3.48	0.39	8.64	4.07	8.22	1.22
SR123	Pekua Government Model GMC Institute	393526.4	2414315	3.69	1.79	3.79	0.40	8.77	4.28	8.64	1.24
SR124	MH Government Primary School	391670.1	2414388	3.73	1.81	3.69	0.45	10.76	4.1	8.77	1.30
SR125	Malumma Government Primary School.	391602.7	2414113	3.64	1.39	3.73	0.46	10.88	3.42	10.76	1.33

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SR126	Uttara Magnama Shah Majidiya Abtedayi Madrasa	389532.8	2414807	2.70	1.42	3.64	0.45	7.60	3.53	10.88	1.31
SR127	Abbas Mia Primary School	387710.7	2413076	2.89	1.34	2.70	0.54	9.15	3.33	6.91	1.53
SR128	Mognama Model KG School	388248.5	2412930	3.25	1.14	2.89	0.54	8.42	3.87	7.84	1.52
SR129	Mognama Adarsha Siksha Niketon	388006.8	2412677	3.28	1.39	2.95	0.56	8.58	3.98	8.42	1.57
SR130	Mognama High School	388104.9	2412552	3.37	1.35	3.10	0.57	8.68	4.06	8.58	1.58
SR131	Mognama Model KG School, Muhuripara	388244.4	2412699	3.34	1.41	3.08	0.56	8.58	4.09	8.68	1.56
SR132	Mognama Majhir Para Shah Rashidia Alim Madrasha	388599.6	2413286	3.16	1.44	2.98	0.52	8.34	4.05	8.57	1.47
SR133	Purba Mognama Bainnaghona Brac Cyclone Shelter and BRAC Primary School	390117.5	2413406	4.67	1.43	2.69	0.51	10.26	3.86	8.10	1.43
SR134	M. H. Government Primary School	391146.6	2413536	3.92	1.2	4.67	0.49	11.15	2.96	10.26	1.39
SR135	Pekua Public High School	391091.4	2413236	3.75	1.47	3.92	0.50	11.25	3.5	11.15	1.42
SR137	Purba Goalkhali Model KG School	392385.3	2412635	4.40	1.49	3.75	0.46	9.56	3.65	11.25	1.41
SR138	Moiyadiya Government Primary School	392124.2	2412105	4.64	1.97	3.95	0.48	9.64	4.19	11.26	1.46
SR139	Pekua Upazila Hospital	393545.9	2413941	3.91	2.08	4.40	0.41	8.80	4.61	9.56	1.26
SR140	Shilkhali High School	396548.4	2413758	3.02	2.14	4.64	0.32	8.38	4.84	9.64	1.06
SR141	Shilkhali Government Primary School Playground	397671.6	2413397	2.26	1.85	3.91	0.29	7.94	4.36	8.80	1.00
SR142	Pathan Matubbar Para Government Primary School	398685.7	2413142	2.24	1.08	3.02	0.27	8.09	4.21	8.38	0.94
SR143	Baraitali High School Cyclone Shelter	403107.6	2413004	2.27	0.86	2.26	0.20	5.47	3.6	7.94	0.71
SR144	Union Health and Family Welfare Centre	403190.3	2412992	2.26	0.74	2.24	0.20	5.45	3.05	8.09	0.71
SR145	Mahmud Nagor Gov't Primary School	403776	2411886	1.95	0.58	2.27	0.19	6.22	1.82	5.47	0.68
SR146	South Baraitoli primary school	402830	2411623	2.06	0.58	2.26	0.20	6.20	1.81	5.45	0.72
SR147	Deingakata Government Primary School	401599	2412715	2.50	0.7	1.95	0.22	5.93	1.6	6.22	0.78
SR148	Pohorchanda Fazil Madrasa	398795.8	2412380	2.76	0.71	2.06	0.27	8.09	1.71	6.20	0.94
SR149	Mehernama Govt. Primary School	397862.7	2412186	2.73	0.63	2.50	0.29	8.38	2.06	5.93	1.00
SR150	Haji Obaidul Hakim Government Primary School	397077.8	2412726	2.34	0.69	2.76	0.30	8.12	2.83	8.09	1.04
SR151	Pekua Ideal High School	391292.3	2411723	4.69	0.75	2.73	0.53	10.87	3.19	8.38	1.55

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SR152	Pekua hedayedul Ulum Islamia Dakhil Madrasha Hifzkhana and Etimkhana and Mosque	390761.9	2411702	4.22	0.88	2.34	0.56	11.52	3.73	8.12	1.58
SR153	Purba Mognama Government Primary School	390404.7	2411571	4.24	2.26	4.69	0.57	11.78	4.51	10.87	1.61
SR154	Mognama SDF Public School	388197.8	2411594	3.69	2.14	4.22	0.63	9.35	4.3	11.52	1.71
SR155	Magnama Farid Ahmed Chowdhury Primary School	387547.3	2411517	3.60	2.02	4.24	0.65	9.32	4.12	11.78	1.75
SR156	Sutachura Government Primary School	391675.3	2410770	4.63	1.52	3.69	0.52	10.18	4.16	8.93	1.59
SR157	Nandir Para Govt Primary School	393806.9	2410736	3.10	1.32	3.52	0.41	9.38	4.25	9.32	1.35
SR158	Mehernama high school	395273.5	2411017	2.92	2.1	4.63	0.35	8.98	5.53	10.18	1.21
SR159	Islamia Norul Ulum Madrasa	395846.9	2411577	2.54	1.24	3.10	0.34	8.68	5.3	9.38	1.15
SR160	B. M. Char Govt. Primary School	397300.9	2410639	3.25	0.97	2.92	0.30	8.33	4.39	8.98	1.04
SR161	Abdur Rahman Government Primary School	399419.5	2410902	2.71	0.94	2.54	0.25	6.67	4.16	8.68	0.89
SR162	Health complex	402004.5	2410289	2.07	0.85	3.25	0.21	7.13	3.02	8.33	0.75
SR163	Al Amin School & College	404748	2411316	1.79	0.73	2.71	0.18	6.62	2.33	6.67	0.65
SR164	Faitong Noya Para primary school	405421.8	2411484	1.75	0.94	2.07	0.18	6.49	1.71	7.13	0.63
SR165	Chakaria Government College	405053.8	2408824	1.69	0.8	1.79	0.17	6.08	1.54	6.62	0.63
SR166	Ottar Lakkharchar Union Parishad Community Hospital	404949.8	2408677	1.66	0.79	1.75	0.17	6.08	1.51	6.49	0.63
SR167	Hazipara Forkania Madrasha and Hifzkhana	404275.5	2408660	1.74	1	1.69	0.18	6.31	2.24	6.08	0.65
SR168	Sreemura Government Primary School	403610.8	2409280	1.98	1	1.66	0.19	6.96	2.28	6.08	0.68
SR169	Hamidulla Muhuri Health Centre	403321.9	2409394	2.03	1.04	1.74	0.19	7.13	2.26	6.31	0.69
SR170	Kaiarbil Islamia Jamiul Ulum Madrasah	403104.2	2409499	2.07	1.04	1.98	0.20	7.23	2.05	6.96	0.70
SR171	Uttar Veola Government Primary School	401001.4	2408377	2.16	1.04	2.03	0.22	7.91	1.99	7.13	0.79
SR172	Betuarkul Jahan Government primary School	399759.6	2408667	2.42	1.03	2.07	0.24	8.12	1.94	7.23	0.85
SR173	Bahadder Kata High School	398428	2409417	2.54	1.21	2.16	0.27	6.97	2.16	7.91	0.94
SR174	Krisnapur Govt. Primary School	397439.2	2409333	2.81	1.22	2.42	0.29	7.49	2.06	8.12	1.02
SR175	konakhali Govt. Primary School	394379.4	2409598	3.91	1.08	2.54	0.38	9.29	2.29	6.97	1.31
SR176	Konakhali Kulsum Nahar Govt. Primary School	394045.8	2408664	3.97	1.07	2.81	0.39	9.82	2.58	7.49	1.36
SR177	Darul Irfan madrasah	393952.1	2408194	3.79	1.03	3.91	0.39	9.91	4.52	9.29	1.37

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SR178	Al-Mohammadia M.H.C Model Madrasah	393374.9	2407886	3.90	1.16	3.97	0.41	10.12	4.3	9.82	1.44
SR179	Purbo Ujantia Government Primary School	390575.2	2408725	4.61	1.33	3.79	0.60	10.54	4.08	9.91	1.86
SR180	Maddhyam Ujantia Veluarpara Government Primary School	388949	2408273	6.22	1.45	3.90	0.79	12.34	4.39	10.12	2.18
SR181	Ujantia A. S. Alim Madrasah	390152.6	2407886	4.73	1.96	4.61	0.62	10.73	6.51	10.54	1.98
SR182	Khan Bahadur Para Govt Primary School	387878.6	2407521	7.35	2.79	6.22	1.00	11.58	5.56	12.34	2.55
SR183	Khan Bahadur Ebtedaye Madrasa	387865.6	2407408	7.29	1.83	4.73	1.01	11.54	6.96	10.73	2.57
SR184	West Uj.Gov.primary School	386812.1	2407243	6.77	3.05	7.35	1.28	12.58	5.29	11.58	3.00
SR185	East ujantia High School	386769.9	2407243	6.84	3.1	7.29	1.28	12.57	5.43	11.54	3.01
SR186	Dhemushia Foez Ahmed Government Primary School	392661	2406958	4.02	2.45	6.77	0.43	10.51	4.52	12.58	1.54
SR187	Dhemushia Jinnat Ali Chowdhury High School	393471.9	2407029	3.67	2.35	6.84	0.39	9.79	4.56	12.57	1.42
SR188	Matamuhuri Ideal School	396791.9	2407919	2.84	1.95	3.77	0.30	8.02	4.4	10.51	1.05
SR189	Betua Government Primary School	398095.2	2407960	2.58	1.89	3.48	0.27	8.55	3.72	9.79	0.95
SR190	Mubinpara Asus Government Primary School	399513.2	2407641	2.15	1.47	2.84	0.24	8.43	2.41	8.02	0.86
SR191	Bheola Manik Char High School	400563.9	2409158	2.34	1.4	2.58	0.23	7.82	2.27	8.55	0.81
SR192	kazir para primary school	403322.9	2407900	1.82	1.31	2.15	0.19	6.43	2.32	8.43	0.68
SR193	Kazirpara Government Primary School	403329.1	2407844	1.83	1.11	2.34	0.19	6.41	1.94	7.82	0.68
SR194	Islamia Amdadul Ulom Mohiussunnah Madrasha	404215.2	2407405	1.77	1.06	1.62	0.17	5.82	2.39	6.43	0.64
SR195	Chakaria Government High School	404222.2	2407149	1.75	1.05	1.60	0.17	5.65	2.41	6.41	0.64
SR196	Al Hera Cadet Academy	404882.2	2408057	1.71	0.95	1.37	0.17	5.89	2.51	5.82	0.63
SR197	Haji Nurul Kabir School & College	404797.2	2408366	1.67	0.92	1.31	0.17	6.04	2.58	5.65	0.63
SR198	Lokksharchor High School	404507.2	2408460	1.67	0.98	1.48	0.18	6.17	2.4	5.89	0.64
SR199	Ottar Lakkarchar Government Primary School	405026.1	2408238	1.68	1	1.58	0.17	5.91	2.34	6.04	0.62
SR200	Childs Modern School and College	405397.7	2407954	1.69	1.02	1.65	0.17	5.63	2.31	6.17	0.61
SR201	Madrashatul Abrar, Koiyar Beel, Islam Nagar	404538.9	2410576	1.93	0.98	1.52	0.18	6.81	2.37	5.91	0.65
SR202	Madrasha Hazrat Usman (Rh.) Hifzkhana and Etimkhana	404771.5	2410351	1.93	0.94	1.39	0.18	6.74	2.42	5.63	0.64
SR203	Shaharbil Union Sub Centre	401509.5	2405847	1.70	0.89	1.93	0.19	6.01	1.66	6.81	0.73
SR204	As Chafa Adarsha Siksha Niketon	401604	2405799	1.69	0.9	1.93	0.19	6.03	1.76	6.74	0.72

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		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
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SR205	Saharbeel BMS High School	401610.5	2406571	1.91	0.98	1.56	0.19	6.54	2.94	6.01	0.73
SR206	Purba Bara Bheola G.N.A. Missionary High School	402212.2	2407666	1.93	0.99	1.58	0.20	6.79	2.96	6.03	0.72
SR207	Jungle Kata Govt. Primary School	396621.3	2409393	3.14	1	1.43	0.31	7.83	2.67	6.54	1.09
SR208	Ilisia Jamila Begum High School	394620.6	2405859	2.96	1.11	1.69	0.32	9.92	2.4	6.79	1.22
SR209	Paschim Boroveola Government Primary School and Cyclone Shelter, Chakaria, Cox's Bazar	393577.9	2405538	3.01	1	3.14	0.34	9.60	2.94	7.83	1.34
SR210	Baitus Sarf Shah Jabbaria Pre-cadet Madrasha	391341.3	2403641	2.96	1.55	2.31	0.39	11.27	3.37	9.92	1.65
SR211	Azizia Islamia Sultanul ulum Madrasha and Shah Jamira Etimkhana	391982.2	2403151	2.79	1.73	2.42	0.36	11.09	3.58	9.60	1.52
SR212	Little Jewels Somobaye School	391701	2401993	2.94	2.78	2.96	0.40	10.64	4.52	11.27	1.54
SR213	Badarkhali Degree College	391928.1	2401884	2.90	2.16	2.56	0.39	10.33	4.37	11.09	1.49
SR214	Badarkhali Government Primary School	391786.6	2402173	2.83	2.94	2.30	0.39	10.54	5.6	10.04	1.54
SR215	Matarbari High School	385942.3	2403612	5.87	2.9	2.28	1.04	13.68	5.74	9.72	3.71
SR216	Matarbari KG. & Pre Cadet School	386051.9	2403598	5.77	2.83	2.37	1.05	13.54	5.28	10.10	3.71
SR217	Matarbari Health & Welfare Centre	386248.8	2403720	4.83	3.22	3.27	1.09	14.46	5.78	13.68	3.67
SR218	Azizia Kasimul Ullum Madrasha	386042.4	2403758	5.76	3.25	3.15	1.08	13.32	5.47	13.54	3.70
SR219	Matarbari Digital Hospital and Diabetes Center	385935.1	2403519	5.85	3.45	3.25	1.02	13.92	4.79	14.46	3.73
SR220	Mojidia Alim Madrasha	385482.8	2403433	4.95	3.27	3.25	0.93	12.72	5.6	13.32	3.72
SR221	Sairadel Primary School	383895	2402272	2.76	3.21	3.22	0.45	8.84	5.76	13.92	2.52
SR222	Srijoni Kindergarten and Junior High School	384691.6	2402494	3.42	2.8	3.09	0.64	11.72	6.15	12.40	3.28
SR223	Adarsha Public High School	385154.1	2402961	4.11	2.76	1.88	0.79	13.79	6.67	8.29	3.66
SR224	Rajghat Government Primary School	386617	2403234	4.66	3.42	2.01	0.99	15.80	6.44	7.54	3.67
SR225	Nidantarani Government Primary School	391256	2404575	3.40	3.23	2.29	0.40	10.24	6.19	11.88	1.69
SR226	Badarshah Academy	393368.5	2402196	2.39	3.63	3.43	0.32	9.04	6.59	15.80	1.27
SR227	Al-Azhar High School	401429.9	2402697	1.74	3.4	3.35	0.17	5.36	4.18	10.24	0.66
SR228	Bottali Government Primary School	401612.2	2403523	1.74	1.93	2.25	0.17	5.84	5.23	9.04	0.68
SR229	Jamia Fatima (Rh.) An Necchaiya	400925.7	2405557	1.73	1.74	1.42	0.19	6.21	3.33	5.01	0.75
SR230	Darul Hikmah Academy	400811.7	2405881	1.77	1.67	1.74	0.20	6.45	3.47	5.84	0.76
SR231	Matamuhuri Dakhil Madrasha	400306.2	2405507	1.78	1.1	1.72	0.20	6.39	3.03	6.21	0.78

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SR232	R. K. Nurul Amin Chowdhury High School	400433.7	2405444	1.80	1	1.59	0.20	6.33	2.92	6.45	0.77
SR233	Kahariaghona Government Primary School	403490.8	2405518	1.56	1.16	1.78	0.16	5.80	3.05	6.39	0.64
SR234	Chakaria City College	403687.5	2405332	1.60	1.17	1.80	0.16	5.78	3.08	6.33	0.63
SR235	Palakata Government Primary School	403862.2	2404210	1.72	0.98	1.56	0.15	5.46	3	5.80	0.61
SR236	Uttar Binamara Mohammadia Hifzkhana and Etimkhana	404478	2405741	1.47	1.02	1.60	0.16	5.57	3.05	5.78	0.61
SR237	ICDDR,B Chakaria Campus	403755.9	2405972	1.53	1.28	1.72	0.17	5.65	3.19	5.46	0.64
SR238	Chakaria Central High School	403634	2405276	1.61	0.88	1.44	0.16	5.79	2.92	5.57	0.63
SR239	Chakaria Imam Hussain (Rh.) Sunnia Dakhil Madrasha	403589.9	2405235	1.63	0.85	1.39	0.16	5.81	2.83	5.65	0.63
SR240	Chiringa Barmis Government Primary School	403487.7	2404920	1.70	1.03	1.61	0.16	5.82	3.07	5.79	0.63
SR241	Madrasha al-balagul mobin	405613.4	2404831	1.56	1.05	1.63	0.14	5.19	3.08	5.81	0.56
SR242	sairar dale govt. primary school	383858.5	2401467	2.71	1.12	1.70	0.45	10.75	3.16	5.82	2.20
SR243	Hasan Bashir Nurani Madrasha, Uttar Nolabila	389174.2	2401586	4.42	1.02	1.56	0.60	13.67	3	5.19	2.18
SR244	Unus Khali Primary School	389000.1	2400264	3.26	2.71	1.48	0.56	12.04	7.81	10.07	1.92
SR245	Sutriar Dale Government Primary School, Dhalghata	382289.4	2396613	2.03	3.1	3.47	0.28	8.69	5.7	13.67	1.29
SR246	Sapmarar Dale Government Primary School and Public Shelter	383973.6	2396067	2.67	2.24	2.69	0.35	13.09	7.26	11.08	1.98
SR247	Amdadia Madrasha, Dhalghata	382287	2397227	2.10	2.03	0.66	0.28	9.22	8.69	4.62	1.28
SR248	Dhalghata Ideal High School	382573.3	2398052	2.16	1.61	1.06	0.30	8.60	6.91	6.45	1.36
SR249	Soraitola Govt. Primary School cum Cyclone Centre	382371.9	2397588	2.13	2.1	0.72	0.29	9.17	9.22	5.29	1.30
SR250	Mohrigohna Alim madrasa	383395.3	2399232	2.26	2.16	0.80	0.37	10.26	8.6	6.42	1.63
SR251	Matarbari Coal Power Plant	384097.8	2400372	2.68	2.13	0.76	0.47	13.26	9.17	5.74	1.42
SR252	Mohurighona CC	383288.5	2398769	2.21	2.22	0.94	0.36	9.66	6.23	7.17	1.66
SR253	Ummuhani Girls Madrasha	383741.4	2400995	2.62	2.45	1.14	0.43	11.99	6.82	8.51	1.84
SR254	Matarbari Ideal Girls High School	384508.7	2403058	2.97	2.14	0.88	0.58	10.22	7.86	8.22	2.98
SR255	Matarbari Govt. Primary School	385968	2403678	5.90	2.62	1.33	1.06	13.55	8.42	7.49	3.71
SR256	Shaitmara Government Primary School	390936.1	2399266	3.35	2.86	2.51	0.45	9.18	6	6.41	1.42

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SR257	Shaitmara Residential Model High School	391098.1	2399014	3.21	3.26	3.31	0.44	8.87	5.77	13.55	1.38
SR258	Jhapua Madrasah	388500.4	2398728	2.55	2.79	2.44	0.46	11.58	9.04	9.18	1.79
SR259	JM Ghat Adarsha High School	391988.6	2396982	2.56	2.73	2.34	0.38	9.17	8.87	8.66	1.25
SR260	Kalarmarchara High School	388359.2	2396003	2.46	2.54	1.99	0.33	10.96	7.87	8.73	1.78
SR261	Kalarmarchara Adarsha Dakhil Madrasah	388461.9	2395004	2.37	2.09	1.86	0.30	8.74	6.6	6.45	1.67
SR262	Nonachari Fakiraghuna Tajbidul Quran Hifzkhana and Etimkhana	388446.7	2395525	2.40	1.33	1.35	0.32	9.64	7.93	9.64	1.73
SR263	Mijjir para government primary school	388062.3	2395904	2.59	1.12	1.21	0.33	10.01	6.53	7.84	1.84
SR264	Kalarmarchara Govt Primary School	388297	2396258	2.51	1.25	1.28	0.34	11.55	7.49	8.84	1.81
SR265	Noyapara Government Primary School	388591.2	2396905	2.26	1.12	1.30	0.36	11.24	7.46	9.27	1.77
SR266	JM Ghat Government primary School	391882.9	2397017	2.59	1.37	1.39	0.38	9.23	8.2	10.00	1.26
SR267	Mithakata Government Primary School	392803.5	2394978	2.33	1.82	1.51	0.32	6.42	8.78	9.53	1.17
SR268	Ghunarpara Government Primary School	393051.7	2394087	2.15	2.04	1.85	0.30	7.41	6.64	6.48	1.14
SR269	Shaplapur Islamia Alim Madrasha	393633	2393993	2.18	1.61	1.47	0.30	6.78	6.35	6.27	1.09
SR270	Shaplapur FWC	393898.4	2393722	2.14	1.51	1.33	0.29	6.79	5.88	6.25	1.06
SR271	ASA Shaplapur Health Center	394094.1	2393632	2.12	1.5	1.37	0.28	6.67	5.25	6.30	1.04
SR272	Shaplapur High School	394106.6	2393746	2.12	1.47	1.35	0.29	6.53	5.23	6.23	1.05
SR273	Shapalapur Islamia Alim Madrasa	394124.9	2393750	2.12	1.47	1.35	0.29	6.50	5.1	6.21	1.04
SR274	Shaplapur Government Primary School	394133.5	2393780	2.12	1.52	1.37	0.29	6.46	5.17	6.24	1.04
SR275	Bariapara Model Academy	394543.8	2390217	1.55	1.53	1.37	0.23	6.98	5.19	6.24	0.91
SR276	Kaidabad Government Primary School	394571.6	2390012	1.53	1.54	1.38	0.23	6.83	5.24	6.24	0.91
SR277	Alhaj Abdul Gani Mastar Nurani Madrasa and School	394803.7	2389124	1.46	1.45	1.11	0.22	6.15	5.58	5.20	0.87
SR278	Dineshpur Government Primary School	394531.3	2388627	1.52	1.46	1.10	0.21	5.49	5.6	5.12	0.87
SR279	Moheskhali Upazila Health Complex	389174.2	2387098	1.58	1.46	1.05	0.18	5.65	5.45	4.74	0.85
SR280	Panirchara govt. primary school	388747.2	2385446	1.39	1.52	1.01	0.17	5.94	5.21	4.87	0.75
SR281	Panirchara Ideal High School	388630.1	2385394	1.40	0.56	0.72	0.17	6.00	4.48	3.30	0.75
SR282	Al Akaba Kindergarten School, Maheshkhali	388813.8	2385472	1.40	0.52	0.67	0.17	5.90	3.29	2.86	0.75
SR283	Panichara Bottala Hafez Khana	388826.3	2385943	1.44	0.52	0.67	0.17	5.95	3.17	2.89	0.78
SR284	Dalghat Para Primary School	388537.7	2386898	1.48	0.52	0.67	0.18	6.26	3.36	2.85	0.83

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SR285	Mohrakata Community Clinic	388583.7	2386918	1.49	0.54	0.69	0.18	6.23	3.58	2.90	0.83
SR286	Adhunagar Islamia kamil Madrasah	389778.1	2388622	1.68	0.56	0.72	0.19	5.77	3.79	3.05	0.96
SR287	Keruntoli Government Primary School and Cyclone Shelter, Maheshkhali, Cox's Bazar	388813.3	2389090	1.74	0.56	0.72	0.20	5.93	3.85	3.07	0.98
SR288	Hoanak Government Primary School	388627.1	2390166	1.84	0.61	0.76	0.21	6.03	5.77	3.68	1.08
SR289	Time Bazar Government Primary School	388687.1	2391813	2.02	0.63	0.80	0.24	6.94	5.37	3.82	1.25
SR290	Chonkhola Primary School	388535.5	2393029	2.17	0.67	0.85	0.26	6.93	5.97	4.19	1.41
SR291	Daillaghona Govt. Primary School	388715.3	2393878	2.21	0.75	0.94	0.27	8.06	6.94	4.72	1.51
SR292	Chiknipara CC/CNC	388539.3	2397823	2.30	0.82	1.01	0.41	9.52	6.88	5.01	1.79
SR293	Napitkhali Secondary School	403146.5	2387574	1.50	0.99	1.09	0.16	4.23	6.14	6.17	0.57
SR294	Islampur Islamia Dakhil Madrasah	401793.9	2386862	1.35	2.15	1.65	0.17	4.93	7.74	8.12	0.60
SR295	Dharmerchara Government Primary School	401780.4	2386958	1.35	1.29	1.11	0.17	4.90	3.48	4.23	0.61
SR296	Gomatali High School	397144.8	2386036	1.26	1.35	1.28	0.18	4.79	4.18	3.71	0.71
SR297	Uttar Gomatali Mohajer Registrar Primary School	397612.9	2387347	1.48	1.35	1.29	0.19	5.76	4.16	3.76	0.72
SR298	Al Jamiah Al Emdadiah Azizul Uloom (Pokkhali Madrasah) Pokkhali	398281.8	2385604	1.30	1.15	0.89	0.18	4.97	4.57	4.16	0.67
SR299	Paschim Gomatali Hossainia Madrasha	397187.8	2385636	1.24	1.02	0.92	0.18	4.54	4.69	4.20	0.70
SR300	Purba Notun Ghona Government primary School	393597.6	2403904	2.83	0.98	0.85	0.31	10.05	4.5	3.75	1.29
SR301	Habibia Government Primary School	392937.8	2401173	2.76	1.18	0.88	0.35	9.03	4.44	4.26	1.28
SR302	Vach School and College	392386.8	2400701	2.77	2.83	2.46	0.39	9.15	4.2	10.05	1.33
SR303	Al Azhar Kindergarten	392016.7	2399539	3.68	2.76	2.08	0.41	8.32	5.26	6.94	1.30
SR304	Al Azhar High School	392009	2399423	3.65	2.63	2.29	0.41	8.27	4.96	7.03	1.29
SR305	Azamnagor Government Primary School	393145.6	2399222	3.22	2.97	2.35	0.36	7.45	7.6	8.32	1.15
SR306	Madinatul Ulum Madrasha	401688	2402913	1.73	2.92	2.33	0.17	5.25	7.81	8.27	0.66
SR307	Dulahazara Degree College	404453	2396130	1.26	2.67	2.04	0.15	4.12	7.25	7.45	0.51
SR308	Bangabandhu Sheikh Mujib Safari Park	404883	2396382	1.27	1.73	1.48	0.14	4.04	3.34	5.16	0.49
SR309	Dulahazara Health & Family Welfare Center	404367.1	2396360	1.24	1.26	1.16	0.15	4.12	3.84	4.12	0.51
SR310	Darul Forkan Umme Hani (Rh.) Madrasha	404138.1	2396561	1.26	1.17	1.27	0.15	4.13	3.92	4.04	0.51

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SR311	Charandwip dulkhalipara Government primary school Chakaria, Cox's Bazar	401677.4	2400965	1.68	1.24	1.23	0.16	4.65	3.94	4.12	0.62
SR312	Charandwip Bhumihin Coastal High School	402602.4	2400613	1.59	1.23	1.26	0.16	4.66	4.04	4.13	0.58
SR313	Palakata High School	403194.2	2403809	1.73	1.3	1.68	0.16	5.42	3.27	4.54	0.62
SR314	Balagul Mobin Madrasha	405639.2	2404478	1.60	1.2	1.59	0.14	5.01	3.35	4.66	0.55
SR315	Mohila Etimkhana and Hafezia Madrasha	405070.1	2404398	1.64	1.45	1.73	0.14	5.15	3.25	5.42	0.57
SR316	Rashid Ahmed Chowdhury High School	405142.7	2403885	1.63	1.07	1.60	0.14	4.79	2.99	5.01	0.56
SR317	Fasiakhali Nurani Kindergarten	405371.4	2403909	1.62	1.13	1.64	0.14	4.73	3.06	5.15	0.55
SR318	Fashiakhali Government Primary School	405193	2403929	1.63	1.27	1.63	0.14	4.81	2.99	4.79	0.56
SR319	Palakata Dakhil Madrasha	403626.6	2403740	1.70	1.25	1.62	0.15	5.22	2.97	4.73	0.60
SR320	Bashkata Nurani Ta'leemul Quran Madrasha	402685.1	2388477	1.58	1.25	1.63	0.17	4.37	2.99	4.81	0.59
SR321	Jumnagar Non-government Primary School	403310.3	2388525	1.58	1.43	1.70	0.16	4.22	3.19	5.22	0.57
SR322	South Fulchari Government Primary School	401728.3	2389331	1.64	1.31	1.09	0.18	4.51	3.35	4.37	0.62
SR323	Noyapada Govt Primary School	402834.4	2389776	1.65	1.38	1.00	0.17	4.07	3.53	4.22	0.58
SR324	Kutakhali grammer school	403976.8	2390613	1.48	1.35	1.14	0.16	4.23	3.64	4.51	0.55
SR325	Diganta Kids Care School	403055.1	2390527	1.61	1.51	0.96	0.17	4.30	4.07	3.96	0.57
SR326	Khutakhali High School.	403641.9	2390979	1.49	1.37	1.04	0.16	4.28	4.23	3.73	0.55
SR327	Kutubdia Para Community Clinic	402697.4	2391839	1.56	1.51	0.97	0.17	4.40	4.3	3.54	0.58
SR328	Paglirbill Govt. Primary School	404796	2394516	1.35	1.38	1.08	0.15	3.69	4.28	3.85	0.50
SR329	Baitun-nur Madrasha	404248.3	2394211	1.37	1.43	1.16	0.16	3.68	4.4	4.07	0.52
SR330	Malumghat Model Public School	404083	2397316	1.41	1.35	1.21	0.15	4.21	2.82	3.69	0.51
SR331	BNS Sheikh Hasina Submarine Base	387159.5	2410443	3.99	1.37	1.27	0.76	10.22	3.02	3.52	1.98
SR332	South Mognama Primary School	387916.3	2410199	5.25	1.1	1.41	0.76	10.26	4.21	3.92	1.97
SR333	Hazi Shafiq Islamia Dhakil Madrasa	404746	2385174	1.30	1.23	3.99	0.15	4.23	4.32	10.12	0.52
SR334	Darussalam Dakhil Madrasah	403983.2	2386214	1.38	1.46	5.25	0.15	4.24	4.19	10.26	0.55
SR335	Markaze Amena Nurani Madrasah	403666.1	2385851	1.31	1.22	1.14	0.15	4.46	3.67	3.53	0.55
SR336	Satjula Kata Government primary School	401600.8	2385196	1.23	1.26	1.15	0.16	5.06	3.64	3.84	0.58
SR337	Pokkhali Adarsha High School	399581.7	2385201	1.37	1.28	1.21	0.17	5.10	3.83	3.62	0.63
SR338	Ma Ariful Quran Nurani Madrasa	404173.2	2422599	1.95	1.11	0.93	0.20	5.97	4.2	3.53	0.66

Appendix H-2: SO_2 Concentration on Sensitive Receptors

ID	Sensitive Receptors Name	Coordinates		SO_2 Concentration (µg/m^3)											
		X	Y	Only project -1 hr.			Only project – 24 hr.			Cumulative- 1 hr.			Cumulative- 24 hr.		
				WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM
SR2	Purbo Tabalerchar Government Primary School	381544.9	2408413	15.4	12.0	8.9	1.59	0.73	0.95	78.2	35.7	78.2	8.6	3.05	5.75
SR1	Tabelarchor Government Primary School	380979.1	2408080	15.2	10.4	8.7	1.29	0.73	1.44	84.3	42.1	71.8	11.6	3.06	6.30
SR3	Blooming Bud Grammar School	380971	2409649	13.7	10.1	6.0	1.46	0.6	1.46	77.0	32.1	72.7	8.0	2.58	5.65
SR4	Kabi Jashim Uddin High School	380711.4	2409676	13.3	9.5	7.1	1.47	0.57	1.47	80.5	33.1	70.3	8.5	2.54	5.28
SR5	Bornomala Kinder Garten School	380650.4	2409645	13.1	9.3	7.5	1.47	0.56	1.47	80.3	33.5	68.8	8.8	2.54	5.14
SR6	Ali Akbar Deil Govt Primary School Cum Cyclone Shelter	380714.5	2409735	13.4	9.5	6.8	1.46	0.57	1.46	80.1	32.8	70.5	8.4	2.53	5.31
SR7	Tekpara Government Primary School	380504.8	2410731	11.2	9.5	8.5	1.35	0.55	1.35	73.8	29.8	67.4	7.5	2.28	5.16
SR8	Kutubawlia Government Primary School	380658.5	2411272	11.8	9.7	10.0	1.28	0.55	1.23	68.3	27.4	62.0	7.5	2.19	5.11
SR9	Merit Plus Kindergarten	380845.8	2411710	11.8	9.7	9.2	1.12	0.55	1.09	74.4	25.5	52.5	6.9	2.12	4.81
SR10	Moddha Aliakber Deil Government School	380907.8	2411885	11.5	9.7	8.4	1.14	0.54	1.03	74.4	24.8	50.9	6.5	2.09	4.66
SR11	Boroghop Ershad Govt. Primary School	380797	2412406	10.5	9.2	8.1	1.15	0.51	0.98	72.4	23.7	49.3	6.2	2	4.47
SR12	ABC Model Kindergarten School	380985.6	2412705	11.5	9.0	9.3	1.26	0.51	0.89	68.1	22.4	53.2	5.9	1.97	4.15
SR13	Kutubdia Government Girl's High School	381275.7	2412920	10.9	8.9	10.2	1.38	0.5	0.85	66.4	23.4	58.7	5.8	1.95	3.82
SR14	Kutubdia Adarsha High School	381391.4	2412770	10.9	9.0	10.4	1.41	0.51	0.87	68.2	24.6	60.2	5.9	1.97	3.80
SR15	Kutubdia Model Govt Primary School Cum Cyclone Shelters	381451.6	2412789	10.6	9.0	10.5	1.43	0.51	0.86	69.2	25.5	60.9	6.1	1.98	3.87
SR16	Baroghop Islamia Fajil (Degree) Madrassa	381384.7	2413070	10.6	8.7	10.3	1.41	0.49	0.84	68.1	25.0	59.8	6.0	1.93	3.81
SR17	Kutubdia Hospital	381481.1	2413182	10.9	8.6	10.2	1.41	0.48	0.81	70.0	26.3	60.1	6.2	1.92	3.87
SR18	Uttor Baroghop Government Primany School	381581.5	2413677	11.2	8.0	9.4	1.32	0.45	0.73	73.7	28.1	59.0	6.4	1.85	3.89
SR19	Kutubdia Women College	381599.4	2413685	11.2	7.9	9.4	1.31	0.45	0.72	73.8	28.3	58.9	6.4	1.85	3.90
SR20	K S Red Crescent Government Primary School	381645.8	2414905	10.0	6.6	10.0	1.17	0.39	0.69	72.0	29.7	54.3	6.4	1.7	3.84
SR21	Koiyerbill Ideal High School	381560.4	2415982	10.4	5.7	8.8	1.06	0.34	0.66	68.4	29.3	50.7	6.1	1.59	3.83
SR22	North Kaiyerbill Primary School	381156	2416872	9.9	5.3	8.5	1.03	0.31	0.62	66.5	26.1	49.7	5.7	1.5	3.39
SR23	Dakkhin Dhurung Government Primary School	380913.4	2418600	8.9	4.4	7.4	0.83	0.26	0.54	62.5	24.9	45.5	5.4	1.36	3.16
SR24	Paschim Dhurung Government Primary School	381342	2421865	7.6	3.2	6.0	0.70	0.19	0.43	50.8	27.6	41.4	4.8	1.45	3.66
SR25	Uttar Dhurung N Hossain Government Primary School	381679.1	2422501	8.05	3.1	6.0	0.82	0.18	0.41	48.0	28.6	41.1	4.5	1.52	3.78
SR26	Char Dhurung Government Primary School	382556.5	2422736	7.59	3.5	6.8	0.84	0.18	0.52	45.5	30.4	35.8	5.9	1.68	3.85
SR27	Azgaria Government Primary School	383172.2	2423444	6.41	3.8	6.2	0.66	0.2	0.53	44.2	29.3	32.4	6.0	1.69	3.56
SR28	M. Rahman Government Primary School	383723	2422232	7.09	4.1	6.8	0.72	0.22	0.59	49.2	29.6	40.9	5.7	1.78	3.99

ID	Sensitive Receptors Name	Coordinates		SO_2 Concentration (µg/m^3)											
		X	Y	Only project -1 hr.			Only project – 24 hr.			Cumulative- 1 hr.			Cumulative- 24 hr.		
				WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM
SR29	Jumma Para Government Primary School	384851.7	2421999	7.98	3.9	6.9	0.95	0.24	0.62	51.6	24.8	51.6	6.4	1.69	6.42
SR30	Foyzanir Para Government Primary School	385587.2	2421424	8.01	3.5	7.5	0.99	0.23	0.86	49.9	21.1	49.9	8.3	1.79	7.27
SR31	Bakkhali Government Primary School	383911.1	2421371	7.45	4.2	7.1	0.79	0.24	0.62	52.2	30.0	44.7	5.5	1.83	4.45
SR32	Bangakata Government Primary School	383222	2421033	7.53	4.0	7.1	0.83	0.21	0.59	48.8	32.1	34.5	5.9	1.84	3.96
SR33	Uttoron Biddaya Niketon	382225.8	2421715	8.71	3.3	6.7	0.90	0.19	0.50	45.6	30.8	41.1	5.3	1.67	4.02
SR34	Uttar Dhurrung Union Health and Family Welfare Centre	382122.8	2421244	8.56	3.4	6.6	0.90	0.19	0.47	48.3	30.9	42.8	5.0	1.67	4.07
SR35	Samadia Government Primary School	381972.6	2421267	8.54	3.4	6.4	0.87	0.19	0.45	49.7	30.4	43.3	4.7	1.63	4.03
SR36	Teliakata Government Primary School	383422.5	2420149	7.87	4.3	7.4	0.84	0.23	0.62	49.8	32.9	37.9	5.8	1.92	4.04
SR37	Jalal Uddin Government Primary School	382935.1	2419574	9.25	3.9	8.0	1.00	0.22	0.60	51.3	34.0	40.8	5.7	1.91	4.36
SR38	Dhurung Ideal High School Stadium	382088.4	2419686	8.86	3.7	6.8	0.86	0.21	0.48	53.8	31.9	46.5	5.1	1.71	4.26
SR39	Friendship Static Clinic	382286.7	2419061	9.24	3.8	7.0	0.90	0.22	0.49	54.3	33.1	47.7	5.2	1.79	4.43
SR40	Rajakhali Government Primary School	383131	2418824	9.35	4.1	8.4	1.03	0.23	0.64	53.2	35.0	40.6	5.7	1.99	4.48
SR41	Jalilia Government Primary School	381937.2	2418617	9.19	3.9	7.6	0.71	0.24	0.52	57.7	31.7	48.1	5.5	1.68	4.27
SR42	Kutubdia Technical & BM College	382246	2417746	9.79	4.1	8.0	0.78	0.25	0.55	59.0	33.8	50.5	5.7	1.81	4.57
SR43	Lemsikhali Piarakata Government Primary School	384292.8	2417751	8.90	5.1	8.8	0.95	0.29	0.76	62.7	33.6	57.4	6.4	2.11	5.57
SR44	Al faruq Madrasha	383978.5	2417444	8.99	5.0	8.7	0.90	0.28	0.74	61.1	35.7	52.4	6.4	2.17	5.01
SR45	Lemshikhaki High School	384104	2417397	8.92	5.1	8.9	0.85	0.28	0.76	62.6	35.2	55.1	6.5	2.17	5.22
SR46	Purbo Lemsikhali Government Primary School	385216.1	2417993	10.14	4.6	9.2	1.17	0.29	0.82	61.7	26.7	61.7	8.1	2.01	7.66
SR47	Dakkhin Dhupipara Government Primary School	384306.2	2419033	8.37	4.8	8.0	0.95	0.27	0.70	59.5	31.5	54.7	6.0	1.99	5.54
SR48	Satar Uddin Government Primary School	385817.1	2420203	8.18	3.4	7.7	1.08	0.24	0.95	54.1	25.8	54.1	9.6	2.1	7.58
SR49	M Rahman Government Primary School	385146.3	2417384	10.50	4.9	9.5	1.21	0.3	0.84	64.1	28.1	64.1	8.0	2.05	7.70
SR50	Union Health and Family Welfare Center	383889	2417039	9.44	5.1	9.0	0.99	0.27	0.75	60.8	36.8	51.1	6.5	2.21	4.94
SR51	Paschim Lemshikhali Darussunnah Hafezia Madrasha	383157.6	2416653	10.60	4.5	8.8	1.13	0.27	0.65	57.3	38.2	48.3	5.8	2.15	5.03
SR52	Koiloyssaghona Government Primary School	382283.2	2416393	10.68	4.8	9.1	0.79	0.3	0.60	63.3	34.9	53.4	6.1	1.87	4.75
SR53	Kayerbill G M Government Primary School	381968.5	2415616	10.58	5.7	9.0	0.97	0.34	0.65	64.6	32.9	51.4	6.4	1.74	4.44
SR54	Dakshin Lemshikhali Govt Primary School	384011.9	2415685	10.27	5.4	10.1	1.10	0.29	0.83	65.7	39.0	56.5	7.0	2.36	5.43
SR55	Ahmadia Faizul Ulum Madrasha	383934.6	2415810	10.35	5.3	10.1	1.12	0.29	0.82	64.0	39.0	54.2	6.9	2.34	5.25
SR56	Khadiartek Government Primary School, Kutubdia, Cox's Bazar	381250.7	2409496	14.05	10.8	6.6	1.46	0.64	1.46	71.3	31.4	71.3	8.3	2.67	5.84
SR57	Ali Akbar Deil High School Cum Cyclone Shelter	381074.1	2410792	12.73	10.5	10.5	1.31	0.6	1.28	77.0	27.6	58.2	7.4	2.32	5.19

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				WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM
SR58	Flight Lieutenant Qaimul Huda Government Primary School	381426.1	2410752	13.35	11.1	10.4	1.24	0.62	1.24	77.7	26.6	57.2	7.2	2.36	4.85
SR59	Amjakhali Govt. Primary School & Cyclone Center	382707	2411722	12.79	10.0	11.2	1.57	0.58	0.86	78.7	40.9	65.8	7.8	2.21	5.72
SR60	Community Clinic	382953.7	2411815	12.02	9.6	11.9	1.38	0.56	0.87	77.3	43.6	67.9	7.7	2.39	6.11
SR61	M H Grammar School	381808.7	2411672	12.18	10.4	11.1	1.50	0.58	0.97	74.9	28.7	65.9	6.6	2.18	4.23
SR62	Pilotkata Government Primary School	382962	2412743	13.05	8.0	10.2	1.12	0.48	0.81	72.3	42.8	64.5	7.3	2.35	5.93
SR63	Nor Badshar Forkania Madrasha	382463.6	2413524	11.80	7.5	10.4	1.16	0.44	0.78	72.2	37.8	59.7	7.1	2.03	5.21
SR64	Kutubdia Government Collage	381919	2413241	11.32	8.3	9.8	1.35	0.47	0.74	77.0	31.8	59.4	6.8	1.92	4.13
SR65	Kutubdia Island High School	381552.5	2413286	11.15	8.4	10.1	1.39	0.48	0.79	72.3	27.3	60.1	6.3	1.9	3.91
SR66	Monohor Khali Govt. Primary School	382352.6	2414004	11.58	7.0	9.8	1.11	0.41	0.75	70.6	36.6	57.8	6.9	1.96	5.02
SR67	Alhaz Anower Ali Government Primary School	383459.2	2414324	12.68	5.6	9.8	1.13	0.34	0.67	63.7	42.6	52.8	6.8	2.44	5.66
SR68	Kayerbill Government Primary School	381268.3	2415723	9.62	6.2	9.4	1.13	0.36	0.65	69.2	26.4	53.0	5.9	1.61	3.55
SR69	Alhaz Fakir Muhammad Nurani Madrasha	382933.5	2415971	11.20	4.8	8.7	0.99	0.29	0.61	58.1	38.6	53.5	5.9	2.14	5.20
SR70	Dingabhanga Government Primary School	381528.6	2417351	9.46	4.8	8.3	0.82	0.29	0.56	62.6	29.2	45.5	5.8	1.53	3.87
SR71	Dharul Hikmah al Malekia Dakhil Maddrasah	382235.6	2417671	9.84	4.1	8.1	0.77	0.26	0.56	59.6	33.9	50.9	5.7	1.82	4.59
SR72	Purbo Dhurung Government Primary School	382742.7	2417842	10.06	4.1	7.7	1.02	0.24	0.55	53.2	35.8	48.8	5.3	1.97	4.76
SR73	Holy child island school	383944.2	2417679	8.86	5.0	8.6	0.89	0.27	0.73	60.2	35.5	51.3	6.4	2.15	4.92
SR74	Jamiria Madrasha Hifzkhana and Etimkhana	384782	2418063	9.61	4.9	8.1	1.12	0.29	0.72	62.0	30.0	62.0	6.9	2.02	6.86
SR76	Noapara Government Primary School	387920.7	2424731	6.01	1.7	6.0	1.28	0.18	0.82	43.6	29.9	42.2	10.4	2.18	5.83
SR77	Sekherkhil Ideal Kindergarten	389882.9	2424994	9.19	1.6	5.4	1.04	0.19	0.70	43.9	35.1	37.4	9.9	2.46	5.05
SR78	Shekherkhil Darussalam Adarsha Senior Alim Madrasha	389943.2	2425117	9.20	3.5	6.3	1.03	0.24	0.88	70.2	43.8	35.7	8.2	2.93	5.12
SR79	Sekherkhil Darussalam Adarsha Senior Madrasha	390389.1	2425129	9.52	3.5	6.3	0.94	0.24	0.88	70.2	43.6	35.5	8.1	2.92	5.13
SR80	Master Nazir Ahmed College	392624	2425021	6.29	4.1	6.4	0.97	0.27	0.92	72.0	43.9	38.1	7.6	2.94	5.36
SR81	Master Nazir Ahmed Degree College	392639.4	2424961	6.32	6.3	5.1	0.98	0.41	0.79	54.7	35.8	39.8	6.7	2.6	6.43
SR82	Ambia Khatun Dakhil Madrasha	392764.6	2424923	6.35	6.3	5.2	0.97	0.41	0.78	54.4	35.6	39.7	6.7	2.59	6.41
SR83	Master Nazir Ahmad Government Primary School	392798.4	2424866	6.37	6.4	5.3	0.97	0.41	0.78	53.4	34.8	39.0	6.8	2.55	6.35
SR84	Chunati Wildlife Sanctuary	399820.6	2423655	7.36	6.4	5.3	1.06	0.42	0.78	53.0	34.5	38.8	6.8	2.54	6.32
SR85	2 No. Dhambi Government Primary School	403881	2423153	6.10	5.2	6.5	1.17	0.51	1.06	54.4	29.9	45.8	9.1	3.83	9.09
SR86	Islampur B Alam Govt. Primary School	404511.7	2421891	6.63	4.2	6.1	1.20	0.48	1.17	38.3	31.8	36.1	7.7	3.97	7.65
SR87	Tamiri E Millat Islamia Dakhil Madrasah	404318.4	2422145	6.51	4.3	6.2	1.18	0.4	1.20	37.5	30.9	37.5	8.7	3.69	8.68
SR88	Health Centre	403575	2422159	6.59	4.4	6.4	1.14	0.42	1.18	36.9	30.6	36.9	8.5	3.78	8.51
SR89	Allama Saydul Amin Education Centre	403549.2	2421960	6.64	4.5	6.6	1.15	0.47	1.14	36.8	30.9	35.8	8.2	3.99	8.22

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				WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM
SR90	Aziznagar Girl's School	403398.6	2422280	6.52	4.5	6.6	1.18	0.46	1.15	36.3	30.6	35.9	8.4	3.98	8.36
SR91	Dhambi Government Primary School	403344.9	2422400	6.44	4.5	6.5	1.19	0.48	1.18	38.2	31.9	36.6	8.0	4.03	8.04
SR92	Chanua Government Primary School	388406.1	2423768	6.23	4.4	6.4	1.17	0.49	1.19	38.9	32.4	36.9	7.9	4.04	7.92
SR93	Noapara Government Primary School	387588.7	2423702	6.28	1.9	4.7	1.33	0.22	0.64	49.4	40.9	37.9	9.0	2.79	4.64
SR94	Totakkhali Govt. Primary School	389001.7	2422964	8.73	1.7	5.9	1.19	0.2	0.77	45.8	35.2	40.4	10.4	2.49	5.48
SR95	Haji Kala Mia Para Community Primary School Cyclone Shelter	389459	2423586	9.48	3.1	6.4	1.12	0.24	0.86	68.6	46.1	36.7	9.1	3.1	4.93
SR96	Poichari Ijjatia Government Primary School	390954.1	2423175	8.06	3.6	6.7	0.97	0.24	0.91	72.6	46.2	37.1	8.7	3.09	5.23
SR97	Poichari Moksuda Khatun Government Primary School	392169.6	2423100	6.94	6.1	5.9	1.05	0.39	0.97	65.8	45.5	42.6	6.6	3.12	6.57
SR98	Purba Poichari Government Primary School	393412	2423251	7.96	6.9	5.7	0.97	0.45	0.83	56.0	37.8	41.2	7.2	2.77	6.58
SR99	Puichari Quaderia Government Primary School	392231.6	2422376	7.62	6.9	5.6	1.05	0.45	0.97	46.5	43.1	43.9	7.0	2.44	6.49
SR100	Digital Hospital Coxbazar pvt ltd	405353.1	2418832	6.76	7.2	6.0	0.85	0.48	0.83	53.5	36.6	42.0	7.4	2.75	6.64
SR101	Harbang Union High School	402382.9	2416059	8.15	2.8	6.3	0.96	0.3	0.85	42.9	26.1	42.9	9.6	2.99	9.64
SR102	Amtalipara Master Muhammed Abdul Hai Primary School	405307.5	2413766	6.02	3.5	6.5	1.15	0.34	0.96	48.5	29.5	48.5	10.8	3.38	10.84
SR103	Uttar Paschim Baraitali Govt. Primary School	402742.7	2413995	8.23	5.1	5.7	1.33	0.29	1.15	51.3	26.6	41.5	7.1	2.18	7.08
SR104	Chainus Hazrat Fatema Islami Academi Madrasha and Hifzkhana	390138	2422109	10.13	5.7	8.2	1.05	0.32	1.33	57.2	25.7	57.2	9.5	3.03	9.51
SR105	Hazrat Abubakkar Siddik (Rah.) Nurani Madrasha	391588.9	2421950	7.33	5.7	7.1	1.11	0.37	1.05	77.5	49.2	44.4	7.7	3.34	6.33
SR106	Uttar Harbang Government Primary School	402813	2418249	7.31	7.3	5.8	1.17	0.48	0.91	59.5	41.5	43.7	7.5	3.01	6.95
SR107	Toitong Alhera Model Academy	393662.2	2418977	9.94	3.9	7.3	1.87	0.38	1.17	45.0	33.2	45.0	9.8	3.66	9.80
SR108	Sayadul Mursalin Talimul Quran Noorani Madrash hefjkhana & Atimkhanaa	392430.8	2419162	9.66	5.7	9.9	1.59	0.57	1.87	64.9	57.5	64.9	10.9	3.34	10.87
SR109	Jamal Meher Government Primary School	389055	2418184	11.94	8.3	9.7	1.26	0.51	1.59	56.6	56.6	46.5	8.0	3.18	7.97
SR110	Faraz Ali Adarsha Dakhil Madrasha	392087.8	2417267	11.91	7.1	8.4	2.02	0.47	1.26	91.5	59.6	49.8	9.3	4.07	7.51
SR111	Abul hossain Shikder Govt. Primary School	392544.6	2417878	11.35	8.0	11.9	1.97	0.52	2.02	63.7	63.8	59.9	10.1	3.62	10.13
SR112	10 Number West Sonaichhari Government Primary School	393288.5	2417925	10.19	7.4	11.4	1.94	0.53	1.97	62.1	62.1	60.8	10.2	3.53	10.20
SR113	Maulvibazar Farukia Madrasha	393182.4	2417618	10.21	5.8	10.2	1.96	0.63	1.94	69.9	59.1	69.9	11.7	3.49	11.70
SR114	Uttar Barabakia Government Primary School	393107.7	2416804	9.37	5.9	10.2	1.88	0.64	1.96	71.4	59.5	71.4	12.0	3.53	11.96
SR115	Sonaichari Government Primary School	394623.8	2416858	10.17	5.8	9.4	1.57	0.69	1.88	76.4	58.0	76.4	13.0	3.94	12.99
SR116	Baitun-ter Islamia Darul Ulum Madrasha Hifzkhana and Etimkhana	395767.5	2416833	8.36	7.7	9.2	1.75	0.78	1.57	65.8	42.4	65.8	13.4	5.05	13.37
SR117	Harabang Adarsha Academy	403026.5	2416877	7.83	7.6	7.8	0.94	0.85	1.75	72.7	43.1	54.4	11.1	4.87	11.09

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SR118	Kala Shikdar Para Nurani Madrasa	401980.4	2415495	8.17	3.2	6.7	0.97	0.34	0.94	47.9	29.4	47.9	10.4	3.27	10.43
SR119	Kacharimura Primary School	395766.1	2414506	10.93	4.0	6.8	1.81	0.34	0.97	48.8	29.4	48.4	11.1	3.45	11.12
SR120	Hosneara Girl High School	395217.3	2415277	9.28	7.4	10.9	2.01	0.79	1.81	64.5	52.6	59.6	11.7	6.21	11.65
SR121	Barabakia Model High School	394805.9	2415379	9.25	7.0	9.0	1.99	0.91	2.01	75.8	49.9	60.6	11.1	5.57	11.13
SR122	Pekua Anowarul Ulum Islamia Alim Madrasha	393901.2	2414328	9.78	8.0	8.4	2.17	0.94	1.99	76.5	46.9	57.6	11.9	5.21	11.93
SR123	Pekua Government Model GMC Institute	393526.4	2414315	9.49	8.5	8.9	2.11	1.03	2.17	77.6	47.9	62.8	13.3	5.55	13.27
SR124	MH Government Primary School	391670.1	2414388	11.07	9.1	8.8	2.13	1.04	2.11	73.2	44.6	67.1	14.3	5.67	14.30
SR125	Malumma Government Primary School.	391602.7	2414113	11.11	6.4	11.1	2.08	0.8	2.13	86.8	66.5	86.8	14.4	4.17	14.36
SR126	Uttara Magnama Shah Majidiya Abtedayi Madrasa	389532.8	2414807	11.47	6.5	11.1	1.54	0.81	2.08	88.7	66.3	88.7	14.7	4.35	14.71
SR127	Abbas Mia Primary School	387710.7	2413076	14.09	10.6	9.2	1.65	0.77	1.54	66.6	56.3	54.7	10.1	4.3	9.61
SR128	Mognama Model KG School	388248.5	2412930	13.15	8.6	9.8	1.87	0.65	1.65	108.0	77.3	61.9	12.6	5.5	10.05
SR129	Mognama Adarsha Siksha Niketon	388006.8	2412677	13.86	10.6	9.5	1.88	0.8	1.69	88.0	73.4	69.8	11.1	5.39	11.11
SR130	Mognama High School	388104.9	2412552	13.31	10.0	9.8	1.93	0.78	1.77	96.9	76.4	70.4	11.2	5.56	11.17
SR131	Mognama Model KG School, Muhuripara	388244.4	2412699	12.82	10.3	9.9	1.91	0.81	1.76	90.7	75.2	71.4	11.4	5.55	11.41
SR132	Mognama Majhir Para Shah Rashidia Alim Madrasha	388599.6	2413286	11.77	10.6	9.8	1.81	0.82	1.70	85.6	73.7	70.8	11.4	5.45	11.36
SR133	Purba Mognama Bainnaghona Brac Cyclone Shelter and BRAC Primary School	390117.5	2413406	16.77	10.9	9.7	2.67	0.82	1.54	74.1	68.9	67.1	10.9	5.12	10.91
SR134	M. H. Government Primary School	391146.6	2413536	11.87	8.0	16.8	2.24	0.69	2.67	70.9	70.1	70.9	12.1	4.18	12.06
SR135	Pekua Public High School	391091.4	2413236	11.93	6.6	11.9	2.15	0.84	2.24	90.5	69.5	90.5	14.8	4.36	14.84
SR137	Purba Goalkhali Model KG School	392385.3	2412635	10.03	7.1	11.9	2.52	0.85	2.15	92.9	68.7	92.9	15.3	4.44	15.26
SR138	Moiyadiya Government Primary School	392124.2	2412105	10.90	9.6	11.2	2.66	1.13	2.26	98.8	61.6	98.8	16.8	5.48	16.80
SR139	Pekua Upazila Hospital	393545.9	2413941	9.95	9.2	10.0	2.24	1.19	2.52	77.6	48.5	77.6	15.8	6.14	15.85
SR140	Shilkhali High School	396548.4	2413758	10.69	8.9	10.9	1.73	1.23	2.66	78.6	49.4	78.6	16.1	6.29	16.13
SR141	Shilkhali Government Primary School Playground	397671.6	2413397	10.45	8.7	9.1	1.30	1.06	2.24	77.4	47.9	65.3	13.9	5.7	13.87
SR142	Pathan Matubbar Para Government Primary School	398685.7	2413142	9.39	6.3	10.7	1.28	0.62	1.73	53.5	46.6	51.9	12.4	6.11	12.41
SR143	Baraitali High School Cyclone Shelter	403107.6	2413004	7.11	4.2	9.8	1.30	0.49	1.30	54.4	44.2	54.4	12.8	5.24	12.79
SR144	Union Health and Family Welfare Centre	403190.3	2412992	6.98	5.5	8.6	1.29	0.42	1.28	58.7	38.1	58.7	12.4	4.39	12.39
SR145	Mahmud Nagor Gov't Primary School	403776	2411886	7.29	5.8	6.4	1.12	0.33	1.30	59.3	25.0	52.3	8.0	2.54	7.98
SR146	South Baraitoli primary school	402830	2411623	7.53	5.7	6.4	1.18	0.33	1.29	59.1	25.4	51.7	8.0	2.51	7.96
SR147	Deingakata Government Primary School	401599	2412715	8.29	5.1	7.3	1.44	0.4	1.12	50.6	34.3	50.6	8.3	2.22	8.35
SR148	Pohorchanda Fazil Madrasa	398795.8	2412380	10.11	5.4	7.5	1.58	0.41	1.18	52.6	33.6	47.6	8.1	2.38	8.14

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SR149	Mehernama Govt. Primary School	397862.7	2412186	10.16	6.3	7.2	1.56	0.36	1.44	61.2	26.7	60.0	9.3	3.05	9.33
SR150	Haji Obaidul Hakim Government Primary School	397077.8	2412726	11.01	6.8	10.1	1.34	0.39	1.58	59.3	33.6	58.8	12.9	4.03	12.91
SR151	Pekua Ideal High School	391292.3	2411723	11.08	6.7	10.2	2.69	0.43	1.56	60.7	39.0	60.7	13.1	4.58	13.11
SR152	Pekua hedayedul Ulum Islamia Dakhil Madrasha Hifzkhana and Etimkhana and Mosque	390761.9	2411702	11.30	4.9	9.6	2.41	0.5	1.34	55.8	45.6	55.8	13.2	5.44	13.23
SR153	Purba Mognama Government Primary School	390404.7	2411571	11.93	9.9	10.5	2.43	1.3	2.69	96.4	51.8	96.4	17.5	6.24	17.54
SR154	Mognama SDF Public School	388197.8	2411594	13.68	9.9	11.3	2.11	1.23	2.41	103.3	62.0	103.3	17.4	5.65	17.41
SR155	Magnama Farid Ahmed Chowdhury Primary School	387547.3	2411517	13.79	9.1	11.9	2.07	1.16	2.43	103.9	66.0	103.9	17.0	5.17	17.02
SR156	Sutachura Government Primary School	391675.3	2410770	12.94	9.8	12.8	2.65	0.87	2.11	72.9	70.1	70.1	12.1	5.54	12.15
SR157	Nandir Para Govt Primary School	393806.9	2410736	13.17	8.5	11.1	1.78	0.76	2.02	101.6	79.5	71.9	12.7	5.96	11.89
SR158	Mehernama high school	395273.5	2411017	11.31	10.6	12.9	1.67	1.2	2.65	85.5	57.4	76.3	15.9	7.15	15.90
SR159	Islamia Norul Ulum Madrasa	395846.9	2411577	11.51	6.0	13.2	1.46	0.71	1.78	66.6	56.6	60.4	14.7	7.71	14.73
SR160	B. M. Char Govt. Primary School	397300.9	2410639	10.17	7.3	9.8	1.86	0.56	1.67	61.8	51.8	61.8	14.9	6.39	14.91
SR161	Abdur Rahman Government Primary School	399419.5	2410902	7.63	6.4	9.3	1.55	0.54	1.46	59.7	49.6	59.7	14.3	6.06	14.30
SR162	Health complex	402004.5	2410289	7.55	8.3	9.0	1.19	0.49	1.86	69.9	33.8	69.9	13.7	4.29	13.73
SR163	Al Amin School & College	404748	2411316	6.30	6.8	7.6	1.02	0.42	1.55	69.8	29.3	67.2	10.1	3.32	10.05
SR164	Faitong Noya Para primary school	405421.8	2411484	6.16	5.0	7.5	1.00	0.54	1.19	60.4	40.6	60.4	10.0	2.32	9.99
SR165	Chakaria Government College	405053.8	2408824	7.43	4.4	6.3	0.96	0.46	1.02	57.2	38.5	57.2	9.4	2.13	9.40
SR166	Ottar Lakkharchar Union Parishad Community Hospital	404949.8	2408677	7.36	4.3	6.2	0.95	0.45	1.00	55.7	38.1	55.7	9.3	2.1	9.27
SR167	Hazipara Forkania Madrasha and Hifzkhana	404275.5	2408660	7.68	5.9	7.4	1.00	0.57	0.96	45.8	37.9	43.1	9.4	2.79	9.38
SR168	Sreemura Government Primary School	403610.8	2409280	8.25	5.8	7.4	1.13	0.57	0.95	44.7	37.7	43.2	9.4	2.87	9.41
SR169	Hamidulla Muhuri Health Centre	403321.9	2409394	8.33	6.0	7.7	1.16	0.59	1.00	49.8	40.0	45.9	9.7	2.78	9.69
SR170	Kaiarbil Islamia Jamiul Ulum Madrasah	403104.2	2409499	8.36	6.6	8.2	1.18	0.6	1.13	57.6	43.3	51.2	10.3	2.48	10.31
SR171	Uttar Veola Government Primary School	401001.4	2408377	9.31	6.5	8.3	1.23	0.59	1.16	57.9	43.9	53.3	10.5	2.5	10.52
SR172	Betuarkul Jahan Government primary School	399759.6	2408667	9.96	6.5	8.4	1.39	0.59	1.18	57.2	44.1	56.6	10.6	2.5	10.63
SR173	Bahadder Kata High School	398428	2409417	8.74	7.2	9.3	1.45	0.69	1.23	63.6	48.8	61.1	11.8	2.84	11.81
SR174	Krisnapur Govt. Primary School	397439.2	2409333	8.78	7.4	10.0	1.61	0.7	1.39	68.9	47.5	68.9	11.8	2.76	11.78
SR175	konakhali Govt. Primary School	394379.4	2409598	11.72	6.6	8.7	2.25	0.62	1.45	74.3	35.9	64.3	10.3	3.25	10.27
SR176	Konakhali Kulsum Nahar Govt. Primary School	394045.8	2408664	10.19	7.4	8.8	2.27	0.61	1.61	78.5	32.0	75.2	11.0	3.68	10.99
SR177	Darul Irfan madrasah	393952.1	2408194	11.21	9.9	11.1	2.17	0.59	2.25	68.8	53.6	68.8	15.9	6.57	15.92

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SR178	Al-Mohammadia M.H.C Model Madrasah	393374.9	2407886	12.55	9.7	10.2	2.25	0.67	2.27	72.1	51.5	72.1	16.3	6.28	16.34
SR179	Purbo Ujantia Government Primary School	390575.2	2408725	16.19	9.7	11.2	2.64	0.76	2.17	79.6	48.5	79.6	16.8	5.98	16.81
SR180	Maddhyam Ujantia Veluarpara Government Primary School	388949	2408273	16.04	9.8	12.5	3.57	0.83	2.25	76.5	53.0	76.5	17.2	6.48	17.18
SR181	Ujantia A. S. Alim Madrasah	390152.6	2407886	14.38	7.7	16.2	2.71	1.12	2.64	89.3	64.6	83.8	16.6	8.73	16.55
SR182	Khan Bahadur Para Govt Primary School	387878.6	2407521	17.04	10.9	16.0	4.23	1.6	3.57	131.1	54.4	131.1	21.1	6.6	21.11
SR183	Khan Bahadur Ebtedaye Madrasa	387865.6	2407408	17.54	8.1	14.4	4.20	1.05	2.71	90.4	68.9	90.4	17.6	9.54	17.57
SR184	West Uj.Gov.primary School	386812.1	2407243	19.00	12.6	17.0	3.90	1.75	4.23	110.5	61.4	110.5	18.5	4.82	18.53
SR185	East ujantia High School	386769.9	2407243	18.96	12.1	17.5	3.94	1.79	4.20	114.1	60.6	114.1	18.8	4.98	18.85
SR186	Dhemushia Foez Ahmed Government Primary School	392661	2406958	16.88	16.1	19.0	2.31	1.41	3.90	93.7	87.6	84.2	16.8	6.25	16.83
SR187	Dhemushia Jinnat Ali Chowdhury High School	393471.9	2407029	15.79	16.2	18.7	2.10	1.35	3.94	93.1	88.2	83.6	17.0	6.31	17.04
SR188	Matamuhuri Ideal School	396791.9	2407919	12.05	9.1	16.9	1.63	1.12	2.16	92.1	53.6	92.1	18.2	6.63	18.24
SR189	Betua Government Primary School	398095.2	2407960	11.11	9.1	15.8	1.48	1.08	1.99	100.2	41.4	100.2	16.4	5.57	16.35
SR190	Mubinpara Asus Government Primary School	399513.2	2407641	9.65	8.0	12.0	1.23	0.84	1.63	76.6	43.9	63.8	11.2	3.49	11.20
SR191	Bheola Manik Char High School	400563.9	2409158	9.28	8.0	11.1	1.34	0.8	1.48	70.7	49.7	70.7	12.4	2.98	12.40
SR192	kazir para primary school	403322.9	2407900	8.29	7.0	9.7	1.04	0.75	1.23	68.2	52.7	65.0	12.7	3.14	12.75
SR193	Kazirpara Government Primary School	403329.1	2407844	8.37	6.7	9.3	1.04	0.64	1.34	66.4	45.5	66.4	11.2	2.62	11.24
SR194	Islamia Amdadul Ulom Mohiussunnah Madrasha	404215.2	2407405	8.55	5.3	7.3	1.01	0.6	0.93	46.7	40.2	45.8	10.0	3.12	10.05
SR195	Chakaria Government High School	404222.2	2407149	8.59	5.2	7.2	1.00	0.6	0.92	45.7	40.2	45.6	10.0	3.16	10.03
SR196	Al Hera Cadet Academy	404882.2	2408057	7.82	3.9	6.8	0.98	0.54	0.78	53.0	38.4	53.0	9.2	3.53	9.19
SR197	Haji Nurul Kabir School & College	404797.2	2408366	7.38	3.5	7.1	0.96	0.53	0.75	54.8	40.9	54.8	9.0	3.71	8.95
SR198	Lokksharchor High School	404507.2	2408460	7.37	4.8	6.7	0.95	0.56	0.85	47.1	37.7	47.1	9.2	3.22	9.22
SR199	Ottar Lakkarchar Government Primary School	405026.1	2408238	7.56	5.4	7.1	0.96	0.57	0.90	43.8	37.7	43.8	9.4	3.03	9.41
SR200	Childs Modern School and College	405397.7	2407954	7.84	5.7	7.4	0.96	0.58	0.94	45.2	38.3	43.9	9.6	2.93	9.58
SR201	Madrashatul Abrar, Koiyar Beel, Islam Nagar	404538.9	2410576	7.26	5.1	6.8	1.10	0.56	0.87	45.8	37.5	45.8	9.2	3.13	9.23
SR202	Madrasha Hazrat Usman (Rh.) Hifzkhana and Etimkhana	404771.5	2410351	7.47	4.4	6.3	1.10	0.54	0.80	49.7	36.5	49.7	8.8	3.32	8.83
SR203	Shaharbil Union Sub Centre	401509.5	2405847	8.26	5.1	7.3	0.97	0.51	1.10	56.0	40.8	56.0	9.9	2.27	9.87
SR204	As Chafa Adarsha Siksha Niketon	401604	2405799	8.09	5.6	7.5	0.97	0.51	1.10	53.1	41.0	52.7	9.8	2.29	9.84
SR205	Saharbeel BMS High School	401610.5	2406571	9.50	5.9	8.1	1.09	0.56	0.89	61.2	48.5	61.2	9.7	4.4	9.67

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SR206	Purba Bara Bheola G.N.A. Missionary High School	402212.2	2407666	8.83	5.9	8.0	1.10	0.56	0.90	60.7	49.2	60.7	9.5	4.44	9.53
SR207	Jungle Kata Govt. Primary School	396621.3	2409393	9.18	4.7	8.4	1.80	0.57	0.82	57.1	43.8	57.1	10.4	3.82	10.44
SR208	Ilisia Jamila Begum High School	394620.6	2405859	13.26	5.4	7.6	1.70	0.63	0.97	53.4	43.7	48.3	10.6	3.1	10.59
SR209	Paschim Boroveola Government Primary School and Cyclone Shelter, Chakaria, Cox's Bazar	393577.9	2405538	13.68	8.1	9.2	1.73	0.57	1.80	79.8	33.7	79.8	13.2	4.21	13.16
SR210	Baitus Sarf Shah Jabbaria Pre-cadet Madrasha	391341.3	2403641	14.86	7.6	13.3	1.70	0.89	1.32	77.5	62.1	77.5	15.4	4.17	15.42
SR211	Azizia Islamia Sultanul ulum Madrasha and Shah Jamira Etimkhana	391982.2	2403151	14.38	9.0	13.7	1.59	0.99	1.39	80.7	59.1	71.1	14.9	4.37	14.90
SR212	Little Jewels Somobaye School	391701	2401993	13.97	10.1	14.9	1.69	1.59	1.70	99.9	69.3	99.9	19.4	5.5	19.39
SR213	Badarkhali Degree College	391928.1	2401884	13.55	10.2	14.4	1.67	1.24	1.46	84.2	75.5	84.2	19.3	6.15	19.25
SR214	Badarkhali Government Primary School	391786.6	2402173	14.47	10.6	14.0	1.62	1.69	1.32	129.3	73.0	129.3	18.8	9.29	17.01
SR215	Matarbari High School	385942.3	2403612	19.01	10.4	13.6	3.39	1.67	1.31	128.6	67.9	128.6	18.3	9.57	16.46
SR216	Matarbari KG. & Pre Cadet School	386051.9	2403598	19.06	9.8	14.5	3.33	1.62	1.36	124.2	75.6	124.2	18.7	8.7	17.02
SR217	Matarbari Health & Welfare Centre	386248.8	2403720	18.63	12.2	16.8	2.83	1.86	1.89	137.4	108.3	123.3	24.3	6.61	24.32
SR218	Azizia Kasimul Ullum Madrasha	386042.4	2403758	19.44	12.1	16.6	3.28	1.88	1.82	138.8	102.3	125.9	24.1	6.25	24.07
SR219	Matarbari Digital Hospital and Diabetes Center	385935.1	2403519	18.56	12.4	16.9	3.37	2.01	1.91	134.4	91.8	125.3	25.7	6.17	25.67
SR220	Mojidia Alim Madrasha	385482.8	2403433	19.36	12.3	17.4	2.83	1.87	1.85	137.1	105.1	123.5	23.7	6.38	23.68
SR221	Sairadel Primary School	383895	2402272	18.74	12.3	16.4	1.58	1.85	1.86	139.1	108.0	125.0	24.8	6.6	24.75
SR222	Srijoni Kindergarten and Junior High School	384691.6	2402494	17.42	17.4	19.4	1.97	1.6	1.77	123.8	123.8	123.1	22.6	7.37	22.06
SR223	Adarsha Public High School	385154.1	2402961	20.53	18.7	15.6	2.38	1.58	1.08	173.2	69.6	173.2	15.6	9.48	14.72
SR224	Rajghat Government Primary School	386617	2403234	20.14	16.7	14.4	2.68	1.97	1.15	167.3	98.6	167.3	20.8	8.72	13.35
SR225	Nidantarani Government Primary School	391256	2404575	13.58	20.5	18.9	1.95	1.88	1.32	140.7	125.2	140.7	24.5	8.13	21.14
SR226	Badarshah Academy	393368.5	2402196	12.48	13.7	20.1	1.37	2.09	1.97	143.9	86.9	143.9	28.0	10.9	28.03
SR227	Al-Azhar High School	401429.9	2402697	7.89	10.4	10.1	1.00	1.95	1.92	105.9	49.5	102.2	17.5	6.23	17.51
SR228	Bottali Government Primary School	401612.2	2403523	7.94	9.8	12.5	0.99	1.11	1.29	111.4	61.5	111.4	15.8	8.64	14.98
SR229	Jamia Fatima (Rh.) An Necchaiya	400925.7	2405557	8.01	7.4	6.6	0.99	1	0.81	56.4	33.4	55.3	8.7	5.35	7.70
SR230	Darul Hikmah Academy	400811.7	2405881	8.70	6.3	6.6	1.01	0.95	0.99	62.1	41.7	62.1	9.0	5.5	9.01
SR231	Matamuhuri Dakhil Madrasha	400306.2	2405507	8.22	6.4	7.9	1.02	0.63	0.98	62.1	50.4	62.1	9.8	4.57	9.80
SR232	R. K. Nurul Amin Chowdhury High School	400433.7	2405444	8.18	6.0	8.5	1.03	0.57	0.91	62.9	46.5	62.9	10.4	4.31	10.40
SR233	Kahariaghona Government Primary School	403490.8	2405518	7.23	6.6	8.1	0.89	0.66	1.02	64.3	49.8	64.3	10.4	4.58	10.36
SR234	Chakaria City College	403687.5	2405332	7.15	6.6	7.9	0.91	0.67	1.03	63.6	50.8	63.6	10.1	4.63	10.12
SR235	Palakata Government Primary School	403862.2	2404210	5.92	5.7	6.7	0.98	0.56	0.89	55.8	49.1	55.8	8.8	4.41	8.80

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SR236	Uttar Binamara Mohammadia Hifzkhana and Etimkhana	404478	2405741	6.89	5.8	6.3	0.84	0.58	0.91	56.5	48.0	56.5	8.8	4.51	8.80
SR237	ICDDR,B Chakaria Campus	403755.9	2405972	7.50	5.2	5.4	0.88	0.73	0.98	56.8	39.3	56.8	8.4	4.97	8.37
SR238	Chakaria Central High School	403634	2405276	7.15	5.3	6.6	0.92	0.51	0.82	53.8	47.2	53.8	8.4	4.24	8.44
SR239	Chakaria Imam Hussain (Rh.) Sunnia Dakhil Madrasha	403589.9	2405235	7.14	5.3	7.2	0.93	0.49	0.80	52.5	48.3	52.5	8.5	4.24	8.50
SR240	Chiringa Barmis Government Primary School	403487.7	2404920	6.92	5.8	6.2	0.97	0.59	0.92	56.8	47.9	56.8	8.8	4.55	8.83
SR241	Madrasha al-balagul mobin	405613.4	2404831	6.28	5.8	6.1	0.89	0.6	0.93	57.1	47.9	57.1	8.8	4.58	8.85
SR242	sairar dale govt. primary school	383858.5	2401467	18.34	5.8	5.8	1.55	0.64	0.97	58.2	46.2	58.2	8.9	4.78	8.90
SR243	Hasan Bashir Nurani Madrasha, Uttar Nolabila	389174.2	2401586	14.54	5.3	5.4	2.52	0.58	0.89	53.4	37.2	53.4	7.9	4.6	7.92
SR244	Unus Khali Primary School	389000.1	2400264	17.29	15.1	11.4	1.86	1.55	0.85	207.8	92.6	207.8	17.9	11.8	17.90
SR245	Sutriar Dale Government Primary School, Dhalghata	382289.4	2396613	10.33	12.0	10.2	1.16	1.76	1.98	157.5	82.8	157.5	24.2	9.63	24.18
SR246	Sapmarar Dale Government Primary School and Public Shelter	383973.6	2396067	12.52	11.3	17.3	1.53	1.28	1.54	135.2	97.3	135.2	20.0	12.3	19.53
SR247	Amdadia Madrasha, Dhalghata	382287	2397227	11.13	10.0	4.7	1.20	1.16	0.38	140.3	135.8	103.8	13.1	13.08	7.34
SR248	Dhalghata Ideal High School	382573.3	2398052	12.34	10.2	8.5	1.24	0.92	0.61	141.1	141.2	136.7	19.7	10.53	9.87
SR249	Soraitola Govt. Primary School cum Cyclone Centre	382371.9	2397588	11.64	8.9	5.3	1.22	1.2	0.41	166.9	127.6	124.6	13.8	13.82	8.47
SR250	Mohrigohna Alim madrasa	383395.3	2399232	14.15	9.1	6.0	1.30	1.24	0.46	160.3	121.8	153.7	12.9	12.73	10.38
SR251	Matarbari Coal Power Plant	384097.8	2400372	16.61	8.7	5.6	1.54	1.22	0.43	171.9	118.8	137.1	13.7	13.68	9.23
SR252	Mohurighona CC	383288.5	2398769	13.16	11.3	6.7	1.26	1.27	0.54	206.5	105.5	206.5	16.5	10.32	11.52
SR253	Ummuhani Girls Madrasha	383741.4	2400995	18.00	13.9	9.1	1.50	1.4	0.65	268.8	126.3	195.9	20.6	10.34	14.09
SR254	Matarbari Ideal Girls High School	384508.7	2403058	20.26	11.2	6.1	1.71	1.22	0.50	188.7	118.8	188.7	16.1	11.92	13.50
SR255	Matarbari Govt. Primary School	385968	2403678	19.28	13.5	10.0	3.38	1.5	0.76	227.1	105.1	227.1	18.2	13.07	12.55
SR256	Shaitmara Government Primary School	390936.1	2399266	13.91	19.2	20.3	1.91	1.65	1.44	157.4	83.9	138.1	18.2	7.73	11.35
SR257	Shaitmara Residential Model High School	391098.1	2399014	13.77	12.1	17.1	1.85	1.87	1.90	137.1	108.0	123.1	24.1	6.58	24.09
SR258	Jhapua Madrasah	388500.4	2398728	12.97	9.0	8.8	1.46	1.59	1.39	131.8	86.9	131.8	16.1	15.53	16.07
SR259	JM Ghat Adarsha High School	391988.6	2396982	12.02	8.8	8.7	1.47	1.57	1.34	128.6	83.3	128.6	15.2	15.25	15.16
SR260	Kalarmarchara High School	388359.2	2396003	9.71	10.1	13.0	1.41	1.45	1.14	150.5	97.3	150.5	20.0	12.97	15.42
SR261	Kalarmarchara Adarsha Dakhil Madrasah	388461.9	2395004	9.43	8.8	9.4	1.35	1.2	1.06	135.2	74.0	71.4	14.7	11.41	10.90
SR262	Nonachari Fakiraghuna Tajbidul Quran Hifzkhana and Etimkhana	388446.7	2395525	9.49	5.4	9.5	1.37	0.76	0.77	161.9	92.0	161.9	19.0	13.78	16.33
SR263	Mijjir para government primary school	388062.3	2395904	10.32	5.1	8.5	1.48	0.64	0.69	128.6	87.4	128.6	14.2	11.35	13.27
SR264	Kalarmarchara Govt Primary School	388297	2396258	9.87	5.2	9.0	1.43	0.71	0.73	148.9	90.9	148.9	16.7	13.02	14.96
SR265	Noyapara Government Primary School	388591.2	2396905	10.22	5.7	9.3	1.29	0.64	0.74	157.4	98.4	157.4	17.3	12.99	15.82

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SR266	JM Ghat Government primary School	391882.9	2397017	12.04	5.5	9.8	1.49	0.78	0.79	166.0	94.1	166.0	20.0	13.88	16.95
SR267	Mithakata Government Primary School	392803.5	2394978	10.09	6.4	10.2	1.33	1.04	0.86	128.1	98.2	128.1	19.4	14.95	15.84
SR268	Ghunarpara Government Primary School	393051.7	2394087	9.59	8.6	9.7	1.23	1.17	1.06	136.5	74.3	71.9	14.8	11.49	10.95
SR269	Shaplapur Islamia Alim Madrasha	393633	2393993	9.54	7.3	9.1	1.25	0.92	0.84	94.9	86.4	61.6	11.0	11.05	10.47
SR270	Shaplapur FWC	393898.4	2393722	9.35	6.9	9.0	1.23	0.86	0.76	80.7	80.7	64.5	11.8	9.79	10.56
SR271	ASA Shaplapur Health Center	394094.1	2393632	9.20	6.8	8.2	1.21	0.86	0.78	83.4	83.4	62.8	10.6	9.12	10.55
SR272	Shaplapur High School	394106.6	2393746	9.15	6.9	7.9	1.22	0.84	0.77	81.1	81.1	62.5	10.5	8.66	10.43
SR273	Shapalapur Islamia Alim Madrasa	394124.9	2393750	9.13	7.1	7.6	1.21	0.84	0.77	80.7	80.7	62.4	10.4	8.64	10.38
SR274	Shaplapur Government Primary School	394133.5	2393780	9.11	7.3	7.5	1.21	0.87	0.78	81.9	81.9	62.6	10.4	8.98	10.40
SR275	Bariapara Model Academy	394543.8	2390217	7.65	7.3	7.5	0.88	0.87	0.78	82.0	82.0	62.6	10.4	9.01	10.40
SR276	Kaidabad Government Primary School	394571.6	2390012	7.45	7.4	7.4	0.87	0.88	0.79	82.2	82.2	62.5	10.4	9.1	10.39
SR277	Alhaj Abdul Gani Mastar Nurani Madrasa and School	394803.7	2389124	7.04	6.1	7.4	0.84	0.83	0.63	72.7	56.7	72.7	11.8	9.12	8.13
SR278	Dineshpur Government Primary School	394531.3	2388627	7.12	6.1	7.3	0.87	0.84	0.63	72.7	54.7	72.7	11.5	9.18	8.01
SR279	Moheskhali Upazila Health Complex	389174.2	2387098	6.21	6.0	6.9	0.90	0.84	0.60	70.4	59.7	70.4	10.4	9.03	7.43
SR280	Panirchara govt. primary school	388747.2	2385446	5.90	6.1	6.6	0.79	0.87	0.58	69.0	61.5	69.0	9.3	8.72	8.25
SR281	Panirchara Ideal High School	388630.1	2385394	5.85	3.5	5.0	0.80	0.32	0.41	70.7	57.1	60.9	8.2	7.42	5.08
SR282	Al Akaba Kindergarten School, Maheshkhali	388813.8	2385472	5.92	3.2	5.0	0.80	0.3	0.38	60.9	41.7	51.5	8.7	5.4	4.24
SR283	Panichara Bottala Hafez Khana	388826.3	2385943	6.04	3.1	5.1	0.82	0.3	0.38	61.9	39.4	50.6	8.9	5.19	4.19
SR284	Dalghat Para Primary School	388537.7	2386898	6.23	3.2	5.0	0.85	0.3	0.38	60.2	42.8	52.0	8.6	5.52	4.28
SR285	Mohrakata Community Clinic	388583.7	2386918	6.25	3.3	5.1	0.85	0.31	0.39	60.0	45.9	54.3	8.7	5.91	4.48
SR286	Adhunagar Islamia kamil Madrasah	389778.1	2388622	7.43	3.4	5.4	0.96	0.32	0.41	62.3	47.7	57.2	9.2	6.25	4.73
SR287	Keruntoli Government Primary School and Cyclone Shelter, Maheshkhali, Cox's Bazar	388813.3	2389090	6.85	3.4	5.4	0.99	0.32	0.41	63.5	48.7	57.6	9.1	6.36	4.76
SR288	Hoanak Government Primary School	388627.1	2390166	7.24	3.6	5.3	1.05	0.35	0.44	68.6	62.7	68.6	9.6	9.63	5.59
SR289	Time Bazar Government Primary School	388687.1	2391813	8.19	3.8	5.5	1.16	0.36	0.45	74.7	65.1	71.1	9.0	8.93	5.91
SR290	Chonkhola Primary School	388535.5	2393029	8.77	4.0	5.9	1.24	0.38	0.49	79.9	67.6	79.9	10.1	10.08	6.50
SR291	Daillaghona Govt. Primary School	388715.3	2393878	9.15	4.4	6.3	1.26	0.43	0.54	91.1	71.6	91.1	11.6	11.62	7.27
SR292	Chiknipara CC/CNC	388539.3	2397823	10.9	4.7	6.9	1.31	0.47	0.58	97.8	74.6	91.5	11.7	11.39	7.91
SR293	Napitkhali Secondary School	403146.5	2387574	5.75	4.8	7.6	0.85	0.57	0.62	92.5	79.6	91.9	13.6	9.69	10.36
SR294	Islampur Islamia Dakhil Madrasah	401793.9	2386862	5.68	8.2	10.8	0.77	1.23	0.94	122.0	90.2	91.6	16.5	13.28	12.96
SR295	Dharmerchara Government Primary School	401780.4	2386958	5.68	4.6	5.1	0.78	0.74	0.64	50.4	48.8	46.4	6.8	4.87	6.76
SR296	Gomatali High School	397144.8	2386036	6.35	5.7	5.2	0.72	0.77	0.73	48.2	42.7	46.3	7.2	6.43	5.98
SR297	Uttar Gomatali Mohajer Registrar Primary School	397612.9	2387347	7.0	5.7	5.3	0.85	0.78	0.74	48.5	42.2	47.0	7.1	6.36	6.06

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SR298	Al Jamiah Al Emdadiah Azizul Uloom (Pokkhali Madrasah) Pokkhali	398281.8	2385604	6.5	5.1	5.9	0.75	0.66	0.51	57.0	53.2	57.0	8.0	7.49	6.99
SR299	Paschim Gomatali Hossainia Madrasha	397187.8	2385636	6.1	4.9	5.8	0.71	0.59	0.53	55.9	47.2	55.9	9.5	7.45	6.43
SR300	Purba Notun Ghona Government primary School	393597.6	2403904	11.3	4.4	5.6	1.62	0.56	0.49	53.8	48.2	53.8	8.3	7.22	5.86
SR301	Habibia Government Primary School	392937.8	2401173	11.4	5.2	5.8	1.59	0.67	0.50	56.0	52.9	56.0	7.6	7.3	7.18
SR302	Vach School and College	392386.8	2400701	11.9	9.4	8.4	1.59	1.62	1.41	77.0	70.6	77.0	17.1	5.48	17.13
SR303	Al Azhar Kindergarten	392016.7	2399539	10.5	10.0	11.4	2.10	1.59	1.20	96.2	52.5	96.1	15.1	8.8	11.68
SR304	Al Azhar High School	392009	2399423	10.9	11.9	9.4	2.10	1.51	1.32	109.4	67.3	109.4	15.2	8.32	11.07
SR305	Azamnagor Government Primary School	393145.6	2399222	10.5	10.3	5.9	1.84	1.7	1.34	111.6	75.9	111.6	14.3	12.98	14.26
SR306	Madinatul Ulum Madrasha	401688	2402913	8.04	10.3	6.0	0.99	1.68	1.34	113.1	78.5	113.1	14.2	13.38	14.24
SR307	Dulahazara Degree College	404453	2396130	6.34	10.5	7.5	0.72	1.53	1.17	102.5	75.1	102.5	12.7	12.41	12.67
SR308	Bangabandhu Sheikh Mujib Safari Park	404883	2396382	6.01	7.0	6.5	0.72	0.99	0.85	56.6	35.5	56.6	8.5	5.36	7.94
SR309	Dulahazara Health & Family Welfare Center	404367.1	2396360	6.27	4.2	5.3	0.71	0.72	0.67	50.8	44.9	50.8	6.5	6.45	6.49
SR310	Darul Forkan Umme Hani (Rh.) Madrasha	404138.1	2396561	6.27	4.3	5.3	0.72	0.67	0.72	50.6	41.3	50.6	6.6	6.56	6.25
SR311	Charandwip dulkhalipara Government primary school Chakaria, Cox's Bazar	401677.4	2400965	8.09	4.2	5.4	0.96	0.71	0.70	51.3	43.2	51.3	6.6	6.62	6.43
SR312	Charandwip Bhumihin Coastal High School	402602.4	2400613	7.78	4.4	5.5	0.91	0.71	0.72	52.1	42.7	52.1	6.8	6.76	6.40
SR313	Palakata High School	403194.2	2403809	6.74	8.1	6.2	0.99	0.74	0.96	62.3	42.8	62.3	7.7	4.54	7.12
SR314	Balagul Mobin Madrasha	405639.2	2404478	5.85	7.8	5.7	0.91	0.69	0.91	57.3	43.5	57.3	7.4	4.77	7.42
SR315	Mohila Etimkhana and Hafezia Madrasha	405070.1	2404398	5.84	5.5	5.9	0.94	0.83	0.99	57.2	39.2	57.2	8.3	5.11	8.32
SR316	Rashid Ahmed Chowdhury High School	405142.7	2403885	5.77	5.2	5.3	0.93	0.61	0.91	52.2	36.8	52.2	7.7	4.63	7.66
SR317	Fasiakhali Nurani Kindergarten	405371.4	2403909	5.64	5.2	5.4	0.92	0.65	0.94	53.7	37.7	53.7	7.9	4.74	7.88
SR318	Fashiakhali Government Primary School	405193	2403929	5.67	4.8	5.3	0.93	0.73	0.93	50.8	34.9	50.8	7.3	4.7	7.30
SR319	Palakata Dakhil Madrasha	403626.6	2403740	6.66	4.7	5.2	0.97	0.71	0.92	50.2	34.5	50.2	7.2	4.65	7.20
SR320	Bashkata Nurani Ta'leemul Quran Madrasha	402685.1	2388477	5.87	4.7	5.2	0.90	0.72	0.93	50.9	35.1	50.9	7.3	4.69	7.32
SR321	Jumnagar Non-government Primary School	403310.3	2388525	5.60	5.4	6.0	0.90	0.82	0.97	55.3	37.8	55.3	8.0	5.02	7.99
SR322	South Fulchari Government Primary School	401728.3	2389331	6.20	5.2	4.7	0.94	0.75	0.63	51.7	51.7	42.0	7.0	5.59	6.95
SR323	Noyapada Govt Primary School	402834.4	2389776	6.16	5.6	3.9	0.94	0.79	0.57	50.3	50.3	40.8	6.6	5.81	6.64
SR324	Kutakhali grammer school	403976.8	2390613	6.03	5.4	5.0	0.85	0.78	0.66	54.0	54.0	42.9	7.2	6.08	7.16
SR325	Diganta Kids Care School	403055.1	2390527	6.07	6.2	3.5	0.92	0.86	0.55	52.8	47.9	40.9	6.6	6.6	6.00
SR326	Khutakhali High School.	403641.9	2390979	6.17	5.4	4.1	0.85	0.79	0.60	56.7	40.9	32.8	6.5	6.47	6.37
SR327	Kutubdia Para Community Clinic	402697.4	2391839	6.51	6.1	3.6	0.89	0.86	0.55	57.7	43.5	34.3	6.8	6.76	6.06
SR328	Paglirbill Govt. Primary School	404796	2394516	5.73	5.4	4.3	0.77	0.79	0.62	57.8	40.6	34.1	6.6	6.51	6.57
SR329	Baitun-nur Madrasha	404248.3	2394211	5.87	5.9	4.6	0.78	0.82	0.66	60.4	39.8	37.5	6.9	6.61	6.93
SR330	Malumghat Model Public School	404083	2397316	6.6	5.2	5.1	0.81	0.77	0.69	50.0	50.0	42.8	6.1	4.75	6.06

ID	Sensitive Receptors Name	Coordinates		SO_2 Concentration (µg/m^3)											
		X	Y	Only project -1 hr.			Only project – 24 hr.			Cumulative- 1 hr.			Cumulative- 24 hr.		
				WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM	WY	Wint.	PM
SR331	BNS Sheikh Hasina Submarine Base	387159.5	2410443	13.7	5.3	5.2	2.29	0.78	0.73	49.9	49.9	40.7	5.8	4.3	5.84
SR332	South Mognama Primary School	387916.3	2410199	19.5	4.8	5.6	3.02	0.63	0.81	53.0	48.6	53.0	7.0	6.96	6.09
SR333	Hazi Shafiq Islamia Dhakil Madrasa	404746	2385174	5.21	9.2	12.4	0.74	0.71	2.29	99.4	78.7	70.4	14.3	6.21	12.62
SR334	Darussalam Dakhil Madrasah	403983.2	2386214	5.46	12.5	19.6	0.79	0.85	3.02	75.8	64.3	69.8	13.1	5.67	13.13
SR335	Markaze Amena Nurani Madrasah	403666.1	2385851	5.35	4.5	5.2	0.75	0.7	0.65	44.5	37.8	44.5	5.9	5.31	5.64
SR336	Satjula Kata Government primary School	401600.8	2385196	5.63	4.4	5.3	0.71	0.72	0.66	47.3	42.6	47.0	6.2	5.14	6.16
SR337	Pokkhali Adarsha High School	399581.7	2385201	6.08	5.0	5.3	0.78	0.73	0.69	45.7	38.8	45.7	6.3	5.64	5.81
SR338	Ma Ariful Quran Nurani Madrasa	404173.2	2422599	6.42	5.4	4.7	1.11	0.64	0.53	45.2	45.2	37.5	7.9	6.86	5.27

Appendix H-3: CO Concentration on Sensitive Receptors

ID	Sensitive Receptors Name	Coordinates		CO Concentration (µg/m^3)					
		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR2	Purbo Tabalerchar Government Primary School	381544.9	2408413	15.2	12.00	8.9	3.8	2.17	2.80
SR1	Tabelarchor Government Primary School	380979.1	2408080	15.4	10.38	8.6	2.8	2.18	3.78
SR3	Blooming Bud Grammar School	380971	2409649	13.7	10.13	6.0	3.3	1.79	3.30
SR4	Kabi Jashim Uddin High School	380711.4	2409676	13.3	9.46	7.1	3.2	1.69	3.23
SR5	Bornomala Kinder Garten School	380650.4	2409645	13.1	9.26	7.4	3.2	1.67	3.23
SR6	Ali Akbar Deil Govt Primary School Cum Cyclone Shelter	380714.5	2409735	13.3	9.52	6.8	3.2	1.69	3.21
SR7	Tekpara Government Primary School	380504.8	2410731	11.2	9.50	8.5	2.9	1.64	2.91
SR8	Kutubawlia Government Primary School	380658.5	2411272	11.8	9.68	10.0	3.1	1.64	3.08
SR9	Merit Plus Kindergarten	380845.8	2411710	11.8	9.88	9.2	3.0	1.68	3.00
SR10	Moddha Aliakber Deil Government School	380907.8	2411885	11.4	9.95	8.4	2.8	1.68	2.82
SR11	Boroghop Ershad Govt. Primary School	380797	2412406	10.5	9.56	8.1	2.5	1.61	2.46
SR12	ABC Model Kindergarten School	380985.6	2412705	11.5	9.60	9.3	2.7	1.61	1.93
SR13	Kutubdia Government Girl's High School	381275.7	2412920	10.9	9.64	10.2	3.4	1.62	1.41
SR14	Kutubdia Adarsha High School	381391.4	2412770	10.9	9.84	10.4	3.5	1.65	1.39
SR15	Kutubdia Model Govt Primary School Cum Cyclone Shelters	381451.6	2412789	10.6	9.87	10.5	3.7	1.66	1.35
SR16	Baroghop Islamia Fajil (Degree) Madrassa	381384.7	2413070	10.6	9.54	10.3	3.7	1.61	1.30
SR17	Kutubdia Hospital	381481.1	2413182	10.9	9.42	10.2	3.8	1.59	1.29
SR18	Uttor Baroghop Government Primany School	381581.5	2413677	11.2	8.86	9.4	3.9	1.51	1.65
SR19	Kutubdia Women College	381599.4	2413685	11.2	8.84	9.4	3.9	1.50	1.67
SR20	K S Red Crescent Government Primary School	381645.8	2414905	10.0	7.88	10.0	3.4	1.30	1.94
SR21	Koiyerbill Ideal High School	381560.4	2415982	10.4	7.30	8.8	2.9	1.16	1.81
SR22	North Kaiyerbill Primary School	381156	2416872	9.9	6.73	8.4	2.7	1.07	1.72
SR23	Dakkhin Dhurung Government Primary School	380913.4	2418600	8.9	5.98	7.4	2.2	0.92	1.45
SR24	Paschim Dhurung Government Primary School	381342	2421865	7.6	5.07	5.9	1.4	0.75	1.15
SR25	Uttar Dhurung N Hossain Government Primary School	381679.1	2422501	8.0	5.52	6.0	1.6	0.81	1.14
SR26	Char Dhurung Government Primary School	382556.5	2422736	7.6	5.93	6.8	1.4	0.88	1.39
SR27	Azgaria Government Primary School	383172.2	2423444	6.4	5.35	6.2	1.4	0.83	1.27
SR28	M. Rahman Government Primary School	383723	2422232	7.1	5.19	6.8	1.5	0.84	1.39
SR29	Jumma Para Government Primary School	384851.7	2421999	8.0	3.88	6.9	1.5	0.72	1.34

ID	Sensitive Receptors Name	Coordinates		CO Concentration (µg/m^3)					
		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR30	Foyzanir Para Government Primary School	385587.2	2421424	8.0	3.44	7.4	1.6	0.71	1.51
SR31	Bakkhali Government Primary School	383911.1	2421371	7.4	5.28	7.1	1.6	0.87	1.45
SR32	Bangakata Government Primary School	383222	2421033	7.5	6.26	7.1	1.5	0.95	1.48
SR33	Uttoron Biddaya Niketon	382225.8	2421715	8.7	6.07	6.7	1.7	0.89	1.35
SR34	Uttar Dhurrung Union Health and Family Welfare Centre	382122.8	2421244	8.6	6.05	6.6	1.7	0.89	1.30
SR35	Samadia Government Primary School	381972.6	2421267	8.5	5.90	6.4	1.7	0.87	1.23
SR36	Teliakata Government Primary School	383422.5	2420149	7.8	6.49	7.3	1.6	1.00	1.54
SR37	Jalal Uddin Government Primary School	382935.1	2419574	9.2	6.90	8.0	1.8	1.03	1.60
SR38	Dhurung Ideal High School Stadium	382088.4	2419686	8.8	6.03	6.8	1.7	0.90	1.25
SR39	Friendship Static Clinic	382286.7	2419061	9.2	6.33	7.0	1.8	0.94	1.31
SR40	Rajakhali Government Primary School	383131	2418824	9.3	7.18	8.4	1.8	1.08	1.68
SR41	Jalilia Government Primary School	381937.2	2418617	9.2	5.81	7.6	1.7	0.84	1.41
SR42	Kutubdia Technical & BM College	382246	2417746	9.8	6.17	7.9	1.9	0.90	1.48
SR43	Lemsikhali Piarakata Government Primary School	384292.8	2417751	8.8	6.42	8.7	1.9	1.09	1.76
SR44	Al faruq Madrasha	383978.5	2417444	9.0	7.27	8.7	1.9	1.17	1.76
SR45	Lemshikhaki High School	384104	2417397	8.9	7.07	8.9	1.9	1.16	1.79
SR46	Purbo Lemsikhali Government Primary School	385216.1	2417993	10.1	4.59	9.2	1.8	0.94	1.79
SR47	Dakkhin Dhupipara Government Primary School	384306.2	2419033	8.3	5.69	8.0	1.8	0.99	1.63
SR48	Satar Uddin Government Primary School	385817.1	2420203	8.2	3.43	7.7	2.0	0.78	1.61
SR49	M Rahman Government Primary School	385146.3	2417384	10.4	4.85	9.4	1.8	1.00	1.82
SR50	Union Health and Family Welfare Center	383889	2417039	9.4	7.64	9.0	1.9	1.21	1.85
SR51	Paschim Lemshikhali Darussunnah Hafezia Madrasha	383157.6	2416653	10.6	7.70	8.8	2.1	1.16	1.73
SR52	Koiloyssaghona Government Primary School	382283.2	2416393	10.6	7.05	9.1	2.0	1.04	1.64
SR53	Kayerbill G M Government Primary School	381968.5	2415616	10.6	7.62	9.0	2.7	1.17	1.74
SR54	Dakshin Lemshikhali Govt Primary School	384011.9	2415685	10.3	8.15	10.1	2.1	1.30	2.05
SR55	Ahmadia Faizul Ulum Madrasha	383934.6	2415810	10.3	8.18	10.1	2.1	1.29	2.04
SR56	Khadiartek Government Primary School, Kutubdia, Cox's Bazar	381250.7	2409496	14.0	10.81	6.6	3.4	1.90	3.43
SR57	Ali Akbar Deil High School Cum Cyclone Shelter	381074.1	2410792	12.7	10.48	10.5	3.2	1.79	3.16
SR58	Flight Lieutenant Qaimul Huda Government Primary School	381426.1	2410752	13.3	11.31	10.4	3.2	1.92	3.20
SR59	Amjakhali Govt. Primary School & Cyclone Center	382707	2411722	12.7	11.51	11.1	4.5	1.97	2.17
SR60	Community Clinic	382953.7	2411815	12.0	11.31	11.9	4.1	1.93	2.39

ID	Sensitive Receptors Name	Coordinates		CO Concentration (µg/m^3)					
		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR61	M H Grammar School	381808.7	2411672	12.1	11.38	11.1	3.6	1.91	1.80
SR62	Pilotkata Government Primary School	382962	2412743	13.0	10.33	10.2	3.4	1.65	2.14
SR63	Nor Badshar Forkania Madrasha	382463.6	2413524	11.8	9.31	10.4	3.5	1.50	2.13
SR64	Kutubdia Government Collage	381919	2413241	11.3	9.33	9.8	4.0	1.59	1.86
SR65	Kutubdia Island High School	381552.5	2413286	11.1	9.31	10.0	3.8	1.57	1.41
SR66	Monohor Khali Govt. Primary School	382352.6	2414004	11.6	8.88	9.8	3.3	1.41	2.05
SR67	Alhaz Anower Ali Government Primary School	383459.2	2414324	12.7	8.15	9.8	2.5	1.20	1.81
SR68	Kayerbill Government Primary School	381268.3	2415723	9.6	7.26	9.4	3.3	1.21	1.83
SR69	Alhaz Fakir Muhammad Nurani Madrasha	382933.5	2415971	11.2	7.13	8.7	2.1	1.08	1.61
SR70	Dingabhanga Government Primary School	381528.6	2417351	9.4	6.57	8.3	2.2	0.99	1.47
SR71	Dharul Hikmah al Malekia Dakhil Maddrasah	382235.6	2417671	9.8	6.24	8.1	1.9	0.90	1.50
SR72	Purbo Dhurung Government Primary School	382742.7	2417842	10.0	7.05	7.6	2.0	1.05	1.50
SR73	Holy child island school	383944.2	2417679	8.8	7.20	8.6	1.8	1.15	1.73
SR74	Jamiria Madrasha Hifzkhana and Etimkhana	384782	2418063	9.6	5.00	8.1	1.8	1.00	1.59
SR76	Noapara Government Primary School	387920.7	2424731	6.1	3.95	5.9	2.6	0.75	1.14
SR77	Sekherkhil Ideal Kindergarten	389882.9	2424994	6.0	5.01	5.3	2.8	0.93	1.07
SR78	Shekherkhil Darussalam Adarsha Senior Alim Madrasha	389943.2	2425117	9.2	5.70	6.3	2.3	1.43	1.24
SR79	Sekherkhil Darussalam Adarsha Senior Madrasha	390389.1	2425129	9.2	5.66	6.3	2.3	1.43	1.24
SR80	Master Nazir Ahmed College	392624	2425021	9.5	5.25	6.4	2.2	1.50	1.28
SR81	Master Nazir Ahmed Degree College	392639.4	2424961	6.3	6.26	5.1	1.8	1.53	1.50
SR82	Ambia Khatun Dakhil Madrasha	392764.6	2424923	6.3	6.28	5.1	1.8	1.53	1.50
SR83	Master Nazir Ahmad Government Primary School	392798.4	2424866	6.3	6.32	5.3	1.8	1.52	1.51
SR84	Chunati Wildlife Sanctuary	399820.6	2423655	6.3	6.33	5.3	1.8	1.52	1.51
SR85	2 No. Dhambi Government Primary School	403881	2423153	7.3	6.00	6.5	1.9	1.35	1.87
SR86	Islampur B Alam Govt. Primary School	404511.7	2421891	6.1	5.74	6.1	2.1	1.12	2.08
SR87	Tamiri E Millat Islamia Dakhil Madrasah	404318.4	2422145	6.6	6.62	6.2	2.0	1.13	2.05
SR88	Health Centre	403575	2422159	6.5	6.50	6.4	2.0	1.13	1.97
SR89	Allama Saydul Amin Education Centre	403549.2	2421960	6.6	6.28	6.6	2.0	1.16	2.04
SR90	Aziznagar Girl's School	403398.6	2422280	6.6	6.43	6.6	2.0	1.16	2.02
SR91	Dhambi Government Primary School	403344.9	2422400	6.5	6.10	6.5	2.1	1.16	2.09
SR92	Chanua Government Primary School	388406.1	2423768	6.4	6.03	6.4	2.1	1.16	2.11

ID	Sensitive Receptors Name	Coordinates		CO Concentration (µg/m^3)					
		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR93	Noapara Government Primary School	387588.7	2423702	6.2	5.87	4.7	2.8	1.18	1.09
SR94	Totakkhali Govt. Primary School	389001.7	2422964	6.3	4.87	5.9	2.9	0.93	1.16
SR95	Haji Kala Mia Para Community Primary School Cyclone Shelter	389459	2423586	8.7	6.28	6.4	2.5	1.46	1.29
SR96	Poichari Ijjatia Government Primary School	390954.1	2423175	9.5	6.07	6.6	2.4	1.51	1.31
SR97	Poichari Moksuda Khatun Government Primary School	392169.6	2423100	8.1	7.27	5.9	1.9	1.76	1.51
SR98	Purba Poichari Government Primary School	393412	2423251	6.9	6.92	5.7	1.9	1.67	1.63
SR99	Puichari Quaderia Government Primary School	392231.6	2422376	8.0	7.95	5.6	1.8	1.47	1.84
SR100	Digital Hospital Coxbazar pvt ltd	405353.1	2418832	7.6	7.62	6.0	1.9	1.69	1.66
SR101	Harbang Union High School	402382.9	2416059	6.8	5.50	6.3	2.4	1.05	2.39
SR102	Amtalipara Master Muhammed Abdul Hai Primary School	405307.5	2413766	8.1	7.14	6.5	2.6	1.24	2.61
SR103	Uttar Paschim Baraitali Govt. Primary School	402742.7	2413995	6.0	5.08	5.7	2.3	2.34	2.20
SR104	Chainus Hazrat Fatema Islami Academi Madrasha and Hifzkhana	390138	2422109	8.2	5.80	8.2	2.3	2.09	2.29
SR105	Hazrat Abubakkar Siddik (Rah.) Nurani Madrasha	391588.9	2421950	10.1	6.85	7.1	2.2	1.83	1.54
SR106	Uttar Harbang Government Primary School	402813	2418249	7.3	7.30	5.8	2.1	1.80	1.72
SR107	Toitong Alhera Model Academy	393662.2	2418977	7.3	6.64	7.3	2.7	1.23	2.67
SR108	Sayadul Mursalin Talimul Quran Noorani Madrash hefjkhana & Atimkhanaa	392430.8	2419162	9.9	8.76	9.9	2.7	1.47	2.66
SR109	Jamal Meher Government Primary School	389055	2418184	9.6	9.37	9.6	2.6	1.73	2.61
SR110	Faraz Ali Adarsha Dakhil Madrasha	392087.8	2417267	11.8	7.53	8.3	2.8	2.37	1.97
SR111	Abul hossain Shikder Govt. Primary School	392544.6	2417878	11.9	9.29	11.9	3.0	1.84	3.04
SR112	10 Number West Sonaichhari Government Primary School	393288.5	2417925	11.3	9.10	11.3	2.9	1.71	2.92
SR113	Maulvibazar Farukia Madrasha	393182.4	2417618	10.2	9.11	10.2	2.7	1.54	2.73
SR114	Uttar Barabakia Government Primary School	393107.7	2416804	10.2	9.19	10.2	2.8	1.56	2.75
SR115	Sonaichari Government Primary School	394623.8	2416858	9.3	9.04	9.3	2.7	1.56	2.66
SR116	Baitun-ter Islamia Darul Ulum Madrasha Hifzkhana and Etimkhana	395767.5	2416833	10.1	8.50	9.1	2.7	1.97	2.70
SR117	Harabang Adarsha Academy	403026.5	2416877	8.3	8.32	7.7	3.1	1.92	3.05
SR118	Kala Shikdar Para Nurani Madrasa	401980.4	2415495	7.8	6.58	6.7	2.6	1.17	2.60
SR119	Kacharimura Primary School	395766.1	2414506	8.2	7.47	6.8	2.6	1.32	2.58
SR120	Hosneara Girl High School	395217.3	2415277	10.9	10.22	10.9	3.3	1.97	3.28

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		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR121	Barabakia Model High School	394805.9	2415379	9.3	9.25	8.9	3.5	1.94	3.47
SR122	Pekua Anowarul Ulum Islamia Alim Madrasha	393901.2	2414328	9.2	9.25	8.4	3.4	2.07	3.45
SR123	Pekua Government Model GMC Institute	393526.4	2414315	9.7	9.74	8.8	3.7	2.25	3.75
SR124	MH Government Primary School	391670.1	2414388	9.5	9.49	8.8	3.7	2.35	3.68
SR125	Malumma Government Primary School.	391602.7	2414113	11.0	9.81	11.0	3.1	1.91	3.12
SR126	Uttara Magnama Shah Majidiya Abtedayi Madrasa	389532.8	2414807	11.1	9.64	11.1	3.2	2.04	3.25
SR127	Abbas Mia Primary School	387710.7	2413076	11.4	11.40	9.2	3.0	2.96	2.94
SR128	Mognama Model KG School	388248.5	2412930	14.0	10.57	9.7	4.0	3.74	3.15
SR129	Mognama Adarsha Siksha Niketon	388006.8	2412677	13.0	10.42	9.5	3.8	3.85	3.24
SR130	Mognama High School	388104.9	2412552	13.8	9.96	9.8	4.0	3.98	3.34
SR131	Mognama Model KG School, Muhuripara	388244.4	2412699	13.3	10.27	9.9	4.0	4.01	3.40
SR132	Mognama Majhir Para Shah Rashidia Alim Madrasha	388599.6	2413286	12.8	10.56	9.8	3.9	3.93	3.35
SR133	Purba Mognama Bainnaghona Brac Cyclone Shelter and BRAC Primary School	390117.5	2413406	11.7	10.86	9.6	3.6	3.63	3.10
SR134	M. H. Government Primary School	391146.6	2413536	16.7	10.75	16.7	4.0	2.63	4.05
SR135	Pekua Public High School	391091.4	2413236	11.9	9.97	11.9	3.4	2.10	3.41
SR137	Purba Goalkhali Model KG School	392385.3	2412635	11.9	9.60	11.9	3.6	2.27	3.56
SR138	Moiyadiya Government Primary School	392124.2	2412105	11.1	10.52	11.1	4.0	2.88	4.02
SR139	Pekua Upazila Hospital	393545.9	2413941	10.0	9.85	10.0	4.4	2.65	4.38
SR140	Shilkhali High School	396548.4	2413758	10.8	9.89	10.8	4.6	2.71	4.62
SR141	Shilkhali Government Primary School Playground	397671.6	2413397	9.9	9.91	9.0	3.9	2.34	3.88
SR142	Pathan Matubbar Para Government Primary School	398685.7	2413142	10.7	9.72	10.7	3.8	1.88	3.78
SR143	Baraitali High School Cyclone Shelter	403107.6	2413004	10.4	8.42	9.7	3.5	1.66	3.52
SR144	Union Health and Family Welfare Centre	403190.3	2412992	9.4	8.85	8.5	3.0	1.84	2.99
SR145	Mahmud Nagor Gov't Primary School	403776	2411886	7.1	5.74	6.4	2.5	2.55	2.42
SR146	South Baraitoli primary school	402830	2411623	7.0	5.71	6.4	2.6	2.56	2.43
SR147	Deingakata Government Primary School	401599	2412715	7.3	5.14	7.3	2.9	2.91	2.58
SR148	Pohorchanda Fazil Madrasa	398795.8	2412380	7.5	5.36	7.5	3.0	3.02	2.70
SR149	Mehernama Govt. Primary School	397862.7	2412186	8.2	6.27	7.1	2.6	2.58	2.52
SR150	Haji Obaidul Hakim Government Primary School	397077.8	2412726	10.1	8.00	10.1	2.7	2.41	2.73

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		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR151	Pekua Ideal High School	391292.3	2411723	10.1	8.86	10.1	2.9	2.33	2.89
SR152	Pekua hedayedul Ulum Islamia Dakhil Madrasha Hifzkhana and Etimkhana and Mosque	390761.9	2411702	10.9	9.09	9.6	3.6	1.79	3.57
SR153	Purba Mognama Government Primary School	390404.7	2411571	11.0	9.88	10.5	4.7	3.05	4.75
SR154	Mognama SDF Public School	388197.8	2411594	11.3	10.43	11.3	4.4	3.12	4.37
SR155	Magnama Farid Ahmed Chowdhury Primary School	387547.3	2411517	11.9	10.68	11.9	4.4	3.08	4.39
SR156	Sutachura Government Primary School	391675.3	2410770	13.7	10.56	12.8	4.2	4.16	4.04
SR157	Nandir Para Govt Primary School	393806.9	2410736	13.7	10.67	11.1	4.4	4.43	3.95
SR158	Mehernama high school	395273.5	2411017	12.9	11.02	12.9	5.0	3.06	4.97
SR159	Islamia Norul Ulum Madrasa	395846.9	2411577	13.1	8.68	13.1	4.7	2.40	4.72
SR160	B. M. Char Govt. Primary School	397300.9	2410639	11.3	9.71	9.8	3.8	2.57	3.78
SR161	Abdur Rahman Government Primary School	399419.5	2410902	11.4	9.72	9.3	3.7	2.21	3.74
SR162	Health complex	402004.5	2410289	10.1	8.28	9.0	3.5	3.53	3.44
SR163	Al Amin School & College	404748	2411316	7.6	6.81	7.6	3.5	3.45	3.21
SR164	Faitong Noya Para primary school	405421.8	2411484	7.5	6.45	7.5	3.4	3.40	2.89
SR165	Chakaria Government College	405053.8	2408824	6.3	5.70	6.3	2.9	2.94	2.50
SR166	Ottar Lakkharchar Union Parishad Community Hospital	404949.8	2408677	6.2	5.57	6.2	2.9	2.85	2.42
SR167	Hazipara Forkania Madrasha and Hifzkhana	404275.5	2408660	7.4	6.66	7.4	2.7	2.71	2.17
SR168	Sreemura Government Primary School	403610.8	2409280	7.4	6.89	7.4	2.7	2.69	2.14
SR169	Hamidulla Muhuri Health Centre	403321.9	2409394	7.7	6.96	7.7	2.8	2.81	2.24
SR170	Kaiarbil Islamia Jamiul Ulum Madrasah	403104.2	2409499	8.2	6.55	8.2	3.1	3.09	2.51
SR171	Uttar Veola Government Primary School	401001.4	2408377	8.3	6.54	8.3	3.2	3.16	2.58
SR172	Betuarkul Jahan Government primary School	399759.6	2408667	8.4	6.46	8.4	3.2	3.22	2.63
SR173	Bahadder Kata High School	398428	2409417	9.3	7.51	9.3	3.5	3.47	2.79
SR174	Krisnapur Govt. Primary School	397439.2	2409333	9.9	7.36	9.9	3.9	3.87	3.18
SR175	konakhali Govt. Primary School	394379.4	2409598	8.7	7.56	8.7	4.2	4.17	3.64
SR176	Konakhali Kulsum Nahar Govt. Primary School	394045.8	2408664	8.7	7.60	8.7	4.4	4.38	3.88
SR177	Darul Irfan madrasah	393952.1	2408194	11.6	9.83	11.0	4.1	4.07	4.13
SR178	Al-Mohammadia M.H.C Model Madrasah	393374.9	2407886	10.2	9.70	10.2	5.3	5.28	5.02
SR179	Purbo Ujantia Government Primary School	390575.2	2408725	11.2	9.66	11.2	5.8	5.78	5.25
SR180	Maddhyam Ujantia Veluarpara Government Primary School	388949	2408273	12.4	9.86	12.4	6.2	6.17	5.57

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SR181	Ujantia A. S. Alim Madrasah	390152.6	2407886	16.0	11.74	16.0	6.8	3.69	6.82
SR182	Khan Bahadur Para Govt Primary School	387878.6	2407521	16.0	13.20	16.0	7.4	5.11	7.40
SR183	Khan Bahadur Ebtedaye Madrasa	387865.6	2407408	14.3	12.36	14.3	6.5	4.93	6.49
SR184	West Uj.Gov.primary School	386812.1	2407243	16.9	15.45	16.9	9.3	6.44	9.33
SR185	East ujantia High School	386769.9	2407243	17.4	15.79	17.4	9.4	6.69	9.39
SR186	Dhemushia Foez Ahmed Government Primary School	392661	2406958	18.8	15.93	18.8	10.3	4.41	10.28
SR187	Dhemushia Jinnat Ali Chowdhury High School	393471.9	2407029	18.9	16.10	18.5	10.3	4.46	10.27
SR188	Matamuhuri Ideal School	396791.9	2407919	16.8	13.20	16.8	6.9	6.89	5.76
SR189	Betua Government Primary School	398095.2	2407960	15.7	12.46	15.7	6.3	6.29	5.17
SR190	Mubinpara Asus Government Primary School	399513.2	2407641	12.0	8.86	12.0	4.7	4.73	3.90
SR191	Bheola Manik Char High School	400563.9	2409158	11.1	8.26	11.1	4.2	4.23	3.43
SR192	kazir para primary school	403322.9	2407900	9.6	9.32	9.6	3.6	3.59	2.86
SR193	Kazirpara Government Primary School	403329.1	2407844	9.3	6.70	9.3	3.7	3.73	3.09
SR194	Islamia Amdadul Ulom Mohiussunnah Madrasha	404215.2	2407405	8.3	8.28	7.3	2.7	2.72	2.15
SR195	Chakaria Government High School	404222.2	2407149	8.4	8.37	7.2	2.7	2.70	2.13
SR196	Al Hera Cadet Academy	404882.2	2408057	8.6	8.55	6.8	2.3	2.32	1.82
SR197	Haji Nurul Kabir School & College	404797.2	2408366	8.6	8.59	7.1	2.2	2.19	1.72
SR198	Lokksharchor High School	404507.2	2408460	7.8	7.82	6.7	2.5	2.49	1.96
SR199	Ottar Lakkarchar Government Primary School	405026.1	2408238	7.4	7.38	7.1	2.6	2.62	2.08
SR200	Childs Modern School and College	405397.7	2407954	7.4	7.23	7.4	2.7	2.70	2.15
SR201	Madrashatul Abrar, Koiyar Beel, Islam Nagar	404538.9	2410576	7.6	7.56	6.8	2.5	2.53	2.00
SR202	Madrasha Hazrat Usman (Rh.) Hifzkhana and Etimkhana	404771.5	2410351	7.8	7.84	6.3	2.4	2.35	1.86
SR203	Shaharbil Union Sub Centre	401509.5	2405847	7.3	5.71	7.3	3.0	3.02	2.52
SR204	As Chafa Adarsha Siksha Niketon	401604	2405799	7.5	5.55	7.5	3.0	2.99	2.47
SR205	Saharbeel BMS High School	401610.5	2406571	8.2	8.24	8.1	2.1	2.08	1.92
SR206	Purba Bara Bheola G.N.A. Missionary High School	402212.2	2407666	8.1	8.09	8.0	2.1	2.08	1.93
SR207	Jungle Kata Govt. Primary School	396621.3	2409393	9.5	9.48	8.4	2.4	2.34	1.83
SR208	Ilisia Jamila Begum High School	394620.6	2405859	8.8	8.82	7.6	2.9	2.86	2.26
SR209	Paschim Boroveola Government Primary School and Cyclone Shelter, Chakaria, Cox's Bazar	393577.9	2405538	9.1	8.04	9.1	4.5	4.46	4.07
SR210	Baitus Sarf Shah Jabbaria Pre-cadet Madrasha	391341.3	2403641	13.2	11.89	13.2	3.9	3.85	3.02

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SR211	Azizia Islamia Sultanul ulum Madrasha and Shah Jamira Etimkhana	391982.2	2403151	13.5	10.60	13.5	3.7	3.72	3.35
SR212	Little Jewels Somobaye School	391701	2401993	14.8	12.48	14.8	5.0	5.01	4.89
SR213	Badarkhali Degree College	391928.1	2401884	14.4	11.59	14.4	4.8	4.76	4.13
SR214	Badarkhali Government Primary School	391786.6	2402173	13.9	11.56	13.9	4.6	4.57	3.49
SR215	Matarbari High School	385942.3	2403612	13.5	11.28	13.5	4.4	4.45	3.41
SR216	Matarbari KG. & Pre Cadet School	386051.9	2403598	14.4	11.86	14.4	4.7	4.70	3.64
SR217	Matarbari Health & Welfare Centre	386248.8	2403720	18.9	18.87	16.8	10.0	10.00	5.61
SR218	Azizia Kasimul Ullum Madrasha	386042.4	2403758	18.9	18.93	16.6	9.8	9.81	5.41
SR219	Matarbari Digital Hospital and Diabetes Center	385935.1	2403519	18.5	18.19	16.8	8.2	8.15	5.57
SR220	Mojidia Alim Madrasha	385482.8	2403433	19.4	19.45	17.4	9.8	9.82	5.57
SR221	Sairadel Primary School	383895	2402272	18.4	18.45	16.3	9.9	9.95	5.52
SR222	Srijoni Kindergarten and Junior High School	384691.6	2402494	19.4	17.55	19.4	8.5	8.49	5.29
SR223	Adarsha Public High School	385154.1	2402961	18.6	18.64	15.6	4.7	4.73	1.94
SR224	Rajghat Government Primary School	386617	2403234	17.3	16.61	14.4	5.9	5.85	3.40
SR225	Nidantarani Government Primary School	391256	2404575	20.3	20.28	18.7	6.8	6.79	3.92
SR226	Badarshah Academy	393368.5	2402196	20.0	15.05	20.0	8.0	7.98	5.70
SR227	Al-Azhar High School	401429.9	2402697	13.5	13.48	10.1	5.4	4.76	5.37
SR228	Bottali Government Primary School	401612.2	2403523	12.4	10.45	12.4	4.1	4.08	3.28
SR229	Jamia Fatima (Rh.) An Necchaiya	400925.7	2405557	7.9	7.36	6.6	2.3	2.21	2.28
SR230	Darul Hikmah Academy	400811.7	2405881	7.9	6.29	6.6	2.2	2.08	2.17
SR231	Matamuhuri Dakhil Madrasha	400306.2	2405507	8.0	7.97	7.9	2.1	2.14	2.03
SR232	R. K. Nurul Amin Chowdhury High School	400433.7	2405444	8.7	8.68	8.5	2.2	2.16	1.97
SR233	Kahariaghona Government Primary School	403490.8	2405518	8.2	8.16	8.1	2.2	2.21	2.10
SR234	Chakaria City College	403687.5	2405332	8.1	8.13	7.9	2.2	2.19	2.09
SR235	Palakata Government Primary School	403862.2	2404210	7.2	7.23	6.7	1.9	1.89	1.81
SR236	Uttar Binamara Mohammadia Hifzkhana and Etimkhana	404478	2405741	7.2	7.15	6.3	1.9	1.85	1.80
SR237	ICDDR,B Chakaria Campus	403755.9	2405972	5.9	5.78	5.4	1.8	1.72	1.77
SR238	Chakaria Central High School	403634	2405276	6.9	6.89	6.6	1.8	1.82	1.71
SR239	Chakaria Imam Hussain (Rh.) Sunnia Dakhil Madrasha	403589.9	2405235	7.5	7.48	7.2	1.9	1.87	1.72

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SR240	Chiringa Barmis Government Primary School	403487.7	2404920	7.1	7.14	6.2	1.8	1.85	1.81
SR241	Madrasha al-balagul mobin	405613.4	2404831	7.1	7.14	6.1	1.8	1.85	1.81
SR242	sairar dale govt. primary school	383858.5	2401467	6.9	6.91	5.8	1.8	1.80	1.80
SR243	Hasan Bashir Nurani Madrasha, Uttar Nolabila	389174.2	2401586	6.3	6.28	5.4	1.6	1.62	1.64
SR244	Unus Khali Primary School	389000.1	2400264	18.3	15.08	11.4	4.6	4.49	1.98
SR245	Sutriar Dale Government Primary School, Dhalghata	382289.4	2396613	14.6	14.56	10.2	7.4	7.36	5.95
SR246	Sapmarar Dale Government Primary School and Public Shelter	383973.6	2396067	17.3	13.35	17.3	5.6	5.59	4.61
SR247	Amdadia Madrasha, Dhalghata	382287	2397227	10.3	9.97	4.7	3.2	3.22	0.85
SR248	Dhalghata Ideal High School	382573.3	2398052	12.5	12.52	8.5	3.3	3.28	1.82
SR249	Soraitola Govt. Primary School cum Cyclone Centre	382371.9	2397588	11.1	8.94	5.3	3.5	3.46	0.86
SR250	Mohrigohna Alim madrasa	383395.3	2399232	12.3	9.00	6.0	3.6	3.61	0.95
SR251	Matarbari Coal Power Plant	384097.8	2400372	11.6	8.64	5.6	3.5	3.54	0.89
SR252	Mohurighona CC	383288.5	2398769	14.1	11.21	6.7	3.7	3.74	1.26
SR253	Ummuhani Girls Madrasha	383741.4	2400995	16.6	13.87	9.1	4.2	4.19	1.79
SR254	Matarbari Ideal Girls High School	384508.7	2403058	13.2	11.17	6.1	3.6	3.57	1.20
SR255	Matarbari Govt. Primary School	385968	2403678	17.9	13.42	10.0	4.4	4.38	1.79
SR256	Shaitmara Government Primary School	390936.1	2399266	20.2	19.02	20.2	5.1	4.91	3.27
SR257	Shaitmara Residential Model High School	391098.1	2399014	19.2	19.24	17.1	10.1	10.06	5.67
SR258	Jhapua Madrasah	388500.4	2398728	13.9	11.31	8.8	4.9	4.92	4.17
SR259	JM Ghat Adarsha High School	391988.6	2396982	13.7	11.15	8.7	4.7	4.69	4.01
SR260	Kalarmarchara High School	388359.2	2396003	13.0	11.59	13.0	4.4	4.37	3.02
SR261	Kalarmarchara Adarsha Dakhil Madrasah	388461.9	2395004	12.0	10.09	9.4	3.8	3.79	3.18
SR262	Nonachari Fakiraghuna Tajbidul Quran Hifzkhana and Etimkhana	388446.7	2395525	9.7	9.71	9.5	3.4	3.16	2.32
SR263	Mijjir para government primary school	388062.3	2395904	9.4	9.41	8.5	3.2	3.01	2.07
SR264	Kalarmarchara Govt Primary School	388297	2396258	9.5	9.49	9.0	3.3	3.07	2.20
SR265	Noyapara Government Primary School	388591.2	2396905	10.3	10.32	9.3	3.5	3.34	2.22
SR266	JM Ghat Government primary School	391882.9	2397017	9.9	9.87	9.8	3.5	3.23	2.38
SR267	Mithakata Government Primary School	392803.5	2394978	10.2	9.81	10.2	3.4	3.44	2.58
SR268	Ghunarpara Government Primary School	393051.7	2394087	12.0	10.24	9.7	3.8	3.81	3.17
SR269	Shaplapur Islamia Alim Madrasha	393633	2393993	10.1	10.10	9.1	3.2	3.20	2.52

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SR270	Shaplapur FWC	393898.4	2393722	9.6	9.53	9.0	2.9	2.93	2.24
SR271	ASA Shaplapur Health Center	394094.1	2393632	9.5	9.51	8.1	3.0	2.97	2.34
SR272	Shaplapur High School	394106.6	2393746	9.3	9.34	7.9	2.9	2.92	2.31
SR273	Shapalapur Islamia Alim Madrasa	394124.9	2393750	9.2	9.17	7.6	2.9	2.90	2.31
SR274	Shaplapur Government Primary School	394133.5	2393780	9.1	9.13	7.5	2.9	2.92	2.34
SR275	Bariapara Model Academy	394543.8	2390217	9.1	9.11	7.5	2.9	2.92	2.35
SR276	Kaidabad Government Primary School	394571.6	2390012	9.1	9.08	7.4	2.9	2.92	2.35
SR277	Alhaj Abdul Gani Mastar Nurani Madrasa and School	394803.7	2389124	7.6	7.27	7.4	2.0	2.02	1.54
SR278	Dineshpur Government Primary School	394531.3	2388627	7.4	7.23	7.3	2.0	1.96	1.50
SR279	Moheskhali Upazila Health Complex	389174.2	2387098	7.0	7.02	6.9	1.8	1.84	1.38
SR280	Panirchara govt. primary school	388747.2	2385446	7.1	7.12	6.6	1.9	1.91	1.26
SR281	Panirchara Ideal High School	388630.1	2385394	6.2	6.12	5.0	2.5	2.05	1.23
SR282	Al Akaba Kindergarten School, Maheshkhali	388813.8	2385472	5.9	5.90	5.1	2.4	1.91	1.15
SR283	Panichara Bottala Hafez Khana	388826.3	2385943	5.8	5.85	5.1	2.4	1.90	1.15
SR284	Dalghat Para Primary School	388537.7	2386898	5.9	5.92	5.0	2.4	1.91	1.15
SR285	Mohrakata Community Clinic	388583.7	2386918	6.0	6.03	5.1	2.4	1.96	1.17
SR286	Adhunagar Islamia kamil Madrasah	389778.1	2388622	6.2	6.20	5.4	2.5	2.03	1.23
SR287	Keruntoli Government Primary School and Cyclone Shelter, Maheshkhali, Cox's Bazar	388813.3	2389090	6.2	6.23	5.4	2.5	2.04	1.23
SR288	Hoanak Government Primary School	388627.1	2390166	7.4	7.42	5.3	2.3	2.08	1.31
SR289	Time Bazar Government Primary School	388687.1	2391813	6.8	6.66	5.5	2.7	2.26	1.36
SR290	Chonkhola Primary School	388535.5	2393029	7.2	7.07	5.9	2.9	2.39	1.45
SR291	Daillaghona Govt. Primary School	388715.3	2393878	8.2	8.18	6.3	2.9	2.58	1.61
SR292	Chiknipara CC/CNC	388539.3	2397823	8.8	8.77	6.9	3.0	2.76	1.74
SR293	Napitkhali Secondary School	403146.5	2387574	9.1	9.12	7.6	2.9	2.78	1.86
SR294	Islampur Islamia Dakhil Madrasah	401793.9	2386862	10.8	10.76	10.8	3.9	3.94	2.83
SR295	Dharmerchara Government Primary School	401780.4	2386958	5.8	5.63	5.1	2.1	2.07	1.51
SR296	Gomatali High School	397144.8	2386036	5.7	5.68	5.2	1.8	1.80	1.48
SR297	Uttar Gomatali Mohajer Registrar Primary School	397612.9	2387347	5.7	5.67	5.3	1.8	1.82	1.47
SR298	Al Jamiah Al Emdadiah Azizul Uloom (Pokkhali Madrasah) Pokkhali	398281.8	2385604	6.3	6.05	5.9	1.6	1.61	1.23

ID	Sensitive Receptors Name	Coordinates		CO Concentration (µg/m^3)					
		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR299	Paschim Gomatali Hossainia Madrasha	397187.8	2385636	7.0	6.67	5.8	1.9	1.94	1.43
SR300	Purba Notun Ghona Government primary School	393597.6	2403904	6.5	5.93	5.5	1.7	1.72	1.26
SR301	Habibia Government Primary School	392937.8	2401173	6.1	6.04	5.8	1.5	1.54	1.19
SR302	Vach School and College	392386.8	2400701	11.2	10.98	8.3	4.1	3.68	4.11
SR303	Al Azhar Kindergarten	392016.7	2399539	11.3	9.92	11.3	3.8	3.81	2.99
SR304	Al Azhar High School	392009	2399423	11.8	11.79	9.4	3.9	3.91	3.17
SR305	Azamnagor Government Primary School	393145.6	2399222	10.5	10.44	5.9	5.2	5.16	4.01
SR306	Madinatul Ulum Madrasha	401688	2402913	10.8	10.23	6.0	5.1	5.13	3.99
SR307	Dulahazara Degree College	404453	2396130	10.5	10.50	7.5	4.4	4.38	3.46
SR308	Bangabandhu Sheikh Mujib Safari Park	404883	2396382	8.0	7.01	6.5	2.2	2.17	2.23
SR309	Dulahazara Health & Family Welfare Center	404367.1	2396360	6.3	6.33	5.3	1.9	1.87	1.58
SR310	Darul Forkan Umme Hani (Rh.) Madrasha	404138.1	2396561	6.0	6.01	5.3	1.8	1.78	1.62
SR311	Charandwip dulkhalipara Government primary school Chakaria, Cox's Bazar	401677.4	2400965	6.3	6.26	5.4	1.9	1.86	1.62
SR312	Charandwip Bhumihin Coastal High School	402602.4	2400613	6.3	6.25	5.4	1.9	1.86	1.65
SR313	Palakata High School	403194.2	2403809	8.1	8.06	6.2	2.1	1.91	2.10
SR314	Balagul Mobin Madrasha	405639.2	2404478	7.8	7.77	5.7	2.0	1.82	2.01
SR315	Mohila Etimkhana and Hafezia Madrasha	405070.1	2404398	6.7	5.91	5.9	1.9	1.83	1.91
SR316	Rashid Ahmed Chowdhury High School	405142.7	2403885	5.8	5.84	5.3	1.6	1.54	1.59
SR317	Fasiakhali Nurani Kindergarten	405371.4	2403909	5.8	5.83	5.4	1.7	1.58	1.62
SR318	Fashiakhali Government Primary School	405193	2403929	5.8	5.50	5.3	1.7	1.65	1.69
SR319	Palakata Dakhil Madrasha	403626.6	2403740	5.6	5.46	5.2	1.7	1.62	1.67
SR320	Bashkata Nurani Ta'leemul Quran Madrasha	402685.1	2388477	5.7	5.49	5.2	1.7	1.64	1.68
SR321	Jumnagar Non-government Primary School	403310.3	2388525	6.7	5.81	6.0	1.9	1.80	1.88
SR322	South Fulchari Government Primary School	401728.3	2389331	5.9	5.79	4.6	2.2	2.18	1.58
SR323	Noyapada Govt Primary School	402834.4	2389776	5.6	5.60	3.8	2.2	2.16	1.56
SR324	Kutakhali grammer school	403976.8	2390613	6.2	6.03	4.9	2.3	2.27	1.66
SR325	Diganta Kids Care School	403055.1	2390527	6.2	6.16	3.5	2.2	2.24	1.65
SR326	Khutakhali High School.	403641.9	2390979	6.0	6.02	4.1	2.0	1.96	1.57
SR327	Kutubdia Para Community Clinic	402697.4	2391839	6.0	6.05	3.6	2.2	2.16	1.65
SR328	Paglirbill Govt. Primary School	404796	2394516	6.2	6.15	4.3	2.0	1.98	1.59

ID	Sensitive Receptors Name	Coordinates		CO Concentration (µg/m^3)					
		X	Y	Only project contribution -1 hr.			Only project contribution -8 hr.		
				Whole Year	Winter	Pre-mon.	Whole Year	Winter	Pre-mon.
SR329	Baitun-nur Madrasha	404248.3	2394211	6.5	6.51	4.6	2.1	2.07	1.68
SR330	Malumghat Model Public School	404083	2397316	5.7	5.73	5.1	1.8	1.78	1.30
SR331	BNS Sheikh Hasina Submarine Base	387159.5	2410443	5.8	5.28	5.2	1.7	1.70	1.27
SR332	South Mognama Primary School	387916.3	2410199	6.6	6.58	5.7	1.9	1.86	1.73
SR333	Hazi Shafiq Islamia Dhakil Madrasa	404746	2385174	13.6	10.97	12.4	5.0	4.74	4.74
SR334	Darussalam Dakhil Madrasah	403983.2	2386214	19.3	12.38	19.3	5.5	4.37	5.53
SR335	Markaze Amena Nurani Madrasah	403666.1	2385851	5.2	4.97	5.2	1.8	1.82	1.33
SR336	Satjula Kata Government primary School	401600.8	2385196	5.5	5.26	5.3	1.9	1.92	1.40
SR337	Pokkhali Adarsha High School	399581.7	2385201	5.4	4.94	5.2	1.8	1.84	1.38
SR338	Ma Ariful Quran Nurani Madrasa	404173.2	2422599	5.6	5.48	4.7	1.7	1.75	1.43

Appendix H-4: PM_{10} Concentration on Sensitive Receptors

ID	Sensitive Receptors Name	Coordinates		PM_{10} Concentration (µg/m^3)							
		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR2	Purbo Tabalerchar Government Primary School	381544.9	2408413	0.32	0.145	0.29	0.030	0.61	0.311	0.42	0.133
SR1	Tabelarchor Government Primary School	380979.1	2408080	0.26	0.145	0.19	0.025	0.71	0.321	0.42	0.122
SR3	Blooming Bud Grammar School	380971	2409649	0.29	0.119	0.29	0.031	0.58	0.262	0.44	0.123
SR4	Kabi Jashim Uddin High School	380711.4	2409676	0.29	0.113	0.29	0.029	0.55	0.255	0.45	0.118
SR5	Bornomala Kinder Garten School	380650.4	2409645	0.29	0.111	0.29	0.028	0.54	0.255	0.45	0.117
SR6	Ali Akbar Deil Govt Primary School Cum Cyclone Shelter	380714.5	2409735	0.29	0.113	0.29	0.029	0.55	0.254	0.45	0.118
SR7	Tekpara Government Primary School	380504.8	2410731	0.27	0.109	0.27	0.030	0.51	0.226	0.43	0.115
SR8	Kutubawlia Government Primary School	380658.5	2411272	0.25	0.109	0.24	0.032	0.53	0.217	0.36	0.118
SR9	Merit Plus Kindergarten	380845.8	2411710	0.22	0.109	0.22	0.034	0.59	0.211	0.34	0.121
SR10	Moddha Aliakber Deil Government School	380907.8	2411885	0.23	0.108	0.21	0.035	0.60	0.209	0.34	0.121
SR11	Boroghop Ershad Govt. Primary School	380797	2412406	0.23	0.103	0.2	0.034	0.58	0.199	0.33	0.117
SR12	ABC Model Kindergarten School	380985.6	2412705	0.25	0.101	0.18	0.035	0.54	0.197	0.32	0.118
SR13	Kutubdia Government Girl's High School	381275.7	2412920	0.28	0.099	0.17	0.036	0.53	0.196	0.31	0.120
SR14	Kutubdia Adarsha High School	381391.4	2412770	0.28	0.101	0.17	0.037	0.54	0.199	0.31	0.122
SR15	Kutubdia Model Govt Primary School Cum Cyclone Shelters	381451.6	2412789	0.29	0.101	0.17	0.037	0.54	0.199	0.31	0.122
SR16	Baroghop Islamia Fajil (Degree) Madrassa	381384.7	2413070	0.28	0.098	0.17	0.037	0.54	0.194	0.30	0.120
SR17	Kutubdia Hospital	381481.1	2413182	0.28	0.096	0.16	0.037	0.54	0.193	0.30	0.120
SR18	Uttor Baroghop Government Primany School	381581.5	2413677	0.26	0.090	0.15	0.037	0.51	0.185	0.31	0.119
SR19	Kutubdia Women College	381599.4	2413685	0.26	0.090	0.14	0.037	0.51	0.185	0.31	0.119
SR20	K S Red Crescent Government Primary School	381645.8	2414905	0.23	0.077	0.14	0.035	0.51	0.168	0.30	0.112
SR21	Koiyerbill Ideal High School	381560.4	2415982	0.21	0.067	0.13	0.033	0.48	0.154	0.28	0.106
SR22	North Kaiyerbill Primary School	381156	2416872	0.20	0.062	0.12	0.030	0.44	0.145	0.27	0.099
SR23	Dakkhin Dhurung Government Primary School	380913.4	2418600	0.16	0.052	0.11	0.028	0.43	0.129	0.24	0.091
SR24	Paschim Dhurung Government Primary School	381342	2421865	0.14	0.037	0.09	0.024	0.43	0.131	0.29	0.079
SR25	Uttar Dhurung N Hossain Government Primary School	381679.1	2422501	0.16	0.036	0.08	0.024	0.42	0.136	0.32	0.077

ID	Sensitive Receptors Name	Coordinates		PM_{10} Concentration (µg/m^3)							
		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR26	Char Dhurung Government Primary School	382556.5	2422736	0.17	0.036	0.1	0.024	0.48	0.144	0.38	0.080
SR27	Azgaria Government Primary School	383172.2	2423444	0.13	0.040	0.11	0.023	0.53	0.141	0.36	0.080
SR28	M. Rahman Government Primary School	383723	2422232	0.14	0.045	0.12	0.025	0.52	0.147	0.35	0.087
SR29	Jumma Para Government Primary School	384851.7	2421999	0.19	0.047	0.12	0.027	0.54	0.141	0.54	0.096
SR30	Foyzanir Para Government Primary School	385587.2	2421424	0.20	0.046	0.17	0.030	0.69	0.133	0.64	0.104
SR31	Bakkhali Government Primary School	383911.1	2421371	0.16	0.047	0.12	0.026	0.51	0.152	0.37	0.091
SR32	Bangakata Government Primary School	383222	2421033	0.16	0.043	0.12	0.026	0.52	0.156	0.40	0.088
SR33	Uttoron Biddaya Niketon	382225.8	2421715	0.18	0.038	0.1	0.025	0.42	0.147	0.37	0.082
SR34	Uttar Dhurrung Union Health and Family Welfare Centre	382122.8	2421244	0.18	0.039	0.09	0.025	0.44	0.148	0.36	0.083
SR35	Samadia Government Primary School	381972.6	2421267	0.17	0.039	0.09	0.025	0.44	0.146	0.34	0.082
SR36	Teliakata Government Primary School	383422.5	2420149	0.17	0.045	0.12	0.028	0.52	0.162	0.41	0.092
SR37	Jalal Uddin Government Primary School	382935.1	2419574	0.20	0.043	0.12	0.028	0.47	0.165	0.42	0.092
SR38	Dhurung Ideal High School Stadium	382088.4	2419686	0.17	0.043	0.1	0.027	0.47	0.154	0.35	0.088
SR39	Friendship Static Clinic	382286.7	2419061	0.18	0.044	0.1	0.028	0.48	0.161	0.36	0.091
SR40	Rajakhali Government Primary School	383131	2418824	0.20	0.045	0.13	0.030	0.49	0.172	0.44	0.096
SR41	Jalilia Government Primary School	381937.2	2418617	0.14	0.047	0.1	0.029	0.47	0.151	0.32	0.092
SR42	Kutubdia Technical & BM College	382246	2417746	0.16	0.050	0.11	0.030	0.49	0.163	0.35	0.097
SR43	Lemsikhali Piarakata Government Primary School	384292.8	2417751	0.19	0.057	0.15	0.033	0.55	0.178	0.46	0.110
SR44	Al faruq Madrasha	383978.5	2417444	0.18	0.055	0.15	0.033	0.54	0.184	0.45	0.109
SR45	Lemshikhaki High School	384104	2417397	0.17	0.056	0.15	0.033	0.53	0.184	0.44	0.111
SR46	Purbo Lemsikhali Government Primary School	385216.1	2417993	0.23	0.058	0.16	0.035	0.68	0.164	0.66	0.119
SR47	Dakkhin Dhupipara Government Primary School	384306.2	2419033	0.19	0.054	0.14	0.030	0.53	0.167	0.44	0.104
SR48	Satar Uddin Government Primary School	385817.1	2420203	0.22	0.048	0.19	0.033	0.81	0.139	0.68	0.112
SR49	M Rahman Government Primary School	385146.3	2417384	0.24	0.060	0.17	0.036	0.68	0.171	0.66	0.123
SR50	Union Health and Family Welfare Center	383889	2417039	0.20	0.055	0.15	0.034	0.54	0.189	0.47	0.111
SR51	Paschim Lemshikhali Darussunnah Hafezia Madrasha	383157.6	2416653	0.22	0.053	0.13	0.034	0.51	0.192	0.45	0.107
SR52	Koiloyssaghona Government Primary School	382283.2	2416393	0.16	0.059	0.12	0.033	0.50	0.164	0.35	0.104

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		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR53	Kayerbill G M Government Primary School	381968.5	2415616	0.19	0.068	0.13	0.034	0.50	0.159	0.31	0.109
SR54	Dakshin Lemshikhali Govt Primary School	384011.9	2415685	0.22	0.059	0.16	0.038	0.56	0.204	0.50	0.121
SR55	Ahmadia Faizul Ulum Madrasha	383934.6	2415810	0.22	0.057	0.16	0.037	0.55	0.202	0.50	0.119
SR56	Khadiartek Government Primary School, Kutubdia, Cox's Bazar	381250.7	2409496	0.29	0.127	0.29	0.033	0.59	0.274	0.43	0.128
SR57	Ali Akbar Deil High School Cum Cyclone Shelter	381074.1	2410792	0.26	0.119	0.25	0.035	0.55	0.234	0.37	0.126
SR58	Flight Lieutenant Qaimul Huda Government Primary School	381426.1	2410752	0.25	0.124	0.25	0.038	0.60	0.241	0.37	0.132
SR59	Amjakhali Govt. Primary School & Cyclone Center	382707	2411722	0.31	0.115	0.17	0.046	0.60	0.231	0.39	0.144
SR60	Community Clinic	382953.7	2411815	0.27	0.112	0.17	0.048	0.61	0.230	0.42	0.146
SR61	M H Grammar School	381808.7	2411672	0.30	0.116	0.19	0.040	0.57	0.224	0.34	0.133
SR62	Pilotkata Government Primary School	382962	2412743	0.22	0.095	0.16	0.045	0.58	0.206	0.42	0.136
SR63	Nor Badshar Forkania Madrasha	382463.6	2413524	0.23	0.088	0.16	0.041	0.56	0.190	0.36	0.126
SR64	Kutubdia Government Collage	381919	2413241	0.27	0.095	0.15	0.039	0.53	0.194	0.32	0.124
SR65	Kutubdia Island High School	381552.5	2413286	0.28	0.095	0.16	0.037	0.53	0.191	0.30	0.120
SR66	Monohor Khali Govt. Primary School	382352.6	2414004	0.22	0.083	0.15	0.039	0.54	0.182	0.35	0.122
SR67	Alhaz Anower Ali Government Primary School	383459.2	2414324	0.23	0.068	0.13	0.041	0.57	0.219	0.47	0.125
SR68	Kayerbill Government Primary School	381268.3	2415723	0.23	0.071	0.13	0.032	0.50	0.157	0.29	0.106
SR69	Alhaz Fakir Muhammad Nurani Madrasha	382933.5	2415971	0.20	0.058	0.12	0.035	0.53	0.193	0.42	0.110
SR70	Dingabhanga Government Primary School	381528.6	2417351	0.16	0.057	0.11	0.030	0.46	0.140	0.27	0.097
SR71	Dharul Hikmah al Malekia Dakhil Maddrasah	382235.6	2417671	0.15	0.051	0.11	0.031	0.49	0.164	0.35	0.098
SR72	Purbo Dhurung Government Primary School	382742.7	2417842	0.20	0.049	0.11	0.031	0.50	0.177	0.41	0.099
SR73	Holy child island school	383944.2	2417679	0.18	0.054	0.15	0.033	0.53	0.182	0.45	0.108
SR74	Jamiria Madrasha Hifzkhana and Etimkhana	384782	2418063	0.22	0.058	0.14	0.034	0.62	0.171	0.56	0.114
SR76	Noapara Government Primary School	387920.7	2424731	0.25	0.036	0.16	0.029	0.82	0.146	0.51	0.095
SR77	Sekherkhil Ideal Kindergarten	389882.9	2424994	0.21	0.039	0.14	0.028	0.72	0.167	0.43	0.091
SR78	Shekherkhil Darussalam Adarsha Senior Alim Madrasha	389943.2	2425117	0.21	0.047	0.18	0.028	0.72	0.213	0.46	0.090

ID	Sensitive Receptors Name	Coordinates		PM_{10} Concentration (µg/m^3)							
		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR79	Sekherkhil Darussalam Adarsha Senior Madrasha	390389.1	2425129	0.19	0.047	0.18	0.028	0.66	0.213	0.46	0.090
SR80	Master Nazir Ahmed College	392624	2425021	0.19	0.054	0.18	0.028	0.57	0.219	0.50	0.088
SR81	Master Nazir Ahmed Degree College	392639.4	2424961	0.19	0.081	0.16	0.028	0.57	0.216	0.55	0.088
SR82	Ambia Khatun Dakhil Madrasha	392764.6	2424923	0.19	0.081	0.16	0.028	0.57	0.216	0.55	0.088
SR83	Master Nazir Ahmad Government Primary School	392798.4	2424866	0.19	0.082	0.15	0.028	0.57	0.214	0.54	0.088
SR84	Chunati Wildlife Sanctuary	399820.6	2423655	0.21	0.082	0.15	0.026	0.65	0.214	0.53	0.084
SR85	2 No. Dhambi Government Primary School	403881	2423153	0.23	0.103	0.21	0.022	0.65	0.306	0.65	0.075
SR86	Islampur B Alam Govt. Primary School	404511.7	2421891	0.24	0.097	0.23	0.022	0.68	0.313	0.65	0.074
SR87	Tamiri E Millat Islamia Dakhil Madrasah	404318.4	2422145	0.24	0.081	0.24	0.022	0.68	0.285	0.68	0.075
SR88	Health Centre	403575	2422159	0.23	0.085	0.24	0.023	0.68	0.294	0.68	0.076
SR89	Allama Saydul Amin Education Centre	403549.2	2421960	0.23	0.093	0.23	0.023	0.68	0.312	0.68	0.077
SR90	Aziznagar Girl's School	403398.6	2422280	0.23	0.092	0.23	0.023	0.67	0.311	0.68	0.077
SR91	Dhambi Government Primary School	403344.9	2422400	0.24	0.096	0.23	0.023	0.67	0.317	0.67	0.077
SR92	Chanua Government Primary School	388406.1	2423768	0.23	0.098	0.24	0.030	0.78	0.318	0.67	0.097
SR93	Noapara Government Primary School	387588.7	2423702	0.26	0.043	0.13	0.030	0.87	0.194	0.39	0.099
SR94	Totakkhali Govt. Primary School	389001.7	2422964	0.24	0.040	0.15	0.031	0.81	0.169	0.47	0.099
SR95	Haji Kala Mia Para Community Primary School Cyclone Shelter	389459	2423586	0.22	0.047	0.17	0.030	0.77	0.222	0.46	0.096
SR96	Poichari Ijjatia Government Primary School	390954.1	2423175	0.19	0.049	0.18	0.030	0.61	0.225	0.48	0.096
SR97	Poichari Moksuda Khatun Government Primary School	392169.6	2423100	0.21	0.078	0.19	0.030	0.61	0.247	0.61	0.095
SR98	Purba Poichari Government Primary School	393412	2423251	0.19	0.091	0.17	0.030	0.58	0.234	0.55	0.093
SR99	Puichari Quaderia Government Primary School	392231.6	2422376	0.21	0.089	0.19	0.031	0.62	0.204	0.53	0.098
SR100	Digital Hospital Coxbazar pvt ltd	405353.1	2418832	0.17	0.095	0.17	0.021	0.73	0.236	0.54	0.073
SR101	Harbang Union High School	402382.9	2416059	0.19	0.061	0.17	0.024	0.80	0.232	0.73	0.086
SR102	Amtalipara Master Muhammed Abdul Hai Primary School	405307.5	2413766	0.23	0.068	0.19	0.021	0.59	0.258	0.80	0.072
SR103	Uttar Paschim Baraitali Govt. Primary School	402742.7	2413995	0.27	0.059	0.23	0.024	0.65	0.183	0.59	0.083

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SR104	Chainus Hazrat Fatema Islami Academi Madrasha and Hifzkhana	390138	2422109	0.21	0.064	0.27	0.032	0.64	0.226	0.65	0.101
SR105	Hazrat Abubakkar Siddik (Rah.) Nurani Madrasha	391588.9	2421950	0.22	0.074	0.21	0.032	0.64	0.257	0.60	0.100
SR106	Uttar Harbang Government Primary School	402813	2418249	0.23	0.095	0.18	0.024	0.74	0.252	0.57	0.083
SR107	Toitong Alhera Model Academy	393662.2	2418977	0.37	0.075	0.23	0.037	0.97	0.280	0.74	0.112
SR108	Sayadul Mursalin Talimul Quran Noorani Madrash hefjkhana & Atimkhanaa	392430.8	2419162	0.32	0.114	0.37	0.037	0.77	0.276	0.97	0.112
SR109	Jamal Meher Government Primary School	389055	2418184	0.25	0.101	0.32	0.040	0.77	0.262	0.77	0.124
SR110	Faraz Ali Adarsha Dakhil Madrasha	392087.8	2417267	0.40	0.093	0.25	0.042	0.96	0.315	0.67	0.125
SR111	Abul hossain Shikder Govt. Primary School	392544.6	2417878	0.39	0.104	0.4	0.040	0.95	0.292	0.96	0.120
SR112	10 Number West Sonaichhari Government Primary School	393288.5	2417925	0.39	0.105	0.39	0.040	1.03	0.282	0.95	0.119
SR113	Maulvibazar Farukia Madrasha	393182.4	2417618	0.39	0.125	0.39	0.040	1.04	0.305	1.03	0.121
SR114	Uttar Barabakia Government Primary School	393107.7	2416804	0.37	0.128	0.39	0.042	1.09	0.315	1.04	0.126
SR115	Sonaichari Government Primary School	394623.8	2416858	0.31	0.138	0.37	0.039	0.96	0.357	1.09	0.122
SR116	Baitun-ter Islamia Darul Ulum Madrasha Hifzkhana and Etimkhana	395767.5	2416833	0.35	0.156	0.31	0.037	0.86	0.411	0.96	0.117
SR117	Harabang Adarsha Academy	403026.5	2416877	0.19	0.170	0.35	0.024	0.78	0.413	0.86	0.083
SR118	Kala Shikdar Para Nurani Madrasa	401980.4	2415495	0.19	0.067	0.19	0.025	0.81	0.252	0.78	0.088
SR119	Kacharimura Primary School	395766.1	2414506	0.36	0.069	0.19	0.039	0.91	0.262	0.81	0.125
SR120	Hosneara Girl High School	395217.3	2415277	0.40	0.158	0.36	0.040	0.93	0.496	0.91	0.127
SR121	Barabakia Model High School	394805.9	2415379	0.40	0.181	0.4	0.041	0.93	0.473	0.93	0.129
SR122	Pekua Anowarul Ulum Islamia Alim Madrasha	393901.2	2414328	0.43	0.188	0.4	0.045	0.97	0.455	0.93	0.139
SR123	Pekua Government Model GMC Institute	393526.4	2414315	0.42	0.204	0.43	0.046	0.96	0.479	0.97	0.142
SR124	MH Government Primary School	391670.1	2414388	0.43	0.207	0.42	0.051	1.21	0.459	0.96	0.149
SR125	Malumma Government Primary School.	391602.7	2414113	0.41	0.159	0.43	0.052	1.22	0.391	1.21	0.152
SR126	Uttara Magnama Shah Majidiya Abtedayi Madrasa	389532.8	2414807	0.31	0.162	0.41	0.051	0.85	0.404	1.22	0.150
SR127	Abbas Mia Primary School	387710.7	2413076	0.33	0.153	0.31	0.062	1.02	0.371	0.77	0.176

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SR128	Mognama Model KG School	388248.5	2412930	0.37	0.130	0.33	0.062	0.95	0.429	0.89	0.175
SR129	Mognama Adarsha Siksha Niketon	388006.8	2412677	0.37	0.159	0.34	0.064	0.97	0.442	0.95	0.180
SR130	Mognama High School	388104.9	2412552	0.38	0.154	0.35	0.065	0.98	0.450	0.97	0.182
SR131	Mognama Model KG School, Muhuripara	388244.4	2412699	0.38	0.161	0.35	0.064	0.97	0.454	0.98	0.179
SR132	Mognama Majhir Para Shah Rashidia Alim Madrasha	388599.6	2413286	0.36	0.164	0.34	0.059	0.94	0.450	0.96	0.169
SR133	Purba Mognama Bainnaghona Brac Cyclone Shelter and BRAC Primary School	390117.5	2413406	0.53	0.163	0.31	0.058	1.17	0.429	0.91	0.164
SR134	M. H. Government Primary School	391146.6	2413536	0.45	0.137	0.53	0.056	1.25	0.331	1.17	0.159
SR135	Pekua Public High School	391091.4	2413236	0.43	0.167	0.45	0.057	1.26	0.401	1.25	0.162
SR137	Purba Goalkhali Model KG School	392385.3	2412635	0.45	0.170	0.43	0.059	1.25	0.417	1.26	0.171
SR138	Moiyadiya Government Primary School	392124.2	2412105	0.53	0.225	0.45	0.055	1.08	0.475	1.25	0.167
SR139	Pekua Upazila Hospital	393545.9	2413941	0.45	0.237	0.5	0.046	0.99	0.517	1.05	0.144
SR140	Shilkhali High School	396548.4	2413758	0.34	0.244	0.53	0.037	0.93	0.543	1.08	0.121
SR141	Shilkhali Government Primary School Playground	397671.6	2413397	0.26	0.211	0.45	0.033	0.87	0.487	0.99	0.114
SR142	Pathan Matubbar Para Government Primary School	398685.7	2413142	0.26	0.123	0.34	0.031	0.90	0.469	0.93	0.107
SR143	Baraitali High School Cyclone Shelter	403107.6	2413004	0.26	0.098	0.26	0.023	0.62	0.402	0.87	0.081
SR144	Union Health and Family Welfare Centre	403190.3	2412992	0.26	0.084	0.26	0.023	0.62	0.343	0.90	0.081
SR145	Mahmud Nagor Gov't Primary School	403776	2411886	0.22	0.066	0.26	0.022	0.71	0.211	0.62	0.077
SR146	South Baraitoli primary school	402830	2411623	0.24	0.066	0.26	0.023	0.71	0.209	0.62	0.081
SR147	Deingakata Government Primary School	401599	2412715	0.28	0.079	0.22	0.025	0.67	0.188	0.71	0.088
SR148	Pohorchanda Fazil Madrasa	398795.8	2412380	0.32	0.081	0.24	0.031	0.89	0.200	0.71	0.107
SR149	Mehernama Govt. Primary School	397862.7	2412186	0.31	0.072	0.28	0.033	0.93	0.238	0.67	0.113
SR150	Haji Obaidul Hakim Government Primary School	397077.8	2412726	0.27	0.078	0.32	0.035	0.89	0.322	0.89	0.118
SR151	Pekua Ideal High School	391292.3	2411723	0.53	0.085	0.31	0.060	1.20	0.361	0.93	0.177
SR152	Pekua hedayedul Ulum Islamia Dakhil Madrasha Hifzkhana and Etimkhana and Mosque	390761.9	2411702	0.48	0.100	0.27	0.063	1.27	0.419	0.89	0.181

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SR153	Purba Mognama Government Primary School	390404.7	2411571	0.48	0.258	0.53	0.066	1.31	0.507	1.20	0.184
SR154	Mognama SDF Public School	388197.8	2411594	0.42	0.245	0.48	0.072	1.05	0.487	1.27	0.197
SR155	Magnama Farid Ahmed Chowdhury Primary School	387547.3	2411517	0.41	0.230	0.48	0.074	1.06	0.469	1.31	0.202
SR156	Sutachura Government Primary School	391675.3	2410770	0.53	0.174	0.42	0.059	1.14	0.463	1.00	0.181
SR157	Nandir Para Govt Primary School	393806.9	2410736	0.35	0.150	0.4	0.047	1.03	0.472	1.06	0.153
SR158	Mehernama high school	395273.5	2411017	0.33	0.239	0.53	0.040	0.99	0.621	1.14	0.137
SR159	Islamia Norul Ulum Madrasa	395846.9	2411577	0.29	0.141	0.35	0.038	0.95	0.597	1.03	0.130
SR160	B. M. Char Govt. Primary School	397300.9	2410639	0.37	0.111	0.33	0.034	0.92	0.496	0.99	0.118
SR161	Abdur Rahman Government Primary School	399419.5	2410902	0.31	0.108	0.29	0.029	0.75	0.468	0.95	0.101
SR162	Health complex	402004.5	2410289	0.24	0.097	0.37	0.024	0.80	0.347	0.92	0.085
SR163	Al Amin School & College	404748	2411316	0.20	0.084	0.31	0.021	0.75	0.269	0.75	0.073
SR164	Faitong Noya Para primary school	405421.8	2411484	0.20	0.107	0.24	0.020	0.73	0.195	0.80	0.071
SR165	Chakaria Government College	405053.8	2408824	0.19	0.092	0.2	0.020	0.68	0.174	0.75	0.071
SR166	Ottar Lakkharchar Union Parishad Community Hospital	404949.8	2408677	0.19	0.090	0.2	0.020	0.68	0.171	0.73	0.071
SR167	Hazipara Forkania Madrasha and Hifzkhana	404275.5	2408660	0.20	0.114	0.19	0.021	0.70	0.258	0.68	0.074
SR168	Sreemura Government Primary School	403610.8	2409280	0.23	0.115	0.19	0.022	0.78	0.261	0.68	0.077
SR169	Hamidulla Muhuri Health Centre	403321.9	2409394	0.23	0.118	0.2	0.022	0.80	0.260	0.70	0.078
SR170	Kaiarbil Islamia Jamiul Ulum Madrasah	403104.2	2409499	0.24	0.119	0.23	0.023	0.81	0.238	0.78	0.079
SR171	Uttar Veola Government Primary School	401001.4	2408377	0.25	0.119	0.23	0.025	0.88	0.232	0.80	0.089
SR172	Betuarkul Jahan Government primary School	399759.6	2408667	0.28	0.118	0.24	0.027	0.91	0.226	0.81	0.096
SR173	Bahadder Kata High School	398428	2409417	0.29	0.138	0.25	0.031	0.78	0.252	0.88	0.107
SR174	Krisnapur Govt. Primary School	397439.2	2409333	0.32	0.140	0.28	0.033	0.84	0.238	0.91	0.115
SR175	konakhali Govt. Primary School	394379.4	2409598	0.45	0.124	0.29	0.043	1.03	0.267	0.78	0.149
SR176	Konakhali Kulsum Nahar Govt. Primary School	394045.8	2408664	0.45	0.122	0.32	0.044	1.08	0.300	0.84	0.154
SR177	Darul Irfan madrasah	393952.1	2408194	0.43	0.118	0.45	0.044	1.09	0.516	1.03	0.155
SR178	Al-Mohammadia M.H.C Model Madrasah	393374.9	2407886	0.45	0.133	0.45	0.046	1.11	0.494	1.08	0.163
SR179	Purbo Ujantia Government Primary School	390575.2	2408725	0.53	0.152	0.43	0.068	1.16	0.469	1.09	0.212

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SR180	Maddhyam Ujantia Veluarpara Government Primary School	388949	2408273	0.71	0.165	0.45	0.090	1.35	0.504	1.11	0.250
SR181	Ujantia A. S. Alim Madrasah	390152.6	2407886	0.54	0.223	0.53	0.071	1.22	0.744	1.16	0.225
SR182	Khan Bahadur Para Govt Primary School	387878.6	2407521	0.84	0.318	0.71	0.115	1.27	0.650	1.35	0.294
SR183	Khan Bahadur Ebtedaye Madrasa	387865.6	2407408	0.83	0.209	0.54	0.115	1.27	0.800	1.22	0.296
SR184	West Uj.Gov.primary School	386812.1	2407243	0.77	0.348	0.84	0.146	1.41	0.643	1.27	0.352
SR185	East ujantia High School	386769.9	2407243	0.78	0.354	0.83	0.146	1.41	0.660	1.27	0.355
SR186	Dhemushia Foez Ahmed Government Primary School	392661	2406958	0.46	0.279	0.77	0.049	1.15	0.507	1.41	0.174
SR187	Dhemushia Jinnat Ali Chowdhury High School	393471.9	2407029	0.42	0.268	0.78	0.045	1.08	0.510	1.41	0.160
SR188	Matamuhuri Ideal School	396791.9	2407919	0.32	0.223	0.43	0.034	0.90	0.504	1.15	0.119
SR189	Betua Government Primary School	398095.2	2407960	0.29	0.216	0.4	0.031	0.96	0.429	1.08	0.108
SR190	Mubinpara Asus Government Primary School	399513.2	2407641	0.25	0.167	0.32	0.027	0.94	0.281	0.90	0.097
SR191	Bheola Manik Char High School	400563.9	2409158	0.27	0.160	0.29	0.026	0.88	0.264	0.96	0.092
SR192	kazir para primary school	403322.9	2407900	0.21	0.150	0.25	0.021	0.72	0.268	0.94	0.077
SR193	Kazirpara Government Primary School	403329.1	2407844	0.21	0.127	0.27	0.021	0.71	0.223	0.88	0.077
SR194	Islamia Amdadul Ulom Mohiussunnah Madrasha	404215.2	2407405	0.20	0.120	0.19	0.020	0.65	0.274	0.72	0.073
SR195	Chakaria Government High School	404222.2	2407149	0.20	0.120	0.18	0.019	0.63	0.275	0.71	0.072
SR196	Al Hera Cadet Academy	404882.2	2408057	0.19	0.109	0.16	0.020	0.66	0.283	0.65	0.071
SR197	Haji Nurul Kabir School & College	404797.2	2408366	0.19	0.105	0.15	0.020	0.67	0.287	0.63	0.071
SR198	Lokksharchor High School	404507.2	2408460	0.19	0.111	0.17	0.020	0.69	0.273	0.66	0.073
SR199	Ottar Lakkarchar Government Primary School	405026.1	2408238	0.19	0.114	0.18	0.019	0.66	0.268	0.67	0.070
SR200	Childs Modern School and College	405397.7	2407954	0.19	0.116	0.19	0.019	0.63	0.265	0.69	0.069
SR201	Madrashatul Abrar, Koiyar Beel, Islam Nagar	404538.9	2410576	0.22	0.112	0.17	0.021	0.76	0.270	0.66	0.074
SR202	Madrasha Hazrat Usman (Rh.) Hifzkhana and Etimkhana	404771.5	2410351	0.22	0.107	0.16	0.021	0.76	0.275	0.63	0.073
SR203	Shaharbil Union Sub Centre	401509.5	2405847	0.19	0.101	0.22	0.021	0.67	0.194	0.76	0.082
SR204	As Chafa Adarsha Siksha Niketon	401604	2405799	0.19	0.103	0.22	0.021	0.67	0.205	0.76	0.082
SR205	Saharbeel BMS High School	401610.5	2406571	0.22	0.111	0.18	0.022	0.73	0.327	0.67	0.083

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SR206	Purba Bara Bheola G.N.A. Missionary High School	402212.2	2407666	0.22	0.113	0.18	0.023	0.75	0.329	0.67	0.082
SR207	Jungle Kata Govt. Primary School	396621.3	2409393	0.36	0.114	0.16	0.035	0.88	0.296	0.73	0.123
SR208	Ilisia Jamila Begum High School	394620.6	2405859	0.34	0.127	0.19	0.037	1.10	0.274	0.75	0.138
SR209	Paschim Boroveola Government Primary School and Cyclone Shelter, Chakaria, Cox's Bazar	393577.9	2405538	0.34	0.114	0.36	0.039	1.06	0.340	0.88	0.151
SR210	Baitus Sarf Shah Jabbaria Pre-cadet Madrasha	391341.3	2403641	0.34	0.177	0.26	0.044	1.23	0.390	1.10	0.187
SR211	Azizia Islamia Sultanul ulum Madrasha and Shah Jamira Etimkhana	391982.2	2403151	0.32	0.197	0.28	0.042	1.21	0.416	1.06	0.173
SR212	Little Jewels Somobaye School	391701	2401993	0.34	0.316	0.34	0.045	1.16	0.514	1.23	0.175
SR213	Badarkhali Degree College	391928.1	2401884	0.33	0.247	0.29	0.044	1.13	0.494	1.21	0.170
SR214	Badarkhali Government Primary School	391786.6	2402173	0.32	0.336	0.26	0.045	1.15	0.616	1.10	0.175
SR215	Matarbari High School	385942.3	2403612	0.67	0.331	0.26	0.118	1.49	0.632	1.07	0.418
SR216	Matarbari KG. & Pre Cadet School	386051.9	2403598	0.66	0.323	0.27	0.119	1.48	0.582	1.11	0.419
SR217	Matarbari Health & Welfare Centre	386248.8	2403720	0.55	0.368	0.37	0.124	1.58	0.684	1.49	0.414
SR218	Azizia Kasimul Ullum Madrasha	386042.4	2403758	0.66	0.371	0.36	0.124	1.45	0.651	1.48	0.418
SR219	Matarbari Digital Hospital and Diabetes Center	385935.1	2403519	0.67	0.394	0.37	0.116	1.52	0.577	1.58	0.420
SR220	Mojidia Alim Madrasha	385482.8	2403433	0.56	0.373	0.37	0.106	1.39	0.667	1.45	0.419
SR221	Sairadel Primary School	383895	2402272	0.31	0.367	0.37	0.052	1.01	0.680	1.52	0.283
SR222	Srijoni Kindergarten and Junior High School	384691.6	2402494	0.39	0.319	0.35	0.072	1.28	0.711	1.35	0.368
SR223	Adarsha Public High School	385154.1	2402961	0.47	0.315	0.21	0.090	1.50	0.761	0.90	0.412
SR224	Rajghat Government Primary School	386617	2403234	0.53	0.390	0.23	0.112	1.72	0.733	0.82	0.413
SR225	Nidantarani Government Primary School	391256	2404575	0.39	0.369	0.26	0.046	1.12	0.699	1.30	0.191
SR226	Badarshah Academy	393368.5	2402196	0.27	0.414	0.39	0.036	1.00	0.739	1.72	0.145
SR227	Al-Azhar High School	401429.9	2402697	0.20	0.388	0.38	0.019	0.59	0.488	1.12	0.075
SR228	Bottali Government Primary School	401612.2	2403523	0.20	0.220	0.26	0.019	0.65	0.577	1.00	0.077
SR229	Jamia Fatima (Rh.) An Necchaiya	400925.7	2405557	0.20	0.199	0.16	0.022	0.69	0.368	0.56	0.084
SR230	Darul Hikmah Academy	400811.7	2405881	0.20	0.190	0.2	0.022	0.72	0.384	0.65	0.086
SR231	Matamuhuri Dakhil Madrasha	400306.2	2405507	0.20	0.126	0.2	0.023	0.71	0.338	0.69	0.088
SR232	R. K. Nurul Amin Chowdhury High School	400433.7	2405444	0.20	0.114	0.18	0.022	0.71	0.325	0.72	0.087

ID	Sensitive Receptors Name	Coordinates		PM_{10} Concentration (µg/m^3)							
		X	Y	Only project contribution -24 hr.			Only project - Annual	Cumulative- 24 hr			Cumulative- Annual
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR233	Kahariaghona Government Primary School	403490.8	2405518	0.18	0.132	0.2	0.019	0.65	0.341	0.71	0.072
SR234	Chakaria City College	403687.5	2405332	0.18	0.133	0.2	0.018	0.64	0.343	0.71	0.071
SR235	Palakata Government Primary School	403862.2	2404210	0.20	0.112	0.18	0.017	0.61	0.335	0.65	0.069
SR236	Uttar Binamara Mohammadia Hifzkhana and Etimkhana	404478	2405741	0.17	0.116	0.18	0.018	0.62	0.341	0.64	0.069
SR237	ICDDR,B Chakaria Campus	403755.9	2405972	0.17	0.146	0.2	0.019	0.63	0.355	0.61	0.072
SR238	Chakaria Central High School	403634	2405276	0.18	0.101	0.16	0.018	0.65	0.326	0.62	0.071
SR239	Chakaria Imam Hussain (Rh.) Sunnia Dakhil Madrasha	403589.9	2405235	0.19	0.097	0.16	0.018	0.65	0.318	0.63	0.072
SR240	Chiringa Barmis Government Primary School	403487.7	2404920	0.19	0.118	0.18	0.018	0.65	0.343	0.65	0.071
SR241	Madrasha al-balagul mobin	405613.4	2404831	0.18	0.119	0.19	0.016	0.58	0.344	0.65	0.063
SR242	sairar dale govt. primary school	383858.5	2401467	0.31	0.127	0.19	0.051	1.21	0.352	0.65	0.249
SR243	Hasan Bashir Nurani Madrasha, Uttar Nolabila	389174.2	2401586	0.50	0.116	0.18	0.069	1.49	0.334	0.58	0.246
SR244	Unus Khali Primary School	389000.1	2400264	0.37	0.309	0.17	0.064	1.33	0.885	1.10	0.216
SR245	Sutriar Dale Government Primary School, Dhalghata	382289.4	2396613	0.23	0.353	0.4	0.032	0.98	0.634	1.49	0.146
SR246	Sapmarar Dale Government Primary School and Public Shelter	383973.6	2396067	0.30	0.255	0.31	0.040	1.46	0.802	1.21	0.222
SR247	Amdadia Madrasha, Dhalghata	382287	2397227	0.24	0.232	0.08	0.032	1.04	0.978	0.51	0.145
SR248	Dhalghata Ideal High School	382573.3	2398052	0.25	0.184	0.12	0.034	0.97	0.778	0.73	0.154
SR249	Soraitola Govt. Primary School cum Cyclone Centre	382371.9	2397588	0.24	0.240	0.08	0.033	1.03	1.037	0.58	0.147
SR250	Mohrigohna Alim madrasa	383395.3	2399232	0.26	0.247	0.09	0.042	1.15	0.971	0.71	0.185
SR251	Matarbari Coal Power Plant	384097.8	2400372	0.31	0.243	0.09	0.053	1.47	1.032	0.63	0.163
SR252	Mohurighona CC	383288.5	2398769	0.25	0.253	0.11	0.041	1.06	0.691	0.79	0.188
SR253	Ummuhani Girls Madrasha	383741.4	2400995	0.30	0.280	0.13	0.049	1.34	0.773	0.94	0.208
SR254	Matarbari Ideal Girls High School	384508.7	2403058	0.34	0.244	0.1	0.066	1.11	0.888	0.91	0.335
SR255	Matarbari Govt. Primary School	385968	2403678	0.67	0.299	0.15	0.120	1.48	0.950	0.82	0.419
SR256	Shaitmara Government Primary School	390936.1	2399266	0.38	0.326	0.29	0.052	1.00	0.689	0.70	0.161
SR257	Shaitmara Residential Model High School	391098.1	2399014	0.37	0.371	0.38	0.050	0.98	0.683	1.48	0.156

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				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR258	Jhapua Madrasah	388500.4	2398728	0.29	0.318	0.28	0.052	1.27	0.997	1.00	0.201
SR259	JM Ghat Adarsha High School	391988.6	2396982	0.29	0.311	0.27	0.043	1.01	0.978	0.95	0.141
SR260	Kalarmarchara High School	388359.2	2396003	0.28	0.290	0.23	0.038	1.20	0.877	0.95	0.199
SR261	Kalarmarchara Adarsha Dakhil Madrasah	388461.9	2395004	0.27	0.239	0.21	0.034	0.96	0.722	0.72	0.186
SR262	Nonachari Fakiraghuna Tajbidul Quran Hifzkhana and Etimkhana	388446.7	2395525	0.27	0.152	0.15	0.036	1.06	0.868	1.06	0.192
SR263	Mijjir para government primary school	388062.3	2395904	0.30	0.127	0.14	0.037	1.10	0.715	0.87	0.205
SR264	Kalarmarchara Govt Primary School	388297	2396258	0.29	0.142	0.15	0.038	1.26	0.820	0.98	0.202
SR265	Noyapara Government Primary School	388591.2	2396905	0.26	0.127	0.15	0.042	1.23	0.816	1.02	0.198
SR266	JM Ghat Government primary School	391882.9	2397017	0.30	0.156	0.16	0.043	1.02	0.901	1.10	0.142
SR267	Mithakata Government Primary School	392803.5	2394978	0.27	0.208	0.17	0.037	0.71	0.964	1.05	0.132
SR268	Ghunarpara Government Primary School	393051.7	2394087	0.25	0.233	0.21	0.034	0.82	0.727	0.72	0.128
SR269	Shaplapur Islamia Alim Madrasha	393633	2393993	0.25	0.184	0.17	0.034	0.75	0.694	0.69	0.122
SR270	Shaplapur FWC	393898.4	2393722	0.24	0.173	0.15	0.033	0.75	0.647	0.69	0.119
SR271	ASA Shaplapur Health Center	394094.1	2393632	0.24	0.171	0.16	0.032	0.74	0.574	0.69	0.118
SR272	Shaplapur High School	394106.6	2393746	0.24	0.168	0.15	0.033	0.72	0.577	0.69	0.118
SR273	Shapalapur Islamia Alim Madrasa	394124.9	2393750	0.24	0.167	0.15	0.033	0.72	0.563	0.68	0.117
SR274	Shaplapur Government Primary School	394133.5	2393780	0.24	0.173	0.16	0.033	0.71	0.566	0.69	0.117
SR275	Bariapara Model Academy	394543.8	2390217	0.18	0.174	0.16	0.027	0.76	0.568	0.69	0.102
SR276	Kaidabad Government Primary School	394571.6	2390012	0.17	0.176	0.16	0.026	0.75	0.573	0.69	0.102
SR277	Alhaj Abdul Gani Mastar Nurani Madrasa and School	394803.7	2389124	0.17	0.166	0.13	0.025	0.67	0.614	0.57	0.097
SR278	Dineshpur Government Primary School	394531.3	2388627	0.17	0.167	0.13	0.024	0.60	0.616	0.56	0.097
SR279	Moheskhali Upazila Health Complex	389174.2	2387098	0.18	0.167	0.12	0.020	0.64	0.599	0.52	0.095
SR280	Panirchara govt. primary school	388747.2	2385446	0.16	0.174	0.12	0.019	0.66	0.572	0.53	0.084
SR281	Panirchara Ideal High School	388630.1	2385394	0.16	0.064	0.08	0.019	0.67	0.493	0.37	0.084
SR282	Al Akaba Kindergarten School, Maheshkhali	388813.8	2385472	0.16	0.060	0.08	0.019	0.66	0.363	0.33	0.085
SR283	Panichara Bottala Hafez Khana	388826.3	2385943	0.16	0.060	0.08	0.019	0.67	0.350	0.33	0.087
SR284	Dalghat Para Primary School	388537.7	2386898	0.17	0.060	0.08	0.020	0.70	0.371	0.32	0.093
SR285	Mohrakata Community Clinic	388583.7	2386918	0.17	0.061	0.08	0.020	0.70	0.396	0.33	0.093

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				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR286	Adhunagar Islamia kamil Madrasah	389778.1	2388622	0.19	0.064	0.08	0.022	0.63	0.418	0.34	0.107
SR287	Keruntoli Government Primary School and Cyclone Shelter, Maheshkhali, Cox's Bazar	388813.3	2389090	0.20	0.064	0.08	0.023	0.67	0.425	0.34	0.110
SR288	Hoanak Government Primary School	388627.1	2390166	0.21	0.069	0.09	0.024	0.68	0.634	0.41	0.120
SR289	Time Bazar Government Primary School	388687.1	2391813	0.23	0.072	0.09	0.027	0.76	0.592	0.42	0.140
SR290	Chonkhola Primary School	388535.5	2393029	0.25	0.077	0.1	0.029	0.77	0.656	0.46	0.157
SR291	Daillaghona Govt. Primary School	388715.3	2393878	0.25	0.085	0.11	0.031	0.89	0.762	0.52	0.168
SR292	Chiknipara CC/CNC	388539.3	2397823	0.26	0.093	0.12	0.046	1.04	0.757	0.56	0.200
SR293	Napitkhali Secondary School	403146.5	2387574	0.17	0.113	0.12	0.018	0.47	0.682	0.68	0.065
SR294	Islampur Islamia Dakhil Madrasah	401793.9	2386862	0.15	0.245	0.19	0.019	0.55	0.847	0.90	0.068
SR295	Dharmerchara Government Primary School	401780.4	2386958	0.15	0.147	0.13	0.019	0.54	0.390	0.47	0.068
SR296	Gomatali High School	397144.8	2386036	0.14	0.154	0.15	0.021	0.53	0.463	0.41	0.080
SR297	Uttar Gomatali Mohajer Registrar Primary School	397612.9	2387347	0.17	0.154	0.15	0.022	0.63	0.460	0.41	0.081
SR298	Al Jamiah Al Emdadiah Azizul Uloom (Pokkhali Madrasah) Pokkhali	398281.8	2385604	0.15	0.131	0.1	0.020	0.55	0.503	0.46	0.075
SR299	Paschim Gomatali Hossainia Madrasha	397187.8	2385636	0.14	0.117	0.11	0.021	0.50	0.518	0.46	0.079
SR300	Purba Notun Ghona Government primary School	393597.6	2403904	0.32	0.112	0.1	0.035	1.10	0.496	0.41	0.146
SR301	Habibia Government Primary School	392937.8	2401173	0.31	0.134	0.1	0.040	0.99	0.488	0.47	0.146
SR302	Vach School and College	392386.8	2400701	0.32	0.323	0.28	0.044	1.01	0.479	1.10	0.152
SR303	Al Azhar Kindergarten	392016.7	2399539	0.42	0.314	0.24	0.047	0.93	0.578	0.76	0.148
SR304	Al Azhar High School	392009	2399423	0.42	0.300	0.26	0.046	0.90	0.545	0.79	0.146
SR305	Azamnagor Government Primary School	393145.6	2399222	0.37	0.338	0.27	0.041	0.83	0.837	0.93	0.131
SR306	Madinatul Ulum Madrasha	401688	2402913	0.20	0.333	0.27	0.019	0.58	0.861	0.90	0.075
SR307	Dulahazara Degree College	404453	2396130	0.14	0.304	0.23	0.017	0.46	0.797	0.83	0.058
SR308	Bangabandhu Sheikh Mujib Safari Park	404883	2396382	0.14	0.197	0.17	0.017	0.45	0.370	0.58	0.056
SR309	Dulahazara Health & Family Welfare Center	404367.1	2396360	0.14	0.144	0.13	0.017	0.46	0.422	0.46	0.058
SR310	Darul Forkan Umme Hani (Rh.) Madrasha	404138.1	2396561	0.14	0.133	0.14	0.017	0.46	0.431	0.45	0.059

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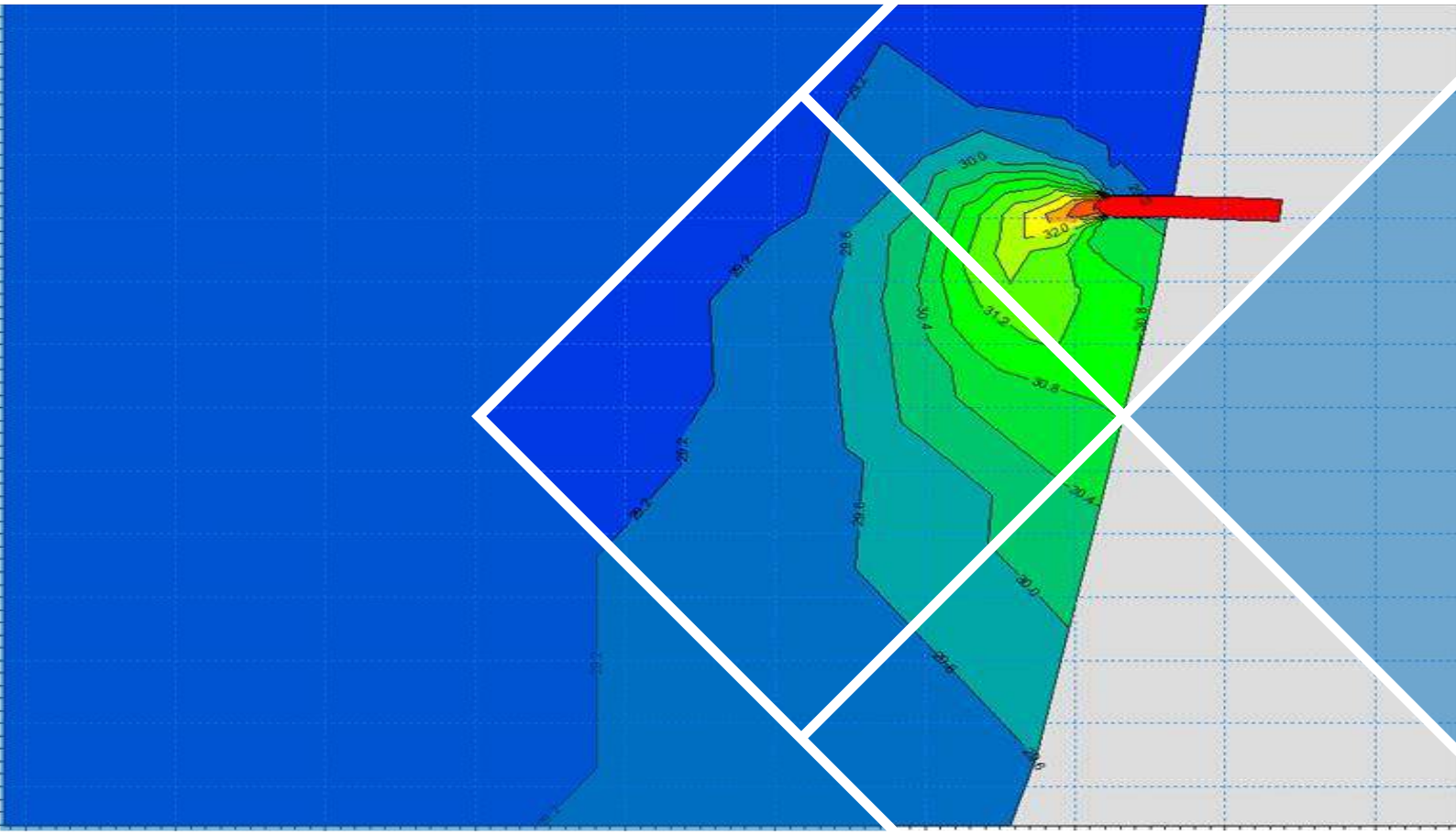
				Whole Year	Winter	Pre-mon.	Whole Year	Whole Year	Winter	Pre-mon.	Whole Year
SR311	Charandwip dulkhalipara Government primary school Chakaria, Cox's Bazar	401677.4	2400965	0.19	0.141	0.14	0.019	0.51	0.433	0.46	0.070
SR312	Charandwip Bhumihin Coastal High School	402602.4	2400613	0.18	0.141	0.14	0.018	0.52	0.444	0.46	0.066
SR313	Palakata High School	403194.2	2403809	0.20	0.148	0.19	0.018	0.60	0.369	0.50	0.070
SR314	Balagul Mobin Madrasha	405639.2	2404478	0.18	0.137	0.18	0.016	0.56	0.378	0.52	0.063
SR315	Mohila Etimkhana and Hafezia Madrasha	405070.1	2404398	0.19	0.165	0.2	0.016	0.57	0.360	0.60	0.064
SR316	Rashid Ahmed Chowdhury High School	405142.7	2403885	0.19	0.122	0.18	0.016	0.53	0.333	0.56	0.063
SR317	Fasiakhali Nurani Kindergarten	405371.4	2403909	0.18	0.129	0.19	0.016	0.53	0.340	0.57	0.062
SR318	Fashiakhali Government Primary School	405193	2403929	0.19	0.145	0.19	0.016	0.54	0.332	0.53	0.063
SR319	Palakata Dakhil Madrasha	403626.6	2403740	0.19	0.142	0.18	0.017	0.58	0.329	0.53	0.068
SR320	Bashkata Nurani Ta'leemul Quran Madrasha	402685.1	2388477	0.18	0.143	0.19	0.019	0.48	0.332	0.54	0.067
SR321	Jumnagar Non-government Primary School	403310.3	2388525	0.18	0.163	0.19	0.018	0.47	0.354	0.58	0.065
SR322	South Fulchari Government Primary School	401728.3	2389331	0.19	0.150	0.12	0.020	0.50	0.373	0.48	0.070
SR323	Noyapada Govt Primary School	402834.4	2389776	0.19	0.158	0.11	0.019	0.45	0.390	0.47	0.066
SR324	Kutakhali grammer school	403976.8	2390613	0.17	0.154	0.13	0.018	0.47	0.401	0.50	0.062
SR325	Diganta Kids Care School	403055.1	2390527	0.18	0.172	0.11	0.019	0.48	0.452	0.44	0.065
SR326	Khutakhali High School.	403641.9	2390979	0.17	0.157	0.12	0.019	0.48	0.474	0.41	0.063
SR327	Kutubdia Para Community Clinic	402697.4	2391839	0.18	0.172	0.11	0.020	0.49	0.479	0.39	0.066
SR328	Paglirbill Govt. Primary School	404796	2394516	0.15	0.158	0.12	0.017	0.41	0.480	0.42	0.058
SR329	Baitun-nur Madrasha	404248.3	2394211	0.16	0.163	0.13	0.018	0.41	0.493	0.45	0.060
SR330	Malumghat Model Public School	404083	2397316	0.16	0.154	0.14	0.017	0.46	0.314	0.41	0.059
SR331	BNS Sheikh Hasina Submarine Base	387159.5	2410443	0.45	0.156	0.15	0.087	1.15	0.347	0.39	0.229
SR332	South Mognama Primary School	387916.3	2410199	0.60	0.125	0.16	0.086	1.19	0.463	0.44	0.227
SR333	Hazi Shafiq Islamia Dhakil Madrasa	404746	2385174	0.15	0.140	0.45	0.017	0.47	0.479	1.15	0.059
SR334	Darussalam Dakhil Madrasah	403983.2	2386214	0.16	0.167	0.6	0.017	0.47	0.466	1.19	0.062
SR335	Markaze Amena Nurani Madrasah	403666.1	2385851	0.15	0.139	0.13	0.018	0.50	0.408	0.39	0.062
SR336	Satjula Kata Government primary School	401600.8	2385196	0.14	0.144	0.13	0.019	0.56	0.405	0.42	0.066
SR337	Pokkhali Adarsha High School	399581.7	2385201	0.16	0.146	0.14	0.020	0.56	0.425	0.40	0.071
SR338	Ma Ariful Quran Nurani Madrasa	404173.2	2422599	0.22	0.127	0.11	0.022	0.67	0.463	0.39	0.075

Appendix I: Plume Water Modelling Report

Orion Power Unit-2 Dhaka Ltd.

PLUME WATER MODEL FOR 635 MW COAL BASED THERMAL POWER PLANT AT MATARBARI, MAHESHKHALI, COX'S BAZAR



FINAL REPORT

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EQMS Consulting Limited
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10 April 2023

PLUME WATER MODEL FOR THE 635 MW COAL BASED THERMAL POWER PLANT AT MATARBARI, MAHESHKHALI, COX'S BAZAR

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1 INTRODUCTION

1.1 Background

According to The Power System Master Plan (PSMP) 2016, Bangladesh aspires to become a high-income country by 2041. Therefore, the development of energy and power infrastructure pursues not only quantity but also quality to realize long-term economic development and to match the objective, improvement of power quality for the forthcoming high-tech industries needs to be addressed holistically.

With reference to the above issues and in connection to the captioned subject it is to mention here that ORION has been awarded for the implementation of a 635 MW (Net) Ultra Super Critical Coal Based power plant under IPP to meet up the demand - supply gap and to meet the vision of the country through setting up such mega power plants. Orion Power Unit-2 Dhaka Limited (OPDL-2) was awarded the Letter of Intent (LOI) by Bangladesh Power Development Board (BPDB) as the "First Ranked Bidder" for designing, financing, insuring, construction, ownership, commissioning, operation, and maintenance of electricity generation facility at Gazaria, Munshiganj. Subsequently, OPDL-2 signed the Power Purchase Agreements (PPA) and Implementation Agreements (IA) to Build, Own and Operate (BOO) a 635 MW Coal Fired Power Plant in Munshiganj on April 21, 2016.

For implementing the projects, OPDL-2 considered a site at Munshiganj (greater Dhaka area), along the bank of the Meghna River. OPDL-2 procured more than 120 Acres of land in that location near the Meghna River and a major industrial area. The land is suitable for such a power plant.

But due to environmental issues worldwide, the use of Coal-based power plants was decreasing day by day. Specially it was decreasing in the developed countries of the world. Most of the developed countries were also discouraging the implementation of Coal-fired power plants. In Bangladesh, OPDL-2 was also not an exception. Bangladesh also faced several National/International pressures to discard Coal-based power plants. Consequently, the Government of Bangladesh discarded many Coal-based power plants in Bangladesh which were previously awarded to different private power producers.

Nevertheless, in recent days of the acute crisis of Oil & Gas due to the effect of the Russia-Ukraine war, many developed countries are changing their strategies for generating electricity to avoid dependency on Russian Oil & Gas. Such as Germany has recently re-opened all of their Coal-based power plants to avoid consuming Russian Oil as well as to generate the least costly electricity.

Despite the above situation, the Government of Bangladesh has given high emphasis on implementing the proposed Coal-based power plant i.e., Orion Power Unit-2 Dhaka Limited for which the Government has instructed to implement the project at a different location which is at Moheshkhali. As part of the Power System Master Plan (PSMP) 2016, Bangladesh Government had taken Moheskhali-Matarbari Integrated Infrastructure Development Initiative (MIDI) where several Coal based thermal power projects were considered and a deep-sea port is under development where coal-carrying mother vessel can directly approach to the shore. As per the Bangladesh Power Development Board (BPDB) and Power Division, Ministry of Power, Energy and Mineral Resources (MOPEMR), this location is the most suitable in Bangladesh for developing Coal based Thermal Power Plants. Here power evacuation facility is also available. As several initial planned coal projects were cancelled by Bangladesh Government due to environmental issues earlier, BPDB and MOPEMR advised OPDL-2 to shift the project site to the Moheskhali area on land owned by Coal Power Generation Company Bangladesh Limited (CPGCBL) to ensure the best utilization of this land as well as most reliable operation of this project i.e., OPDL-2.

The proposed project is a 1x635MW sub-bituminous coal based thermal power Plant. The plant will consist of one ultra-supercritical pulverized coal fired boiler with built in dry low NOx burners suitable for outdoor installation with a stack of 220-meter high and a tandem-compound, multi cylinder design condensing type steam turbine. The plant will have Electrostatic Precipitator (ESP) to arrest dust and

Flue Gas Desulfurization (FGD) system for reduction of sulfur di-oxide. The proposed plant will comprise of an opposed wall fired Benson once through two pass radiant- type super critical boiler with a super heater steam system and a single reheats steam system and will be able to operate in sliding pressure mode. The project will adopt once through cooling water system.

1.2 Scope of Work

Heat dispersion model includes the following scopes:

- Data collection of ambient temperature and Kutubdia channel water temperature for the project area.
- Measurement of Kutubdia channel water temperature.
- Collection of river catchment hydrological data like discharge from the upstream, flow velocity, water level.
- Hydrodynamic modelling for the model catchment generation.
- Dispersion Modelling.
- Conclusion on the heat dispersion modelling and the temperature gradient mapping in horizontal and vertical heat dispersion modelling.
- Horizontal and vertical mapping for the heat dispersion model

1.3 Approach and Methodology

- Different types of hydrological and hydrodynamic data have been collected for establishing the hydrodynamic model and watershed delineation for the flow model.
- MIKE 3 FM model has been used, which is a comprehensive modelling system for 3D water modelling based on a flexible mesh-finite volume method. MIKE 3 FM model is a hydrodynamic model software and produced by the Danish Hydraulic Institute (DHI), headquarter in Denmark.
- Water temperature has also been measured in the Kutubdia channel and calibrated the data with the model data and result interpreted accordingly.
- Power plant discharge water temperature data has been collected from the engineering team of Orion Power Unit-2 Dhaka Ltd. and used in the model data for different scenario generation.
- Different Tidal time models have been generated and shown in the corresponding report figures.
- Mesh generator tool is an inbuilt tool of MIKE 3 FM. The mesh generator can construct meshes that consist of both triangular and quadrangular elements. The approach being that the area of interest is divided into different regions (like road, flat land, low land, high land, river etc.) described through polygons. In this study, water dynamics with heat exchange between sea and river will be simulated.

2 DESCRIPTION OF THE PROJECT AREA

The project area is in the Matarbari Union of Moheskhali Upazila of Cox's Bazar District. At the west side of the project area there is Ocean front and Kutubdia Channel upstream. On the north side the project there is a Matamuhuri River, which meet the Kutubdia channel at the north-west side. At the east side of the project the Kohelia River is located. The project location is shown in the below Figure 2-1.

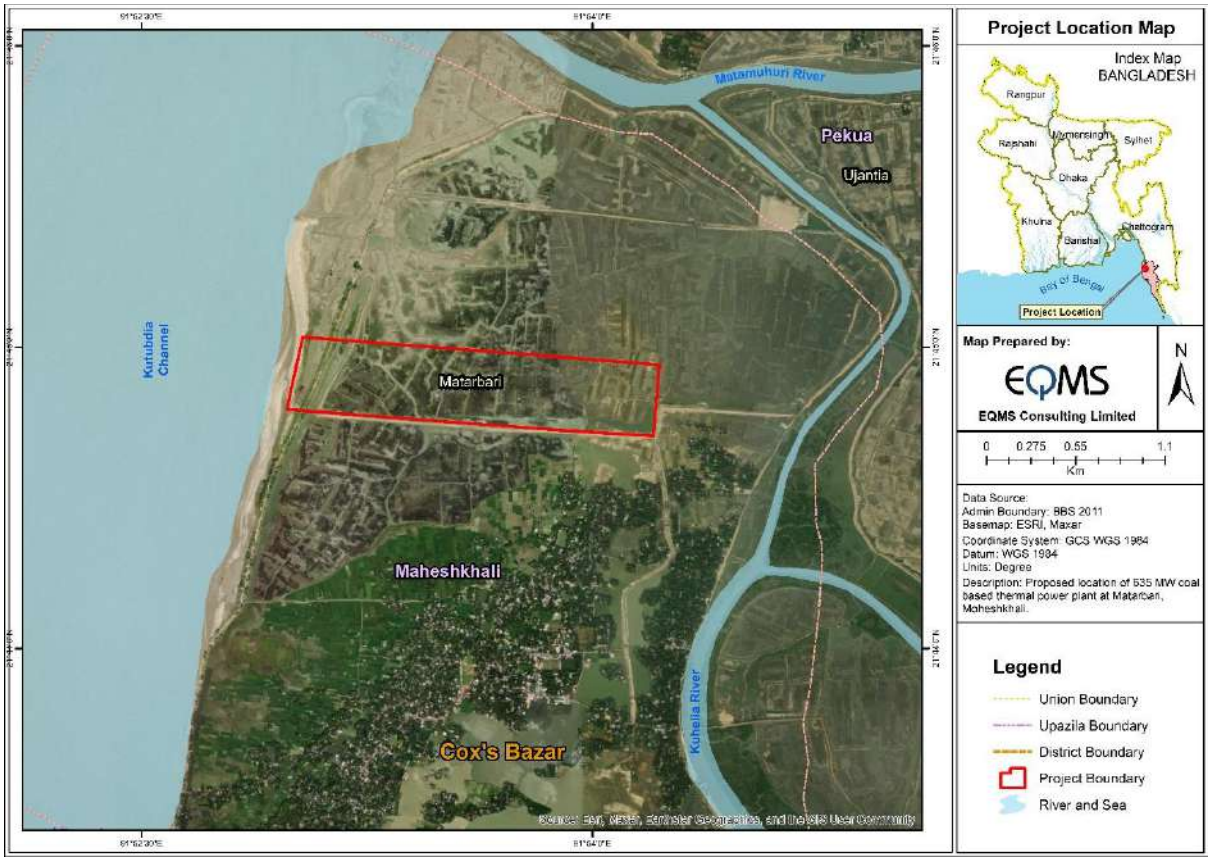


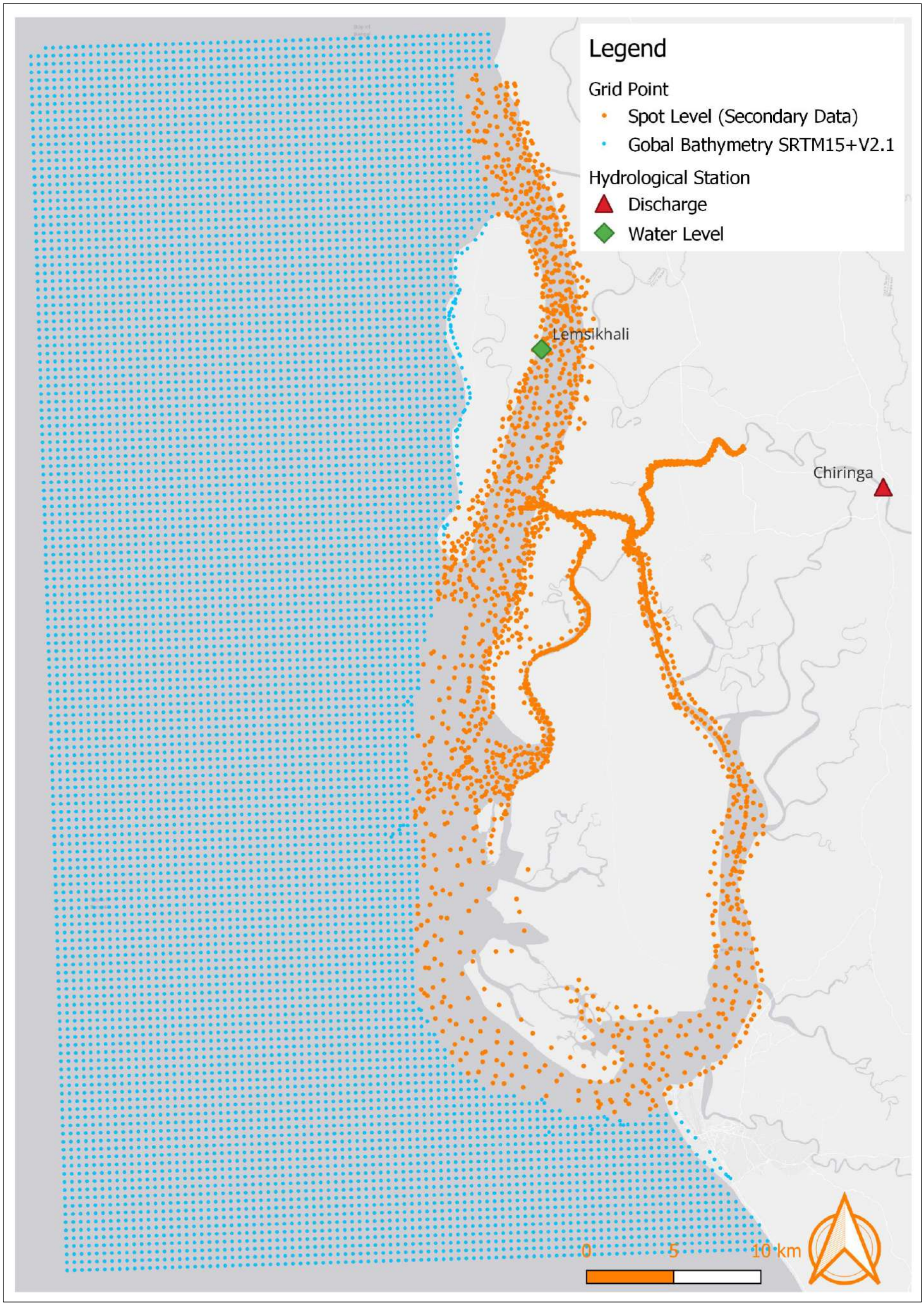
Figure 2-1: Project location in the Matarbari of Moheshkhali Upazila

3 DATA USED IN THE MODEL

Different types of data have been used in the modelling system for the heat dispersion model of the Orion Power Dhaka Unit-2 Ltd., like topographical elevation data of the study catchment area, water level data in tidal and non-tidal time, discharge of the catchment, water velocity etc.

3.1 Topographic and Bathymetric Data

Global bathymetry SRTM15_V2.1 and some secondary (BWDB surveyed cross section data in study area) data has been used to prepare the bathymetry of the model. Global bathymetry SRTM15_V2.1 data mainly covered the sea part and secondary data are used in Kutubdia channel and Matamuhuri River. Figure 3-1 shows collected bathymetry spot levels. Considering a 35km buffer area topographic and bathymetric data have been used.



Sources: Global bathymetry SRTM15_V2.1 and BWDB bathymetric data.

Figure 3-1: Bathymetric Elevation Spot levels in the model catchment area in Kutubdia channel in Moheshkhali

3.2 Water Level

Available Hydrological Data: water level and discharge have been collected from BWDB. List of hydrological stations are given in Table 3-1.

Table 3-1: List of Hydrological Stations.

S/L	Station Name	Location	Type	Source
1	Lemshikhal	Kutubdia Khal	Water Level	BWDB
2	Chiringa	Matamuhuri	Discharge	BWDB

Source: Bangladesh Water Development Board (BWDB).

The project area is located in Moheshkhali Upazila and beside the Kutubdia channel. There are no such water level measuring gauge stations near the project area except the Lemsikhali station which is located 7km upstream from the project location. The max, min and average water level has been modeled and shown below for the year between 2066 and 2021 in the Kutubdia channel. The Table 3-2 shows the water level for the year 2006-2021.

Table 3-2: Simulated Water Level near the Project Area in Kutubdia channel

Year	Water Level (mPWD)		
	Max	Avg	Min
2006	3.10	0.70	-0.37
2007	3.50	0.73	-0.35
2008	2.25	0.82	-0.48
2009	2.27	0.79	-0.37
2010	2.22	0.82	-0.37
2011	2.77	0.89	-0.33
2012	2.62	0.92	-0.45
2013	2.72	0.93	-1.23
2014	2.82	0.96	-0.24
2015	2.62	0.93	-0.27
2016	3.81	0.95	-0.35
2017	3.02	0.98	-0.28
2018	2.75	0.87	-0.36
2019	3.01	0.95	-0.87
2020	3.47	0.88	-0.38
2021	3.05	0.95	-0.27

From the above table, the max water level has been found to be 3.81 (mPWD), minimum water level found 0.7 (mPWD) and the average water level was -0.44 (mPWD).

3.3 Temperature

For the model verification one set of temperature has been measured at the downstream (21°45'54.60"N, 91°53'9.10"E) of Kutubdia channel near the project area on 13th December 2022. Measured data has presented in the Table 3-3 and the Figure 3-2 shows the measured points at the downstream of the Kutubdia Channel. This measurement was done from left bank to right bank near the inlet of the Orion power Plant in Moheshkhali.

Table 3-3: Measured temperature data in Kutbdia channel at observed location

Depths	Temperature (°C) at Different Points					Max.	Min.	Avg.
	Point 1	Point 2	Point 3	Point 4	Point 5			
1 Feet	25.6	26.8	26.3	26.3	26	26.8	25.6	26.2
5 Feet	25.8	27	26.7	26.6	26.1	27	25.8	26.44
10 Feet	26.1	27.4	27	27.2	26.3	27.4	26.1	26.8

From the above Table 3-3, temperature of Kutubdia channel have been measured at different depths from the surface water like 1-Feet, 5-Feet and 10-Feets. The average depth at 1-Feet, 5-Feet and 10-Feet depths have been found to be 26.2°C, 26.4°C and 26.8°C.

Figure 3-2: Temperature Measured Points

The Figure 3-2, shows the temperature measuring points near the project area. From this figure, P1 represents the first measuring point where water temperatures have been measured at different depths in December 2022, as mentioned above. The geographic coordinates of the measuring location were latitude 21°45'54.60"N and longitude 91°53'9.10"E. Water temperature was also collected during summer season (October 2022) from six locations. The highest temperature was recorded 28.5°C.

3.3.1 Ambient Air Temperature

Monthly ambient air temperature has been collected from the web-based weather data (Ref.: *www.weather-and-climate.com)* (Figure 3-3) at Maheshkhali station for the atmospheric condition of the heat dispersion model.

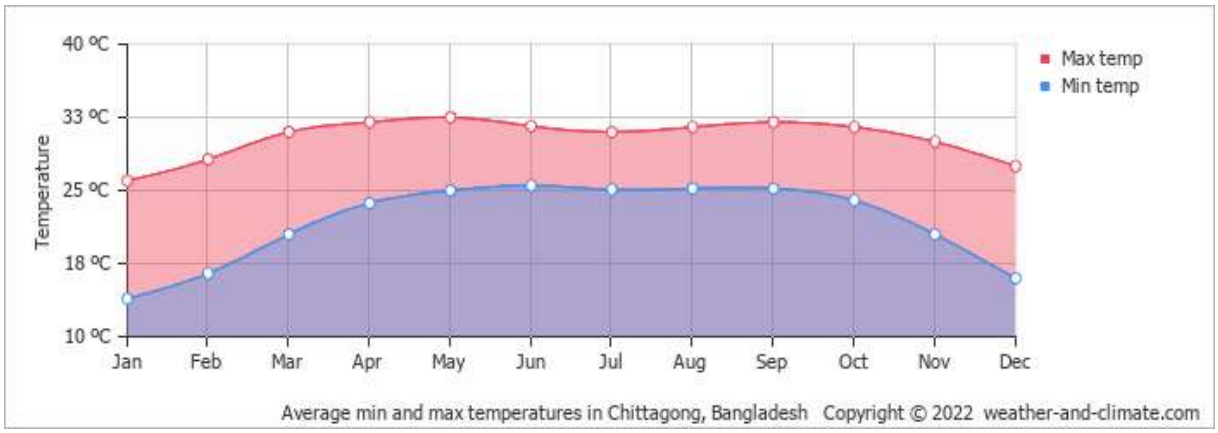


Figure 3-3: Monthly Maximum and Minimum Air Temperature variation of the Moheshkahli Area

3.3.2 Sea/Ocean Front Temperatures

In the Figure 3-4 is showing historical sea surface temperature at Cox's Bazar. This has been derived from analysis of two decades of oceanographic satellite measurements on nearby open water surface through Radar based satellite data. From this historical data the average water temperature variation has been calculated for a whole year as well as the extreme temperature condition that have been observed on each date.

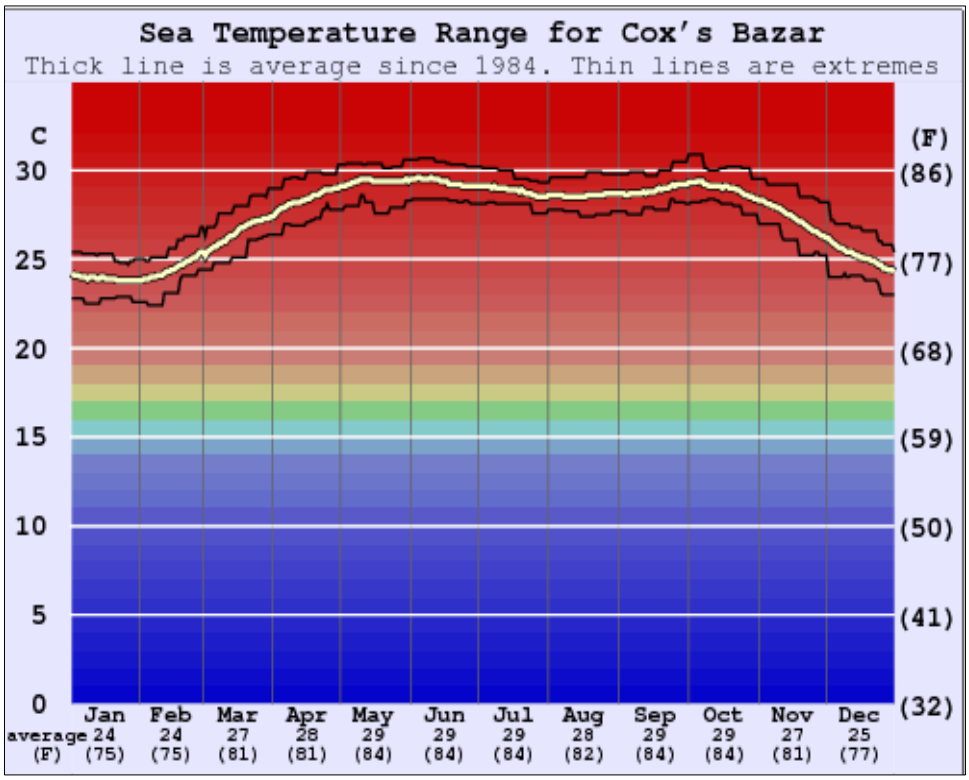


Figure 3-4: Monthly Maximum and Minimum Sea Surface Temperature variation at Cox's Bazar

Near Cox's Bazar Sea front area, temperature getting rises ranging from 28°C to 31°C (82 to 88°F) on around the 3rd of June and getting lowest on about the 21st of January ranges from 23°C to 25°C (73 to 77°F). Based on this temperature data, temperature boundary data have been prepared and input in the model for heat dispersion modelling of this project.

3.3.3 Humidity

Monthly average relative humidity (Figure 3-5) has been collected from the web source[1]. This data has been used in the model input as atmospheric condition.

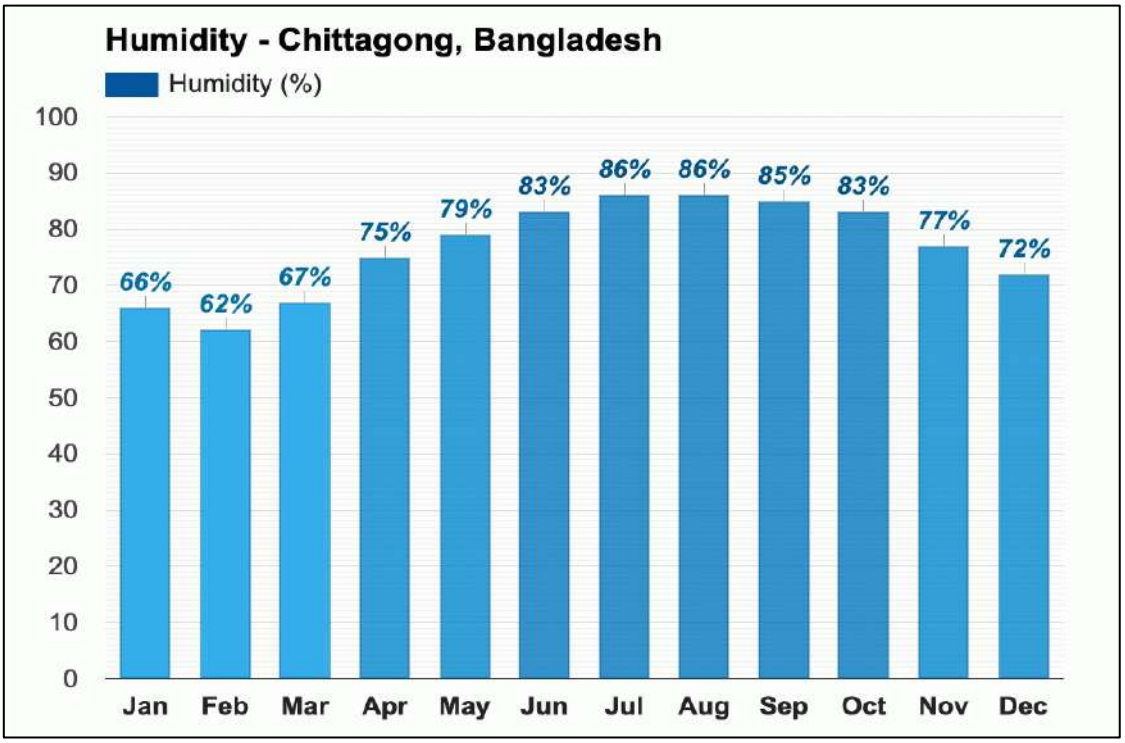


Figure 3-5: Average Humidity at Chittagong, Bangladesh.

From the above figure it has been observed that the monthly humidity increases from March to August and decreases from the month of September. January and February are the lowest months in terms of humidity.

[1] www.weather-and-climate.com

4 HEAT DISPERSION MODEL DEVELOPMENT

4.1 MIKE 3 FM Model

MIKE 3 FM is a comprehensive modelling system for 3D water modelling based on a flexible mesh-finite volume method. The modelling system has been developed for application within oceanographic, coastal, and estuarine environments (DHI 2012). A detailed description of MIKE 3 FM is given in Rasmussen et al. (2009), Zhang et al. (2014), and Payandeh et al. (2015). The governing equations of MIKE 3 are continuity, momentum, temperature, salinity, and density. MIKE 3 assumes that the fluid is incompressible, and therefore its density depends only on temperature and salinity. MIKE 3 calculates free surface water by using the sigma-coordinate transformation method or the combination of sigma and z-level coordinate systems. The related equations for this model are summarized for Cartesian coordinates (DHI 2012).

4.2 2D Mesh Generation

Mesh generator tool is an inbuilt tool of MIKE 3 FM. The mesh generator can construct meshes that consist of both triangular and quadrangular elements. The approach being that the area of interest is divided into different regions (like road, flat land, low land, high land, river etc.) described through polygons. Each polygon may have distinct properties: maximum area of mesh, shape (triangular or a quadrangular), interpolation technique etc. In this study, water dynamics with heat exchange between sea and river will be simulated. Triangular mesh performs well in the sea and where flow direction is not defined. Thus, triangular mesh is used everywhere in this model domain.

One of the advantages of the flexible mesh is creating different size of elements for different parts of the area. Small sizes of the element (mesh) give more detailed information in the important areas. In the plain area where water level, flow velocity and other variables do not vary rapidly, larger size mesh is used than other areas. These element size differences also give advantage for the model calculation time. Model calculation time is directly related to the number of calculation nodes in the model. Each element represents one calculation node. Since the total calculation nodes are reduced with bigger size of elements at some parts, calculation time is reduced too.

Mesh polygon have been shown in the below Figure 4-3.

4.3 Hot Water Discharge Outlet and Water Intake Point

Water intake point and hot water discharge outlet coordinates shown in the Table 4-1 and Figure 4-2 shows the inlet/outlet location in the project area.

Table 4-1: Water Intake Point and hot water discharge outlet coordinates

Description	Latitude	Longitude
Water Intake point	21°43'50.43"N	21°43'50.43"N
Hot water discharge outlet	21°45'1.08"N	91°52'56.22"E
Outlet discharge volume	81,259 m^3/hr	22.57 m3/s

For the heat water dispersion modelling, hot water discharge outlet point has been input in the hydro-dynamic model.

4.4 Mixing Zone for the Hot Water Dispersion

A mixing zone is an area of a lake or river where pollutants from a point source discharge are mixed, usually by natural means, with cleaner water. In the mixing zone, the level of toxic pollutants/ is allowed to be higher than the acceptable concentration for the general water body. The mixing zone is an area where the higher concentration is diluted to legal limits for water quality. Outside the mixing zone, the pollutant levels must meet water quality standards like temperature and other water physical and

chemical parameters. A typical mixing zone consists of two parts: the zone of initial dilution (ZID), near the outfall, and the chronic mixing zone from the ZID out to where water quality criteria are met. The discharge into the mixing zone may be effluent from water treatment plants, chemicals, or hot water from cooling towers[2].

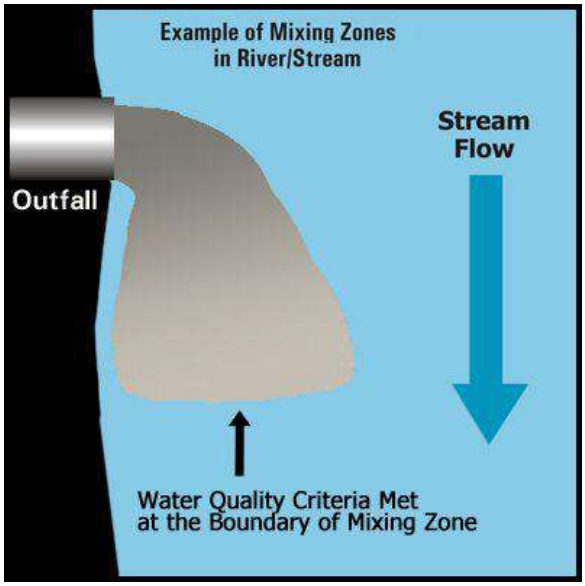


Figure 4-1: Mixing zone concept for discharge outlet

Outfall location at the surface or sub-surface, volume of hot water discharges, interval of discharges and the depth at the outfall location has been considered for the heat dispersion modelling.

Thermal power plants with steam-powered generators and once-through cooling systems use significant volume of water to cool and condense the steam for return to the boiler. The heated water is normally discharged back to the source water (i.e., river, lake, estuary, or the ocean) or the nearest surface water body. In general, thermal discharge should be designed to ensure that discharge water temperature does not result in exceeding relevant ambient water quality temperature standards outside a scientifically established mixing zone. The mixing zone is typically defined as the zone where initial dilution of a discharge takes place within which relevant water quality temperature standards are allowed to exceed and considers cumulative impact of seasonal variations, ambient water quality, receiving water use, potential receptors, and assimilative capacity among other considerations. Establishment of such a mixing zone is project specific and may be established by local regulatory agencies and confirmed or updated through the project's environmental assessment process. Thermal discharges should be designed to prevent negative impacts to the receiving water considering the following criteria[3]:

- The elevated temperature areas because of thermal discharge from the project should not impair the integrity of the water body as a whole or endanger sensitive areas (such as recreational areas, breeding grounds, or areas with sensitive biota).
- There should be no lethality or significant impact to breeding and feeding habits of organisms passing through the elevated temperature areas.
- There should be no significant risk to human health or the environment due to the elevated temperature or residual levels of water treatment chemicals.

[2] United States Environmental Protection Agency (USEPA). Web source: https://sor.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&glossaryName=Bay%20TMDL%20Glossary#formTop

[3] IFC Environmental, Health, and Safety Guidelines for Thermal Power Plants (2008).

- Elevated temperature areas due to discharge of once-through cooling water (e.g., 1 Celsius above, 2 Celsius above, 3 Celsius above ambient water temperature) should be minimized by adjusting intake and outfall design through the project specific EA depending on the sensitive aquatic ecosystems around the discharge point.

Moreover, in the newly published gazette on the Bangladesh Environmental Conservation Rules (2023) by the Ministry of Environment, Forest and Climate Change (MoEFCC) of Bangladesh, it has been mentioned on the Shcedule-4 titled "Waste Discharge Standard for Industry or Project" that, temperature shall not be exceeded more than 5-degree centigrade from the reservoir or coastal water temperature.

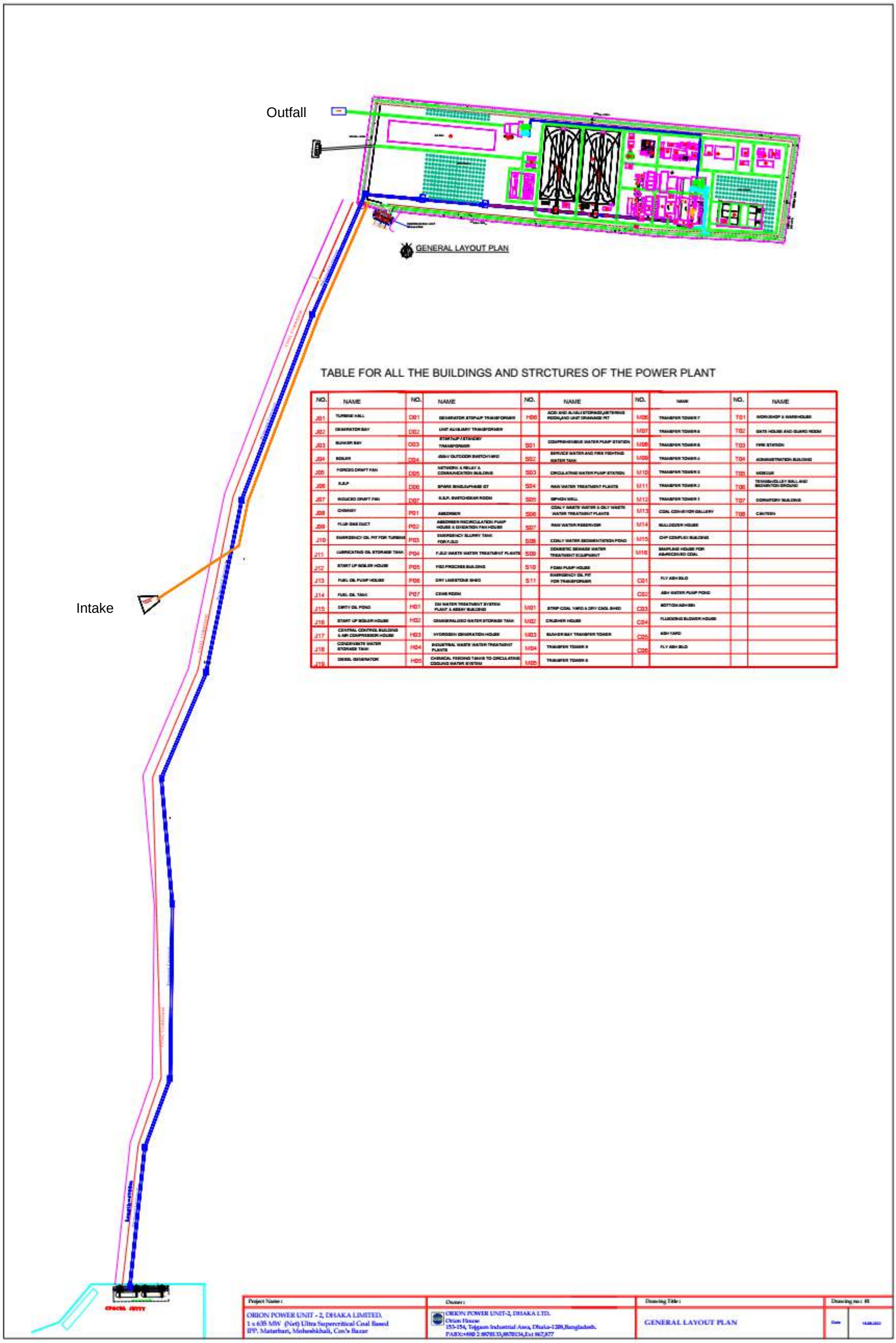


Figure 4-2: Inlet and outlet location of the 600MW CCPP power plant in Matarbari of Moheshkhali Upazila

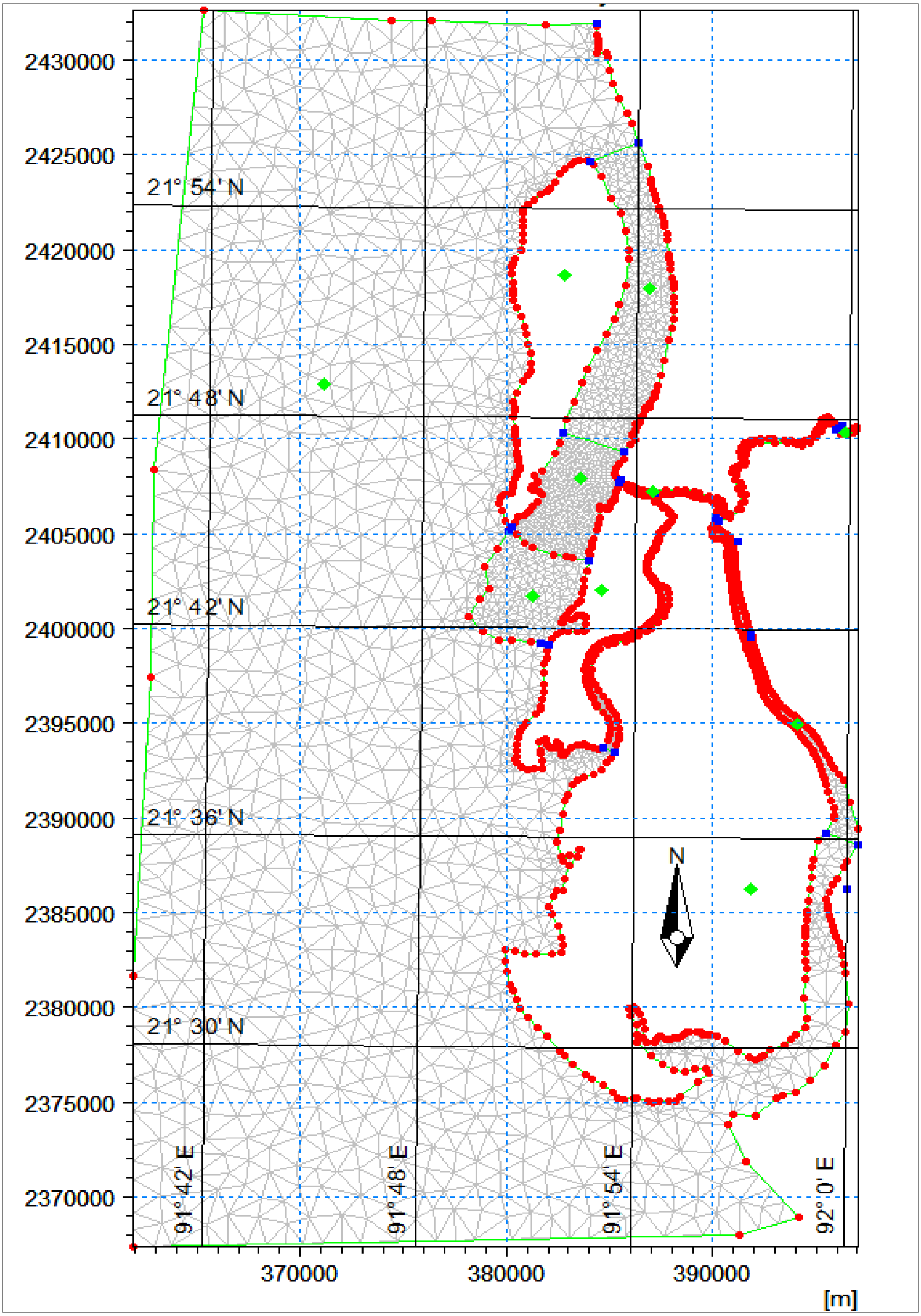


Figure 4-3: Polygon for Mesh Generation for the Study Area

The mesh generation tool allows the user to create polygons that define the model extent and regions with local properties. The steps to generate such a mesh are the following:

- Define polygons to be used for triangular mesh by boundary file (XYZ is the file extension of MIKE model), it is generated from shape file of different area with model domain)
- Set properties for each (default values used if local properties are not supplied)
- Set the exclude properties where high land where inundation never happens, or area is less important for the model.
- Generate the mesh within each polygon.
- Analyse the mesh based one timestep, area and angle of the mesh.

Detail mesh generated shown in the Figure 4-3 and omitted mesh area from the land parts have been shown in the Figure 4-4.

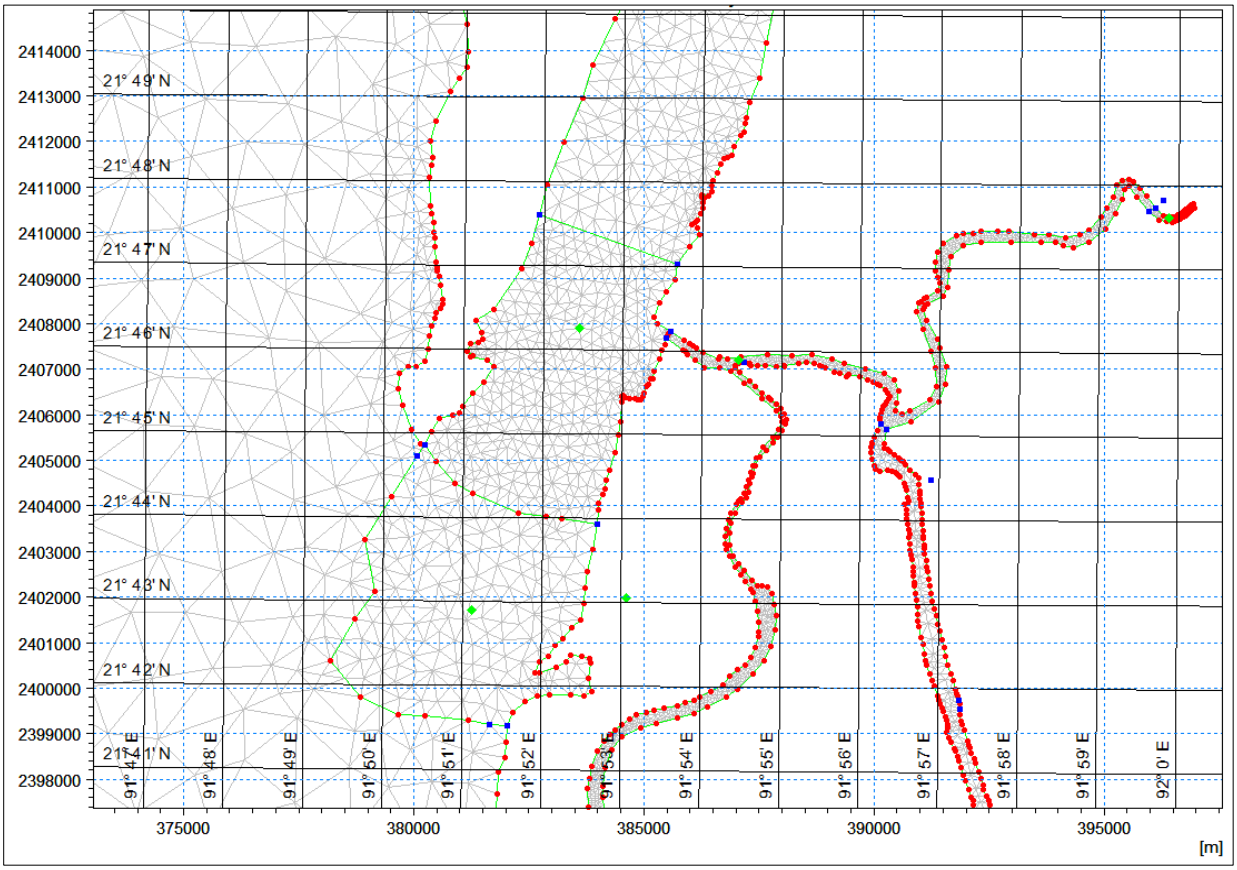


Figure 4-4: Detail Mesh and omitted land part of the river from the detail mesh

The primary input for the simulation is bathymetric data, which is in general terms the topographic file. Once the mesh elements are created, the topographic data has been used to interpolate a topographic surface over the generated mesh. Global bathymetric data and secondary data have been used after correction to prepare topographic surface. Details of Global data have been explained in the data section. The mesh topography is shown in Figure 4-5 and Figure 4-6. Land parts are kept undefined in the model domain.

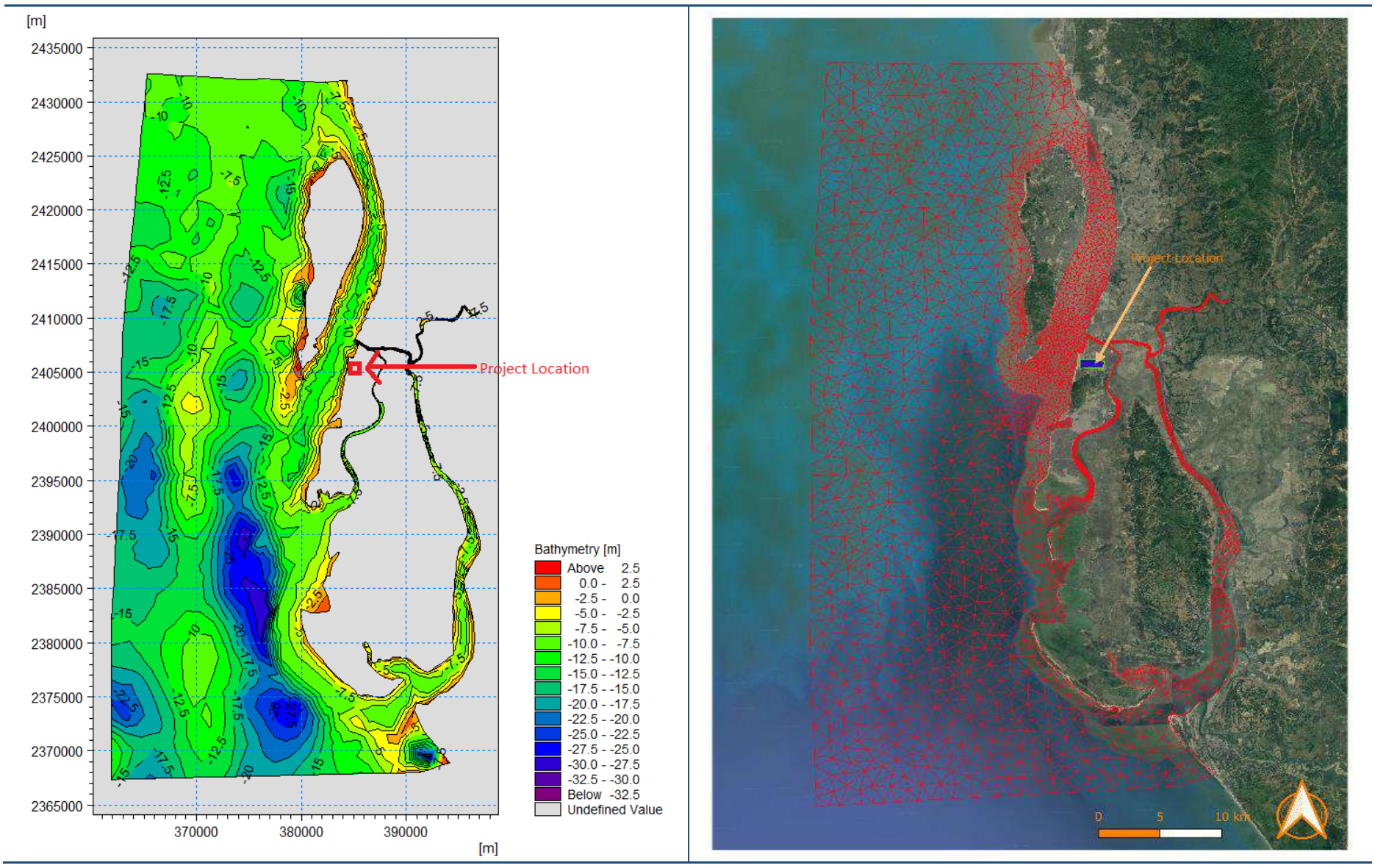


Figure 4-5: Mesh representing bathymetric data for the study area used in the catchment model.

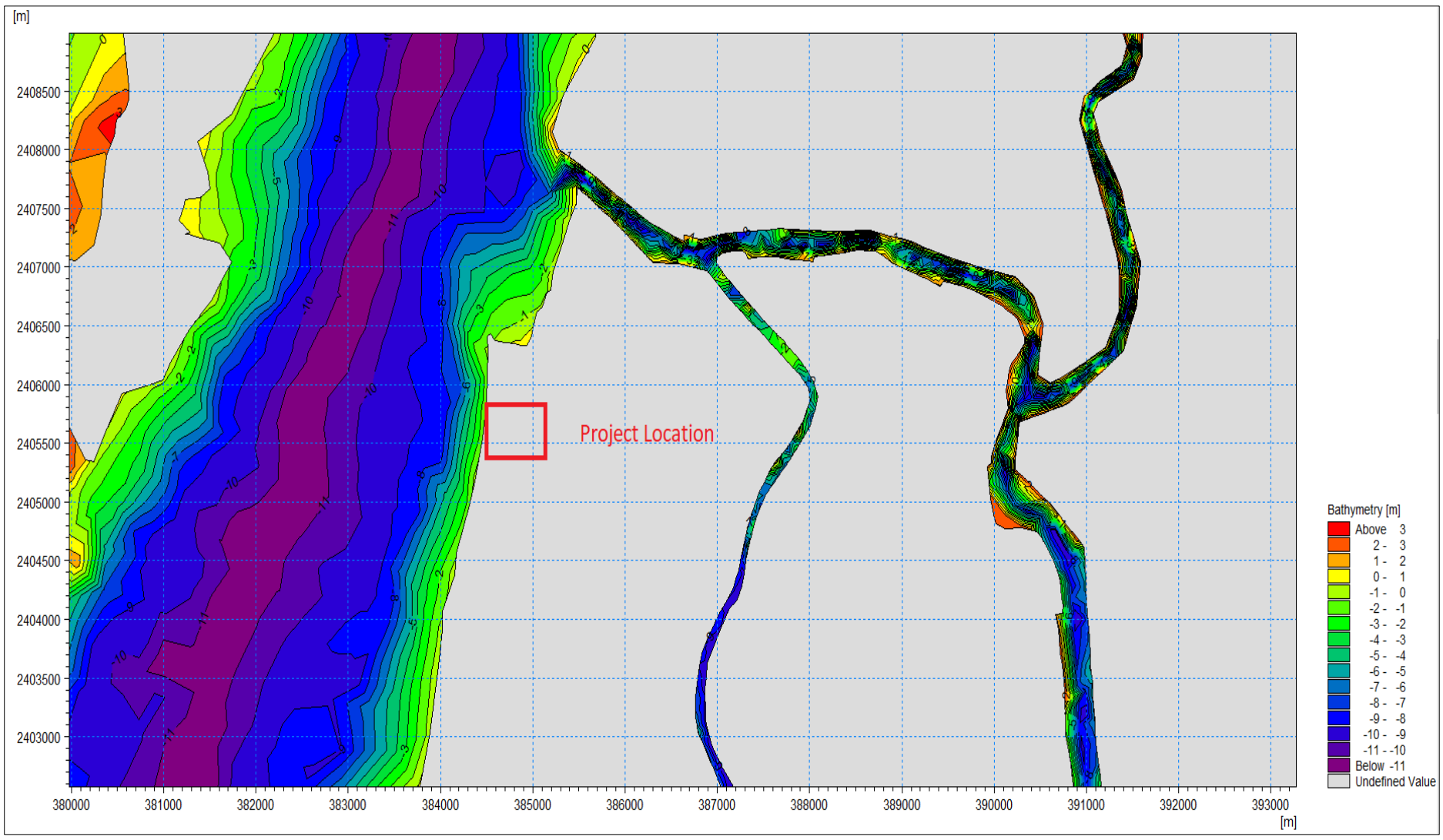


Figure 4-6: Bathymetric depth and surface elevation showing the variation of elevation in model area for this study.

4.5 Hydrodynamic Model Setup

4.5.1 Module Selection

The hydrodynamic module with inland flooding has been chosen for this study.

Solution Technique

The shallow water equations were chosen to be solved with high-order time integration and space discretization. The minimum time step, which was set to 0.01 s refers to the shortest time step the calculations are allowed to use to fulfil the critical CFL number, set to 0.8. The maximum time was set to the time step specified in the time setup, 30s.

Vertical Mesh Setup (3D)

In the vertical domain a layered mesh is applied. Two different types of mesh can be used: Sigma or Combined sigma/z-level. In this study model, Sigma domain distribution is used. In the sigma domain, the vertical distribution of the layers can be specified in three different ways: Equidistant, Layer thickness, and Variable.

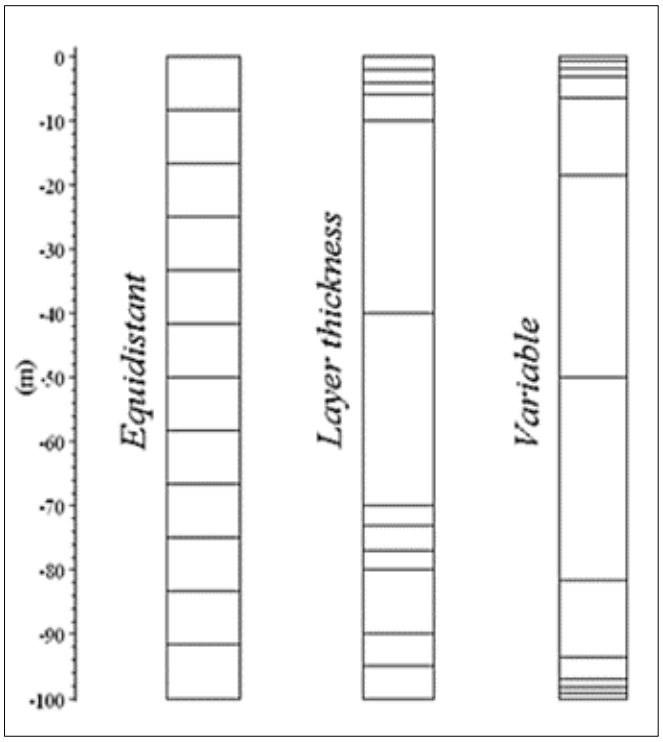


Figure 4-7: Example of sigma vertical domain distribution.

The equidistance sigma distribution is easier to set up and faster than other distributions. Equidistance sigma vertical mesh (for 3D model) is used in the model setup.

Flood and Dry

The advanced flood and dry (floodplain) type was chosen. The drying depth was set to 0.005 m and the wetting depth to 0.01 m. A lower value of the wetting depth was desired as this controls the limit for when the momentum equations are taken into consideration. However, this was as low as it was possible to go without experiencing violated CFL numbers, unrealistic velocity values and crashed programs.

Coriolis Forcing

Domain varying option is selected; the Coriolis force has been calculated based on the geographical information given in the mesh file.

Wind Forcing

It is possible to take into account the effect of the wind on the flow field, but wind force does not play a significant role here for this reason it not included here.

Tidal Potential

The tidal potential is a force generated by the variations in gravity due to the relative motion of the earth, the moon, and the sun. The forcing acts throughout the computational domain. The forcing is considered as the sum of several harmonic terms, each representing a specific constituent, that are specified separately. The tidal potential is defined by the number of constituents that should be included and each constituent is described by several parameters. The default is 11 constituents comprising M2, O1, S2, K2, N2, K1, P1, Q1, Mm, Mf and Ssa. There is no limit on the number of constituents that can be defined. The default and standard values for other constituents can be found in standard tidal books as for example (Pugh, 1987) is used in this study.

Infiltration

It is not applicable for this study.

Eddy Viscosity

This was kept as the same value as default, 0.08 m^2/s.

Bed Resistance

The bed resistance was represented by Manning's number, M. The values have been chosen as the default value (m=40) normally used by DHI. These values might not represent the actual values of M. In calibration period, domain varying Manning's M will be used if it is necessary.

Precipitation – Evaporation

Precipitation data have not been used.

Catchment Boundary for the Model

In this study 3D model, land boundaries have been chosen based on considering riverbank or Land part in the model domain area (Code-1). Code- 2 is Upstream of this model where it is represented inflow of Matamuhuri River inflow. Here, monthly average inflow of Matamuhuri River is used as inflow and Code-3 is a downstream boundary where water level data is used. The downstream water level is extracted from the global model using tidal constituents. Figure 4-8 is showing the boundary location in the model.

Sources

The outlet and inlet are considered considering the following major characteristics of the cooling water.

Outlet Discharge

Outlet discharge and inlet have been used as 22.22 m3/s for the model input as source data. Here, Outlet means hot water will come from power plant and inlet means water will go into the power plant.

GPS Coordinates of Inlet and Outlet

Inlet: Easting: 384422.11 and Northing: 2405606.87

Outlet: Easting: 383768.52and Northing: 2403428.28

Initial Conditions

As in the MIKE 3FM model setup, the initial surface elevation, initial velocity conditions, like u-velocity and v-velocities have been set to zero value (0)[4] initially. But after a few times step-forward of model run the velocity value has been adjusted based on boundary conditions input.

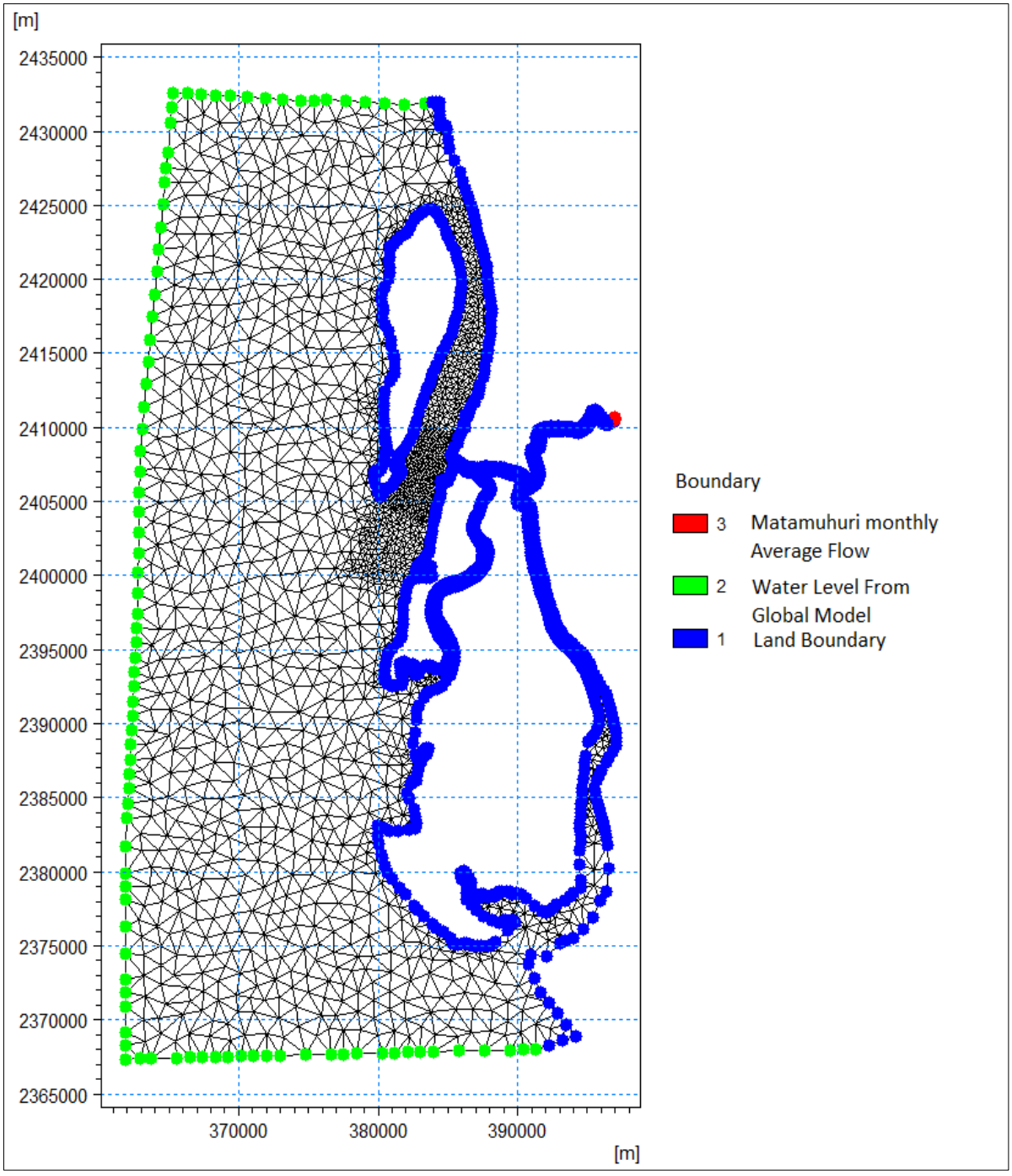


Figure 4-8: Model domain of the study area showing different open boundaries.

[4] This was the initial condition for model setup. As there is no exact velocity for the catchment boundary, we use zero (0) value initially to model input, but after few minutes of model-run started, it's been adjusted based on boundary data and model parameters.

4.6 Temperature Module Setup

The temperature module is invoked from the specification of the density, provided baroclinic density (density depends on temperature) is selected for temperature dispersion in the domain. This TS module sets up additional transport equations for temperature and salinity. Additionally, the calculated temperatures are feedback to the hydrodynamic equations through buoyancy forcing induced by density gradients.

Dispersion Model

In 3-D models the dispersion usually describes transport due to non-resolved processes. In coastal areas it is important to distinguish between horizontal dispersion due to e.g., non-resolved eddies, and vertical dispersion due to e.g., bed generated turbulence. Hence, dispersion in horizontal and vertical directions is specified separately. In this study, the scaled eddy viscosity formulation has been used for both vertical and horizontal dispersion and the dispersion coefficient is calculated as the eddy viscosity used in solution of the flow equations multiplied by at scaling factor.

Heat Exchange

The heat in the water can interact with the atmosphere through heat exchange. The heat exchange is calculated on basis of the four physical processes: Latent heat flux (evaporation), Sensible heat (convection), Short wave radiation, long wave radiation and monthly (max and min) air temperature, average relative humidity at Cox's Bazar is used for atmospheric conditions.

Boundary

Monthly average temperature data of Cox's Bazar is used as the downstream boundary temperature dispersion model and the yearly average temperature of Matamuhuri River data is used as the upstream boundary as like a hydrodynamic model.

Sources

The outfall is considered considering the following major characteristics of the cooling water.

Temperature of Sources: Different scenarios have been developed for sources temperature based on different season and uses of power plant. Source temperature is described Table 3-3.

Model Output

Three output types (Surface Elevation, Total water depth, Velocity and CFL number, temperature) were specified as an out output of the model. Model result will be generated as a 3D and 2D ('dfsu' is the software file extension name for the MIKE model developed for this project).

4.7 Hydrodynamic Model Simulation

This study model has been simulated for different scenarios. All scenarios are given in Table 4-2. Two scenarios have three sub scenarios except calibration scenarios.

Table 4-2: Calibration, validation, and different scenarios list for this study.

Simulation Name	Item	Temperature Rise (℃)	Ambient Temperature (℃)	Period
Calibration	Water Level	Atmospheric	Monthly Average Water Temperature	01 Jan to 02 Mar 2022
Calibration	Temperature	Atmospheric	Monthly Average Water Temperature	12 Dec to 15 Dec 2022
Scenario-1	Monsoon High tide and low tide	5	28.5	01 July to 30 August 2022

Simulation Name	Item	Temperature Rise (℃)	Ambient Temperature (℃)	Period
Scenario-2	Dry season low tide	5	26.3	1 January to 28 Feb 2022

4.7.1 Model Calibration and Validation

The developed model has been simulated from 1st Jan 2022 to 2nd March 2022 for calibration. Lemshikhali is only water level station near project area (almost 7 kilometers away in Figure 3-1). Water level variation is insignificant, average 10 cm. Above this reason, Lemshikhali water level is used for calibration the model. Figure 4-9 shows the good agreement between model simulated and observed water level of Lemishikhali.

Further this calibrated model has been simulated from 12th December to 15th December 2022 for temperature calibration. There is only one set of temperature data available across the Kutubdia Channel measured on 13th December 2022. Figure 4-10 shows calibration plot and temperature dispersion vertically in Figure 4-11.

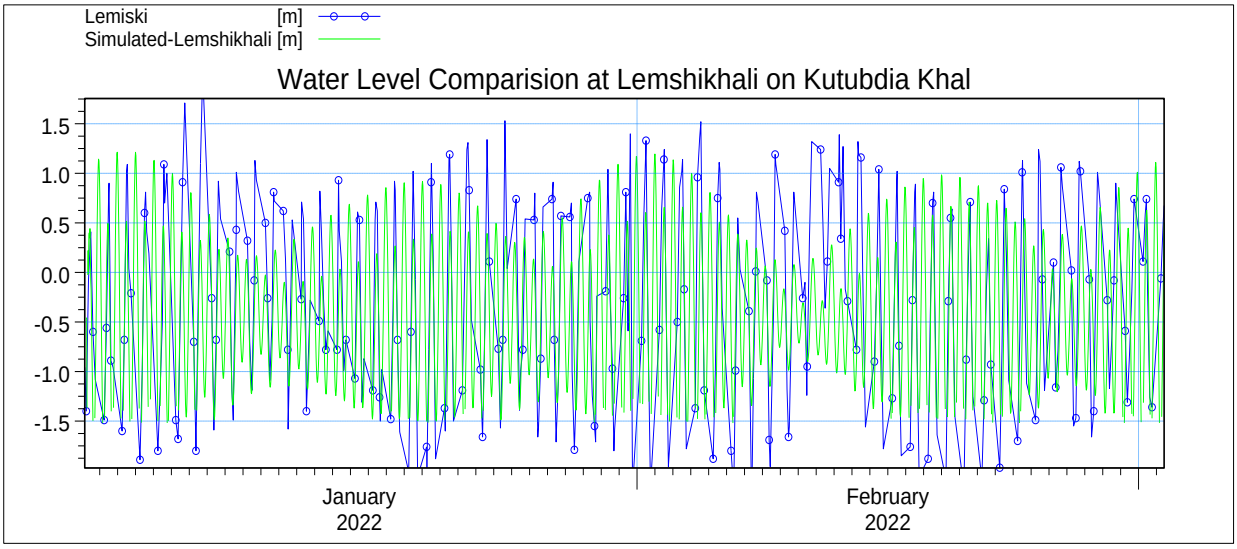


Figure 4-9: Water level comparison in between model and observed data at Lemshikhali canal and Kutbdia Channel

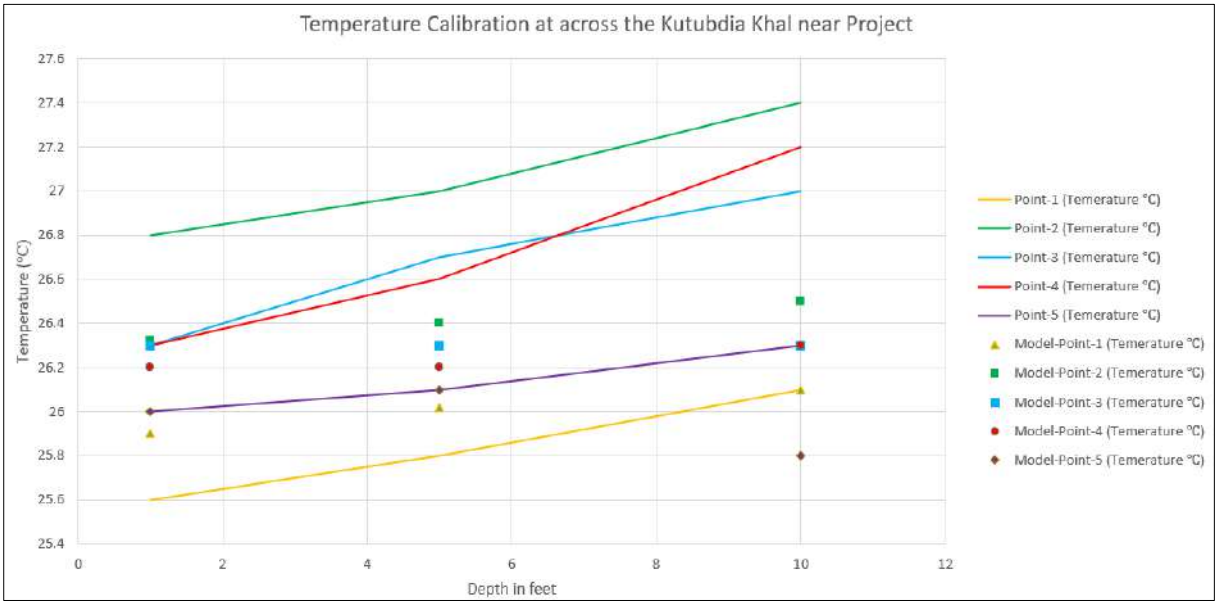


Figure 4-10: Water temperature comparison between observed and model at different locations

From the below Figure 4-11, it has been shown that the temperature vertical profile at that location (Lat: 21°46'3.84"N, long: 91°52'59.73"E). This measured point is referred to as the Figure 3-2. This temperature profile shows the vertical profile of the temperature variation as marked with different color ramping ranges from 25.98°C to above 26.33°C. At the shoreline temperature ranges from 25-26°C (±0.1) and at the middle of the cross-section temperature ranges 26.2-26.4°C (approximately). This measurement has been done in the month of December 2022.

Temperature data of summer season has been collected as mentioned above in the sub-chapter 3.3 and calibrated for the model and input in the dispersion model as ambient conditions.

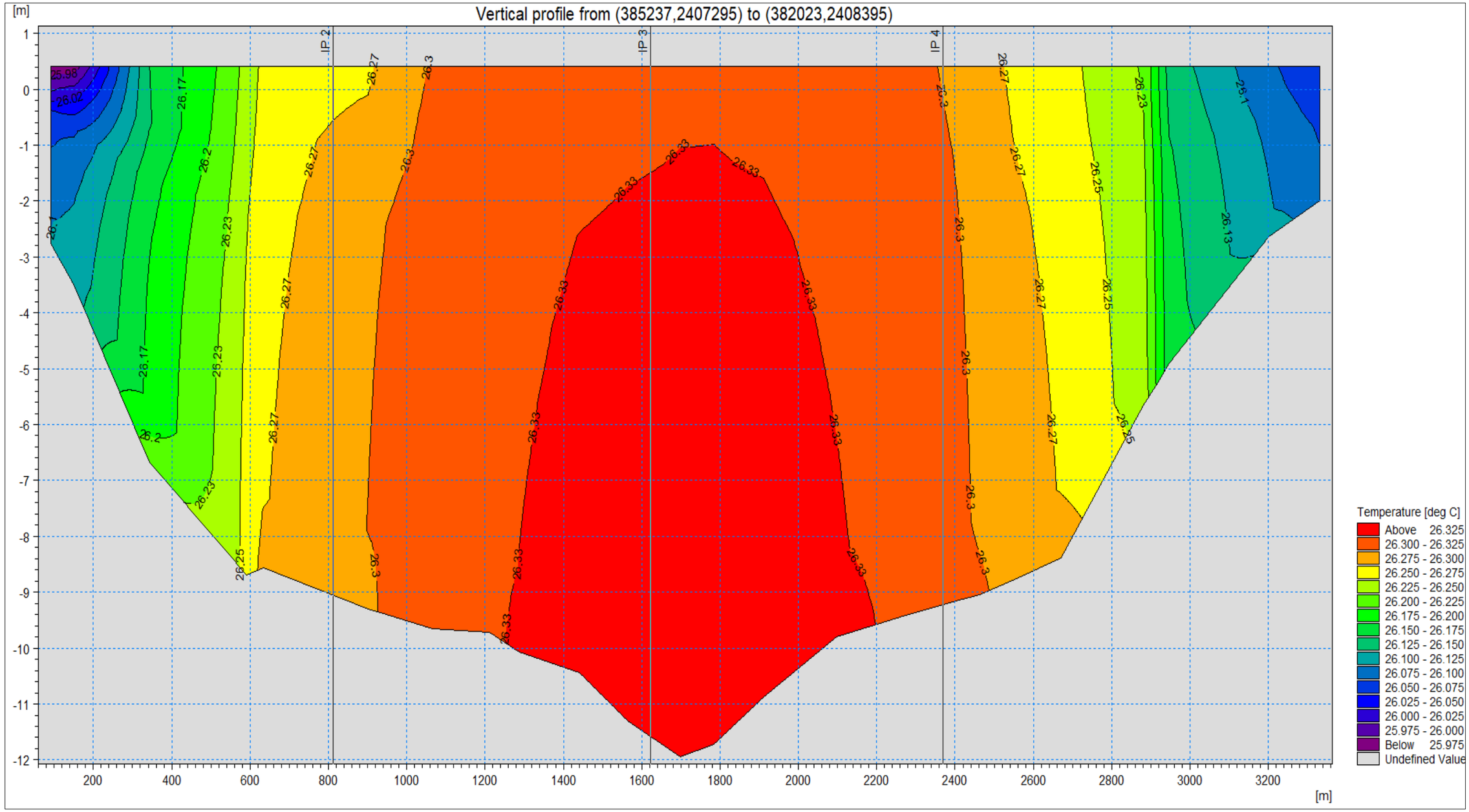


Figure 4-11: Vertical temperature in Kutubdia Channel in December

5 RESULT FROM THE MODEL SIMULATION

Heat dispersion modelling has been done to simulate the different seasons temperature modules. Both the dry (winter) season and monsoon (summer) season conditions have been considered for this model along with the tidal and non-tidal conditions. All the seasonal and tidal effects have been integrated to run the simulation model for different temperatures like the temperature rise of 5°C from the ambient temperature. The horizontal and vertical temperature profiles have been shown as below figures and temperature rise from the ambient has been depicted below.

5.1 Scenario – 1 (5°C Temperature rise in Monsoon High Tide (Summer Season)

The 5-degree centigrade rise of temperature from the ambient temperature (28.5℃) at the outfall location is simulated in this scenario. The temperature distribution in different direction during high tide on 17 August 2022 (Maximum) is shown in **Figure 5-1** and **Figure 5-2**. The maximum temperature rises at 50m away towards North direction from outfall on that day is 31.19℃. **Table 5-1** shows that the temperature has been dropped down less than 1℃ within 500 meters at north direction during high tide in summer season. At north direction, 0.98℃- 2.69℃ temperature will be varied within 500 meters whereas insignificant temperatures will disperse towards south and west direction during high tide in summer season. The rise of temperature distribution towards West, South and North directions from the outfall are shown in **Table 5-1**.

Table 5-1: Summary of the Temperature Rise Distribution at different direction during High Tide in Summer Season

Distance from Outfall (m)	Towards North Direction	Towards South Direction	Towards West Direction
50 m away from outfall	2.69	0.55	1.05
100m away from outfall	2.02	0.55	0.58
200m away from outfall	1.47	0.55	0.54
300m away from outfall	1.23	0.55	0.54
400m away from outfall	1.1	0.55	0.53
500 m away from outfall	0.98	0.55	0.52
600m away from outfall	0.95	0.55	0.52
700 m away from outfall	0.90	0.55	0.51
800m away from outfall	0.85	0.55	0.50
900 m away from outfall	0.81	0.55	0.50
1000 m away from outfall	0.72	0.55	0.49
1500 m away from outfall	0.60	0.55	0.48
2000 m away from outfall	0.45	0.46	0.42
2500 m away from outfall	0.43	0.37	0.34
3500 m away from outfall	0.43	0.25	0.22

From the above table, the maximum 2.69℃ temperature rise has been found at 50 m north direction from the outfall location. **Table 5-1** shows that the temperature has been dropped down less than 1℃ within 500 meters at north direction during high tide in summer season. At north direction, 0.98℃- 2.69℃ temperature will be varied within 500 meters whereas insignificant temperatures will disperse towards south and west direction during high tide in summer season.

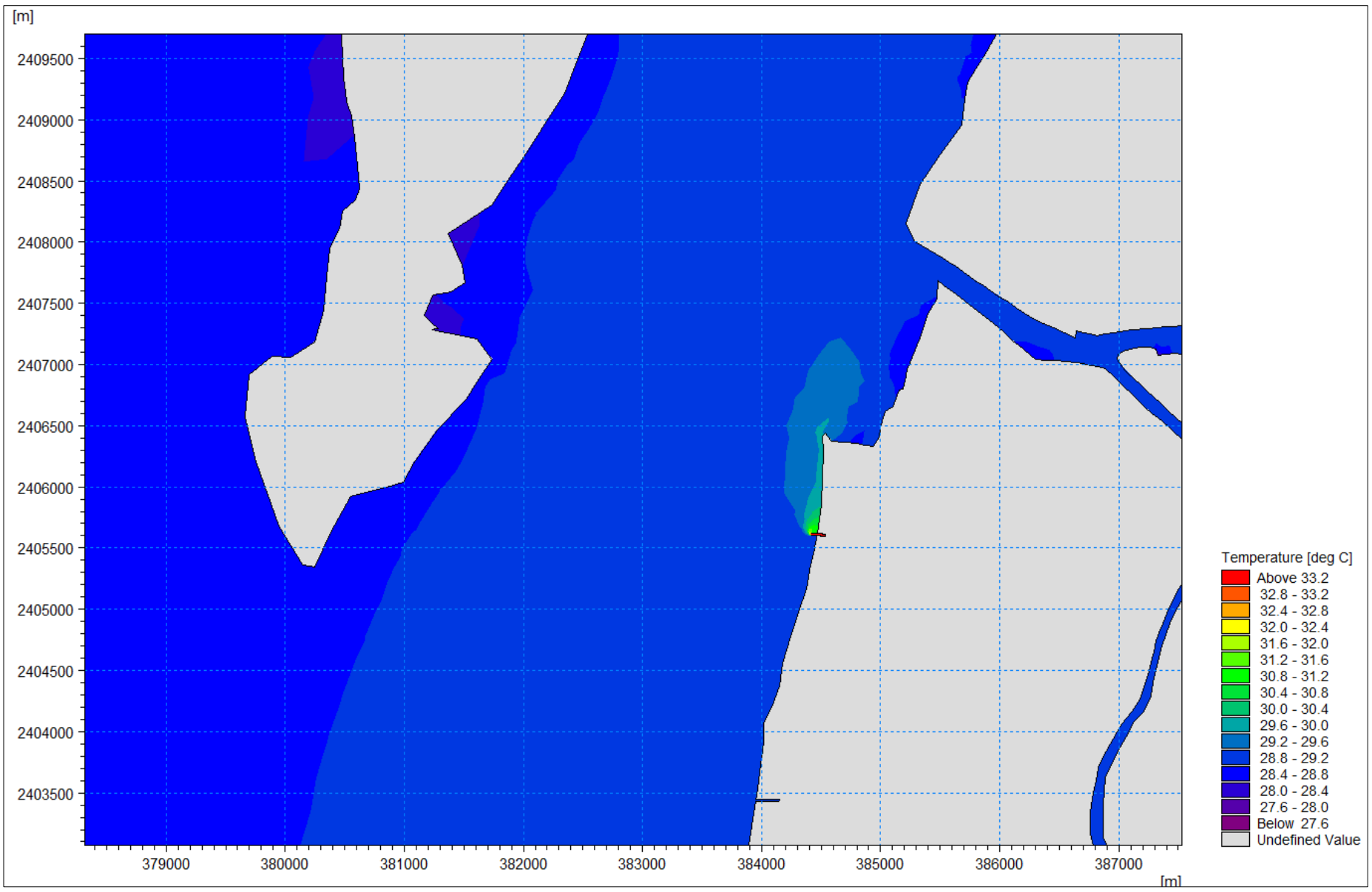


Figure 5-1: Maximum Horizontal Temperature Distributions during High Tide in Summer Season

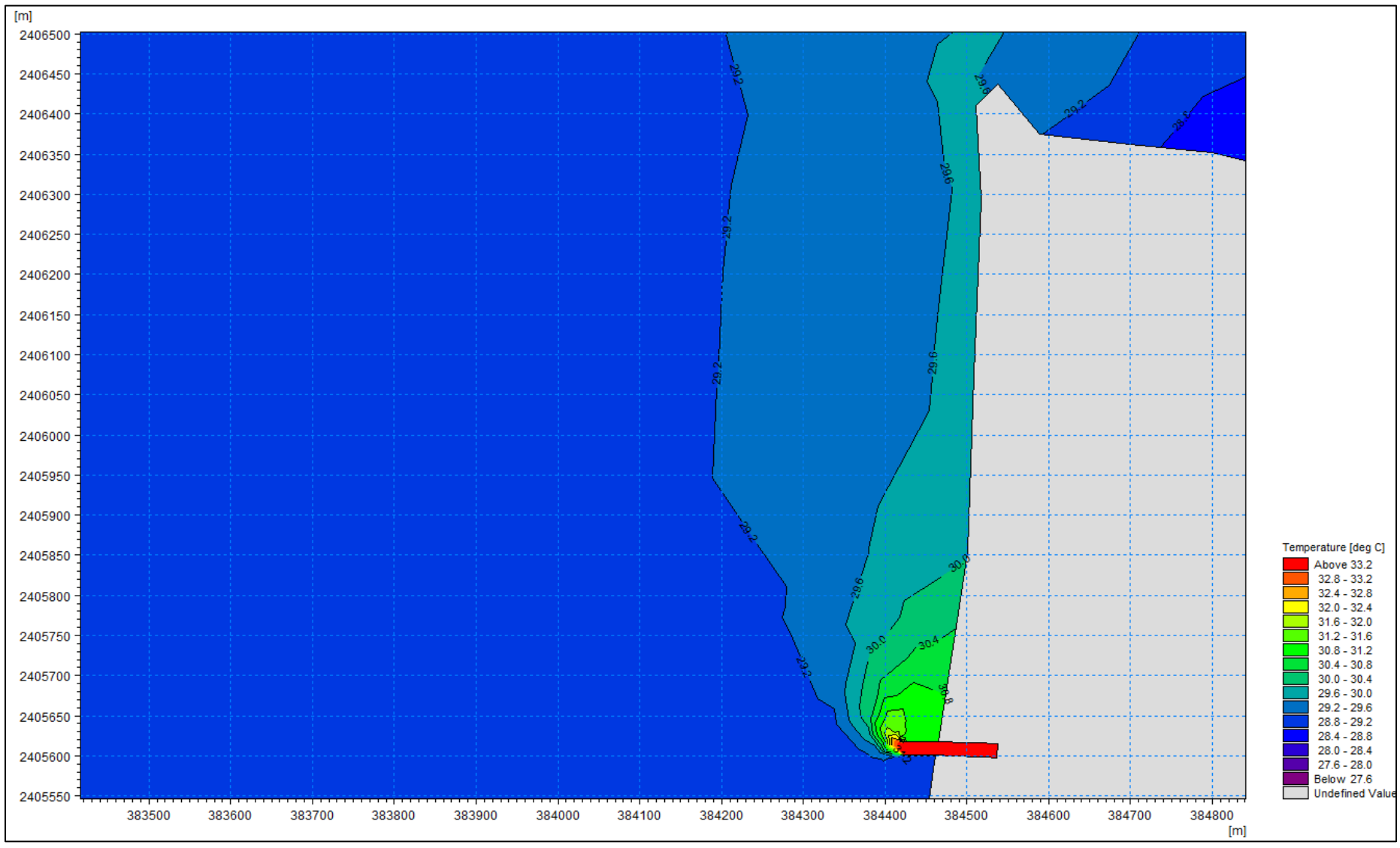


Figure 5-2: Maximum Horizontal Temperature Distributions Contour Line during High Tide in Summer Season

5.2 Scenario – 2 (5°C Temperature Rise in Low tide of Monsoon (Summer Season)

The 5-degree centigrade rise of temperature from the ambient temperature (28.5℃) at the outfall location is simulated in this scenario. The temperature distribution in different direction during low tide on 17 August 2022 (Maximum) is shown in **Figure 5-3** and **Error! Reference source not found.**. The maximum temperature rises at 50m away toward North direction from outfall on that day is 31.35℃. The temperature will be dropped down less than 1℃ after 500 meters at south direction during low tide in summer season. The temperature will be dropped less than 1℃ at 200 meter in west direction whereas insignificant temperature will be dispersed to the north direction. Highest temperature will be varied within 500 meters towards south direction in a range of 0.97℃- 2.85℃. It is evident that during low tide temperature will be raised higher than high tide. The Rise of temperature distribution towards west, south and North directions from the outfall are shown in **Table 5-2**.

Table 5-2: Summary of the Temperature Rise Distribution at different direction during Low Tide in Summer Season

Distance from Outfall (m)	Towards North Direction	Towards South Direction	Towards West Direction
50 m away from outfall	0.67	2.85	2.55
100m away from outfall	0.59	2.78	2.11
200m away from outfall	0.56	1.97	0.68
300m away from outfall	0.53	1.44	0.57
400m away from outfall	0.51	1.05	0.57
500 m away from outfall	0.5	0.97	0.56
600m away from outfall	0.51	0.85	0.56
700 m away from outfall	0.51	0.81	0.56
800m away from outfall	0.51	0.78	0.56
900 m away from outfall	0.53	0.77	0.56
1000 m away from outfall	0.52	0.72	0.55
1500 m away from outfall	0.55	0.71	0.53
2000 m away from outfall	0.51	0.73	0.49
2500 m away from outfall	0.48	0.67	0.45
3500 m away from outfall	0.48	0.47	0.39

From the above table, it has been shown that the maximum temperature will rise 2.85°C in the south direction, which is 50m away from the outfall location. After 500m away from the outfall location, max temperature rise is very minimal and less than 1 degree centigrade.

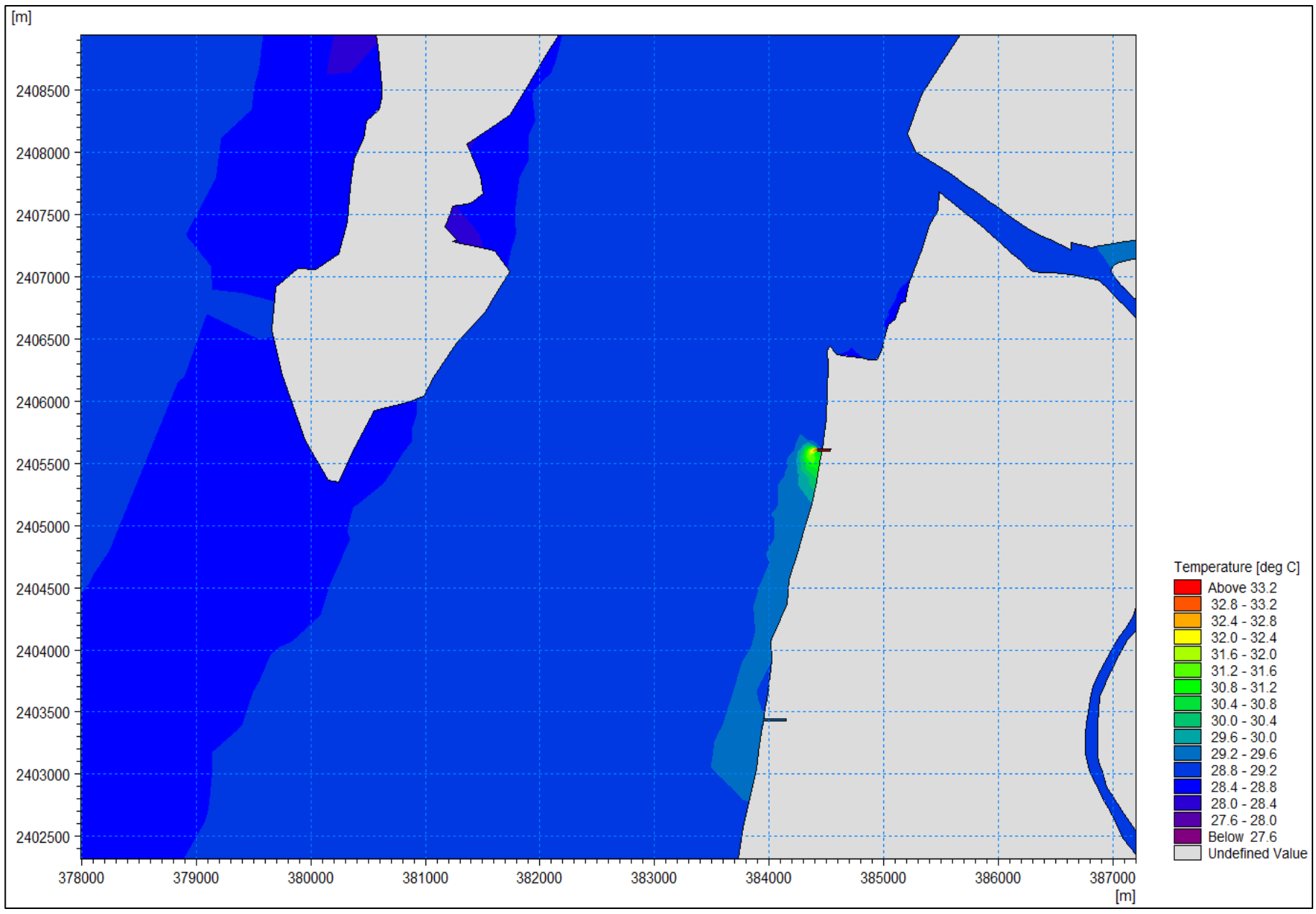


Figure 5-3: Maximum horizontal Temperature Distributions during Low Tide in Summer Season

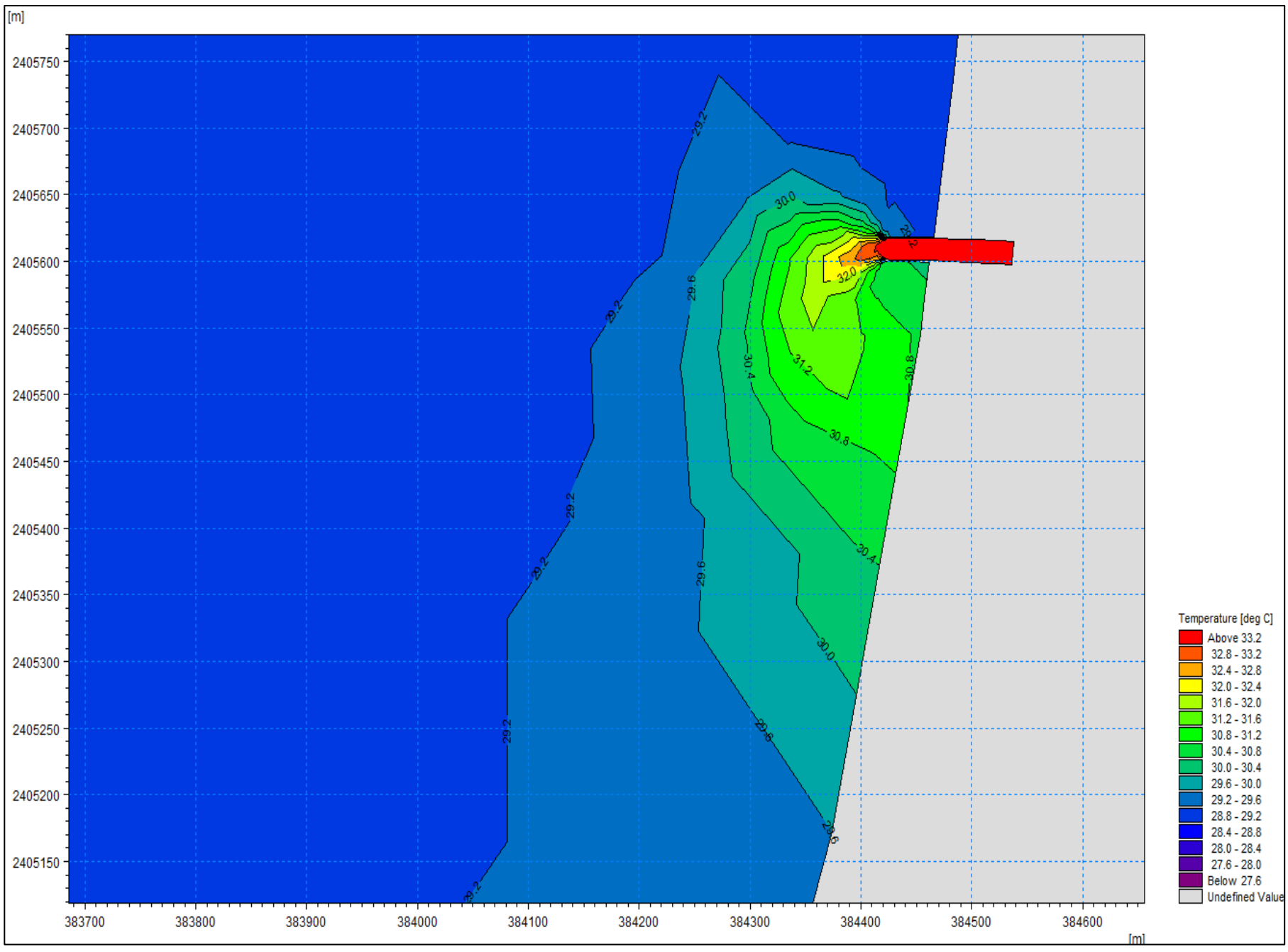


Figure 5-4: Maximum Horizontal Temperature Distributions Contour Line during Low Tide in Summer Season

5.3 Scenario – 3 (5 °C Temperature Rise in Dry Season High Tide)

The 5-degree centigrade rise of temperature from the ambient temperature (26.3℃) at the outfall location is simulated in this scenario. The maximum temperature rises at 50 m away towards north direction has been found from outfall location as 29.07℃ which is 2.77℃ higher than the ambient temperature. **Table 5-3** shows that the temperature will be dropped down less than 2℃ after 100 m and 1℃ after 500 meters during high tide in winter season. The maximum temperature will be dispersed at 500 m towards north direction in the range of 0.99℃- 2.77℃. The insignificant temperature will be raised towards south and west directions during low tide in winter season. The temperature dispersion in different direction during high tide on 13 December 2022 (Maximum) is shown in **Figure 5-5** and Figure 5-6. The maximum temperature rises at 50m away toward North direction from outfall on that day is 29.07℃. The rise of temperature distribution towards west, south and North directions from the outfall are shown in **Table 5-3**.

Table 5-3: Summary of the Temperature Rise Distribution at different direction during High Tide in Dry Season

Distance from Outfall (m)	Towards North Direction	Towards South Direction	Towards West Direction
50 m away from outfall	2.77	0.64	1.4
100m away from outfall	2.25	0.63	0.7
200m away from outfall	1.69	0.62	0.57
300m away from outfall	1.37	0.61	0.53
400m away from outfall	1.12	0.61	0.67
500 m away from outfall	0.99	0.61	0.46
600m away from outfall	0.96	0.6	0.41
700 m away from outfall	0.92	0.6	0.38
800m away from outfall	0.86	0.59	0.35
900 m away from outfall	0.81	0.59	0.31
1000 m away from outfall	0.75	0.58	0.29
1500 m away from outfall	0.51	0.56	0.23
2000 m away from outfall	0.28	0.32	0.21
2500 m away from outfall	0.22	0.19	0.19
3500 m away from outfall	0.15	0.12	0.11

From the above table, it has been shown that the maximum temperature will rise 2.77°C in the north direction, which is 50m away from the outfall location. After 500m away from the outfall location, the max temperature rise is 0.99 degree centigrade in the north direction.

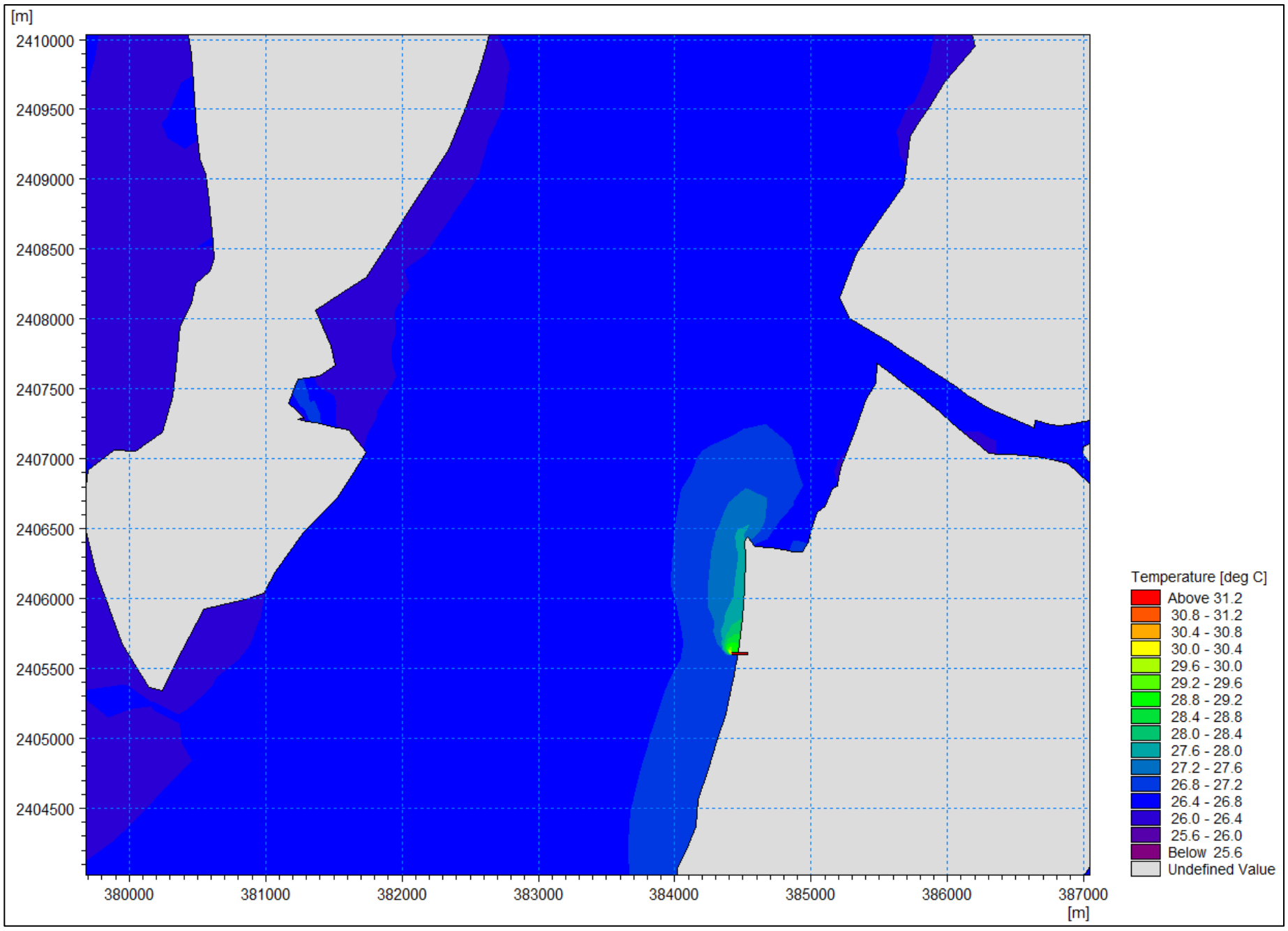


Figure 5-5: Maximum Horizontal Temperature Distributions during High Tide in Dry Season

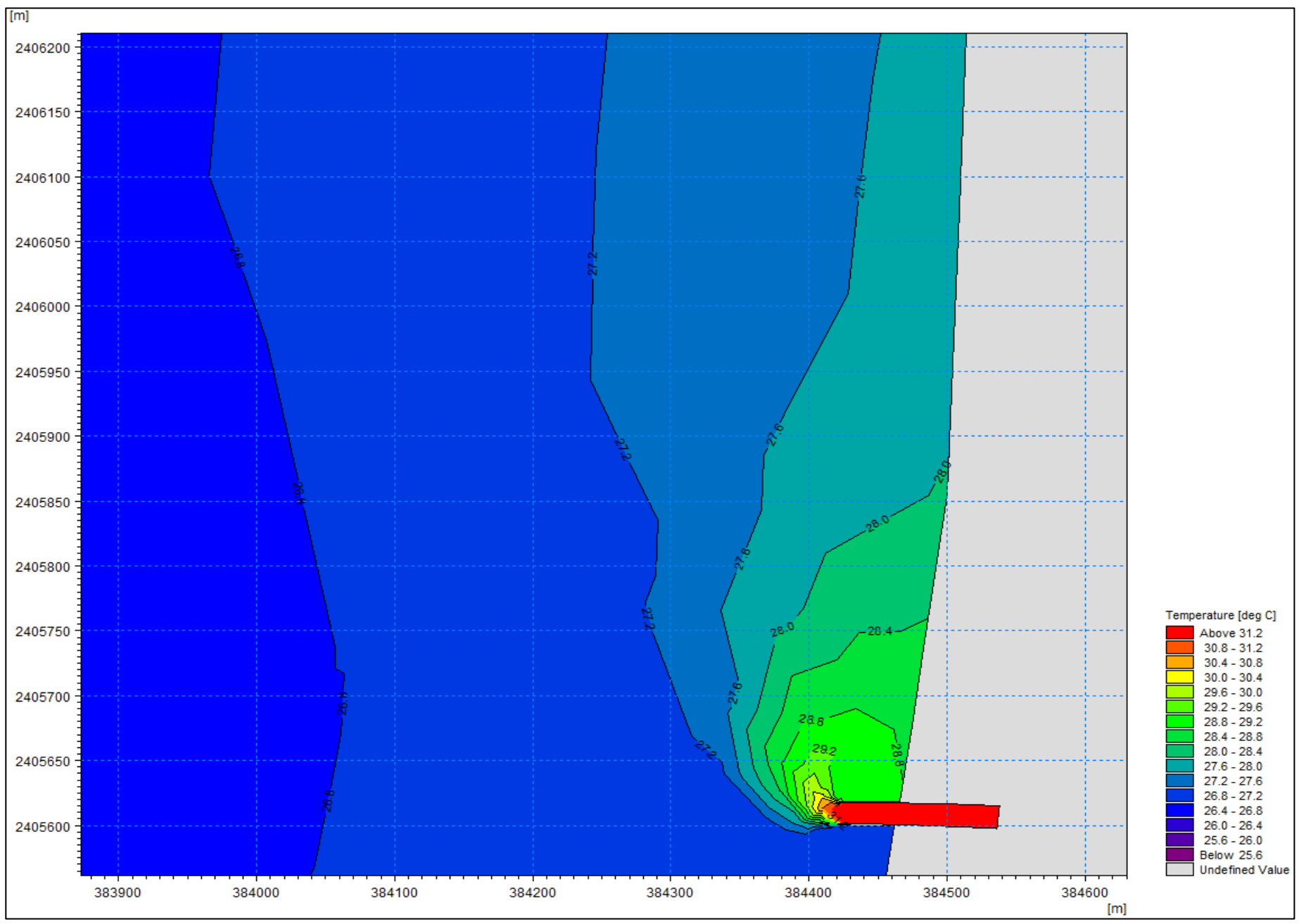


Figure 5-6: Maximum Horizontal Temperature Distributions Contour Line during High Tide in Dry Season

5.4 Scenario – 4 (5°C Rise of Temperature in Low tide Dry season)

The 5-degree centigrade rise of temperature from the ambient temperature (26.3℃) at the outfall location is simulated in this scenario. The temperature dispersion in different direction during high tide on 13 December 2022 (Maximum) is shown in **Figure 5-7** and **Figure 5-8**. The maximum temperature rises at 50 m away towards north direction has been found from outfall location as 29.07℃ which is 2.77℃ higher than the ambient temperature. **Table 5-4** shows that the temperature will be dropped down less than 2℃ after 100 m and 1℃ after 500 meters during high tide in winter season. The maximum temperature will be dispersed at 500 m towards north direction in the range of 0.99℃- 2.77℃. The insignificant temperature will be raised towards south and west directions during low tide in winter season. The rise of temperature distribution towards west, south and North directions from the outfall are shown in **Table 5-4**.

Table 5-4: Summary of the Temperature Rise Distribution at different direction during Low Tide in Dry Season

Distance from Outfall (m)	Towards North Direction	Towards South Direction	Towards West Direction
50 m away from outfall	0.48	2.75	2.03
100m away from outfall	0.42	2.37	0.64
200m away from outfall	0.38	1.55	0.37
300m away from outfall	0.37	1.25	0.36
400m away from outfall	0.36	0.93	0.33
500 m away from outfall	0.36	0.83	0.31
600m away from outfall	0.36	0.77	0.29
700 m away from outfall	0.36	0.71	0.26
800m away from outfall	0.36	0.67	0.24
900 m away from outfall	0.35	0.64	0.23
1000 m away from outfall	0.32	0.53	0.2
1500 m away from outfall	0.25	0.31	0.13
2000 m away from outfall	0.21	0.09	0.07
2500 m away from outfall	0.27	0.07	0.03
3500 m away from outfall	0.26	0.04	0

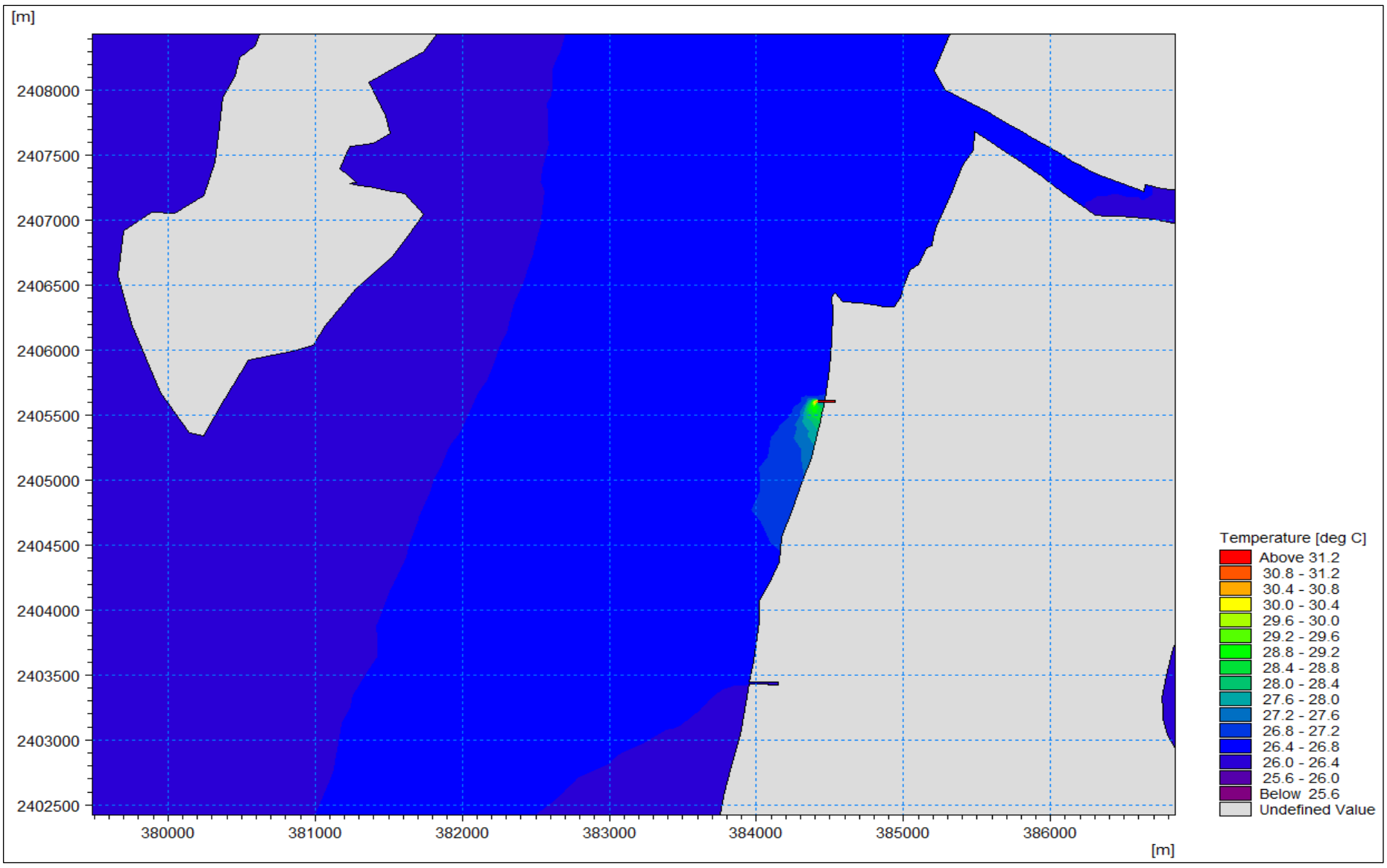


Figure 5-7: Maximum Horizontal Temperature Distributions during High Tide in Dry Season

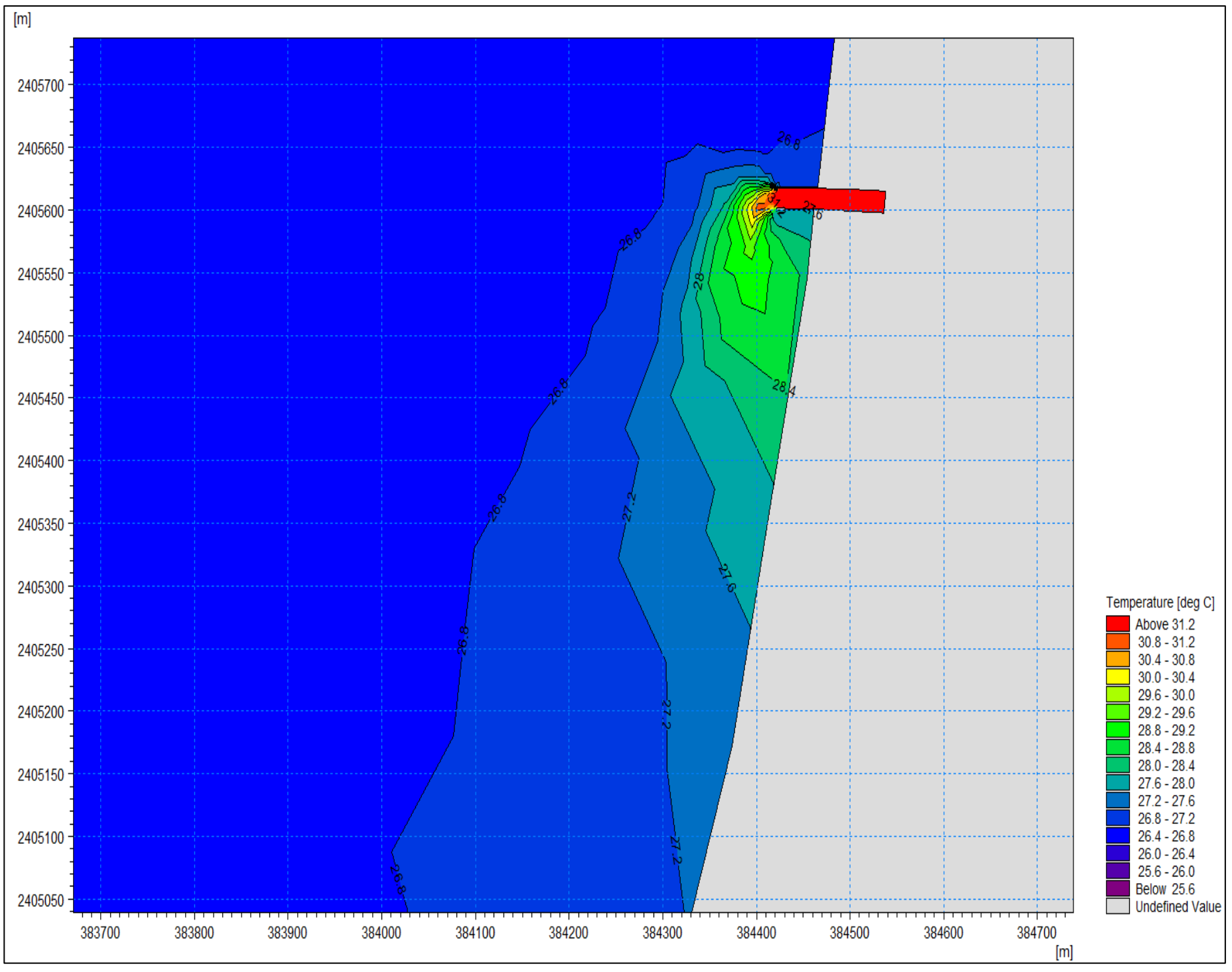


Figure 5-8: Maximum Horizontal Temperature Distributions Contour Line during Low Tide in Dry Season

6 CONCLUSION

Four scenarios have been developed considering two seasons (dry and monsoon) and tide (low and high). Each scenario has been run for 5℃ temperatures rise from ambient temperature. Considering all the scenarios, the following findings are given below:

1. Maximum temperature rise is found 2.85℃ from ambient temperature (28.5) within 50m towards south direction from the outlet point during low tide in summer season.
2. Temperature will be dropped less than 2°C within 200 meters whereas less than 1°C within 500 meters.
3. Temperature rise in monsoon season is more than dry scenario but both scenarios show no significant temperature rise after 500m away from the outlet point.
4. The mixing zone can be defined 500 m from the outfall location.
5. The warm water will disperse towards the north direction during high tide and south direction during low tide. Insignificant water temperature will rise towards west direction during both seasons.
6. It is found that the highest temperature at 50 m distance will be less than 10% of ambient water temperature.

7 REFERENCES

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4. Payandeh A, Zaker NH, Niksokhan MH (2015) Numerical modeling of pollutant load accumulation in the Musa estuary, Persian Gulf. Environ J Earth Sci 73(1):185–196
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Appendix J: Attendance Sheet of FGD and PCM

Appendix J-1: Attendance Sheet of FGD

FGD with Local Fishermen

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: পূর্ব পাড়ে ২নং ওয়ার্ড, মাতাবাড়ি, মাহেশখালী, কক্সবাজার

Date and Time: 16/10/22, 4:30 pm

List of Participants

SL#	Name	Occupation	Address/No.	Signature
1.	আঃ কাদের	জেলে	01853-374497	
2.	আবাসুদ হোসেন	"	01818-155336	
3.	জাহেদ আলম	"	01834-597524	
4.	ওমর ফারুক	"	01843-814969	
5.	শরিফুল	"	01845-680140	
6.	বাদল মিয়া	"	01875-835196	
7.	আবুল হোসেন	"	01835-899130	
8.	ইমরান	"	01836-464932	
9.	জোসিম বাবু	"	01823-809017	
10.	আঃ হক	"	0187-882796	
11.				
12.				
13.				

FGD with Local Saltpan Workers

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: Ward no. 2. Bandi Shikder para, Matarbari.

Date and Time: 16/10/2022,

List of Participants

SL#	Name	Occupation	Address/Mob. No.	Signature
1.	[illegible]	লবণচাষী	01853-744968	[illegible]
2.	[illegible]	"	01820-119949	
3.	[illegible]	"	01857-072755	[illegible]
4.	[illegible]	"	01876-885048	[illegible]
5.	[illegible]	"	0130-083326	
6.	[illegible]	"	01852-256171	[illegible]
7.	[illegible]	"	01859-970510	[illegible]
8.				
9.				
10.				
11.				
12.				
13.				

FGD with Local Salt/Shrimp Cultivators

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: Bamiaghata, 2 no. Union, Mohesh Khali, Cox's Bazar.

Date and Time: 17/10/22

List of Participants

SL#	Name	Occupation	Address / Mob No.	Signature
1.	নূর মোহাম্মদ	লবন চাষী	01864-919576	
2.	আকবর আলী	চিংড়ী চাষী	01850-115174	
3.	আজম উদ্দিন	ব্যবসা	01879-450291	
4.	মো: আবু	লবন চাষী	017585-34357	
5.	নাজিম উদ্দিন	চিংড়ী চাষী	01880-646483	
6.	আবুল হাকিম	লবন চাষী	01817-620796	
7.	এনাম মিয়া	ব্যবসায়ী	01882-787468	
8.				
9.				
10.				
11.				
12.				
13.				

FGD with Local Drivers

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: 2no. Ward, Bandi Shikdar Para, Maheshkhali, Cox's Bazar.

Date and Time: 17/10/22

List of Participants				
SL#	Name	Occupation	Address	Signature
1.	মোঃ আকরাম উদ্দিন	Auto driver	01881-325205	
2.	মোঃ রফিক মিয়া	"	0187-749901	
3.	মোঃ জুবায়ের আলম	"	01789-903025	
4.	নুরুল হক	"	01875-804267	
5.	মাহমুদ মিয়া	"	01884-768605	
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

FGD with Local Women-1

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: বানিয়াঘাটা

Date and Time: 17. 10. 2022 → 3:30

List of Participants

SL#	Name	Occupation	Address	Signature
1.	হাসিনা বেগম	House wife	01816-010846	
2.	জুবর নাহার	"	01816-397234	
3.	ফুলু বেগম	"	01889-446035	
4.	আরেফা বেগম	"		
5.	বানু আরা বেগম	"	01837-022317	
6.	[illegible]	"		
7.	কমরুন্নাহার			
8.	আফিজা বেগম	"	01798-556686	
9.	রোজিনা বেগম	"	01849-513034	
10.	[illegible]	"	01830-998304	
11.	ছালেমা বেগম	"	01871395636	
12.	মোমেনা বেগম	"	01824-428534	
13.				

FGD with Local Women-2

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: 2 no. Ward, Uttar Shikder Para, Matarbari, Cox's Bazar

Date and Time: 18/10/2022, 11:00 am.

List of Participants				
SL#	**Name**	**Occupation**	**Address**	**Signature**
1.	আফিদা আক্তার	House wife	01832-476837	আফিদা আক্তার
2.	জিয়ান বেগম	"	01	সজিব
3.	নূর বেগম	"		
4.	রাবেয়া বসরী	"		দারিদ্র্য
5.	মনোয়ারা বেগম	"	01860-620610	মনুষ্যত্ব
6.	বেহানা	"		বোধনা
7.	শাহীন আক্তার	"	018 54 05 14 76	শারমিন আক্তার
8.				
9.				
10.				
11.				
12.				
13.				

FGD with Local Businessmen

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: Uttar Shikdarpara, Matarbari, Cox's Bazar

Date and Time: 18/10/2022, 11:45 am

List of Participants				
SL#	Name	Occupation	Address/Mob. No	Signature
1.	[illegible]	ব্যবসা	01710-980561	
2.	[illegible]	"	01829-177287	
3.	[illegible]	"	01689-451098	
4.	[illegible]	"		
5.	[illegible]	"		
6.	[illegible]	"	01	
7.	[illegible]	"	01879-822754	
8.				
9.				
10.				
11.				
12.				
13.				

FGD with Local Community-1

IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

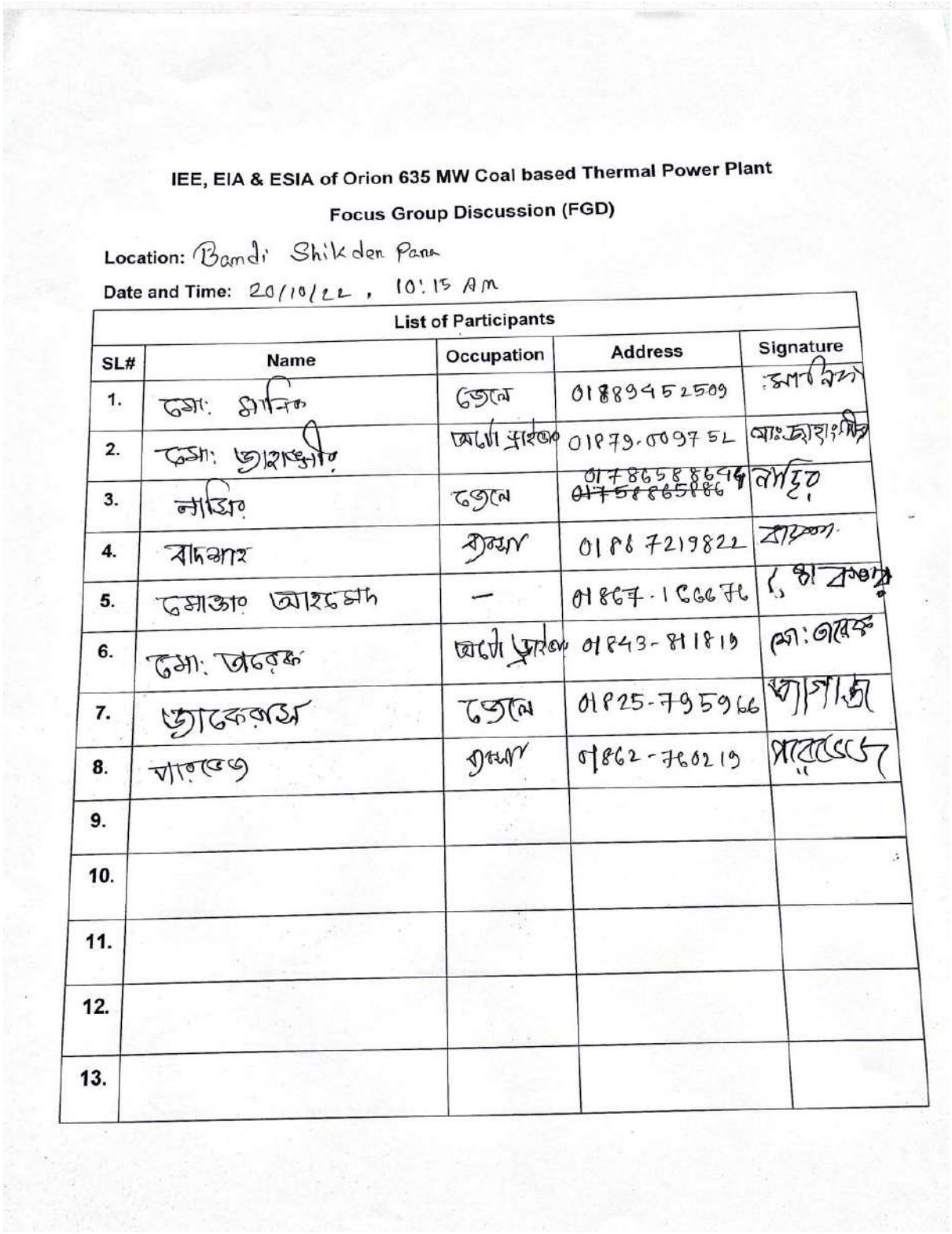
Location: উত্তর শিকদারপাড়া, মাতারবাড়ি, কক্সবাজার

Date and Time: ২৮/১০/২২, সময় ১০:০০

List of Participants

SL#	Name	Occupation	Address/Mob. No.	Signature
1.	আবুল বাশার	ব্যবসা	0182-2258999	
2.	ভাসানি হোসেন	"	01875-389464	
3.	আনোয়ার হোসেন	ব্যবসা	01839-553214	
4.	মিনু মিঞা	ব্যবসা	01867-884312	
5.	মো: আহমদ	"	01874-912871	
6.	মো: হারুন	"	01889-446157	
7.	মো: মনসুর	"	01865-582849	
8.	জাকের হোসেন	"	01880-327028	
9.	মো: মোস্তফা আলম	ব্যবসা	01881-60096	
10.	মো: নাসির	"	01875-528424	
11.	মো: আবদান	"	01893-611876	
12.				
13.				

FGD with Local Community-2



IEE, EIA & ESIA of Orion 635 MW Coal based Thermal Power Plant

Focus Group Discussion (FGD)

Location: Bamdi Shikder Para

Date and Time: 20/10/22, 10:15 AM

List of Participants

SL#	Name	Occupation	Address	Signature
1.	মো: [illegible]	ভেনে	01889452509	[illegible]
2.	মো: [illegible]	[illegible]	01879-009752	[illegible]
3.	[illegible]	ভেনে	01758865886	[illegible]
4.	[illegible]	[illegible]	0181 7219822	[illegible]
5.	[illegible]	—	01867-166676	[illegible]
6.	মো: [illegible]	[illegible]	01843-811819	[illegible]
7.	[illegible]	ভেনে	01825-795966	[illegible]
8.	[illegible]	[illegible]	01862-760219	[illegible]
9.				
10.				
11.				
12.				
13.				

Appendix J-2: Attendance Sheet of PCM

পরিবেশগত প্রভাব (ইআইএ) মূল্যায়নের উপর মতবিনিময় সভা

প্রকল্পের নামঃ ৬৩৫ মেগাওয়াট কয়লা ভিত্তিক তাপবিদ্যুৎ কেন্দ্র, মাতারবাড়ী, মহেশখালী, কক্সবাজার

No. (নং)	Name (নাম)	Occupation (পেশা)	Age (বয়স)	Mobile No (ফোন নাম্বার)
০১	আব্দুর রহিম	কৃষক	৫১	01727038820
02	[illegible]	M.U.P	৫৬	01829811425
০৩	সোলায়মান হাকিম	ব্যবসা	৫৫	01812429339
০৪	[illegible]	[illegible]	৫৫	01816706871
০৫	আবদুল খালেক	M.U.P-1	৩৮	01786650457
০৬	মো: আলাউদ্দিন	M.U.P-3	৬৪	01759039933
০৭	মো: ফরহাদ হোসেন	চাকুরী	88	01916-052367
০৮	মো: ওসমান সরোয়ার	চাকরী	৩১	01740540978
০৯	মো: সাইফুল ইসলাম	চাকুরী	৩২	01711711867
১০	শহিদুল করিম	দিনমজুর	৪৫	01878376654
১১	মো: মনির আহমদ	কৃষক	৫০	01610968690
১২	[illegible]	[illegible]	82	01730162237
১৩	সৈয়দ আহমদ কামাল	প্রকৌশলী	২৫	01866777199
১৪.	সুজয় লাহিড়ী	[illegible]	৪১	01700713869
১৫	মো: কাউচার	লেবা	৪০	01816884103
১৬	জয়নাল আবেদিন	লেবা	৫৫	01831648171
১৭	জসিম উদ্দীন	লেবার	৫০	01782126682
১৮	আতিকুর রহমান	চাকুরী	৩৫	01776-139557
১৯	[illegible]	ব্যবসায়ী	২৪	01885320666
	আবু তাহের	লেবার	৫১	01872056015
২১	নুরুল আবছার	ব্যবসা	৬৫	01829-180126
22	নুরুল ইসলাম		৬৫	01884036258
২৩	[illegible]	[illegible]	৫০	01888039110
২৪	[illegible]	কৃষক	৪৮	01816158822
২৫	[illegible]	[illegible]	৫০	[illegible]

পরিবেশগত প্রভাব (ইআইএ) মূল্যায়নের উপর মতবিনিময় সভা

প্রকল্পের নামঃ ৬৩৫ মেগাওয়াট কয়লা ভিত্তিক তাপবিদ্যুৎ কেন্দ্র, মাতারবাড়ী, মহেশখালী, কক্সবাজার

No. (নং)	Name (নাম)	Occupation (পেশা)	Age (বয়স)	Mobile No (ফোন নাম্বার)
২৬	Idris Ali	Job CARE	42	01718543631
২৭	[illegible]	ব্যবসা	৩০	01835532711
২৮	[illegible]	ব্যবসা	৪৫	01754909638
২৯	[illegible]	[illegible]	৩০	01850533931
৩০	আমির উদ্দীন	ব্যবসা	৩৫	01829492260
৩১	মোহাম্মদ	ড্রাইভার	৩০	01632194903
৩২	জাকের উল্লাহ	ব্যবসা	22	01871271425
৩৩	রুহুল কাদের	[illegible]	৩২	01823911348
৩৪	একরাম	শ্রমিক	৩০	01823971963
৩৫	[illegible]	শিক্ষক	৬৮	01815-648720
৩৬	মোঃ কামাল উদ্দীন	শ্রমিক	৪০	01882425833
৩৭	মো: জসীম উদ্দীন	ব্যবসা	29	01827069887
৩৮	মো: আইয়ুব	ব্যবসা	৩৭	01633288546
৩৯	মোঃ আমিনুল ইসলাম	ব্যবসা	35	01823864271
৪০	মোঃ সাদিক	ব্যবসা	37	01815145816
৪১	বাবুল	কৃষক	৪০	01831683326
৪২	জিয়াউদ্দীন	শিক্ষক	33	01813-200364
৪৩	মো: শহীদুল্লাহ	শ্রমিক	34	01872858840
৪৪	মো: ইসমাইল খান	শ্রমিক	34	01632757429
৪৫	মনু মিয়া	ড্রাইভার	৫০	01929006446
৪৬	আবু তাহের	ব্যবসা	৫২	01832475411
৪৭	ফজলুল করিম	কৃষক	৪০	01860296722
৪৮	হুমায়ুন কবির	লবণ চাষী	৪০	.
৪৯	আব্দুর রহমান	লবণ চাষী	৬৬	01853542261
৫০	মোহাম্মদ ইব্রাহিম	ব্যবসা	26	01640630047

পরিবেশগত প্রভাব (ইআইএ) মূল্যায়নের উপর মতবিনিময় সভা

প্রকল্পের নামঃ ৬৩৫ মেগাওয়াট কয়লা ভিত্তিক তাপবিদ্যুৎ কেন্দ্র, মাতারবাড়ী, মহেশখালী, কক্সবাজার

No. (নং)	Name (নাম)	Occupation (পেশা)	Age (বয়স)	Mobile No (ফোন নাম্বার)
০১	মোহাম্মদ [illegible]	[illegible]	২৫	01884036144
০২	মোহাম্মদ রাকিব	শ্রমিক	৪৫	01872056086
০৩	নাজিম উদ্দিন	শ্রমিক	৩৮	01887069925
০৪	নুরুল আলম	শ্রমিক	৫৫	01879469936
০৫	[illegible]	শ্রমিক	৬৫	01885999197
০৬	মোহাম্মদ [illegible]	ব্যবসায়ী	৩২	01823614615
০৭	[illegible]	শ্রমিক	৬৩	01887223596
০৮	[illegible] নুর	শ্রমিক	৫২	01882337 6846
০৯	আবিদ মোহাম্মদ [illegible]	ব্যবসায়ী	২৫	01840004446
১০	[illegible]	শ্রমিক	৬৭	01855376068
১১	[illegible]	শ্রমিক	৫৬	01829953363
১২	[illegible]	শ্রমিক	৪৭	01845528949
১৩	[illegible]	শ্রমিক	৬৫	
১৪	[illegible]	[illegible]	৪০	01882426870
১৫	মোহাম্মদ [illegible]	শ্রমিক	৬৫	01830740558
১৬	মোহাম্মদ [illegible]	ছাত্র	২০	01610948009
১৭	আনোয়ার [illegible]	শ্রমিক	৭০	
১৮	[illegible]	শ্রমিক	৩৫	01823560870
১৯	মো: [illegible]	শ্রমিক	৫৫	01884810031
২০	মো: [illegible]	শ্রমিক	৬২	01831857472
২১	[illegible]	শ্রমিক	৬২	01856[illegible]2644
২২	[illegible] উদ্দিন	শ্রমিক	৪০	01893009976
২৩	ইসমাইল হোসেন	শ্রমিক	৬৫	
২৪	নুরুল আবছার	শ্রমিক	৬১	01968-591071

পরিবেশগত প্রভাব (ইআইএ) মূল্যায়নের উপর মতবিনিময় সভা

প্রকল্পের নামঃ ৬৩৫ মেগাওয়াট কয়লা ভিত্তিক তাপবিদ্যুৎ কেন্দ্র, মাতারবাড়ী, মহেশখালী, কক্সবাজার

Attendance Sheet (উপস্থিতির তালিকা)

No. (নং)	Name (নাম)	Occupation (পেশা)	Age (বয়স)	Mobile No (ফোন নাম্বার)
①	Abu Haidor	Chairman	45	01711963310
②	Mohammad Nurun Nabi	Headteacher	45	01820-863963
③	Mehedi Islam Aneek	Engineer	33	01552 402427
4	Md. Abdur Rahman.	Director	67	01975011361
5.	Md. Rezakhan	Headteacher	58	01708557070

Appendix K: Photographs of KII, FGD and PCM

Appendix K-1: Photographs of KII and FGD

	
Consultation with **Md. Abdur Rahman Khan** Senior Upazila Fisheries Officer, Maheshkhali Upazila	Consultation with **Pulok Kanti Sarker** Station Officer, Maheshkhali Upazila
	
Consultation with **S.M Abu Haider** UP Chairman, Matarbari Union	Consultation with **Abul Kalam Azad** Bit Officer, Kalarmarchhara Bit, Maheshkhali Upazila
	
Consultation with **Zubida Akter** Sub Assistant Agriculture Officer, Maheshkhali Upazila	FGD with **Local Businessmen** Uttar Sikdar Para, Matarbari, Cox's Bazar

	
FGD with **Local Fishermen** Purba Para (Ward 2), Matarbari, Cox's Bazar	FGD with **Local Saltpan Workers** Bandi Sikdar Para (Ward 2), Matarbari, Cox's Bazar
	
FGD with **Local Salt/Shrimp Cultivators** Baniakata, Matarbari, Cox's Bazar	FGD with **Local Drivers** Bandi Sikdar Para (Ward 2), Matarbari, Cox's Bazar
	
FGD with **Local Women-1** Baniakata, Matarbari, Cox's Bazar	FGD with **Local Women-2** Uttar Sikdar Para (Ward 2), Matarbari, Cox's Bazar

	
FGD with **Local Community-1** Uttar Sikdar Para, Matarbari, Cox's Bazar	FGD with **Local Community-2** Bandi Sikdar Para, Matarbari, Cox's Bazar

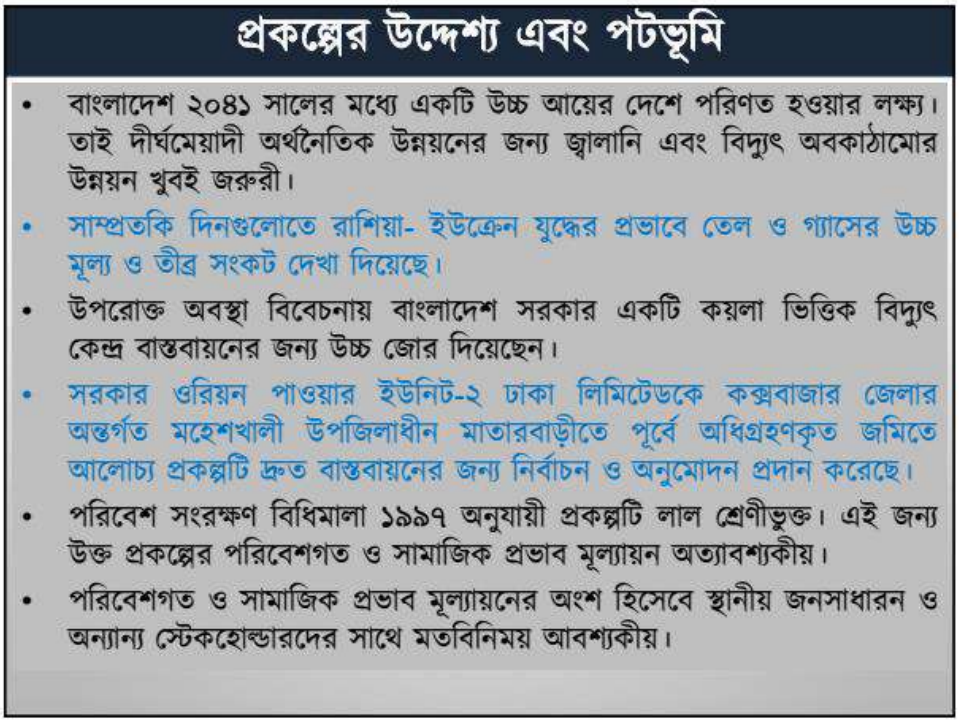
Appendix K-2: Photographs of PCM

	
Introductory Speech by Mr. Mehedi Hasan Anik Vice President, Orion Power Unit-2 Dhaka Limited	Briefing of EIA scoping by Mr. Tauhidul Hasan Principal Consultant, EQMS Consulting Limited
	
Views shared by Mr. Md. Alauddin Member, Matarbari Union Parishad	Views shared by Mr. Md. Abu Bakkar Siddik Businessman, Matarbari
	
Views shared by Mr. Abdul Khaleq Member, Matarbari Union Parishad	Views shared by Mr. Md. Rafikul Islam Assistant Teacher, Matarbari High School

	
Views shared by Mr. Abu Hayder, Chairman 1 No. Matarbari Union Parishad	Concluding speech by Mr. Abduhu Ruhulla Orion Power Unit-2 Dhaka Limited
	
Attendees of Public Consultation Meeting	Back drop of the Public Consultation Meeting

Appendix L: Presentation of 1st Public Consultation Meeting

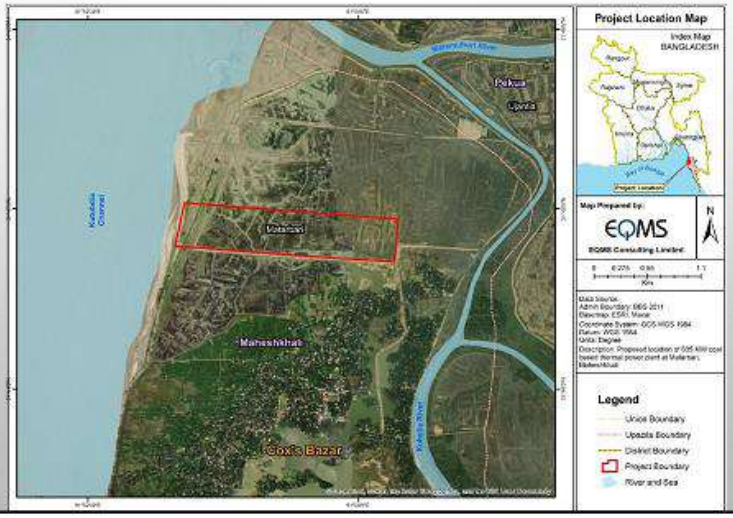
1



2

প্রকল্পের অবস্থান

প্রস্তাবিত ৬৩৫ মেগাওয়াট কয়লা ভিত্তিক তাপবিদ্যুৎ প্রকল্পটি কক্সবাজার জেলার অন্তর্গত মহেশখালী উপজিলাধীন মাতারবাড়ী ইউনিয়নে অবস্থিত। মোট জমির পরিমান = প্রায় ২২৫ একর।



3

প্রকল্পের পরিধি

- ৬৩৫ মেঃওঃ কয়লাভিত্তিক বিদ্যুৎ কেন্দ্র
- কয়লা খালাস
- ছাই এর পুকুর
- কয়লা পরিবহনের জন্য কনভেয়র বেল্ট/করিডোর
- বাঁধ এবং অভ্যন্তরীণ রাস্তা
- সংযোগ সড়ক
- সঞ্চালন লাইন নির্মাণ
- নির্মাণের সময়কালে নির্মাণের লে-ডাউন এলাকা, ফ্যাব্রিকেশন ইয়ার্ড, অস্থায়ী সাইট অফিস এবং কর্মী ক্যাম্প ইত্যাদি। ভবিষ্যতে এটি স্টোরেজ ইয়ার্ড ও সবুজায়নের জন্য ব্যবহৃত হবে।

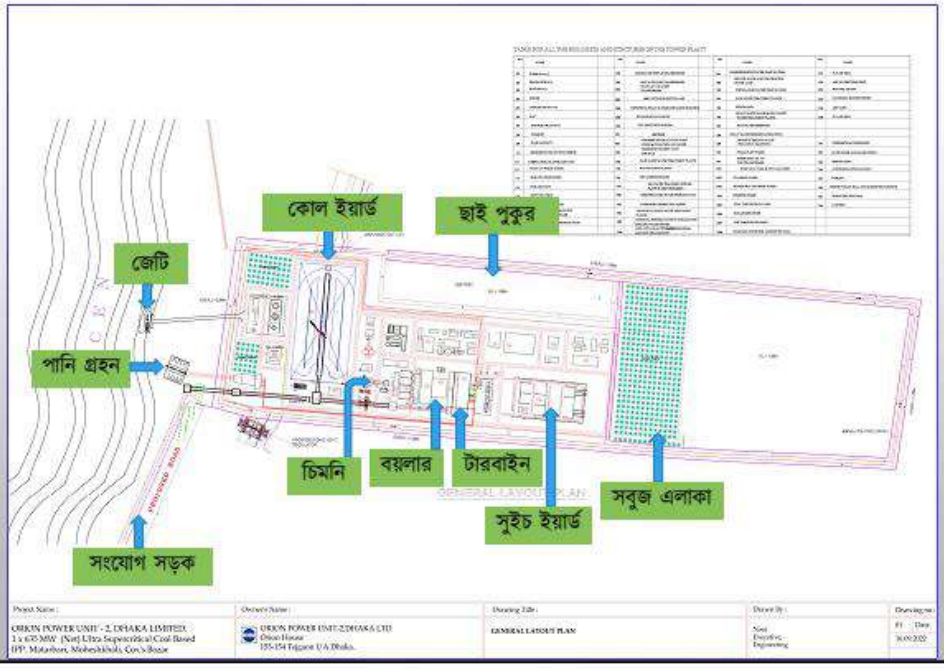
4

প্রকল্পের সংক্ষিপ্ত বিবরণ

প্রকল্পের নাম	৬৩৫ মেগাওয়াট কয়লা ভিত্তিক তাপবিদ্যুৎ কেন্দ্র, মাতারবাড়ী, মহেশখালী, কক্সবাজার"
প্রকল্পের আবস্থান	ইউনিয়ন: মাতারবাড়ী, উপজেলা: মহেশখালী, জেলা: কক্সবাজার
বিভাগ	বাংলাদেশ বিদ্যুৎ উন্নয়ন বোর্ড (বিপিডিবি)
বাস্তবায়ন ও পরিচালনায়	ওরিয়ন পাওয়ার ইউনটি-২ ঢাকা লিমিটেড
প্রকল্প ব্যয়	১১,৩৩৩.৮ কোটি টাকা
উন্নয়ন এলাকা	২২৫ একর
কয়লার উৎস	অস্ট্রেলিয়া ও ইন্দোনেশিয়া
চিমনির উচ্চতা	২২০ মিটার
বাস্তবায়ন সময়	ডিসেম্বর ২০২২ থেকে ডিসেম্বর ২০২৬ (প্রস্তাবিত)
সংরক্ষিত বন/জাতীয় উদ্যান	১০ কিঃমিঃ ভিতরে কোন সংরক্ষিত বন/জাতীয় উদ্যান নেই
ঐতিহাসিকভাবে গুরুত্বপূর্ণ স্থান/স্মৃতিস্তম্ভ	কাছাকাছি ঐতিহাসিক গুরুত্বপূর্ণ স্থান/স্মৃতিস্তম্ভ নেই

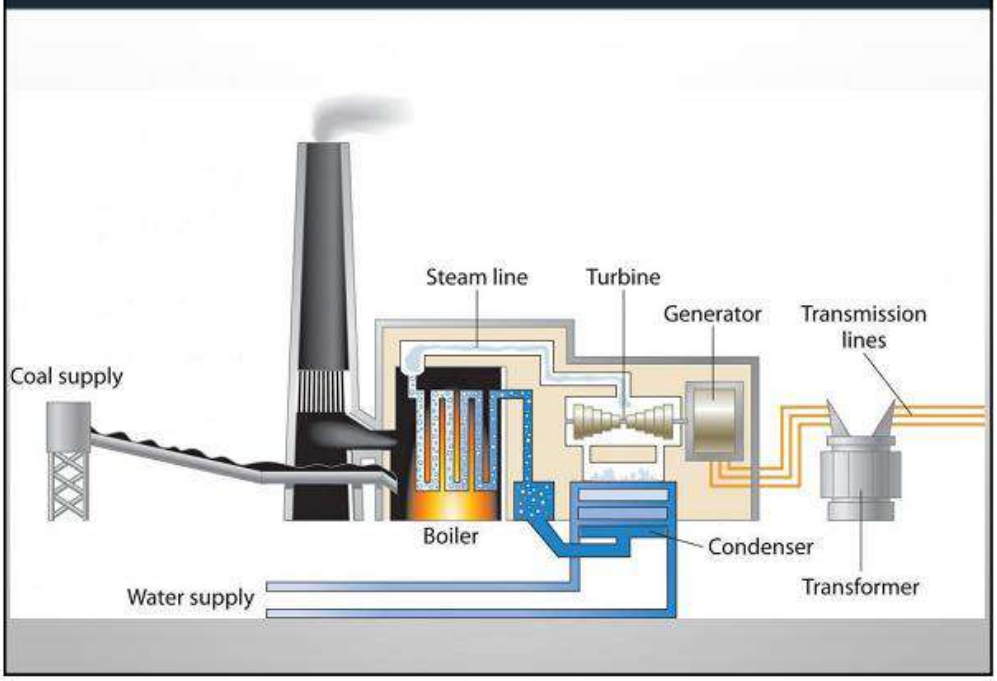
5

প্রকল্পের লে-আউট ও প্রধান অংশ



6

কয়লা ভিত্তিক তাপ বিদ্যুৎ কেন্দ্রের খসড়া চিত্র



7

সাধারণ ভূমি ব্যবহারের সারসংক্ষেপ

ভূমির ব্যবহার নমুনা	একর	বর্গ মিটার	%
বিদ্যুৎ কেন্দ্র	৫৪.১০	২১৮,৯৪৩.২৩	২৪.০৪
কোল ইয়ার্ড	৩০.১৮	১২২,১৫৩.৯৫	১৩.৪১
ছাই এর পুকুর	১৪.১৮	৫৭.৩৮৮.৪০	৬.৩০
সবুজ অঞ্চল	২২.৯৯	৯৩,০৩৭.৫৮	১০.২২
কয়লা পরিবহনের জন্য কনভেয়র বেল্ট/করিডোর	১৮.৬৩	৭৫,৩৯৩.০০	৮.২৮
লে-ডাউন এলাকা	৫৬.২১	২২৭,৪৮৪.৪৬	২৪.৯৮
বাঁধ এবং অভ্যন্তরীণ রাস্তা	২৬.৯৭	১০৯,১৪৩.৮১	১১.৯৮
সংযোগ সড়ক	১.৭৩	৭০০১.০৭	০.৭৭
মোট	**২২৫.০০**	**৯১০,৫৪৫.৫০**	**১০০.০০**

8

পরিবেশের ভিত্তি উপাত্ত (বেইজলাইন)

ভৌত পরিবেশ

- **আবহাওয়াবিদ্যা**

প্রকল্প এলাকায় মাসিক সর্বাধিক তাপমাত্রা ২৬.৭ ডিগ্রী সেলসিয়াস থেকে ৩৬.৪ ডিগ্রী সেলসিয়াস পর্যন্ত এবং মাসিক সর্বনিম্ন তাপমাত্রা ১৩.৪ ডিগ্রি সেলসিয়াস থেকে ২৪.৬ ডিগ্রি সেলসিয়াস পর্যন্ত বিরাজ। মাসিক গড় আর্দ্রতা ৭৪.৭% থেকে ৮৭.৮%। বছরে মোট গড় বৃষ্টিপাত ৩১১৭ মি মি।

- **ভূতত্ত্ব**

প্রকল্প এলাকার Beach and dune sand ভূতাত্ত্বিক প্রকারে অবস্থিত।

- **টোপোগ্রাফি**

প্রকল্প এলাকাটি উচ্চতা এমএসএল +২ মিটার থেকে +৭ মিটার পর্যন্ত।

- **ভূকম্পবিদ্যা**

প্রস্তাবিত প্রকল্প জোন-৩ ভূমিকম্প অঞ্চলে অবস্থিত। যা মধ্যম ভূমিকম্প ঝুঁকির একটি অঞ্চল।

- **হাইড্রলজি**

প্রকল্পের পশ্চিমে কুতুবদিয়া চ্যানেল, পূর্বে কুহেলিয়া নদী এবং উত্তরে মাতামুহুরি নদী অবস্থিত

9

পরিবেশগত ভিত্তি উপাত্ত সংগ্রহ

- **বায়ুর গুণগতমান**

পাঁচ (৫) স্থানের পরিবেশগত বায়ুর গুণমান (PM_{10}, $PM_{2.5}$, NO_2, SO_2 এবং CO) পরিমাপ করা হয়েছে। এতে Haz-Scanner Environmental Perimeter Air Station (EPAS) মেশিন ব্যবহার করা হয়েছে।

10


পরিবেশগত ভিত্তি উপাত্ত সংগ্রহ
▪ শব্দের মাত্রা
পাঁচ (৫) টি স্থান থেকে Tekoplus Digital Sound Level Meter ব্যবহার করে শব্দ পরিমাপ করা হয়েছে।
ANL1
ANL2
ANL3
ANL4
ANL5

11


পরিবেশগত ভিত্তি উপাত্ত সংগ্রহ
▪ পানির গুণগতমান
কুতুবদিয়া চ্যানেল, কুহেলিয়া নদী এবং মাতামুহুরি নদী থেকে ছয়টি (৬) ভূপৃষ্ঠ পানির এবং আশেপাশের এলাকা থেকে চারটি (৪) ভূগর্ভস্থ পানির নমুনা সংগ্রহ করা হয়েছে।
SW1
SW2
SW3
SW4
SW5
SW6

12

পরিবেশগত ভিত্তি উপাত্ত সংগ্রহ

- **মাটির গুণগতমান**

প্রকল্প এলাকার চারপাশ থেকে চারটি (৪) মাটির নমুনা সংগ্রহ করা হয়েছে। কুতুবদিয়া চ্যানেল, কুহেলিয়া নদী এবং মাতামুহুরি নদীর তলদেশ থেকে মোট ৬ টি পলি মাটির নমুনা সংগ্রহ করা হয়েছে।

13

পরিবেশগত ভিত্তি উপাত্ত

জীববৈচিত্রসংক্রান্ত পরিবেশ

- **সুরক্ষিত এলাকা (PAs)**

প্রকল্পের AOI-এর মধ্যে কোনো সংরক্ষিত এলাকা নেই। সাইট থেকে নিকটতম PA হল ফাসিয়াখালি বন্যপ্রাণী অভয়ারণ্য, যা প্রকল্পের অবস্থান থেকে প্রায় ১৬.৫ কিলোমিটার দক্ষিণ-পূর্বে অবস্থিত।

- **পরিবেশগত সংকটাপন্ন এলাকা (ECAs)**

প্রকল্পের ১০ কিলোমিটার-এর মধ্যে কোনো পরিবেশগত সংকটাপন্ন এলাকা অবস্থিত নয়। প্রকল্পের অবস্থান থেকে নিকটতম ECA (সোনাদিয়া দ্বীপ) ২৪.৩ কিমি দূরে দূরত্বে অবস্থিত।

14

পরিবেশগত ভিত্তি উপাত্ত

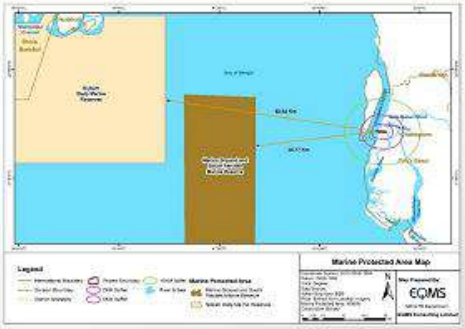
জীববৈচিত্রসংক্রান্ত পরিবেশ

▪ সামুদ্রিক সুরক্ষিত এলাকা (MPA)

প্রকল্প দ্বারা প্রভাবিত এলাকার (AOI) মধ্যে কোনো **MPA** এলাকা নেই। প্রকল্পের অবস্থান থেকে সবচেয়ে কাছের **MPA** হল মিডল গ্রাউন্ড এবং সাউথ প্যাচ, যা পশ্চিম দিকে ৩৬.১৭ কিমি দূরত্বে অবস্থিত।

▪ গুরুত্বপূর্ণ পাখি এবং জীববৈচিত্র্য এলাকা (IBAs)

প্রকল্পের দ্বারা প্রভাবিত এলাকার (AOI) এর মধ্যে কোন IBA নেই। প্রকল্পের অবস্থান থেকে সবচেয়ে কাছের **IBA** হল সোনাদিয়া দ্বীপ, যা ২৫.৩ কিলোমিটারেরও বেশি দূরে অবস্থিত।



15

সামাজিক ভিত্তি উপাত্ত

আর্থ-সামাজিক পরিবেশ

- মাতারবাড়ী ইউনিয়নের আয়তন ৬৫৩২ একর (২৬.৪৩ বর্গ কিলোমিটার)। ২০১১ সালের পরিসংখ্যান অনুযায়ী মাতারবাড়ী ইউনিয়নের লোকসংখ্যা ৩৬,৩০৯ জন।
- গড় সাক্ষরতার হার ৩৫.৬% ।
- প্রকল্প এলাকায় গড় স্ত্রী-পুরুষের অনুপাত ১০২.৭।
- প্রকল্প এলাকায় গড় পরিবারের আকার ৫.৪।
- প্রকল্প এলাকায় ৯৬.৮% মুসলিম পাশাপাশি হিন্দু (৩.০%), বৌদ্ধ (০.১৬%)।
- প্রকল্প এলাকায় প্রধান আয় উৎস চাকরি পাশাপাশি শিল্প এবং কৃষি।
- প্রকল্প এলাকার কাঠামো প্রধানত কাঁচা পাশাপাশি ঝুপরি, আধা-পাকা এবং পাকা কাঠামো আছে।
- পানির প্রধান উৎস হল টিউব-ওয়েল (৯৫.১%)।
- প্রকল্প এলাকার স্বাস্থ্যসম্মত শৌচাগার ৫৭.৮%।
- ২০১১ সালের পরিসংখ্যান অনুযায়ী, প্রকল্প এলাকার বিদ্যুৎ সংযোগের গড় ১৯.৩%।

16

ভূমি অধিগ্রহণ এবং সামাজিক জরিপ

- জেলা প্রশাসক কর্তৃক ভূমি ক্ষতিগ্রস্তদের উপর জরিপ সম্পন্ন ও ক্ষতিপূরণ ইতিমধ্যে প্রদান করা হয়েছে।
- ইকিউএমএস ৫ কি.মি. ব্যাসার্ধ এলাকায় প্রাথমিক আর্থ-সামাজিক জরিপ সম্পাদন করেছে
- বিশেষ শ্রেণীর জনসাধারণের সাথে আলোচনা করা হয়েছে।

17

ইতিবাচক প্রভাব

- কম ভূমি বাবহার করে বেশি বিদ্যুৎ উৎপাদন
- এই প্রকল্পের দ্বারা জাতীয় গ্রিডে নিরবিছিন্ন বিদ্যুৎ সরবরাহ করা সম্ভব হবে
- সরকারকে তার প্রস্তাবিত জ্বালানি লক্ষ্যমাত্রা অর্জনে অবদান এবং সহায়তা করবে
- এই প্রকল্পের দ্বারা উৎপন্ন বিদ্যুৎ উৎপাদন জাতীয় গ্রীডে যুক্ত হবে যা জাতীয় ও স্থানীয় অর্থনৈতিক উন্নয়নে গুরুত্বপূর্ণ ভূমিকা রাখবে
- এলাকায় অতিরিক্ত কর্মসংস্থানের সুযোগ সৃষ্টি হবে
- স্থানীয় সম্প্রদায়ের দক্ষতা স্থানান্তর এবং শিক্ষা/প্রশিক্ষণের সুযোগ হবে
- প্রকল্পের ফলে সম্ভাব্য ইতিবাচক আর্থ-সামাজিক প্রভাবগুলি, যেমন স্থানীয় ব্যবসার ও কর্মসংস্থানের সুযোগ সৃষ্টি করা সম্ভব হবে

18

নির্মাণ পর্যায়ে পরিবেশগত ও সামাজিক প্রভাব

পরিবেশগত প্রভাবের এলাকা	সম্ভাব্য পরিবেশগত প্রভাব সমূহ
বায়ু দূষণ	❖ ভূমি উন্নয়ন, রাস্তা নির্মাণ, ইউটিলিটি ড্রেন, দালান নির্মাণ ও পুকুর নির্মাণের ফলে ধুলিবালি উৎপন্ন হবে ❖ যানবাহন, জেনারেটর এবং সরঞ্জাম থেকে গ্যাসীয় নির্গমন
পানি দূষণ	❖ নির্মাণস্থল থেকে পলল/পলি ও তেল মিশ্রিত পানি আশপাশের খালের পানিকে দুষিত করতে পারে
বর্জ্য	❖ নির্মাণ কাজ ও শ্রমিকদের থাকার স্থান থেকে উৎপন্ন বর্জ্য মাটি ও পানি দূষণ করতে পারে
মাটি দূষণ	❖ জ্বালানি তেল এবং নির্মাণ ধ্বংসাবশেষের দুর্ঘটনাজনিত কারনে মাটিতে মিশে মাটি দূষন হতে পারে
শব্দ দূষণ	❖ নির্মাণ কাজের জন্য বিভিন্ন যন্ত্রাদি এবং সরঞ্জামাদি চালানো, নির্মাণ সামগ্রী পরিবহন জন্য ভারী গাড়ী চলাচলের ফলে শব্দ দূষণ হবে
নদী/খালের তলদেশের মাটির গুনগত মান	❖ নির্মাণ কার্যক্রম, জ্বালানি এবং নির্মাণ ধ্বংসাবশেষ থেকে বর্জ্য আশেপাশের জলাভূমির নীচের তলদেশের মাটি দূষিত হতে পারে;

19

নির্মাণ পর্যায়ে পরিবেশগত ও সামাজিক প্রভাব

পরিবেশগত প্রভাবের এলাকা	সম্ভাব্য পরিবেশগত প্রভাব সমূহ
বাস্তুসংস্থানের উপর প্রভাব	❖নির্মাণ কাজের ফলে সৃষ্ট শব্দে পাখি ও অন্যান্য প্রাণী ক্ষতিগ্রস্ত হবে ❖আশেপাশের জলাশয় বৈশিষ্ট্য হারাতে পারে
পেশাগত নিরাপত্তা	❖ধুলো, আগুন/বিস্ফোরণ, কাজের স্থান, রাসায়নিক, গ্যাস, ধোঁয়া ইত্যাদি শ্রমিকদের স্বাস্থ্যের জন্য ক্ষতিকর
স্থানীয় সংঘাত	❖প্রকল্পের নির্মাণ কাজে অভিবাসী শ্রমিকের কারণে স্থানীয় সংঘাত হতে পারে
শিশু অধিকার	❖প্রকল্পের নির্মাণ কাজে শিশুদের দিয়ে কাজ করানোর সম্ভাবনা আছে যা অত্যন্ত ঝুঁকিপূর্ণ
কাজের সুযোগ	❖ক্ষতিগ্রস্তদের কাজের সুযোগ সৃষ্টি ❖প্রকল্পের নির্মাণ কাজে ২৫০০-৩০০০ শ্রমিক কাজের সুযোগ পাবে

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বিদ্যুৎ কেন্দ্র চলমান পর্যায়ে পরিবেশগত ও সামাজিক প্রভাব

পরিবেশগত প্রভাবের এলাকা	সম্ভাব্য পরিবেশগত প্রভাব সমূহ
বায়ু দূষণ	❖বিদ্যুৎ কেন্দ্র থেকে বায়ু নির্গমন নির্গমনের ফলে বায়ু দূষণ ❖যানবাহন চলাচল এবং এর গ্যাসীয় নির্গমন
পানি দূষণ	❖বিদ্যুৎ কেন্দ্র থেকে উৎপন্ন গৃহস্থালি ও তরল বর্জ্য আশেপাশের জলাভূমির পানি দুষিত করতে পারে ❖নদীতে পানি নির্গত করার ফলে পানির তাপমাত্রা বেড়ে যেতে পারে ❖কয়লা পরিবহনে নদী ও সমুদ্রের পানি দূষণ হতে পারে।
বর্জ্য	❖বিদ্যুৎ কেন্দ্র থেকে উৎপন্ন কঠিন এবং তরল বর্জ্য জল এবং মাটির মানের উপর প্রভাব ফেলতে পারে
মাটি দূষণ	❖যথাযথ পরিশোধন ছাড়া বিদ্যুৎ কেন্দ্র থেকে কঠিন ও তরল বর্জ্য মাটির গুনাগুন নষ্ট করতে পারে
শব্দ দূষণ	❖বিদ্যুৎ কেন্দ্রের মেশিন ও গাড়ী চলাচলের জন্য শব্দ দূষণ হবে
বাস্তুসংস্থান	❖বিদ্যুৎ কেন্দ্রের অপারেশানে বায়ু নিঃসরণ, শব্দ দূষণ, বর্জ্য নির্গমন এবং যানবাহন চলাচলের প্রবণতা বাস্তুসংস্থানের উপর সামগ্রিক নেতিবাচক প্রভাব ফেলতে পারে

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বিদ্যুৎ কেন্দ্র চলমান পর্যায়ে পরিবেশগত ও সামাজিক প্রভাব

পরিবেশগত প্রভাবের এলাকা	সম্ভাব্য পরিবেশগত প্রভাব সমূহ
পানি ব্যবহার	❖বিদ্যুৎ কেন্দ্র চালানোর জন্য আনুমানিক প্রতিদিন প্রচুর পানির প্রয়োজন হবে যা নদী থেকে নেয়া হবে।
সংক্রামক রোগ	❖অভিবাসী কর্মী, যারা বিদ্যুৎ কেন্দ্র অপারেশনের সময় কাজ করবে যার ফলে সংক্রামক রোগ স্থানীয় মানুষের মধ্যে ছড়িয়ে পড়তে পারে
স্থানীয় সংঘাত	❖বিদ্যুৎ কেন্দ্রে কর্মরত লোকজন ও স্থানীয় লোকজনের মধ্যে স্থানীয় সংঘাত তৈরি হতে পারে
পেশাগত ও সামাজিক স্বাস্থ্য ও নিরাপত্তা	❖প্রকল্পের মেশিন অপারেশন, আগুন/বিস্ফোরণ, রাসায়নিক, গ্যাস, ধোঁয়া ইত্যাদি প্রকল্পে কর্মরত লোকজনের স্বাস্থ্যের জন্য ক্ষতিকর প্রভাব ফেলতে পারে ❖সড়ক দুর্ঘটনা হতে পারে
কাজের সুযোগ	❖প্রকল্পের অপারেশন কাজে স্থানীয় শ্রমিক কাজে অগ্রাধিকার পাবে
জলবায়ু পরিবর্তন	❖কয়লা ভিত্তিক বিদ্যুৎ কেন্দ্র জলবায়ু পরিবর্তনে ভুমিকা রাখতে পারে

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অনুশীলন পরিকল্পনা

পরিকল্পনা সূচি	বিষয়
ইআইএ	
১১ ডিসেম্বের ২০২২	১ম মতবিনিময় সভা (চলমান সভা)
ডিসেম্বের ও জানুয়ারী ২০২২	• পরিবেশ ও সামাজিক জরিপ • সিমুলেশন মডেল দ্বারা বায়ু, শব্দ ও পানি দূষণ নিরুপন • নির্মাণ ও বিদ্যুৎ কেন্দ্র চলমান পর্যায়ে পরিবেশগত ও সামাজিক প্রভাব নিরুপন • পরিবেশের ব্যবস্থাপনা -প্রতিকার ব্যবস্থা, উন্নয়ন ব্যবস্থা, পর্যবেক্ষণ ব্যবস্থা
জানুয়ারী/ফেব্রুয়ারী ২০২২	২য় মতবিনিময় সভা (খসড়া ইআইএ উপস্থাপনা ও আলোচনা)
জানুয়ারী/ফেব্রুয়ারী ২০২২	• ২য় মতবিনিময় সভার মতামত অনুযায়ী ইআইএ সংশোধন • সংশোধিত ইআইএ পর্যালোচনার জন্যে প্রেরণ
ফেব্রুয়ারী/মার্চ ২০২২	সংশোধিত ইআইএ পরিবেশগত ছারপত্রের জন্য পরিবেশ অধিদপ্তরে জমা ও উপস্থাপন করা

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আলোচনা ও মন্তব্য পর্বে সবাইকে স্বাগতম

জনসাধারণের মতামত

৩০ মিনিট

সর্বোচ্চ ২ টি মন্তব্য/প্রতি জন

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Appendix M: Land Lease Agreement

খচ ৫৪২৯৫৭৫

MEMO NO: 27.32.0000.002.99.003.22.605; Dated: 27 February 2023

LAND LEASE AGREEMENT

BY AND BETWEEN

Coal Power Generation Company Bangladesh Limited (CPGCBL)

AND

Orion Power Unit-2, Dhaka Ltd (OPDL-2)

Dated: 27 February 2023

"দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন"

খচ ৫৪২৯৫৭৬

Table of Content

"দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন"

MEMO NO: 27.32.0000.002.99.003.22.605; Dated: 27 February 2023

THIS LAND LEASE AGREEMENT (this **"Lease Agreement"**) is entered into as of this 27 February 2023, in Dhaka, Bangladesh.

BY AND BETWEEN

Coal Power Generation Company Bangladesh Limited (CPGCBL), with its registered office located at Unique Heights (Level-17), 117 Kazi Nazrul Islam Avenue, Eskaton, Dhaka-1217 and hereinafter referred to as the **"CPGCBL",** which expression wherever the terms so admit or imply includes its successors, representatives or assigns;

AND

Orion Power Unit-2, Dhaka Ltd. (OPDL-2) with its registered office located at Orion House, 153-154, Tejgaon Industrial area, Dhaka-1208, Bangladesh and hereinafter referred to as the **"Company",** which expression wherever the terms so admit or imply shall include its successors, representatives and permitted assigns.

RECITALS

WHERE AS, the Company is a party to a Land Lease Agreement (all as hereinafter);

WHEREAS, in consideration of the Rent, CPGCBL hereby demises to the Company the Demised Premises in an "AS IS WHERE IS" state and grants to the Company non-exclusive, free and use of the Access Road for the Term so that it can establish and operate the Facility from the Demised Premises;

NOW, THEREFORE, in consideration of the mutual benefits and covenants contained herein, CPGCBL and the Company here by agree as follows:

10.6 Language

The language of this Lease Agreement shall be English. All documents, notices, waivers and all other communication written or otherwise between the Parties in connection with this Lease Agreement shall be in English or Bengali (Bangla).

10.7 Entirety

This Lease Agreement and the Schedules attached hereto are intended by the Parties as the final expression of their agreement and are intended also as a complete and exclusive statement of the terms of their agreement with respect to the subject matter hereof.

10.8 Successors and Assigns

This Lease Agreement shall be binding upon, and inure to the benefit of, the Parties and their respective permitted successors and permitted assigns.

10.9 Counterparts

This Lease Agreement is executed in English in counterparts and all so executed counterparts shall constitute one agreement binding on both Parties.

IN WITNESS WHEREOF, the Parties have executed and delivered this Lease Agreement as of the date first above written.

Coal Power Generation Company Bangladesh Limited (CPGCBL)

Signeture:

Name: Md. Mizanur Rahman
Designation: Company Secretary

Witness:

(1) Mohammed Shahid Ullah
Executive Director (Finance)
CPGCBL

(2) Mohammad Moniruzzaman
Superintendent Engineer (Design)
Coal Power Generation Company
Bangladesh Limited (CPGCBL)

(3) Imran Sarker
Assistant Company Secretary
Coal Power Generation Company
Bangladesh Limited (CPGCBL)

Orion Power Unit-2, Dhaka Ltd. (OPDL-2)

Signeture:

Name: Salman Obaidul Karim
Designation: Managing Director

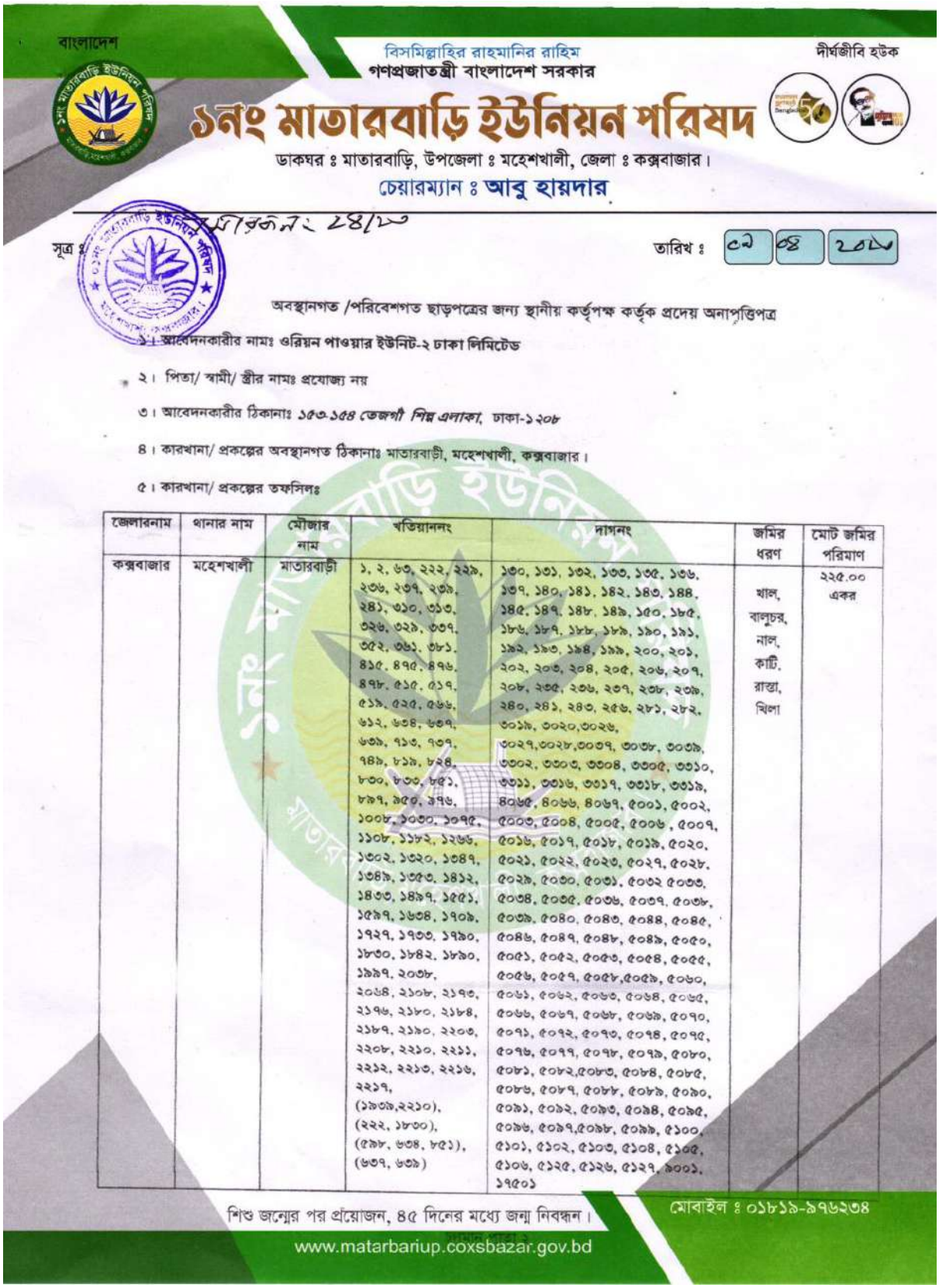
Witness:

(1) Mohammad Shamim Reza Khan
Senior Vice President
Dutch-Bangla Power & Associates Ltd.
Orion Group.

(2) Md. Abdus Salam
Assistant Vice President
Coordination & Support Service

(3)

Appendix N: No Objective Certificate



বাংলাদেশ

বিসমিল্লাহির রাহমানির রাহিম

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

দীর্ঘজীবি হউক

১নং মাতারবাড়ি ইউনিয়ন পরিষদ

ডাকঘর ঃ মাতারবাড়ি, উপজেলা ঃ মহেশখালী, জেলা ঃ কক্সবাজার।

চেয়ারম্যান ঃ আবু হায়দার

সূত্র ঃ রেজিঃ নং ২৪/১৩

তারিখ ঃ ০৯ ০৪ ২০১৬

অবস্থানগত /পরিবেশগত ছাড়পত্রের জন্য স্থানীয় কর্তৃপক্ষ কর্তৃক প্রদেয় অনাপত্তিপত্র

১। আবেদনকারীর নামঃ ওরিয়ন পাওয়ার ইউনিট-২ ঢাকা লিমিটেড

২। পিতা/ স্বামী/ স্ত্রীর নামঃ প্রযোজ্য নয়

৩। আবেদনকারীর ঠিকানাঃ ১৫৩-১৫৪ তেজগাঁ শিল্প এলাকা, ঢাকা-১২০৮

৪। কারখানা/ প্রকল্পের অবস্থানগত ঠিকানাঃ মাতারবাড়ী, মহেশখালী, কক্সবাজার।

৫। কারখানা/ প্রকল্পের তফসিলঃ

জেলারনাম	থানার নাম	মৌজার নাম	খতিয়াননং	দাগনং	জমির ধরণ	মোট জমির পরিমাণ
কক্সবাজার	মহেশখালী	মাতারবাড়ী	১, ২, ৬৩, ২২২, ২২৯, ২৩৬, ২৩৭, ২৩৯, ২৪১, ৩১০, ৩১৩, ৩২৬, ৩২৯, ৩৩৭, ৩৫২, ৩৬১, ৩৮১, ৪১৫, ৪৭৫, ৪৭৬, ৪৭৮, ৫১৫, ৫১৭, ৫১৯, ৫২৫, ৫৬৬, ৬১২, ৬৩৪, ৬৩৭, ৬৩৯, ৭১৩, ৭৩৭, ৭৪৯, ৮১৯, ৮২৪, ৮৩০, ৮৩৩, ৮৫১, ৮৯৭, ৯৫০, ৯৭৬, ১০০৮, ১০৩০, ১০৭৫, ১১০৮, ১১৮২, ১২৬৬, ১৩০২, ১৩২০, ১৩৪৭, ১৩৪৯, ১৩৫৩, ১৪১২, ১৪৩৩, ১৪৯৭, ১৫৫১, ১৫৯৭, ১৬৩৪, ১৭০৯, ১৭২৭, ১৭৩৩, ১৭৯০, ১৮৩০, ১৮৪২, ১৮৯০, ১৯৯৭, ২০৩৮, ২০৬৪, ২১০৮, ২১৭৩, ২১৭৬, ২১৮০, ২১৮৪, ২১৮৭, ২১৯০, ২২০৩, ২২০৮, ২২১০, ২২১১, ২২১২, ২২১৩, ২২১৬, ২২১৭, (১৯৩৯,২২১০), (২২২, ১৮৩০), (৫৯৮, ৬৩৪, ৮৫১), (৬৩৭, ৬৩৯)	১৩০, ১৩১, ১৩২, ১৩৩, ১৩৫, ১৩৬, ১৩৭, ১৪০, ১৪১, ১৪২, ১৪৩, ১৪৪, ১৪৫, ১৪৭, ১৪৮, ১৪৯, ১৫০, ১৮৫, ১৮৬, ১৮৭, ১৮৮, ১৮৯, ১৯০, ১৯১, ১৯২, ১৯৩, ১৯৪, ১৯৯, ২০০, ২০১, ২০২, ২০৩, ২০৪, ২০৫, ২০৬, ২০৭, ২০৮, ২৩৫, ২৩৬, ২৩৭, ২৩৮, ২৩৯, ২৪০, ২৪১, ২৪৩, ২৫৬, ২৮১, ২৮২, ৩০১৯, ৩০২০,৩০২৬, ৩০২৭,৩০২৮,৩০৩৭, ৩০৩৮, ৩০৩৯, ৩৩০২, ৩৩০৩, ৩৩০৪, ৩৩০৫, ৩৩১০, ৩৩১১, ৩৩১৬, ৩৩১৭, ৩৩১৮, ৩৩১৯, ৪০৬৫, ৪০৬৬, ৪০৬৭, ৫০০১, ৫০০২, ৫০০৩, ৫০০৪, ৫০০৫, ৫০০৬ , ৫০০৭, ৫০১৬, ৫০১৭, ৫০১৮, ৫০১৯, ৫০২০, ৫০২১, ৫০২২, ৫০২৩, ৫০২৭, ৫০২৮, ৫০২৯, ৫০৩০, ৫০৩১, ৫০৩২ ৫০৩৩, ৫০৩৪, ৫০৩৫, ৫০৩৬, ৫০৩৭, ৫০৩৮, ৫০৩৯, ৫০৪০, ৫০৪৩, ৫০৪৪, ৫০৪৫, ৫০৪৬, ৫০৪৭, ৫০৪৮, ৫০৪৯, ৫০৫০, ৫০৫১, ৫০৫২, ৫০৫৩, ৫০৫৪, ৫০৫৫, ৫০৫৬, ৫০৫৭, ৫০৫৮,৫০৫৯, ৫০৬০, ৫০৬১, ৫০৬২, ৫০৬৩, ৫০৬৪, ৫০৬৫, ৫০৬৬, ৫০৬৭, ৫০৬৮, ৫০৬৯, ৫০৭০, ৫০৭১, ৫০৭২, ৫০৭৩, ৫০৭৪, ৫০৭৫, ৫০৭৬, ৫০৭৭, ৫০৭৮, ৫০৭৯, ৫০৮০, ৫০৮১, ৫০৮২,৫০৮৩, ৫০৮৪, ৫০৮৫, ৫০৮৬, ৫০৮৭, ৫০৮৮, ৫০৮৯, ৫০৯০, ৫০৯১, ৫০৯২, ৫০৯৩, ৫০৯৪, ৫০৯৫, ৫০৯৬, ৫০৯৭,৫০৯৮, ৫০৯৯, ৫১০০, ৫১০১, ৫১০২, ৫১০৩, ৫১০৪, ৫১০৫, ৫১০৬, ৫১২৫, ৫১২৬, ৫১২৭, ৯০০১, ১৭৫০১	খাল, বালুচর, নাল, কাটি, রাস্তা, খিলা	২২৫.০০ একর

শিশু জন্মের পর প্রয়োজন, ৪৫ দিনের মধ্যে জন্ম নিবন্ধন।

মোবাইল ঃ ০১৮১৯-৯৭৬২৩৪

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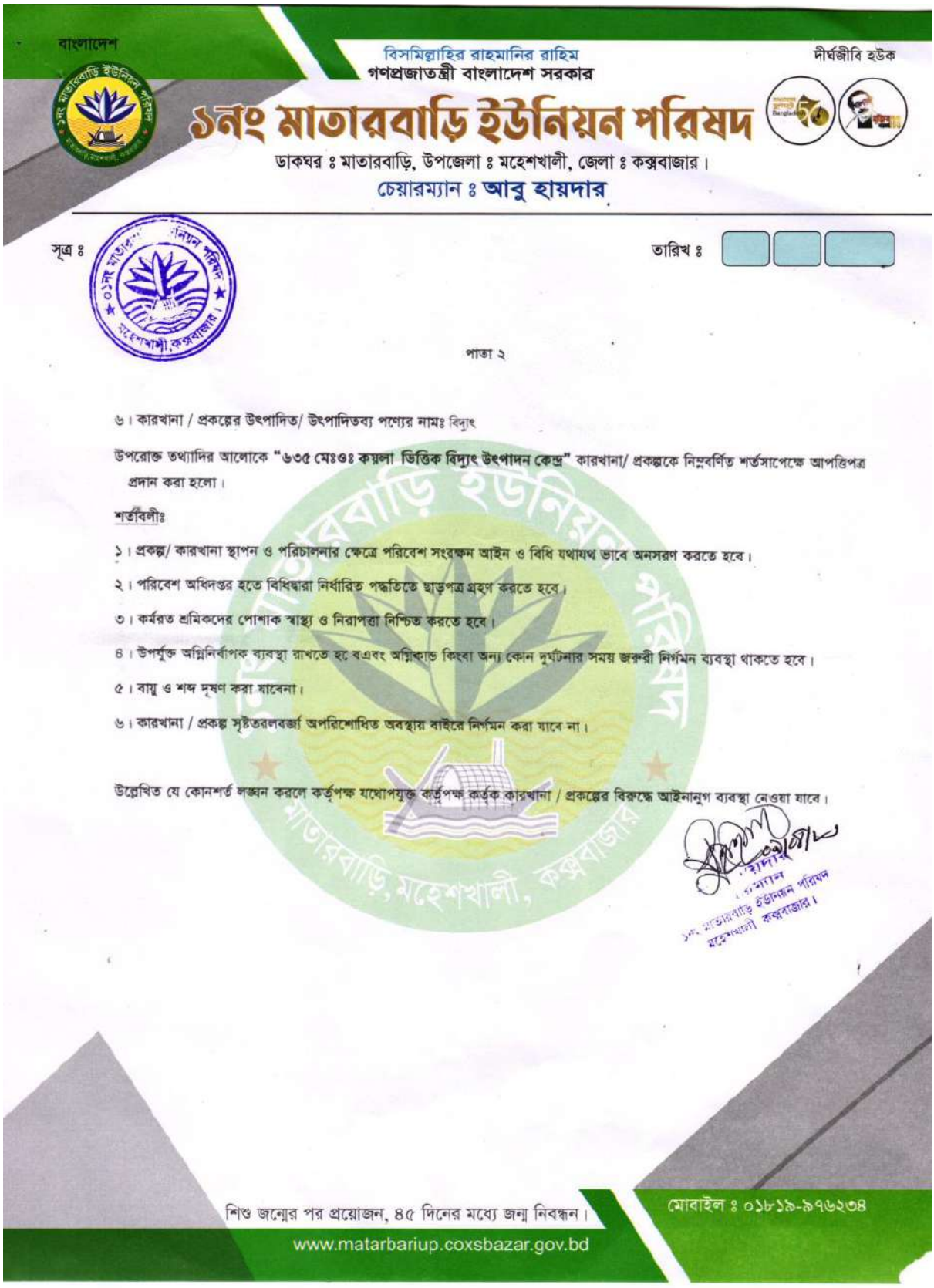

বাংলাদেশ

বিসমিল্লাহির রাহমানির রাহিম

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

দীর্ঘজীবি হউক

১নং মাতারবাড়ি ইউনিয়ন পরিষদ

ডাকঘর ঃ মাতারবাড়ি, উপজেলা ঃ মহেশখালী, জেলা ঃ কক্সবাজার।

চেয়ারম্যান ঃ আবু হায়দার

সূত্র ঃ

তারিখ ঃ

পাতা ২

৬। কারখানা / প্রকল্পের উৎপাদিত/ উৎপাদিতব্য পণ্যের নামঃ বিদ্যুৎ

উপরোক্ত তথ্যাদির আলোকে **"৬৩৫ মেঃওঃ কয়লা ভিত্তিক বিদ্যুৎ উৎপাদন কেন্দ্র"** কারখানা/ প্রকল্পকে নিম্নবর্ণিত শর্তসাপেক্ষে আপত্তিপত্র প্রদান করা হলো।

শর্তাবলীঃ

১। প্রকল্প/ কারখানা স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষন আইন ও বিধি যথাযথ ভাবে অনসরণ করতে হবে।

২। পরিবেশ অধিদপ্তর হতে বিধিদ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।

৩। কর্মরত শ্রমিকদের পোশাক স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।

৪। উপর্যুক্ত অগ্নিনির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরী নির্গমন ব্যবস্থা থাকতে হবে।

৫। বায়ু ও শব্দ দূষণ করা যাবেনা।

৬। কারখানা / প্রকল্প সৃষ্টতরলবর্জ্য অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবে না।

উল্লেখিত যে কোনশর্ত লঙ্ঘন করলে কর্তৃপক্ষ যথোপযুক্ত কর্তৃপক্ষ কর্তৃক কারখানা / প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেওয়া যাবে।

চেয়ারম্যান
১নং মাতারবাড়ি ইউনিয়ন পরিষদ
মহেশখালী কক্সবাজার।

শিশু জন্মের পর প্রয়োজন, ৪৫ দিনের মধ্যে জন্ম নিবন্ধন।

মোবাইল ঃ ০১৮১৯-৯৭৬২৩৪

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Appendix O: Company's Legal Documents

Appendix O-1: BIDA Approval

Board Of Investment
Prime Minister's Office

Ref No. **03.231.161.00.00.1193.2016-** 101 Date: 2016-08-21

Sub: Registration of proposed industrial project under the title: **Orion Power Unit-2 Dhaka Limited**

Dear Sir,
With reference to your application received on 2016-08-18 concerning the above subject, I am pleased to confirm that your proposed industrial project has been duly registered with the Board of Investment. The Registration number for this project is **J-312016086314-H** and the particulars of the terms and conditions of which are appended.

If we could be of any further assistance to you, please do not hesitate to call our Service Center representative who could be reached at telephone # 9577271-2.

In the meantime, we would like to take this opportunity to extend our best wishes to you in your future endeavours.

Thanking You,

Sincerely yours,

Sabina Yeasmin
Director (R&I-1), Industrial
Board of Investment Bangladesh.

Managing Director
Orion Power Unit-2 Dhaka Limited
House/Plot/Holding Number: 153-154, Tejgaon I/A, Flat/Apartment/Floor Number:
Orion House,
Road Name/Road Number: N/A, Post Office: Tejgaon,
Thana/Upazilla: Tejgaon, District: Dhaka, - 1208.

Ref No. 03.231.161.00.00.1193.2016 Date: 2016-08-21

Copy for kind information and necessary action:
1. Director General, Deptrtment of Environment , Poribesh Bhaban, Plot No. 16 Agargaon, Sher-e-Bangla Nagar, Dhaka.
2. Registrar, Joint Stock Companies & Firms, TCB Bhaban, 1 Karwan Bazar, Dhaka.
3. General Manager, Statistics Department Bangladesh Bank, 29 th Storied Building, Motijheel C/A, Dhaka.
4. Deputy Commissioner, Munshigonj.
5. Director (P&P), Board of Investment, Jibon Bima Tower, 10 Dilkusha C/A, Dhaka.
6. Director (IIMC), Board of Investment, Jibon Bima Tower, 10 Dilkusha C/A, Dhaka.
7. P.S. to Executive Chairman, Board of Investment, Dhaka.
8. Master file.

Sincerely yours,

(Abu Mohammad Nurul Hayat Totul)
Assistant Director (R&I-1), Industrial
Board of Investment - Bangladesh

BOI BANGLADESH
Board of Investment, Prime Minister's Office, Jiban Bima Tower, 10 Dilkusha C/A, Dhaka-1000, Bangladesh.
Phone : PABX 88-02-956 1416, 957 7271-2, **Fax :** 88-02-956 2312, **E-mail :** service@boi.gov.bd, **Web :** www.boi.gov.bd

Appendix O-2: Letter of Intent (LOI)

Central Secretariat
Bangladesh Power Development Board
WAPDA Building (1st Floor)
Motijheel C/A, Dhaka-1000.

বাংলাদেশ বিদ্যুৎ উন্নয়ন বোর্ড

Bangladesh Power Development Board

Memo No:2158-BPDB(Sectt.)/Dev-194/2000 Dated: 31-10-2013

To
Orion Power & Associates
153-154 Tejgaon I/A
Dhaka-1208, Bangladesh
Telephone number: +88-02-8870133
Fax number: +88-02-8870108
E-mail: orion@oriongroup.net

Subject: Letter of Intent (LOI) for the development of a Coal-Fired Power Generation Facility of 635 MW (Net) Capacity at Dhaka, Bangladesh.

Ref: বিদ্যাখস/বিঃউঃ-১/কয়লা প্লান্ট-১১/২০১৩/৮৯৮ dated: 21/10/2013

Dear Sir,

A. REFERENCE

On September 11, 2012, Bangladesh Power Development Board issued Bid Document comprising of Qualification Document and Request for Proposal for designing, financing, insuring, construction, ownership, commissioning, operation and maintenance of an electricity generation project of 600-800 MW (net) at Dhaka, Bangladesh, which will sell Dependable Capacity and Net Energy Output to the Bangladesh Power Development Board, hereinafter referred to as "BPDB". Following the submission of your Qualification Statement and Proposal dated January 10, 2013, in response to the Qualification Document and Request for Proposal (RFP), and subsequent evaluation and you being designated as the "First Ranked Bidder", this Letter of Intent, hereinafter referred to as the "LOI" is being issued to the addressee pursuant to approval received from the Power Division, Ministry of Power, Energy and Mineral Resources (MPEMR), Bangladesh Secretariat, Dhaka vide memo referred above for the development of the project identified below (the "Project") on the terms described in the RFP and in this LOI. Capitalized terms used and not defined herein are defined in the RFP.

B. AUTHORIZATION

The People's Republic of Bangladesh represented by the Power Division, Ministry of Power, Energy and Mineral Resources, hereinafter referred to as the "GOB" accords its approval on the Levelized Tariff of 8.3700 US cents/kWh (at 84.6% plant factor, 12% discount factor, Bid Coal Price 4.3 US dollar/GJ and exchange rate 1 USD = 80 taka) of Orion Power & Associates, hereinafter referred to as the "Sponsor" and grants its permission to Orion Power & Associates, to design, finance, insure, construct, own, Commission, operate and maintain (the "Project") a 635 MW (at Reference Site Condition), Coal-fired power generating facility at Dhaka, hereinafter referred to as the "Facility", as more fully described in the Proposal.

The Facility will have a net electric power generating capacity of 635 MW. Net Dependable Capacity and Net Energy Output from the Facility will be sold under the Power Purchase Agreement, hereinafter referred to as the "PPA". The Company formed by the Sponsor shall be solely responsible for the development and completion of the Project and development of the necessary related facilities in accordance with the requirements contained in the RFP and the timetable and milestones contained in the Proposal, as measured from the date of issuance of this LOI and from the Project Effective Date.

1

C. FORMATION OF COMPANY

The Project Agreements shall be executed by a "Company" which will be responsible for design, finance, insure, build, own, operate and maintain etc. of the Project. The "Company" for the purpose of this project will be a special purpose vehicle i.e. a public/private limited company incorporated in Bangladesh promoted and sponsored by the Sponsor (in case of Joint Venture Consortium by all the Joint Venture Partners). After the incorporation of the "Company", the rights and obligations of the Sponsor hereunder will be assigned to the "Company".

D. NO LIABILITY FOR REVIEW

No review, examination, evaluation or approval by BPDB of any document, instrument, drawing, specifications or design proposed or delivered by the Sponsor or the Company in connection with the delivering of its Proposal or BPDB's evaluation thereof or the issuance of this LOI shall relieve the Sponsor or the Company from any obligation or liability that it would otherwise have had for its negligence in the preparation of such document, instrument, drawing, specification or design or failure to comply with applicable laws of Bangladesh or to satisfy the Company's obligations under this LOI, the Project Agreements, or the other documents comprising the Security Package (as defined in the IA) with respect thereto, nor shall BPDB be liable to the Sponsor or the Company or any other person by reason of its review, examination, evaluation or approval of any document, instrument, drawing, specification, or design.

E. VALIDITY OF THE PROPOSAL AND THE BID SECURITY

Pursuant to Request for Proposal (RFP), the validity of the Proposal and Bid Security shall have to be extended upon request from BPDB for an additional period of three (3) Months or more until such time as the Project Agreements are executed.

F. GOVERNING LAW

This Letter of Intent shall be governed by and construed in accordance with the Laws of Bangladesh.

G. ACCEPTANCE OF LETTER OF INTENT (LOI)

You are requested to communicate your acceptance (not acknowledgement) of this LOI within 7 (seven) days from the issuance of this LOI.

H. TERMINATION OF LOI

1. The Company formed by the Sponsor will sign the Implementation Agreement ("IA") and the Power Purchase Agreement ("PPA") (collectively, the "Project Agreements", which will be available from 2nd week of November 2013 at the Office of the IPP Cell-1, BPDB, Dhaka) with the GOB and BPDB respectively on the date to be notified by BPDB, failure to which, BPDB shall reserves the right to terminate this LOI by written notification to the Sponsor & forfeit the Bid Security.

2. The Sponsor will provide the Performance Security Deposit for the amount of USD 2,28,60,000 (Two crore twenty eight lac sixty thousand) only, Certificate of Incorporation (along with Memorandum and Articles of Association) for newly formed "Company" in Bangladesh no later than two (2) days prior to the date of signing of the Project Agreements, failure to which, BPDB shall reserves the right to terminate this LOI by written notification to the Sponsor.

3. The Sponsor will provide its acceptance of LOI within fifteen (15) days and the initialed Project Agreements and location of the Site along with Mouza name, RS Dag No., RS Khatian No. and Quantity of Land (Site description will be part of the PPA) for the proposed Site as per submitted Proposal within 30 (thirty) days from the issuance of this LOI.

   If the Sponsor fails to furnish (i) the acceptance of LOI, (ii) initialed Project Agreements and (iii) location of the Site along with Mouza name, RS Dag No., RS Khatian No. and Quantity of Land within stipulated time as mentioned above, BPDB reserve the right to terminate this LOI and forfeit the Bid Security.

2

4. The Sponsor shall submit their financing plan of the Project along with the acceptance of LOI, failure to which, BPDB shall reserves the right to terminate this LOI by written notification to the Sponsor.

5. The Sponsor shall extend the Bid Validity (Proposal validity) & the Bid Security validity at least 7 (seven) days prior to the expiration of the Bid validity and Bid Security validity, failure to which, BPDB shall have the right to forfeit the Bid Security.

6. Upon termination of LOI, neither the Sponsor nor the Company shall have any claim for compensation or damages against BPDB or any other governmental agency on any grounds whatsoever.

BPDB looks forward to working with you to make the Project a great success.

Golam Kibria
Director
IPP CELL-1, BPDB, Dhaka.

By order,

(Md. Azizul Islam)
Secretary
Bangladesh Power Development Board

Memo No- -BPDB(Sectt.)/Dev- Dated: - -2013

Copy to:

1. Member, Finance/Company Affairs/Generation/Administration/P&D/Distribution, BPDB, Dhaka.
2. Managing Director, PGCB, IEB Bhaban, Ramna, Dhaka. Fax: 7171833.
3. Chief Engineer, Private Generation/Generation/P&D, BPDB, Dhaka.
4. Controller of Accounts & Finance, BPDB, Dhaka.
5. Director, IPP Cell-1/IPP Cell-2/ IPP Cell-3/Finance/Contract and Consultant Administration, BPDB, Dhaka.
6. C S O to Chairman, BPDB, Dhaka.
7. P S to Secretary, Power Division, Ministry of Power, Energy & Mineral Resources, Bangladesh Secretariat, Dhaka.

Senior Section Officer (Dev)
Central Secretariat, BPDB, Dhaka.

Senior Section Officer (Dev)
Central Secretariat, BPDB, Dhaka.

Appendix O-3: Tax Identification Number (TIN)

Government of the People's Republic of Bangladesh

National Board of Revenue

Taxpayer's Identification Number (TIN) Certificate

TIN : 465767672394

This is to Certify that **ORION POWER UNIT - 2 DHAKA LIMITED** is a Registered Taxpayer of National Board of Revenue under the jurisdiction of **Taxes Circle-294 (Company)** , Taxes Zone **14, Dhaka**.

Taxpayer's Particulars :

1) Name : **ORION POWER UNIT - 2 DHAKA LIMITED**

2) Registered Address/Permanent Address : **Orion House, 153-154, Tejgaon I/A, Dhaka**

3) Current Address : **Orion House, 153-154, Tejgaon I/A, Dhaka**

4) Previous TIN : **Not Applicable**

5) Status : **Company**

Date : March 01, 2015

Please Note:

1. A Taxpayer is liable to file the Return of Income under section 75 of the Income Tax Ordinance, 1984.
2. Failure to file Return of Income under section 75 is liable to-

   (a) Penalty under section 124, and

   (b) Prosecution under section 164 of the Income Tax Ordinance, 1984.

Deputy Commissioner of Taxes
Taxes Circle-294 (Company)
Taxes Zone 14, Dhaka
Address : 12/1, As-Tarick Tower, Bijoynagar, Dhaka Phone : 7115223

N. B. This is a system generated certificate and requires no manual signature.

Appendix O-4: Income Tax Certificate

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

National Board Of Revenue

Income Tax Wing

Income Tax Certificate

Particulars Of The Tax Payer :

a) Name	:	**ORION POWER UNIT-2 DHAKA LIMITED**
b) Father's Name	:	N/A
c) Present Address	:	Orion House, 153-154, Tejgaon I/A, Tejgaon, Dhaka.
d) Permanent Address	:	Orion House, 153-154, Tejgaon I/A, Tejgaon, Dhaka.
e) Status :	:	Company
f) Tax Payer Identification Number (e-TIN)	:	**4657 6767 2394/Circle-294(Company).**
g) Business Identification Number (BIN)	:	N/A

This is to certify that **ORION POWER UNIT-2 DHAKA LIMITED** is an assessee Company of Taxes Circle-294(Company), Taxes Zone-14, Dhaka. The assessee Company has submitted return for the assessment year 2020-2021 which is **under process** for disposal.

18.05.2022

(Khandaker Md. Hashanul Islam)
Deputy Commissioner of Taxes
Circle-294(Company)
Taxes Zone-14, Dhaka.
☎ 47115223

18/05/2022

Appendix O-5: Tade License

ঢাকা উত্তর সিটি কর্পোরেশন

www.dncc.gov.bd

লাইসেন্স ইস্যুর বিবরণ

ইস্যুর তারিখ :01/08/2022
ইস্যুর সময় :13:18:46

ই-ট্রেড লাইসেন্স

লাইসেন্স নং : TRAD/DNCC/012897/2022

স্থানীয় সরকার (সিটি কর্পোরেশন) আইন, ২০০৯ (২০০৯ সনের ৬০ নং আইন) এর ধারা ৮৪- তে প্রদত্ত ক্ষমতাবলে সরকার প্রণীত আদর্শ কর তফসিল, ২০১৬ এর ১০ অনুচ্ছেদ অনুযায়ী ব্যবসা, বৃত্তি, পেশা বা শিল্প প্রতিষ্ঠানের উপর আরোপিত কর আদায়ের লক্ষ্যে নিম্নে বর্ণিত ব্যক্তি/ প্রতিষ্ঠানের অনুকূলে অত্র ট্রেড লাইসেন্সটি ইস্যু করা হলো।

১। ব্যবসা প্রতিষ্ঠানের নাম	:	ওরিয়ন পাওয়ার ইউনিট-২ ঢাকা লিমিটেড		
২। প্রতিষ্ঠানের মালিকের নাম	:	সালমান ওবায়দুল করিম		
৩। পিতা / স্বামীর নাম	:	মোহাম্মদ ওবায়দুল করিম		
৪। মাতার নাম	:	আরজুদা করিম		
৫। ব্যবসার প্রকৃতি	:	লিমিটেড কোম্পানী		
৬। ব্যবসার ধরণ	:	বিতরন,বিদ্যুৎ উৎপাদন (অফিস)		
৭। প্রতিষ্ঠানের ঠিকানা	:	১৫৩-১৫৪ তেজগাঁও শি/এ, ঢাকা- ১২০৮		
৮। অঞ্চল / বাজার শাখা	:	৩ মহাখালী	ওয়ার্ড / মার্কেট:	২৪
এলাকা	:	তেজগাঁও শিল্প এলাকা		
৯। এনআইডি/পাসপোর্ট/জন্ম নিব: নং	:	৮২৩৮৭৫৭০০২	বিআইএন নং:	
ফোন	:	০১৮১৯২০৭৬৮৫	ই-মেইল:	
১০। অর্থ বছর	:	২০২২-২০২৩ (নবায়নকৃত)	ব্যবসা শুরুর তারিখ:	১২/০৭/২০১৮

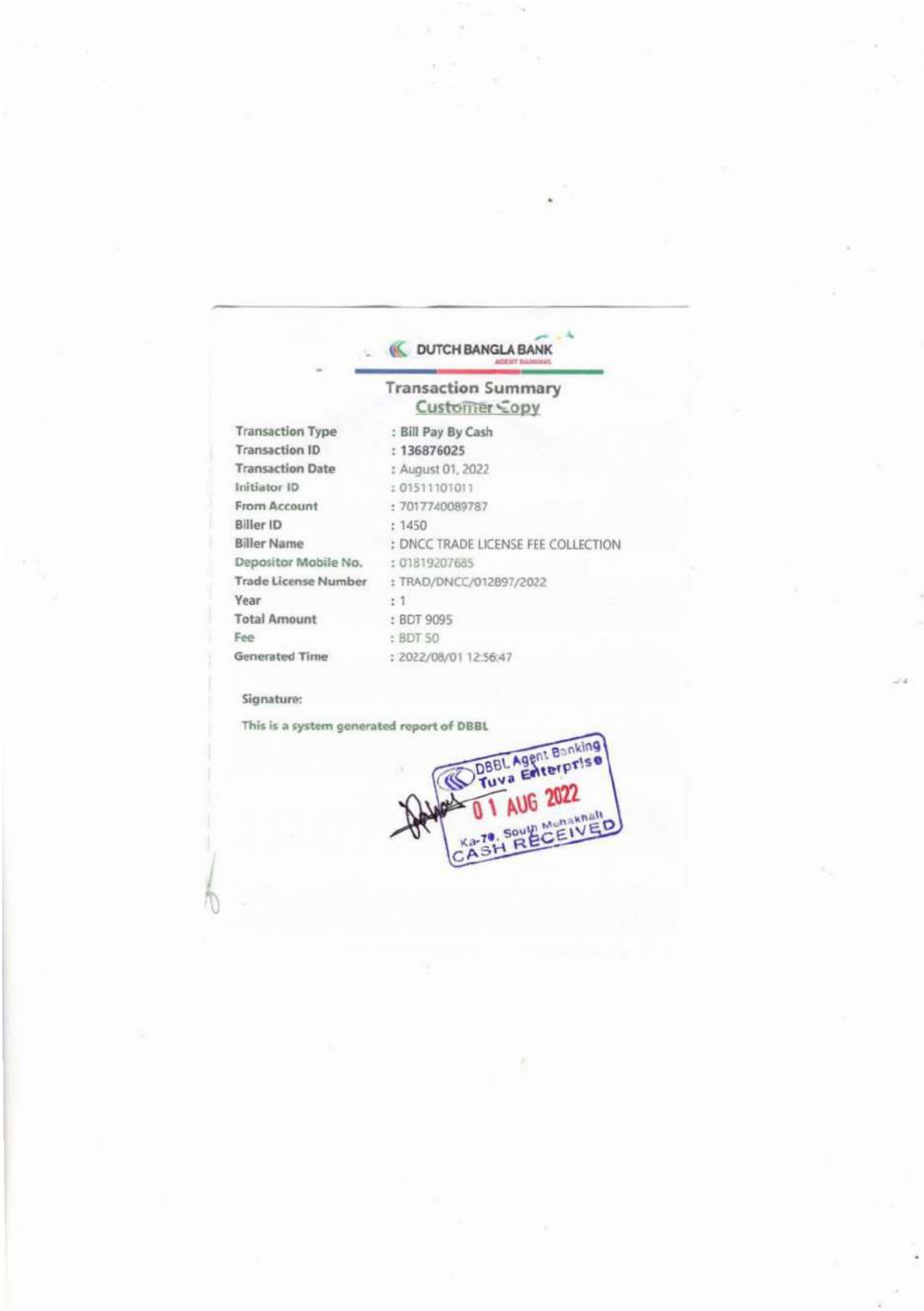
১১। মালিকের বর্তমান ঠিকানা			মালিকের স্থায়ী ঠিকানা		
হোল্ডিং নং	:	বাড়ী-১২	হোল্ডিং নং	:	
রোড নং	:	১৮, ব্লক- জে	রোড নং	:	
গ্রাম / মহল্লা	:		গ্রাম / মহল্লা	:	
পোস্টকোড	:	১২১৩	পোস্টকোড	:	ঐ
থানা	:	বনানী	থানা	:	
জেলা	:	ঢাকা	জেলা	:	
বিভাগ	:	ঢাকা	বিভাগ	:	

১২। ট্রেড লাইসেন্স/নবায়ন ফি(বার্ষিক)					
লাইসেন্স/নবায়ন ফি	:	৪৫০০	সাইনবোর্ড কর	:	৮০০
সারচার্জ	:	০	ভ্যাট	:	৭৯৫
আয়কর / উৎসকর	:	৩০০০	বই মূল্য	:	০
বকেয়া ()	:	০	ফর্ম ফি	:	০.০০
সংশোধনী ফি	:	০.০০	সর্বমোট	:	৯০৯৫.০০

অত্র ট্রেড লাইসেন্স এর মেয়াদ ৩০ শে জুন, 2023 পর্যন্ত

লাইসেন্স ও বিজ্ঞাপন সুপারভাইজার

কর কর্মকর্তা



DUTCH BANGLA BANK
AGENT BANKING

Transaction Summary
Customer Copy

Transaction Type	: **Bill Pay By Cash**
Transaction ID	: **136876025**
Transaction Date	: August 01, 2022
Initiator ID	: 01511101011
From Account	: 7017740089787
Biller ID	: 1450
Biller Name	: DNCC TRADE LICENSE FEE COLLECTION
Depositor Mobile No.	: 01819207685
Trade License Number	: TRAD/DNCC/012897/2022
Year	: 1
Total Amount	: BDT 9095
Fee	: BDT 50
Generated Time	: 2022/08/01 12:56:47

Signature:

This is a system generated report of DBBL

DBBL Agent Banking
Tuva Enterprise
01 AUG 2022
Ka-78, South Munakhali
CASH RECEIVED

বাংলাদেশ বিছমিল্লাহির রহমানির রহিম দীর্ঘজীবী হউক

১নং মাতারবাড়ি ইউনিয়ন পরিষদ কার্যালয়

ডাকঘরঃ মাতারবাড়ি, উপজেলা ঃ মহেশখালী, জেলা ঃ কক্সবাজার।

ট্রেড লাইসেন্স

ক্রমিক নং- 491

ইউ.পি. ফরম নং-১৩

তারিখ ঃ ০৭ ০৪ ২০২৩

লাইসেন্স নং- ২৮৮/২০২২-২০২৩

ব্যবসা প্রতিষ্ঠানের নাম ঃ ওরিয়ন পাওয়ার ইউনিট-২ ঢাকা লিমিটেড,মাতারবাড়ী

মালিক/লাইসেন্সধারীর নাম ঃ সালমান ওবায়দুল করিম

পিতা/স্বামীর নাম ঃ মোহাম্মদ ওবায়দুল করিম

ঠিকানা ঃ মাতারবাড়ী, মহেশখালী, কক্সবাজার,

বৃত্তি/ব্যবসা/পেশার ধরণ ঃ বিদ্যুৎ উৎপাদন ও বিতরণ স্থান ঃ মাতারবাড়ী

মেয়াদ ঃ ১লা জুলাই/২০২২ ইং হইতে ৩০ শে জুন/২০২৩ ইং পর্যন্ত।

ফিসের পরিমাণ ঃ

হাল ঃ ৫,০০০/- টাকা

বকেয়া (যদি থাকে) ঃ — টাকা

ভ্যাট ঃ ৭৫০/- টাকা

মোট টাকার পরিমাণ ঃ পাঁচ হাজার সাতশত পঞ্চাশ টাকা। কথায় ঃ

প্রাপ্ত হয়ে বৈধভাবে তার বৃত্তি/ব্যবসা পেশা অত্র-ইউনিয়নে চালিয়ে যাবার জন্য এই লাইসেন্স প্রদান করা হইল।

০৭/০৪/২৩
মোঃ শাহজাহান
(সচিব)
১নং মাতারবাড়ী ইউনিয়ন পরিষদ
মহেশখালী, কক্সবাজার।

অফিস সীল

আবু হায়দার
চেয়ারম্যান
১নং মাতারবাড়ি ইউনিয়ন পরিষদ
মহেশখালী, কক্সবাজার।