कोलकाता पत्तन न्यास
KOLKATA PORT TRUST
हल्दिया गोदी परिसर
HALDIA DOCK COMPLEX
उप प्रबंधक (आई. एंड सी. एफ.)
Sr. Dy. Manager [I&CF]

SAGARMALA

ISO 9001:2015 Certified by IRQS

MGMT. SYS. RvA C 1171

No: I&CF/IZ & R/SDM/ 1427

28.05.2020

Dr. Suresh Babu Pasupuleti
Scientist C
Ministry of Environment, Forest and Climate Change
Eastern Regional Office
A/3, Chandersekharpur
Bhubaneswar – 751 023

Sub: Compliance Report for the EC Conditions for the Project "Setting up of Mini Bulk Carriers Handling Facility in the Upstream of 3rd Oil Jetty with the Help of Floating Crane / Pontoon Fitted Crane at Haldia Dock Complex (HDC), Kolkata Port Trust (West Bengal) by M/s Kolkata Port Trust" for the Period of October 2019 to March 2020.

Ref: Environmental and CRZ Clearance Letter No. F.No.10-26/2015-IA-III dated 17.05.2017
Your Office Letter No. 102-574/EPE/594 dated 06.03.2018
Your Office Letter No. File No. 106-12/EPE dated 11.05.2020

Sir,

With reference to the above, the six monthly compliance report (period: October 2019 to March 2020) of the subject-mentioned project is enclosed herewith as Appendix A along with the other relevant documents (Annexure I to Annexure VI).

The soft copy of the same will also be sent to the e-mail roez.bsr-mef@nic.in.

Encls: As above.

Thanking you,

Yours faithfully,

28/5/2020

P. DASGUPTA
Authorized Signatory
and Sr. Dy. Manager – I
I&CF Division, HDC, KoPT

Copy to:
1. Member Secretary, CPCB – for information please.
2. Member Secretary, WBPCB – for information please.

APPENDIX – A

Name of the Project	**:**	**Setting up of Mini Bulk Carriers Handling Facility in the Upstream of 3rd Oil Jetty with the Help of Floating Crane / Pontoon Fitted Crane at Haldia Dock Complex (HDC), Kolkata Port Trust (West Bengal) by M/s Kolkata Port Trust**
Clearance Letter/s No. and Date	**:**	**F.No.10-26/2015-IA-III dated 17.05.2017**
Period of Compliance Report	**:**	**October 2019 to March 2020**

Sl No	Condition of EC	Compliance Status of Action Plan
A	**Specific Condition**	
i	Consent to Establish shall be obtained from State Pollution Control Board under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974	Compiled. Attached as Annexure I
ii	Construction activity shall be carried out strictly according to the provisions of CRZ Notification, 2011. No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal Regulation Zone area.	Construction activity was completed according to the provisions of CRZ Notification, 2011.
iii	All the recommendations and conditions stipulated by the West Bengal Coastal Zone Management Authority (WBCZMA) vide letter No. 285/EN/T-II-4/011/2016 dated 26th December, 2016, shall be strictly complied with.	WBCZMA recommendations (vide letter No. 285/EN/T-II-4/011/2016 dated 26.12.2016) (Annexure III) is compiled.
iv	The project proponent shall ensure that no creeks or rivers are blocked due to any activities at the project site and free flow of water is maintained.	No creeks or rivers have been blocked during construction activities at the project site.
v	Shoreline shall not be disturbed due to dumping. Periodical study on shore line changes shall be conducted and mitigation carried out, if necessary. The details shall be submitted along with the six monthly monitoring report.	Shoreline already protected and no sign of erosion.
vi	The ground water shall not be taped within the CRZ areas to meet with the requirement in any case	Ground water is not be extracted within the CRZ areas for any construction / operation related activities
vii	The commitments made during the Public Hearing and recorded in the Minutes shall be complied with letter and spirit. A hard copy of the action taken shall be submitted to the Ministry.	Public Hearing meeting was held on 21.09.2016, where the project was appreciated by the participants. No issues were raised from any of the members present during the public- hearing. Refer Annexure IV for the minutes of public hearing.
viii	All the conditions stipulated in the earlier Clearance including the recommendations of Environment Management Plan. Disaster management Plan shall be strictly complied with.	Agreed.
ix	The coal shall be stored only in designated stock yard with dust control measures viz. wind screen of height at least 2 m. above the coal stock, made of fabric/HDPE, water sprinkler arrangement, green belt of at least three layers of suitable trees and scrubs.	Agreed.
x	The coal from the ships shall be conveyed through closed conveyor to the coal stock yard. The conveyor shall be seamless without joints / transfer points.	Compiled.

Sl No	Condition of EC	Compliance Status of Action Plan
xi	The dust from the roads shall be periodically cleaned and dust suppression by water spray be carried out.	Compiled.
xii	Cargo shall be unloaded directly into hopper from the ship and transported to the stack yards through closed conveyor system only. Inbuilt dust suppression systems shall be provided at hoppers and all the transfer points/storage yards. Cargo shall not be unloaded directly onto the berth. Water meters shall be provided at different locations to record the consumption of water used for dust suppression and daily log shall be maintained.	Agreed.
xiii	Necessary arrangements for the treatment of the effluents and solid wastes must be made and it must be ensured that they conform to the standards laid down by the competent authorities including the Central or State Pollution Control Board and under the Environment (Protection) Act, 1986.	Only domestic waste is being generated in the project site and it is being regularly collected by Haldia Municipal Authority. No industrial effluent generated from the said area.
xiv	Runoff from project site shall be passed through an oil separator followed by settling tank. Treated water from the sump shall be allowed to overflow to the existing storm water drain of HDC for ultimate disposal. All the operational areas shall be connected with the network of liquid waste collection corridor comprising of storm water, oily waste and sewage collection pipelines.	Action being taken as per condition.
xv	Marine ecology shall be monitored regularly also in terms of sea weeds, sea grasses, mudflats, sand dunes, fisheries, echinoderms, shrimps, turtles, corals, coastal vegetation, mangroves and other marine biodiversity components as part of the management plan.	Monitoring of the marine biology was executed as per environmental monitoring plan of EIA Report. As per records, there is no evidence of sea weeds, sea grasses, turtle corals, mudflats, sand dunes, etc. in the riverine ecosystem of the project area (Annexure V).
xvi	Measures shall be taken to contain, control and recover the accidental spills of fuel and cargo handle.	Disaster Management Plan (DMP) and Oil Pollution Emergency Plan (OPEP) for Haldia Dock complex was prepared and required Oil Spill Response Equipments (OSRE) have already procured to combat with adverse situation.
xvii	All the mitigation measures submitted in the EIA report shall be prepared in a matrix format and the compliance for each mitigation plan shall be submitted to the RO, MoEF & CC along with half yearly compliance report.	Enclosed as Annexure VI.
xviii	Ships / barges / vessels shall not be allowed to release any oily bilge waste in the sea. Any effluents	Ships / barges / vessels are not being allowed to release any oily bilge waste in Hooghly river or

Sl No	Condition of EC	Compliance Status of Action Plan
	from the Jetty which have leachable characteristics shall be segregated and recycled/disposed as per SPCB guidelines. Ships/vessels calling at the jetty shall not dump waste/bilge water during the berthing period.	nearby surface water bodies and also at the time of berthing of the cargo ships / vessels.
xix	Location of DG sets and other emission generating equipment shall be decided keeping in view the predominant wind direction so that emissions do not effect nearby residential areas. Installation and operation of DG sets shall comply with the guidelines of CPCB.	Same will be complied during installation of DG Set.
xx	The quality of treated effluents, solid wastes, emissions and noise levels and the like, from the project area must conform to the standards laid down by the component authorities including the Central or State Pollution Control Board and under the Environment (Protection) Act, 1986.	The same is within the permissible limit as per enclosed environmental monitoring report (Annexure IV).
xxi	The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.	Complied.
xxii	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its concerned Regional Office.	Agreed.
xxii	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.	Implementation process as per commitments and recommendations made in the EIA/EMP report are under progress.
xxiv	Corporate Social Responsibility	
a	The company shall have a well laid down Environment Policy approved by the Board of Directors.	Will be compiled.
b	The Environment Policy shall prescribe for standard operating process / procedures to bring into focus any infringements / deviation / violation of the environmental or forest norms / conditions.	Will be compiled.
c	The hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.	KoPT maintains an Environment Cell headed by Manager (Environment) and assisted by OSD (Environment). A separate full-fledged Environment Cell in HDC, KoPT is also established with two environmental officers headed by Sr. Dy. Manager I under General Manager (Engg.).

Sl No	Condition of EC	Compliance Status of Action Plan
d	To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large.	A complain register is being maintained in the office of the General Manager (Engg.) to record the non-compliances / violations of environmental norms. GM (Engg.) reports the same to the Dy. Chairman, HDC. Moreover, WBPCB officials visit Haldia Port time to time.
B	**General Conditions**	
i	Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality.	Complied during construction phase.
ii	Full support shall be extended to the officers of this Ministry / Regional Office at Bhubaneswar by the project proponent during the inspection of the project for the monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities	Agreed.
iii	A six-monthly monitoring report shall need to be submitted by the project proponents to the Regional Office of this Ministry at Bhubaneswar regarding the implementation of the stipulated conditions.	Environmental monitoring report is being submitted to the Regional Office along with the six monthly compliance report in soft copy and hard copy within stipulated time.
iv	Ministry of Environment, Forest and Climate Change or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.	Agreed.
v	The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry.	Agreed.
vi	In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment, Forest and Climate Change.	Agreed.
vii	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.	Consent to Establish and Consent to Operate taken form WBPCB are enclosed (Annexure I and Annexure II) and the project is under operation phase.
viii	A copy of the clearance letter shall be marked to concern Panchayat / local NGO, if any, from whom any suggestion / representation has been made received while processing the proposal.	Complied.
ix	A copy of this clearance letter shall also be	The copy of the clearance letter already

Sl No	Condition of EC	Compliance Status of Action Plan
	displayed on the website of the concerned state Pollution Control Board. The Clearance letter shall also be displayed at the Regional Office. District industries center and Collector's office/ Tehsildar's Office for 30 days.	forwarded to State Pollution Control Board from MoEF &CC.

List of Annexures	
Annexure I	Consent to Establish
Annexure II	Consent to Operate
Annexure III	CRZ Recommendation Letter
Annexure IV	Public Hearing Document
Annexure V	Environmental Monitoring Report
Annexure VI	EMP Matrix

P. DASGUPTA
Authorized Signatory
and Sr. Dy. Manager – I
I&CF Division, HDC, KoPT

ANNEXURE – I

(For internal circulation only)

Sl. No.
NOC 1268 [handwritten over stamped number]

WEST BENGAL POLLUTION CONTROL BOARD

Paribesh Bhawan
10A, Block-LA, Sector-III
Bidhannagar, Kolkata-700 098

Memo No. 458-2N-36/2013(E) Dated 04.09.2017

From :
Member Secretary,
West Bengal Pollution Control Board

To : The Sr. Deputy Manager(Dock), Haldia Dock Complex, Kolkata Port Trust, Cluster - V, PO-Haldia Township, Haldia, Purba Medinipur - 721607, West Bengal.

Sub : Consent to Establish (NOC) from Environmental Point of View

Ref : Your letter No. SDM/RZ/15-16/T/01/292 Dated 31.07.2017

Dear Sirs,

In response to the application for Consent to Establish (NOC) for proposed Unit of M/s Haldia Dock Complex, Kolkata Port Trust for setting up Mini Bulk Carriers Handling Facility in the Upstream of 3rd Oil Jetty with the Helpof Floating Crane/Pontoon Fitted Crane at Haldia Dock Complex,Kolkata Port Trust, Haldia, West Bengal.

this is to inform you that this Board hereby grants the Consent to Establish (NOC) from the environmental point of the above subject to the following conditions and special conditions annexed.

1. The quality of sewage and trade effluent to be discharged from your factory shall satisfy the permissible limits as prescribed in IS : 2490 (Pt. I) of 1974, and/or its subsequent amendment and Environment (Protection) Rules 1986,
2. Suitable measures to treat your effluent shall be adopted by you in order to reduce the pollutional load so that the quality of the effluent satisfies the standards mentioned above,
3. You shall have to apply to this Board for its consent to operate and discharge of sewage and trade effluent according to the provisions of the water (Prevention & Control of Pollution) Act, 1974. No sewage or trade effluent shall be discharged by you without prior consent of this Board.
4. All emission from your factory shall conform to the standards as laid down by this Board,
5. No. emission shall be permitted without prior approval of this Board and you shall apply to this Board for its consent to operate and atmospheric emission as per provision of the Air (Prevention & Pollution) act, 1981,
6. No industrial plant, furnace, flues, chimneys, control equipment, etc. shall be constructed/reconstructed/ erected re-erected without prior approval of this Board,

Kmandal 04.09.2017

NOC

7. You shall comply with
   (i) Water (Prevention and Control of Pollution) Cess Act, 1977, if applicable.
   (ii) Water (Prevention and Control of Pollution) Cess Act, 1978, if applicable.
   (iii) Environment (Protection) Act, 1986
   (iv) Environment (Protection) Rules, 1986
   (v) Hazardous Wastes (Management and Handling) Rules, 1989 and Amended Rules, 2000
   (vi) Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and Amended Rules, 2000
   (vii) Manufacture, Use, Import and Storage and Hazardous Micro-Organisms, Genetically Engineered Organisms or Cell Rules, 1989
   (viii) The Public Liability Insurance Act, 1991 and Amended Act, 1992
   (ix) The Public Liability Insurance Rules, 1991 and Amended Rules 1993
   (x) Biomedical Wastes (Management & Handling) Rules, 1998 and Amended Rules 2000 if applicable.
   (xi) Recycled Plastics Manufacture and Usage Rules 1999, if applicable and
   (xii) Ozone Depleting Substances (Regulation & Control) Rules, 2000, if applicable

8. You will have to abide by any other stipulations as may be prescribed by any authority/local bodies/Government Departments etc.

SPECIAL CONDITION :

See annexure.

Gross capital investment : Rs.737000000/-

Any violation of the aforesaid conditions shall entail cancellation of this Consent to Establish (NOC)

Yours faithfully,

14.09.2017

Member Secretary, /SR. ENV. ENGR.
West Bengal Pollution Control Board
(EIM CELL)

453(1-6)-EN-36/2013(E) dd. 04.09.2017

Memo No. .....

Dated .....

Copy forwarded for information to :

1. Chief Inspector of Factories, Government of West Bengal, N. S. Building, Kolkata-700 001
2. Director of Industries/Director of Cottage & Small Scale Industries, Government of West Bengal, N. S. Building, Kolkata-700 001
3. Guard file, West Bengal Pollution Control Board.
4. Environmental Engineer, I/II/Alipur R.O./Howrah R.O./Hooghly R.O./B.R.O./D.R.O./Haldia R.O./S.R.O./Malda R.O./ Asansol Sub-R.O./WBPC Board

Himalaya Bhawan
Delhi Road, Dankuni
Dist. Hooghly

Paribesh Bhawan
10A, LA-Block, Sector-III
Salt Lake City,
Kolkata-700 098

Satya Chowdhury
Indoor Stadium
Balurchar Bandh Road
Malda-732101

Vill, Panpur
Kalyani Expressway
P.O. Narayanpur
Dist. 24 Pgs. (N)

Block-05 at 40
Flats Complex
Adjacent to Priyambada
Housing Estate
P.O. : Khanjanchak,
P.S. Durgachak
Haldia-721602
Dist. : Purba Medinipur

Asansol Sub-Regional Office
Ghanty Mansion (2nd Floor)
60, G. T. Road
Asansol-713 301

Sahid Khudiram Sarani
City Centre, Durgapur-16
Dist. Burdwan

Paribahan Nagar,
Matigara, Siliguri
Dist-Darjeeling

Bhabani Bhawan
2nd Floor, Alipur
Kolkata-700 027

10, Camac Street
2nd Floor
Kolkata-700 017

04.09.2017

Member Secretary,
West Bengal Pollution Control Board /SR.E.E.
(EIM CELL)

Annexure to NOC Sl. No. **NO147045**

Special Conditions issued to M/s Kolkata Port Trust for setting up of Mini Bulk Carriers Handling Facility in the Upstream of 3rd Oil Jetty with the Help of Floating Crane/ Pontoon Fitted Crane at Haldia Dock Complex (HDC), Kolkata Port Trust (West Bengal)

A. Emission:-

1. Measures should be taken for abatement of vehicular pollution by installing adequate dust suppression system.
2. Coal and cargo must be transported from ships to designated stockyard through closed conveyers. Coal stockyard must be equipped with proper screen and dust suppression system.

B. Effluent:-

Domestic – wastewater generated from the entire project shall be treated in existing STP of Haldia Dock Complex comprising of waste stabilization pond. Proper storm water pollution prevention plan should be developed and implemented.

C. Solid Waste :-

To be collected and disposed off through onsite compost plant regularly as per the Solid Waste Management Rules, 2016. Hazardous Waste to be collected and disposed of as per the Hazardous and Other Wastes (Handling and Trans-boundary Movement) Rules, 2016.

General:-

1. Water sprinkling arrangement should be ensured at every loading and unloading point to prevent spreading of dust. Rubbish, debris, broken materials and others must be kept properly within project area at suitable place with proper water sprinkling to prevent fugitive dust spreading.
2. Provision of drinking water, wastewater disposal and solid waste management should be ensured for labour camps. Proper sanitation facilities should be provided for construction workers to ensure environmental sanitation. Health and safety of the workers should be ensured during construction.
3. Necessary dust barrier should be provided during construction phase. Before taking up the construction work it is preferable to enclose the area with some enclosure.
4. Ground water should not be abstracted without obtaining prior permission of the Local body as well as the Competent Authority as per the West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005.
5. The proponent should strictly abide by The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006 and subsequent rules. No trees can be felled without prior permission from the Tree Cutting Authority constituted as per the West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006 and subsequent rules. Adequate green belt is to be developed within the project site. Water intensive and/or invasive species should not be used for landscaping.
6. Adequate firefighting storage should be provided as per Rules.
7. Adequate parking space should be provided within the project site as per Rules.
8. Road design should be done with due consideration for environment and safety of users. The entry and exit points should be designed properly without disturbing the existing traffic.
9. No expansion of the project should be undertaken without prior permission of the State Board.
10. Project proponent should not undertake any activity on any portion of land which is not under their possession.
11. Statutory clearance/license from competent authorities, as applicable to be obtained.
12. The unit should not start operation without obtaining 'Consent to Operate' from this Board.

04.09.2017

Annexure to NOC Sl. No. **NO147045**

Special Conditions issued to M/s Kolkata Port Trust for setting up of Mini Bulk Carriers Handling Facility in the Upstream of 3rd Oil Jetty with the Help of Floating Crane/ Pontoon Fitted Crane at Haldia Dock Complex (HDC), Kolkata Port Trust (West Bengal)

13. Conditions laid down in the Environmental Clearance obtained for the project from MoEF, GoI vide memo no10-26/2015-IA-III dated 17.05.2017 must be strictly complied with.
14. Conditions laid down by the West Bengal Coastal Zone Management Authority (WBCZMA) vide letter no. 285/EN/T-II-4/011/2016 dated 26.12.2016 should be strictly complied with.
15. This NOC is valid up to **31.08.2024** for setting up of Mini Bulk Carriers Handling Facility in the Upstream of 3rd Oil Jetty with the Help of Floating Crane/ Pontoon Fitted Crane at Haldia Dock Complex (HDC), Kolkata Port Trust (West Bengal).

24.05.2017

Member Secretary/Sr. Environmental Engineer (EIM Cell)
West Bengal Pollution Control Board

ANNEXURE – II

WEST BENGAL POLLUTION CONTROL BOARD

'Paribesh Bhawan',
Bldg. No. - 10A, Block - LA, Sector-III,
Salt Lake City, Kolkata - 700 098

Consent Letter Number : CO106577

Memo Number : 13-HL-CO-R-18-0201

Date : 25-09-2018

Consent to Operate

under

Section 25 & 26 of the **Water (Prevention and Control of Pollution) Act, 1974** and
Section 21 of the **Air (Prevention and Control of Pollution) Act, 1981**

The West Bengal Pollution Control Board (hereinafter referred to as State Board) under the provisions of Section 25 & 26 of the Water (Prevention and Control of Pollution) Act, 1974, as amended and Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, as amended, and Rules and Orders made thereunder, hereby grants its consent to :

M/s. HALDIA DOCK COMPLEX, KOLKATA PORT TRUST

(Address of Regd. office/Head/Office/City Office)

(hereinafter referred to as Applicant) for its unit located at Near 3rd Oil Jetty, Haldia Dock Complex, Haldia, Dist: Purba Medinipur,

(Detailed address of the manufacturing unit)

for a period from Date of issue to 20/02/2023

to operate the industrial unit and to discharge liquid effluent and to emit gaseous effluent from the premises/land of the industrial unit, in accordance with the conditions as mentioned in the Annexure to this consent letter provided on any day at any instance the quantity and quality of liquid discharge and gaseous emission shall not exceed the permissible limit as specified in the Table I & II of this consent letter and in the Environmental (Protection) Act, 1986.

Breach of the conditions and / or failure to comply with the directions as set out in the Annexure shall render the applicant liable for prosecution under the provisions of the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.

The State Board reserve the right to revoke, withdraw or make any reasonable variation / change / alter the conditions of this consent letter giving one month's notice to the applicant.

Office of The Sr. Environmental Engineer W.B.P.C.B. Cannac Street Circle Office Kolkata

For and on behalf of the State Board

(~~Member Secretary~~/~~Chief Engr.~~/Sr. Env. Engr./~~Env. Engr.~~/~~Asst. Env. Engr.~~)

Senior Environmental Engineer
W.B. Pollution Control Board

Annexture to Consent to Operate Sl. No.CO106577

Special Conditions issued to: M/s. Haldia Dock Complex, Kolkata Port Trust
Near 3rd Oil Jetty, Haldia Dock Complex, Haldia,
Purba Medinipur

1. Regular water sprinkling to be carried out in all vulnerable locations to reduce fugitive emission.

2. Dust from rod shall be periodically cleaned.

3. All other terms & conditions issued in the Environmental Clearance issued by the MoEF & CC and Consent to Establish issued by the State Board for this project to be strictly complied with.

25/11/18

Senior Environmental Engineer
Camac Street Circle Office
W.B. Pollution Control Board.

Senior Environmental Engineer
W.B. Pollution Control Board

J10657 7

Consent to ..... M/s. HALDIA DOCK COMPLEX, Kolkata Port Trust, ... Page 03 of 06

for its unit at ..... Up stream of 3rd oil hetty@ Haldia Dock Complex, ...

..... Haldia, Dist: Purba Medinipur, ...

Table - I

Outlet No.	Nature of effluent	Parameters	Standard	Frequency of effluent sampling
01	Domestic	pH	Between : 5.5 - 9.0	Yearly
		Total Suspended Solids	Not to exceed : 100 mg/l.	
		Biochemical Oxygen Demand (3day at 27°C)	Not to exceed : 30 mg/l.	
		Chemical Oxygen Demand	Not to exceed : 250 mg/l.	
		Oil & Grease	Not to exceed : 10 mg/l.	

09. The *Applicant* falls in the ..... Category of the Water (Prevention and Control of Pollution) Cess Act, 1977 and Rules made thereunder and the Applicant shall comply with the provisions of the said Act and Rules made thereunder.

10. **Daily** water consumption for the following purposes should not exceed :-

- Industrial cooling, spraying in mine pits and boiler feed water (Water used for gardening should be included in this category of use) → 150 (for water sprinkling) KL *
- Domestic purpose → 3.5 KL
- Processing whereby water gets polluted and the pollutants are easily biodegradable → ---- KL
- Processing whereby water gets polluted and the pollutants are not easily biodegradable → ---- KL

The *Applicant* shall regularly submit to the Board the Returns of Water Consumption in the prescribed from and pay the Cess as specified under Section 3 of the said Act.

* Waste Water to be settled in settling tank and after settling treated waste water shall be used in gardening, road cleaning, sprinkling and the unit shall maintain zero discharge.

(Member Secretary/~~Chief Engr./Sr. Env. Engr./Env. Engr./Asst. Env. Engr.~~)

Senior Environmental Engineer
W.B. Pollution Control Board

Continued.....

Consent to ..... M/s. HALDIA DOCK COMPLEX, Kolkata Port Trust,

for its unit at ..... Up stream of 3rd oil jetty, Haldia Dock Complex,

Haldia, Dist: Purba Medinipur,

11 The *Applicant* shall install suitable device for measuring the volume of water consumed for different purposes as mentioned above giving correct result to the satisfaction of the *State Board*.

12 All the stacks connected to various sources of emissions must be designated by numbers such as S-1, S-2, S-3, etc., and this must be painted/displayed to faciliate identification.

13 The *Applicant* shall install comprehensive control system consisting of pollution control equipment as is warranted with reference to generation of air emissions and operate and maintain the same continuously so as to achieve the level of pollutants of the *Standard* as given in Table-II below :

Table - II

Stack No.	Stack height from G.L., (in mts.)	Stack attached to (sources and control system, if any) :	Volume $Nm^3/hr.$	Velocity of gas emission	Concentrations of parameters not to exceed					Frequency of emission sampling
				m/sec	SPM (mg/Nm^3)	CO (% v/v)				
S-I										
S-2										
S-3										
S-4										
S-5										
S-6										
S-7										
S-8										
S-9										
S-10										

(Member Secretary/Chief Engr./Sr. Env. Engr./Env. Engr./Asst. Env. Engr.)

Senior Environmental Engineer
W.B. Pollution Control Board

Continued....

Consent to ..... M/s. HALDIA DOCK COMPLEX, Kolkata Port Trust,

for its unit at ..... Up.stream of 3rd Jetty, Haldia Dock Complex,

..... Haldia, Dist: Purba Medinipur,

11. The *Applicant* shall provide ports in the stack(s) and other necessary permanent facilities such as ladder, platform, etc. for monitoring/sampling the air emissions and the same shall be made available for inspection and use by the *State Board's* staff as well as *State Board's* authorised agencies.

15. The *Applicant* shall observe the following fuel consumption pattern :=

Sl. No.	Type of fuel	Quantity consumed per day	Fuel burning operation where the fuel is used
01	N.A.		
02			
03			
04			
05			

16. The *Applicant* shall maintain the generation and treatment / disposal of non-hazardous solid waste as specified below :

Type of waste	Quantity	Treatment	Disposal
M S W	100 Kg/day	----	To municipal vat

17. The *Applicant* shall take adequate measures for control of noise levels from its own sources within the premises within the limit given below :—

Time	Limit in dB(A) Leq
Day Time (06 a.m. to 09 p.m.)	75
Night Time (09 p.m. to 06 a.m.	70

18. The *Applicant* shall at all times maintain good house-keeping, proper working order, and operate efficiently for control of pollution from all sources so as not to cause nuisance to surrounding areas/inhabitants and to achieve compliance with the terms and conditions of the consent.

19. The *Applicant* shall bring about at least 33% of the available open land under the green coverage/plantation.

20. The *Applicant* shall provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the *Applicant* to maintain compliance with the terms and conditions of the consent. In absence of such an alternate electric power source, the *Applicant* shall stop, reduce or otherwise control production to abide by the terms and conditions of the Consent regarding pollution level.

21. The *Applicant* shall install a separate energy meter showing the consumption of energy for operation of pollution control devices.

22. The *Applicant* shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.

23. The *Applicant* shall provide drainage system for conveying industrial and domestic liquid waste. Storm-water drain shall be kept separate from the drainage system meant for industrial and domestic liquid waste.

25/9/18

(~~Member Secretary~~/~~Chief Engr.~~/Sr. Env. Engr./~~Env. Engr.~~/~~Asst. Env. Engr.~~)

Senior Environmental Engineer
W.B. Pollution Control Board

Continued.....

CO 106577

Consent to M/s. HALDIA DOCK COMPLEX, Kolkata Port Trust.

for its unit at Up stream of 3rd Jetty, Haldia, Dock Complex, Haldia, Dist: Purba Medinipur.

24. The *Applicant* shall maintain a separate register showing consumption of chemicals used in pollution control systems.

25. The *Applicant* Shall get the samples of hazardous wastes/leachates analysed at least once in..... from the laboratory recognised of the West Bengal Pollution Control Board and ensure that they conform to the limit stipulated. Test reports shall be sent to the Board.

26. The *Applicant* shall provide adequate and safe facility for collection of air, waste water and solid waste samples by the *State Board's* staff as well as *State Board's* authorised agencies.

27. The *Applicant* shall submit to the *State Board* by the 30th September of every year the Environmental Statement Report for the financial year ending 31st March of the current year in the prescribed form (Form - V) as required under the provisions of rule 14 of the Environment (Protection) [Second Amendment] Rules. 1992.

28. The *Applicant* shall allow the Officers of the *State Board* to enter into the applicant's premises at any reasonable time to inspect the pollution control systems as well as monitoring and measuring devices in connection with prevention & control of pollution.

29. The *Applicant* shall maintain an Inspection Book in the factory premises which shall be made available to Officers & employees of the *State Board* for inspection, review and to write down any direction or observation as is deemed necessary during the inspection from time to time.

30. The *Applicant* shall furnish to the *State Board* all information in respect of quality, quantity, rate of discharge, place of discharge of liquid effluent and air emissions.

31. The *Applicant* shall maintain adequate number of qualified and trained personnel among his staff for proper maintenance and operation of the effluent treatment and / or emission control devices and for overall environment management of the industry.

32. The *Applicant* shall have to make registration for the use of groundwater if any, with Central Ground Water Authority.

33. The *Applicant* shall intimate to the *State Board* immediately of any occurrence or apprehension of occurrence of discharge of any poisonous, noxious or pollutants in excess of quality as well as quality as mentioned earlier to any receiving water body/receiving system or to atmosphere owing to accident or other unforeseen incident/event including natural disaster. The *Applicant* Shall (i) take all steps adequate to prevent such accident discharge/release of poisonous, noxious or pollutants and to limit their consequences to persons and the environment. (ii) provide to the persons working on the site with the information, training and equipment including antidotes necessary to ensure their safety and mitigate the accidental release of poisonous, noxious or pollutants to the environment.

34. The *Applicant* shall make an applicant to the *State Board* in the prescribed form for renewal of the consent at least 60 (sixty) days before the date of expiry of this Consent.

35. The *Applicant* shall not make any alternation/modification/expansion in the existing manufacturing process and equipment as well as the pollution control system without prior approval of the Board.

36. The Applicant shall comply with the conditions as laid down in the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and Hazardous Wastes (Management & Handling) Rules, 1989.

Additional Conditions Please see refer to annexure

25/4/12

(~~Member Secretary~~/~~Chief Engr.~~/Sr. Env. Engr./~~Env. Engr.~~/~~Asst. Env. Engr.~~)

Senior Environmental Engineer
W.B. Pollution Control Board

ANNEXURE – III

WEST BENGAL STATE COASTAL ZONE MANAGEMENT AUTHORITY
Poura Bhawan, 4th Floor, FD-415A
Sector – III, Salt Lake, Kolkata – 700 106
Telefax No. : 033 2337 0268
E mail – environmentwb@gmail.com

No. 2856/EN /T-II-4/011/2016 Date : 26/12/2016

From : Sandipan Mukherjee
Member Secretary, WBSCZMA

To : The Secretary
Ministry of Environment, Forests and Climate Change
Government of India
Indira Paryavaran Bhawan
Jorbagh Road, New Delhi – 110 003

SUB. : *Recommendation from CRZ angle for the project* ***" Setting up of Mini Bulk Carriers Handling Facility on the Upstream of 3rd Oil Jetty and West Bank of River Hooghly Floating Crane/Pontoon Fitted Crane at Haldia Dock Complex(HDC)*** *by Kolkata Port Trust*

Sir,

This has reference to the above mentioned subject wherein ***Kolkata Port Trust*** has submitted an application to the West Bengal State Coastal Zone Management Authority (WBSCZMA) seeking recommendation from CRZ angle for ***Setting up of Mini Bul Carriers Handling Facility on the Upstream of 3rd Oil Jetty and West Bank of River Hooghly Floating Crane/Pontoon Fitted Crane at Haldia Dock Complex(HDC)*** as per ToR issued by MoEF&CC, Govt. of India vide F.N. 10-26/2015.IA.III dtd. 8th January,2016 as submitted by the Project Proponent.

As per the project documents submitted by the Project Proponent it has been observed that the project area, lying in **CRZ –I, CRZ-II and CRZ-IVB**, is required for setting up of the Mini Bulk Carriers Handling Facility .

It was found that movement of ships inside the dock complex through the lock gate takes considerable time. Hence, in order to avoid movement of ships through the lock gate and decongestion of impounded docks as well as to improve the turnaround time thereby increasing the output of Haldia Dock Complex as demanded by the shipping industries, the decision of setting up of mini-bulk handing facility outside the dock area but within the Port complex of Haldia port has been proposed in an area having proper draught by Kolkata Port Trust. In view of the tidal influx within the river, a floating pontoon jetty has been proposed with walkway and conveyor. The activity is permissible in terms of 4(i) of CRZ Notification,2011.

cont.....

c/c

The proposal for recommendation from CRZ angle was considered by WBSCZMA in its 4th meeting dated 29/11/2016. The Authority after going through the documents as well as the presentation given by the Project Proponent and after detailed discussion in this regard unanimously agreed to recommend the above project to Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India for CRZ clearance based on CRZ Notification 2011. Now, after receipt of extra copies of the entire document from the Project Proponent the case is being forwarded along with duplicate copies, subject to the following conditions :

SPECIFIC CONDITIONS

i. CRZ norms as laid down in CRZ Notification, 2011 should be strictly followed.

ii. The built up area as proposed should be strictly adhered to.

iii. Noise and vibration during construction should be minimized through good working practices and management of working hours.

iv. The structures created under this project should be able to withstand cyclonic storm that is likely to strike the coast once in 20 years interval. The project proponent should get the plan certified by a competent architect regarding its structural stability.

v. Extraction of sand, levelling or digging of sandy stretches except for structural formation should not be done under any circumstance.

GENERAL CONDITIONS

i. Liquid wastes if any, from this area will not be allowed to drain directly into the river.

ii. The Proponent should abide by the Municipal Solid Waste (Management & Handling) Rules, 2000. The Proponent must develop the solid waste management and disposal scheme ensuring storage and segregation of bio-degradable and non-biodegradable wastes. The solid wastes to be composted and used as manure.

iii. The project proponent shall submit half yearly compliance report in respect of stipulated terms and conditions in hard and soft copies on 1st June and 31st December of each calendar year.

iv. Adequate provisions for the infrastructure facilities including water supply and sanitation may be ensured for the labourers during the construction period in order to avoid damage to the surrounding environment.

v. Construction materials and wastes including hazardous substances such as oil, if any, should not be allowed to pollute the surrounding land or aquatic environment as the case may be and should be disposed of as per prevalent rule.

vi. The noise level and the suspended particulate matters should be kept within permissible levels at the time of establishment as well as operations

vii. There should not be any removal of vegetative cover both at the establishment as well as operations stage, without the sanction of appropriate authority.

.....cont.

viii. The ships should not discharge ballast water or any untreated sewage directly into the river.

ix. The WBSCZMA may monitor the implementation of the project at any stage. For all activities the authorized member of West Bengal State Coastal Zone Management Authority will have the power to inspect the sites to enforce conditions imposed by the state authority. The Authority reserves the right to add additional safeguard measures subsequently if found necessary.

This issues with approval of the competent authority.

Yours faithfully,

(Sandipan Mukherjee)
Member Secretary, WBSCZMA

Encl. : 2(two) Copies of Detailed Project Report
along with Maps etc.

No. 2856/EN /T-II-4/011/2016/1(1) Date : 26/12/2016

Copy forwarded for kind information to :

The Chief Engineer, Civil Engineering Department (Environment Cell), Kolkata Port Trust, 15, Strand Road, Kolkata-700 001

Member Secretary
WBSCZMA

No.2856/EN /T-II-4/011/2016/2(4) Date : 26/12/2016

1. District Magistrate, Purba Medinipur District.
2. Member Secretary, West Bengal Pollution Control Board.
3. Executive Officer, Haldia Development Authority
4. P.S. to Chairman, WBSCZMA, Environment Department

Member Secretary
WBSCZMA

o/c

ANNEXURE – IV

WEST BENGAL POLLUTION CONTROL BOARD
(Department of Environment, Govt. of West Bengal)
Paribesh Bhawan, 10A, Block - LA, Sector III
Bidhannagar, Kolkata-700 098, India
Tel : 2335 - 9088 / 7428 / 8211 / 6731 / 0261 / 8861 / 1625
Fax : 2335 2813
City Code : 33, Country Code : 91
Website: **www.wbpcb.gov.in**

Memo No. -2N-36/2013(E) Manager (Environment) **Dated:** .10.2016

पंजीकरण सं. ..... दि. .....
Regn. No. D/928 Dt. 7.10.16
कोलकाता पत्तन न्यास
KOLKATA PORT TRUST
मुख्य अभियंता विभाग
Chief Engineer's Dept

To,
The Member Secretary
Expert Appraisal Committee (EAC)
Ministry of Environment, Forests & Climate Change,
Govt. of India, Indira Paryavaran Bhawan,
Jor Bagh Road, New Delhi – 110.

Sub: Public Hearing for the proposed setting up of Mini Bulk Carriers Handling Facility on the upstream of 3rd Oil Jetty and west bank of river Hooghly at Haldia Dock Complex, Dist – Purba Medinipur, West Bengal, by **M/s. Kolkata Port Trust.**

Sir,

I am enclosing herewith the following documents for the above mentioned project towards environmental clearance by the Ministry of Environment, Forests & Climate Change, Govt. of India.

1) Chronology of events leading to Public Hearing. (Annexure – I).
2) Minutes of Public Hearing dated 21.09.2016 at the B. B. Ghosh Auditorium, Haldia Township, Opposite Port Hospital, Dist – Purba Medinipur, West Bengal. (Annexure – II).
3) Copy of attendance of panel members and others in Public Hearing. (Annexure – III).
4) One CD containing the videography of the public hearing. (Annexure – IV).

Yours faithfully,

Sd/-
(D. Sarkar)
Senior Environmental Engineer (EIM Cell)
West Bengal Pollution Control Board

Enclo: As stated.

Memo No. 6600(1) -2N-36/2013(E) **Dated:** 05.10.2016

Copy to:
Shri A. K. Jain, Chief Engineer, M/s. Kolkata Port Trust, 15, Strand Road, Kolkata – 700 001.

5/10/2016.
(D. Sarkar)
Senior Environmental Engineer (EIM Cell)
West Bengal Pollution Control Board

13/10/16.

Annexure-I

Chronology of events leading to Public Hearing

1) Copy of the letter from the Additional District Magistrate (Dev.), Dist – Purba Medinipur dated 12.08.2016 (copy enclosed).

2) Letter of circulation of copies of Executive Summary and EIA / EMP of the project on 22.08.2016 (copy enclosed).

3) Notification of Public Hearing in two local dailies published on 20.08.2016 (copy enclosed).

4) Holding Public Hearing at the B. B. Ghosh Auditorium, Haldia Township, Opposite Port Hospital, Dist – Purba Medinipur, West Bengal on 21.09.2016.

Copies of Executive Summary with EIA/EMP report were available for public scrutiny in the offices of:

1. Office of the District Magistrate, Purba Medinipur, Govt. of West Bengal.
2. Office of the Additional District Magistrate (Dev.), Dist – Purba Medinipur, Govt. of West Bengal.
3. Office of the Sub-Divisional Officer, Haldia Sub Division, Dist – Purba Medinipur.
4. Office of the General Manager, D.I.C., Purba Medinipur.
5. Office of the Chairman, Haldia Municipality, Dist – Purba Medinipur.
6. Office of the CEO, Haldia Development Authority, Dist – Purba Medinipur
7. Office of the Chief Engineer (O & E), Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata – 700 098.
8. Office of the Senior Environmental Engineer, Camac Street Circle Office, KIT Building 1st Floor, 247, Deshpran Shasmal Road, Tollygunge, Kolkata – 700 033.
9. Office of the Environmental Engineer, Haldia Regional Office, Super Market Building, (3rd Floor), PO & PS – Durgachak, Haldia, Dist – Purba Medinipur.
10. Department of Environment, Govt. of West Bengal, Poura Bhavan, 4th Floor, FD-415/A, Sector – III, Salt lake, Kolkata 700 106.
11. Ministry of Environment, Forests & Climate Change, Eastern Zonal Office, Bhubaneswar.
12. Head Office of West Bengal Pollution Control Board, Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata – 700 098.

PROCEEDINGS OF THE PUBLIC HEARING FOR THE PROPOSED SETTING UP OF MINI BULK CARRIER HANDLING FACILITY ON THE UPSTREAM OF 3rd OIL JETTY AND WEST BANK OF RIVER HOOGHLY AT HALDIA DOCK COMPLEX, HALDIA, DIST - PURBA MEDINIPUR, WEST BENGAL BY M/S KOLKATA PORT TRUST HELD ON 21.09.2016 AT 12.00 NOON AT THE B.B GHOSH AUDITORIUM, HALDIA TOWNSHIP, DIST - PURBA MEDINIPUR, WEST BENGAL.

M/s. Kolkata Port Trust submitted an application to the West Bengal Pollution Control Board for conducting a Public Hearing for the proposed setting up of mini bulk carrier handling facility on the upstream of 3rd oil jetty and west bank of river Hooghly at Haldia dock complex, Haldia, Dist - Purba Medinipur, West Bengal. As per the EIA Notification S.O. 1533 dated 14th September, 2006 of the MoEF & CC, Govt. of India, Environmental Clearance (EC) of the said project is required to be obtained from the MoEF, Govt. of India after conducting the Public Hearing.

Accordingly, West Bengal Pollution Control Board after observing all formalities conducted the Public Hearing on 21.09.2016 at 12.00 Noon at the B.B Ghosh Auditorium, Haldia Township, Dist - Purba Medinipur, West Bengal. Sri K. Basak, WBCS (Exe.), Additional District Magistrate (Dev), Purba Medinipur, presided over the hearing. List of the panel members and the others present in the public hearing is enclosed.
The hearing started with a welcome note from Sri D.Sarkar, Sr. Environmental Engineer, WBPCB. He explained the provisions of the above stated MoEF Notification and also informed the audience about the proposal of M/s. Kolkata Port Trust for the proposed project. Sri. D. Sarkar further informed the gathering that the entire public hearing procedure will be recorded and unedited videography will be sent to the MoEF & CC, Govt. of India for their consideration.

Sri K. Basak, WBCS (Exe.), Additional District Magistrate (Dev.), Purba Medinipur, presided over the hearing. He highlighted the importance & objectives of Public Hearing and informed the audience about the proposed expansion project. He requested the project proponent to clearly describe the proposed expansion project to be undertaken in detail and to use local language.

Annexure-I

Chronology of events leading to Public Hearing

1) Copy of the letter from the Additional District Magistrate (Dev.), Dist – Purba Medinipur dated 12.08.2016 (copy enclosed).

2) Letter of circulation of copies of Executive Summary and EIA / EMP of the project on 22.08.2016 (copy enclosed).

3) Notification of Public Hearing in two local dailies published on 20.08.2016 (copy enclosed).

4) Holding Public Hearing at the B. B. Ghosh Auditorium, Haldia Township, Opposite Port Hospital, Dist – Purba Medinipur, West Bengal on 21.09.2016.

Copies of Executive Summary with EIA/EMP report were available for public scrutiny in the offices of:

1. Office of the District Magistrate, Purba Medinipur, Govt. of West Bengal.
2. Office of the Additional District Magistrate (Dev.), Dist – Purba Medinipur, Govt. of West Bengal.
3. Office of the Sub-Divisional Officer, Haldia Sub Division, Dist – Purba Medinipur.
4. Office of the General Manager, D.I.C., Purba Medinipur.
5. Office of the Chairman, Haldia Municipality, Dist – Purba Medinipur.
6. Office of the CEO, Haldia Development Authority, Dist – Purba Medinipur
7. Office of the Chief Engineer (O & E), Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata – 700 098.
8. Office of the Senior Environmental Engineer, Camac Street Circle Office, KIT Building 1st Floor, 247, Deshpran Shasmal Road, Tollygunge, Kolkata – 700 033.
9. Office of the Environmental Engineer, Haldia Regional Office, Super Market Building, (3rd Floor), PO & PS – Durgachak, Haldia, Dist – Purba Medinipur.
10. Department of Environment, Govt. of West Bengal, Poura Bhavan, 4th Floor, FD-415/A, Sector – III, Salt lake, Kolkata 700 106.
11. Ministry of Environment, Forests & Climate Change, Eastern Zonal Office, Bhubaneswar.
12. Head Office of West Bengal Pollution Control Board, Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata – 700 098.

PROCEEDINGS OF THE PUBLIC HEARING FOR THE PROPOSED SETTING UP OF MINI BULK CARRIER HANDLING FACILITY ON THE UPSTREAM OF 3rd OIL JETTY AND WEST BANK OF RIVER HOOGHLY AT HALDIA DOCK COMPLEX, HALDIA, DIST – PURBA MEDINIPUR, WEST BENGAL BY M/S KOLKATA PORT TRUST HELD ON 21.09.2016 AT 12.00 NOON AT THE B.B GHOSH AUDITORIUM, HALDIA TOWNSHIP, DIST – PURBA MEDINIPUR, WEST BENGAL.

M/s. Kolkata Port Trust submitted an application to the West Bengal Pollution Control Board for conducting a Public Hearing for the proposed setting up of mini bulk carrier handling facility on the upstream of 3rd oil jetty and west bank of river Hooghly at Haldia dock complex, Haldia, Dist – Purba Medinipur, West Bengal. As per the EIA Notification S.O. 1533 dated 14th September, 2006 of the MoEF & CC, Govt. of India, Environmental Clearance (EC) of the said project is required to be obtained from the MoEF, Govt. of India after conducting the Public Hearing.

Accordingly, West Bengal Pollution Control Board after observing all formalities conducted the Public Hearing on 21.09.2016 at 12.00 Noon at the B.B Ghosh Auditorium, Haldia Township, Dist – Purba Medinipur, West Bengal. Sri K. Basak, WBCS (Exe.), Additional District Magistrate (Dev), Purba Medinipur, presided over the hearing. List of the panel members and the others present in the public hearing is enclosed.
The hearing started with a welcome note from Sri D.Sarkar, Sr. Environmental Engineer, WBPCB. He explained the provisions of the above stated MoEF Notification and also informed the audience about the proposal of M/s. Kolkata Port Trust for the proposed project. Sri. D. Sarkar further informed the gathering that the entire public hearing procedure will be recorded and unedited videography will be sent to the MoEF & CC, Govt. of India for their consideration.

Sri K. Basak, WBCS (Exe.), Additional District Magistrate (Dev.), Purba Medinipur, presided over the hearing. He highlighted the importance & objectives of Public Hearing and informed the audience about the proposed expansion project. He requested the project proponent to clearly describe the proposed expansion project to be undertaken in detail and to use local language.

Sri D. Sarkar, Sr. Environmental Engineer, WBPCB, mentioned that earlier Haldia Industrial Area was notified as Critically Polluted Area by MoEF & CC and moratorium was imposed for development of new industrial activity. Now, the moratorium was lifted by MoEF & CC and WBPCB regularly monitors the environmental quality of the area. He expressed his hope that more industrial activities will be developed due to the proposed port activities. He also requested the proponent to address the issues raised by the public and incorporate the suggestions made by them in their Final EIA/EMP report

Sri A.K Dutta, G.M (Materials), of M/s. Kolkata Port Trust assured the gathering that all the issues raised will be duly considered during construction as well as operation phase of the proposed project. He further mentioned that for the proposed project approx. 80-90% of the cargo will be transported through railways and closed conveyor belt will be provided for transportation of materials and therefore, possibilities of air pollution will be less. He also mentioned that due to the proposed project, socio-economic development of local area including employment will be further improved.

In general, local people present in the hearing welcomed the expansion project provided that the project proponent will implement all the commitments made during public hearing.

Sri K. Basak, WBCS (Exe.), Additional District Magistrate (Dev), Purba Medinipur requested the project proponent for development of green belt in the township, river bank and other areas of the port authority and monitoring mechanism during transportation of materials by road. He expressed his gratitude to the audience for their active participation in this public hearing and concluded the session.

21/09/2016

D. Sarkar
Sr Environmental Engineer
West Bengal Pollution Control Board

21/9/16

Additional District Magistrate (Dev.)
Purba Medinipur

Sri K. Basak, WBCS (Exe.)
Additional District Magistrate (Dev)
Purba Medinipur

...of ... the proposed setting up of Mini Bulk Carriers handling facili... the upstream of 3rd Oil jetty and west bank of river Hooghl... at Haldia Dock Complex, Dist- Purba Medinipur, W. B by M/s. Kolkata Port Trust. Public Hearing held on 21.09.16 at 12:00 noon ~~at the B B Ghosh Auditorium, Haldia Township, Oppo. Port Hospi...~~ Dist- Purba Medinipur.

Sl NO.	Name of the panel members	Signature
01.	Sri K. Basak, WBCS (Exe), Addl. District Magistrate (Dev)	[signature]
02.	Sri D. Sarkar, Sr. E.E WBPCB	[signature]
03.	Sri Abutayeb Dy. Magistrate,	[signature]

97. Subho
98.

No.	Name	Signature
		S. Das
2	[illegible]ndal Rangapalchak	[illegible]ndal.
3.	Rajesh Saw	Rajesh
4	MANOJ KUMAR	[illegible]
5.	Gouri Sankar Das	
6	RABIN	
6	RABIN PASWAN	RABI
7.	Goutam Mondal	G. Mondal
8.	SK. MD. ALI	
9	মো: তস্লীম.	[illegible]
10	[illegible]	[illegible]
11.	Devprasad Mandal	[illegible]
12.	Tapan Jana	Jana
13.	Surjit Ali	S. Ali
14	Raju Das	R. Das
15	Amit Maity	A. Maity
16	Bipul Das	B. Das
17.	Tapan Mandal	T. Mandal
18.	Sunil Prasad	Sunil
19	[illegible]	
20	[illegible]	
21	K. Kishan Raju	Kishan Raju
22	K. Santhi Sagar	[illegible]
22	M.V. Jaga	Ja[illegible]
23		

Other persons & Govt. officials present in the Public Hearing held on 21.09.2016.

Sl. No.	Name of persons with address	Signatures.
Vill	Ramgopal Chak Do/ Day Vook	
Vill	Rangopal chak Do/ Day Vook	
VIII	G. Mandal (Vill) Sovaram Pan	
	Bhabanipur	
	Dasak Chak	
	Deenab Chak	
	Bishnuram chak	
	Sultan chak	
	Dasherchak	
	Dasherchak	
	Dasherchak	

Other persons & Govt. officials present in the Public Hearing held on 21.09.2016.

Sl. No.	Name of the persons with address	Signature
23	Prudhvi Raj	[signature]
24.	K. Naveen	[signature]
25	SK Samim Aktar	Sapiana
26,	SK A esedul Rahaman	[signature] 21/09/16
27)	QAIYUM KHAN	[signature] 21/09/16
23,	Rahamatullah Khan	[signature]
24	SK Rahul Amin	
25	Md Murtaza Alam	[signature]
26.	Bandab Das.	[signature]
(27	Sikendel Pandit	
(28	Rejaul Islam Khan	
(29	Pradip Das	
(30	[illegible]	
31	Bimal [illegible]	
32	Gowhari Gagan.	
33	[illegible]	
34	Safibul Sha	
35	[illegible]	
36	R. Mallik	
37	Ranjit Jana	
38	[signature]	
39	Bimalendu Pramanik	
40	Sanjay Sharma	
41.	Sirabanath Mondal	
42	Samsad	[signature]
43	Manjaj Ali Shah	[signature]
44/	Krishnendu Bera	[signature]
45	Rajendra Pramanik	[signature]
46	Asoy Mohanty	

(24)

Government of West Bengal
OFFICE OF THE DISTRICT MAGISTRATE
TAMLUK :: PURBA MEDINIPUR

Memo No: 10/PCL/PM   Date: 12/08/2016

To
The Sr. Environmental Engineer (EIM cell)
West Bengal Pollution Control Board
Department of Environment, Govt. of West Bengal
ParibeshBhavan, 10A, Block-LA, Sector-III
Bidhannagar, Kolkata-700098

Subject:- Re-Submission of Date, Time & Venue for Public Hearing for the proposed setting up a Mini Bulk Carriers Handling Facility on the upstream of 3rd Oil Jetty and west bank of river Hoogly at Haldia Dock Complex. Dist-PurbaMedinipur.

Reference:- Your Memo No-513-2N-36/2013(E), Dated, 10/08/2016.

Sir,

With reference to subject mentioned above, it is to be recommended that the date of the said hearing programme has been fixed to be held on **21/09/2016** at **12:00 noon**. The Venue of the said hearing programme will be at **B.B. Ghosh Auditorium, Haldia Township, opposite Port Hospital**.

This is for your information and taking necessary action.

Yours Sincerely,

12/8/16

Additional District Magistrate (Dev.)
PurbaMedinipur

Memo No 10/PCL/PM-1(3)   *Date: 12/08/2016*

Copy forwarded for information to-

1) *The Sub-Divisional Officer, Haldia, PurbaMedinipur.*
2) *The M/S Kolkata Port Trust.*
3) *C.A. to the District Magistrate, PurbaMedinipur.*

12/8/16

Additional District Magistrate (Dev.)
PurbaMedinipur

File 16.08.16

WEST BENGAL POLLUTION CONTROL BOARD
(Department of Environment, Govt. of West Bengal)
Paribesh Bhawan, 10A, Block - LA, Sector-III,
Bidhannagar, Kolkata-700 098, India
Tel : 2335 - 9088 / 7428 / 8211 / 6731 / 0261 / 8861 / 5868 / 1625
Fax : 2335 - 5868 / 2813
City Code : 33, Country Code : 91
Website: www.wbpcb.gov.in

Memo No. 546(1-12) -2N-36/2013(E) Dated: 22.08.2016

CIRCULAR

It is hereby informed that a Public Hearing will be held on **21.09.2016** at **12:00 noon** at the B. B Ghosh Auditorium, Haldia Township, Opposite Port Hospital, Dist – Purba Medinipur, West Bengal for the proposed setting up of Mini Bulk Carriers Handling Facility on the upstream of 5th Oil Jetty and west bank of river Hooghly at Haldia Dock Complex, Dist – Purba Medinipur, West Bengal, by **M/s. Kolkata Port Trust.** Paper notification in this respect may kindly be seen in "The Times of India" and "Bartaman".

In this regard copies of the draft EIA / EMP report and Executive Summary of the project along with soft copies are sent herewith for record and for access to the general public for their information and participation of locally affected persons in the Public Hearing on **21.09.2016.** Special care against any damage or pilferage of the draft EIA / EMP report and Executive Summary copies should be taken as these are very much limited in number.

22/08/16

(D. Sarkar)
Senior Environmental Engineer (EIM Cell)
West Bengal Pollution Control Board

emo No. 5406(12)-2N-36/2013(E) Dated: 22.08.2016

Copy forwarded with copies of draft EIA / EMP report, Executive Summary (English and Bengali) along with soft copies: -

1. Office of the District Magistrate, Purba Medinipur, Govt. of West Bengal	1 Set of Executive summary in English & Bengali and one draft EIA / EMP report
2. Office of the Additional District Magistrate (Dev.), Dist - Purba Medinipur, Govt. of West Bengal	- Do -
3. Office of the Sub-Divisional Officer, Haldia Sub Division, Dist – Purba Medinipur	- Do -
4. Office of the General Manager, D.I.C., Purba Medinipur.	- Do -
5. Office of the Chairman, Haldia Municipality, Dist – Purba Medinipur.	- Do -
6. Office of the CEO, Haldia Development Authority, Dist - Purba Medinipur	- Do -
7. Office of the Chief Engineer (O & E), Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata - 700 098	- Do -
8. Office of the Senior Environmental Engineer, Camac Street Circle Office, KIT Building 1st Floor, 247, Deshpran Shasmal Road, Tollygunge, Kolkata – 700 033.	- Do -
9. Office of the Environmental Engineer, Haldia Regional Office, Super Market Building (3rd Floor), PO & PS - Durgachak, Haldia, Dist – Purba Medinipur.	- Do -
10. Department of Environment, Govt. of West Bengal, Poura Bhavan, 4th Floor, FD-415 A, Sector - III, Salt lake, Kolkata 700 106	- Do -
11. Ministry of Environment, Forests & Climate Change, Eastern Zonal Office, Bhubaneswar	- Do -
12. Head Office of West Bengal Pollution Control Board, Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata - 700 098	- Do -

22/08/16

(D. Sarkar)

Senior Environmental Engineer (EIM Cell)

West Bengal Pollution Control Board

26.08.2016

নোটিস

পশ্চিমবঙ্গ দূষণ নিয়ন্ত্রণ পর্ষদ

ভারত সরকারের পরিবেশ, বন ও জলবায়ু পরিবর্তন মন্ত্রকের ১৪.০৯.২০০৬ তারিখের নোটিফিকেশন নং এস.ও. ১৫৩৩ (ই) অনুযায়ী এতদ্বারা জানানো হচ্ছে যে মেঃ কলকাতা পোর্ট ট্রাস্ট দ্বারা পশ্চিমবঙ্গের পূর্ব মেদিনীপুর জেলার হলদিয়া ডক কমপ্লেক্সে ৩য় অয়েল জেটির আপস্ট্রিমে প্রস্তাবিত মিনি বাল্ক ক্যারিয়ার হ্যান্ডলিং ফেসিলিটি গড়ে তোলার জন্য জনশুনানী এতদ্বারা, পশ্চিমবঙ্গের জেলার পূর্ব মেদিনীপুরে, হলদিয়া টাউনশীপে, পোর্ট হাসপাতালের উল্টোদিকে, বি.বি. ঘোষ অডিটোরিয়ামে ২১.০৯.২০১৬ তারিখে, দুপুর ১২টায় নির্ধারিত হয়েছে। কোনও ব্যক্তি বা ব্যক্তি সংগঠন যাঁরা মনে করেন তাঁরা/সেটি ক্ষতিগ্রস্ত হতে পারেন বা সংশ্লিষ্ট স্থানীয় কর্তৃপক্ষ যুক্ত, তাঁরা নিম্নোক্ত অফিসগুলিতে রাখা প্রকল্পের এক্সিকিউটিভ সামারির কপি (ইংরাজি ও বাংলা) এবং ড্রাফট ইআইএ/ইএমপি রিপোর্ট দেখতে পারেন : (১) ডিস্ট্রিক্ট ম্যাজিস্ট্রেট, জেলা পূর্ব মেদিনীপুরের অফিস, (২) অ্যাডিশনাল ডিস্ট্রিক্ট ম্যাজিস্ট্রেট (ডেভ.), জেলা পূর্ব মেদিনীপুরের অফিস, (৩) সাব-ডিভিশনাল অফিসার, হলদিয়া সাব-ডিভিশন, জেলা পূর্ব মেদিনীপুরের অফিস, (৪) জেনারেল ম্যানেজার, ডি.আই.সি, জেলা পূর্ব মেদিনীপুরের অফিস, (৫) সভাধিপতি, হলদিয়া মিউনিসিপ্যালিটি, জেলা-পূর্ব মেদিনীপুরের অফিস, (৬) সিইও, হলদিয়া ডেভলপমেন্ট অথরিটি, জেলা-পূর্ব মেদিনীপুরের অফিস, (৭) সিনিয়র এনভায়রনমেন্টাল ইঞ্জিনিয়ার, ক্যামাক স্ট্রীট সার্কেল অফিস, কেআইটি বিল্ডিং, ২য় তল, ২৪৭, দেশপ্রাণ শাসমল রোড, টালিগঞ্জ, কলকাতা-৭০০ ০৩৩-এর অফিস, (৮) এনভায়রনমেন্টাল ইঞ্জিনিয়ার, হলদিয়া রিজিওনাল অফিস, সুপার মার্কেট বিল্ডিং, (৪র্থ তল), ডাকঘর ও থানা- দুর্গাচক, হলদিয়া, জেলা পূর্ব মেদিনীপুরের অফিস, (৯) ডিপার্টমেন্ট অফ এনভায়রনমেন্ট, পশ্চিমবঙ্গ সরকার, পৌরভবন, ৪র্থ তল, এফডি-৪১৫/এ, সেক্টর-III, সল্ট লেক, কলকাতা-৭০০ ১০৬-এর অফিস, (১০) পরিবেশ, বন ও জলবায়ু পরিবর্তন মন্ত্রক, ইস্টার্ন জোনাল অফিস, ভুবনেশ্বর, (১১) পশ্চিমবঙ্গ দূষণ নিয়ন্ত্রণ পর্ষদ, পরিবেশ ভবন, ১০এ, ব্লক-এলএ, সেক্টর-III, সল্টলেক, কলকাতা-৭০০ ০৯৮-এর হেড অফিস। প্রকল্পের এক্সিকিউটিভ সামারি ও দরখাস্ত ফর্ম পর্ষদের ওয়েবসাইট www.wbpcb. gov.in থেকেও পাওয়া যাবে।

কোন ব্যক্তি বা গোষ্ঠী যাঁরা প্রস্তাবিত প্রকল্প বা কার্যাবলীর দ্বারা স্থানীয়ভাবে ক্ষতিগ্রস্ত হতে পারেন, তাঁরা ২১.০৯.২০১৬ তারিখের দুপুর ১২টায় পশ্চিমবঙ্গের জেলা পূর্ব মেদিনীপুরে, হলদিয়া টাউনশীপে, পোর্ট হাসপাতালের উল্টোদিকে, বি.বি. ঘোষ অডিটোরিয়ামে অনুষ্ঠেয় জনশুনানীতে সভার আলোচ্য বিষয়ে তাঁরা তাঁদের পরামর্শ/আপত্তি মৌখিক বা লিখিতভাবে জানাতে পারেন। অন্য কোনও সংশ্লিষ্ট ব্যক্তিগণ যাঁদের প্রকল্প বা কার্যাবলীর পরিবেশগতদিক হতে কোনও যুক্তিসঙ্গত স্বার্থ আছে, তাঁরা জনশুনানীর তারিখের পূর্বে সিনিয়র এনভায়রনমেন্টাল ইঞ্জিনিয়ার (ইআইএম সেল), পরিবেশ ভবন, ১০এ ব্লক-এলএ, সেক্টর-III, সল্টলেক, কলকাতা-৭০০ ০৯৮-এর নিকট তাঁদের পরামর্শ/আপত্তি লিখিতভাবে জানাতে পারেন।

সিনিয়র এনভায়রনমেন্টাল
ইঞ্জিনিয়ার (ইআইএম সেল),
পশ্চিমবঙ্গ দূষণ নিয়ন্ত্রণ পর্ষদ

Bhowmik EE
D 23/8/16

NOTICE

West Bengal Pollution Control Board

... 14.09.2006 of Ministry of Environment, Forests & Climate Change, Govt. of India it is hereby notified ... Mini Bulk Carriers Handling ... upstream of 3rd Oil Jetty and west bank of river Hooghly at Haldia Dock Complex, Dist Purba Medinipur, West Bengal, by M/s. Kolkata Port Trust is hereby scheduled on 21.09.2016 at 12:00 noon at the B. B. Ghosh Auditorium, Haldia Township, Opposite Port Hospital, Dist.-Purba Medinipur, West Bengal. Any person or association of persons who feel that he ... might be affected or the ... may ... the copies of Executive Summary of the project (English and Bengali) and the draft EIA/ EMP report would be available at the (1) Office of the District Magistrate, Purba Medinipur (2) Office of the Additional District Magistrate (Dev.), Dist.-Purba Medinipur (3) Office of the Sub-Divisional Officer, Haldia Sub-Division, Dist.-Purba Medinipur (4) Office of the General Manager, D.I.C., Purba Medinipur (5) Office of the Chairman, Haldia Municipality, Dist. - Purba Medinipur (6) Office of the CEO, Haldia Development Authority, Dist.-Purba Medinipur (7) Office of the Senior Environmental Engineer, Camac Street Circle Office, KIT Building, 1st Floor, 247, Deshpran Sasmal Road, Tollygunge, Kolkata 700 033 (8) Office of the Environmental Engineer, Haldia Regional Office, Super Market Building, 3rd Floor, PO & PS-Durgachak, Haldia, Dist.-Purba Medinipur (9) Department of Environment, Govt. of West Bengal, Poura Bhavan, 4th Floor, FD-415/A, Sector - III, Salt Lake, Kolkata 700 106 (10) Ministry of Environment, Forests & Climate Change, Eastern Zonal Office, Bhubaneswar (11) Head office of West Bengal Pollution Control Board, Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake, Kolkata - 700 098. Executive Summary and the application form of the project would also be available in the website of the Board www.wbpcb.gov.in

Any person or groups who might be locally affected from the proposed project or activity may participate in the public hearing to be held on 21.09.2016 at 12:00 noon at the B. B. Ghosh Auditorium, Haldia Township, Opposite Port Hospital, Dist.-Purba Medinipur, West Bengal. They may make verbal or written suggestions / objections in the matter in the public hearing meeting. Any other concerned persons having a plausible stake in the environmental aspects of the project or activity, may make suggestions / objections in writing to the Senior Environmental Engineer (EIM Cell), Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake, Kolkata-700 098 before the date of public hearing.

Senior Environmental
Engineer (EIM Cell)

ANNEXURE – V

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No. : 9711159210, 9711159427, SMS/Whatsapp No. : 9711163422; E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

ENVIRONMENTAL MONITORING
POST MONSOON SEASON -OCT-DEC 2019

*at*KOLKATA PORT TRUST
HALDIA DOCK COMPLEX

Submitted To:

KOLKATA PORT TRUST
Haldia Dock Complex
Haldia Townahip, Haldia
Distt: PurbaMedinpur (West Bengal)

Prepared by:

EKO PRO ENGINEERS PVT LTD
32/41, South Side of GT Road
UPSIDC Industrial Area,
Ghaziabad (U.P) 201009

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

CONTENT

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

1. Summary

Kolkata Port Trust, Haldia Dock Complexhasawardedtheprojecttitled"POST PROJECT MONITORING OF DIFFERENT ENVIRONMENTAL PARAMETERS UNDER HALDIA DOCK COMPLEX, HALDIA" to M/s. Eko Pro Engineers Private Limited, Ghaziabad vide work order No. I&CF/IZ&R/T/296/702 dated 10.10.2019.

The main objective of environmental Monitoring is to take the environmental observations, inside and outside the Dock complex.

A comprehensive environmental monitoring program has been planned to monitor data for the Yearly period of **October 2019 – December 2019**. The monitored data of Ambient Air Quality, Fugitive Emission, Ambient Noise Quality, Marine Water Quality, Sediment Quality and green belt study in an around Haldia Dock complex.

In this study, multiple and periodic sampling has been carried out for Ambient air Quality. The frequency of Air monitoring is followed twice a week for a season.

Ambient Noise monitoring is followed once in month i.e. Oct- Dec 2019. The observations of total twelve locations were taken.

Marine Water quality samples for Physico-Chemical Analysis and Biological Analysis are carried out once in season.

Marine Sediment Quality samples for physico-chemical analysis and biological analysisalso being carried out once as the frequency for the same is once in a season.

Green Belt Survey also been conducted in the Dock premises once in season.

Eko Pro Engineers Private Limited mobilized sampling team for conducting the Water, Noise, sediment and Air monitoring in Haldia Dock Complex.

All the work was carried out by team and submitted the samples in lab.

We are very thankful to the official staff of Dock complex to support us and make this successfully happen. A big support of official staff we had at site to get the study and sample collection job done and gave us such type of opportunity.

The results and interpretation of study and monitoring is follows

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

2. Ambient Air Quality

2.1 Selection of Monitoring Station

Ambient Air Quality Monitoring (AAQM) stations were set up at four locations with due consideration of meteorological conditions on synoptic basis, topography of the study area, representatives of regional background air quality for obtaining baseline and consultation with Halia Dock Complex officials. The monitoring locations are given in **Table 2.1**

Table 2.1: Monitoring Station of Ambient Air Quality (AAQ)

S.NO.	STATION CODE	LOCATION	LATITUDE	LONGITUDE
1	AAQ-1	Near MBC Jetty	22°01'01.07"N	88°04'06.56"E
2	AAQ-2	Top of Marine House	22°01'32.55"N	88°05'17.88"E
3	AAQ-3	Top of RZ Office	22°01'21.80"N	88°03'43.83"E
4	AAQ-4	Chrinjibpur Office	22°03'08.55"N	88°05'48.64"E

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Figure 2.1 AAQ Location

2.2 Sampling Methodology and Parameter Selection

Ambient air quality monitoring has been carried out twice in each location during the study period (Post Monsoon-October to November). The baseline data of ambient air has been generated for the following parameters as mentioned below.

- SPM
- PM_{10}
- $PM_{2.5}$
- Sulphur-dioxide (SO_2)
- Oxides of Nitrogen (NO_X)
- Carbon monoxide (CO)

It was ensured that the equipment was placed at a height of at least 3 to 4 m above the ground level at each monitoring station, for negating the effects of wind-blown ground dust. The distance of the sampler from

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

any air flow obstacle i.e. buildings, walls, was more than two times the height of the obstacle. The equipment was placed at open space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. Monitoring has been carried out as per the latest CPCB and MoEF guidelines and notifications.

2.3 Sampling and Analysis Technique

With a view to collecting the samples, Envirotech Make Calibrated Respirable Dust Samplers (SL No.-2757-DTL-2019 & 2054-DTE-2016) along with Gaseous attachment and Fine Particulate Matter (FPS-Instrument SL No.115-A-2018 & 892-DTL-2019) have been used. The RDS is capable of drawing air at a flow rate of 0.95 to 1.3 m^3/min with very little pressure drop for RDS and FPS is designed to operate at an air flow rate of 1m^3/hr. Filter papers (MGF 2000 and PTFE (46.2 dia)) were used for the collection of particulate matters and heavy metals. SO_2&NOx were collected by drawing air at a flow-rate of 0.5 liters per minute (lpm) through an absorbing solution for the duration of 24 hrs. Ammonia and ozone were collected drawing air flow rate of 1 liter per minute (lpm) for the duration of 1 hour. Sampling and analysis methodology adopted is given in Table 2.2 and National Ambient Air Quality Standards is given in Table 2.3.

Table 2.1: Sampling & Analysis Methodology

Sl. No.	Parameter	Methodology
1	Suspended Particulate Matter (SPM) (µg/m^3)	Respirable Dust Sampler (Gravimetric method)
2	Particulate Matter 10 (PM 10) (µg/m^3)	Respirable Dust Sampler (Gravimetric method)
3	Particulate Matter 2.5 (PM 2.5) (µg/m^3)	APM 550 Fine Particulate Sampler (Gravimetric method)
4	Sulphur Dioxide SO_2 (µg/m^3)	West and Gaeke Method
5	Oxides of Nitrogen (µg/m^3)	IS 5182, Part 6, Jacob &Hochheiser modified
6	Carbon monoxide (mg/m^3)	IS 5182, Part 10, Non-dispersive Infrared Absorption method

2.4 Duration of Sampling

The duration of sampling of fine particulate matter ($PM_{2.5}$), Respirable particulate matter (PM_{10}), SO_2 and NOx was each twenty four hourly continuous sampling per day and CO was sampled for eight hours continuous monitoring. The monitoring was conducted for two days in a week for one month in each quarter. The monitoring parameters and frequency of sampling are describe in tabular below.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Table- 2.3 Monitored Parameters and Frequency of Sampling

Parameters	Sampling Frequency
Fine Particulate Matter ($PM_{2.5}$)	24 hourly sample twice a week for one months
Respirable Particulate Matter (PM_{10})	24 hourly sample twice a week for one months
Sulphur dioxide (SO_2)	24 hourly sample twice a week for one months
Nitrogen dioxide (NO_2)	24 hourly sample twice a week for one months
Carbon Monoxide (CO)	8 hourly samples twice a week for one months

Table 2.4: National Ambient Air Quality Standards

Pollutant	Concentration in µg/m³ except for CO in mg/m³		
	Time	Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
Sulphur Dioxide (µg/m³)	Annual Avg.* 24 hours**	50 80	20 80
Nitrogen Dioxide (µg/m³)	Annual Avg. 24 hours	40 80	30 80
Carbon monoxide (mg/m³)	8 hours 1 hour	2 4	2 4
PM10 (µg/m³)	Annual Avg. 24 hours	60 100	60 100
PM2.5 (µg/m³)	Annual Avg. 24 hours	40 60	40 60
Ozone O_3 (µg/m³)	8 hourly 1 hourly	100 180	100 180
Lead Pb (µg/m³)	Annual Avg. 24 hours	0.50 1	0.50 1
Ammonia NH_3 (µg/m³)	Annual Avg. 24 hours	100 400	100 400
Arsenic As (µg/m³)	Annual Avg.	06	06
Nickel Ni (ng/m³)	Annual Avg.	20	20
Pyro Benzene (BaP) (ng/m³)	Annual Avg.	1	1

Source: Gazette of India Notification, dated 16th Nov, 2009

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

**** Annual Arithmetic Mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals***
***** 24 hourly or 8 hourly or 01 hourly monitored values, as applicable shall be complied with 98% of the time in a year. 2% of the time they may exceed the limits but not on two consecutive days of monitoring***

2.5 Analytical Result

Table 2.5: Ambient Air Quality-1 (Near MBC Jetty)

S.No.	Parameters	AAQ – 1 Near MBC Jetty							
		1st Round	2nd Round	3rd Round	4th Round	5thRound	6th Round	7th Round	8th Round
		15.11.19	16.11.19	23.11.19	25.11.19	10.12.19	12.12.19	15.12.19	16.12.19
i	PM_{10} (µg/m³)	85.6	82.9	80.9	81.6	84.3	79.8	81.4	82.5
ii	$PM_{2.5}$ (µg/m³)	46.5	48.3	48.6	50.8	49.7	47.9	48.2	49.8
iii	SO_2(µg/m³)	9.25	10.2	10.6	9.56	9.45	9.36	10.4	10.8
iv	NO_2(µg/m³)	23.4	26.2	21.5	19.3	22.3	24.3	25.3	23.9
v	CO(mg/m³	0.65	0.69	0.71	0.69	0.72	0.73	0.71	0.68

Table 2.6: Ambient Air Quality-2 (Top of Marine House)

S.No.	Parameters	AAQ – 2 Top of Marine House							
		1stRound	2nd Round	3rd Round	4th Round	5th Round	6th Round	7thRound	8th Round
		19.11.19	22.11.19	24.11.19	28.11.19	30.11.19	03.12.19	08.12.19	10.12.19
i	PM_{10} (µg/m³)	92.3	94.2	90.4	89.4	88.3	89.5	91.7	89.1
ii	$PM_{2.5}$ (µg/m³)	52.6	51.7	53.8	51.9	50.9	53.2	52.7	51.6
iii	SO_2(µg/m³)	12.2	13.5	13.8	12.6	13.9	12.5	12.8	13.6
iv	NO_2(µg/m³)	30.4	32.6	29.5	28.3	30.4	30.3	32.4	31.6
v	CO(mg/m³	0.86	0.96	0.86	0.86	0.94	0.88	0.87	0.86

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Table 2.7: Ambient Air Quality-3 (Top of RZ Office)

S.No.	Parameters	AAQ – 1 Top of RZ Office							
		1st Round	2nd Round	3rd Round	4th Round	5thRound	6th Round	7th Round	8th Round
		19.11.19	22.11.19	24.11.19	28.11.19	30.11.19	03.12.19	08.12.19	10.12.19
i	PM_{10} (µg/m³)	84.6	85.9	81.7	84.9	89.3	80.7	82.6	84.3
ii	$PM_{2.5}$ (µg/m³)	46.9	49.6	50.3	46.3	45.9	50.1	51.8	52.9
iii	SO_2(µg/m³)	8.36	9.26	8.36	9.12	9.58	10.2	9.36	9.14
iv	NO_2(µg/m³)	18.3	20.3	19.2	19.8	18.4	21.3	20.6	18.6
v	CO(mg/m³	0.56	0.62	0.65	0.62	0.63	0.59	0.58	0.62

Table 2.8: Ambient Air Quality-4 (Chrinjibpur Office)

S.No.	Parameters	AAQ – 4 Chrinjibpur Office							
		1stRound	2nd Round	3rd Round	4th Round	5th Round	6th Round	7thRound	8th Round
		13.11.19	14.11.19	20.11.19	21.11.19	05.12.19	06.12.19	15.12.19	16.12.19
i	PM_{10} (µg/m³)	95.3	91.7	93.7	94.2	90.5	95.1	91.8	93.2
ii	$PM_{2.5}$ (µg/m³)	55.9	52.7	57.3	52.9	54.3	54.9	52.8	55.8
iii	SO_2(µg/m³)	11.5	13.2	12.8	13.6	12.4	13.6	12.8	14.3
iv	NO_2(µg/m³)	32.5	33.6	32.5	31.6	30.4	32.8	31.2	32.4
v	CO(mg/m³	0.95	0.96	0.85	0.94	0.96	0.85	0.93	0.84

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

2.6 Interpretation

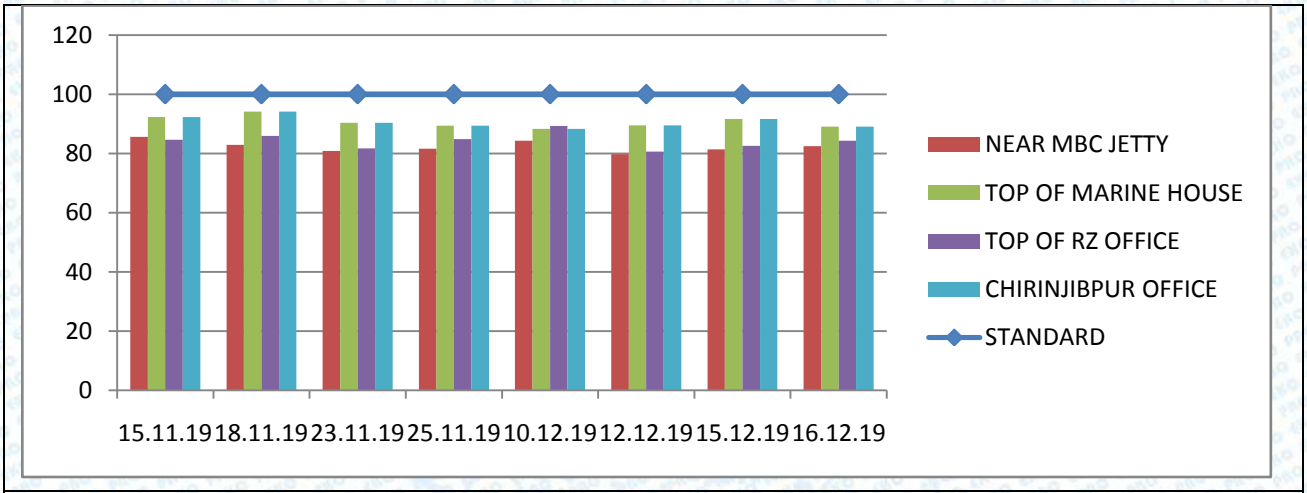


Figure 2.2: PM_{10}

The PM_{10} concentration varies between 79.8 µg/$m^3$to 95.3 µg/m^3during the study period (in post monsoon season October to December 2019). The results were compared with the National Ambient Air Quality Standards 2009. The values were found within the permissible limit. The various sources of air pollution are observed in the study area i.e. industrial, traffic, urban and rural activities.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

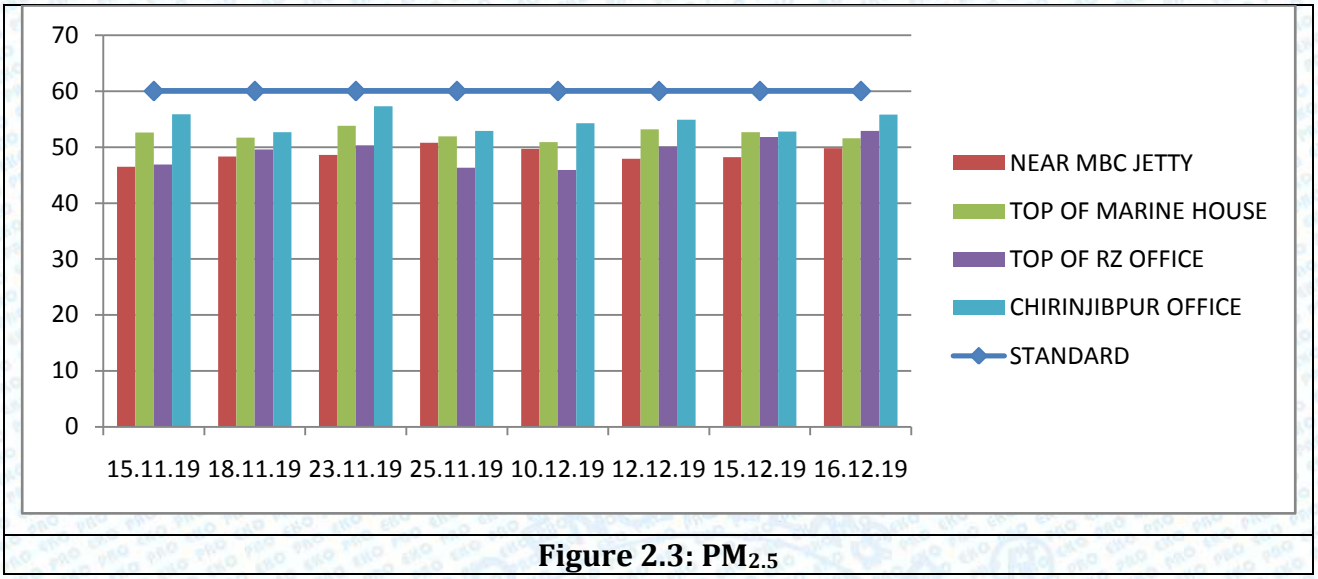


Figure 2.3: $PM_{2.5}$

The $PM_{2.5}$ concentration varies between45.9 µg/m^{3}to 57.3 µg/m^{3}in post monsoon season (October to December 2019). However, the levels for $PM_{2.5}$were found to be below the National Ambient Air Quality Standards (< 60µg/m^3) of NAAQS: 2012.Populations subjected to long-term exposure to particulate matter has a significantly higher cardiovascular incident and mortality rate. Short-term acute exposures subtly increase the rate of cardiovascular events within days of a pollution spike.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

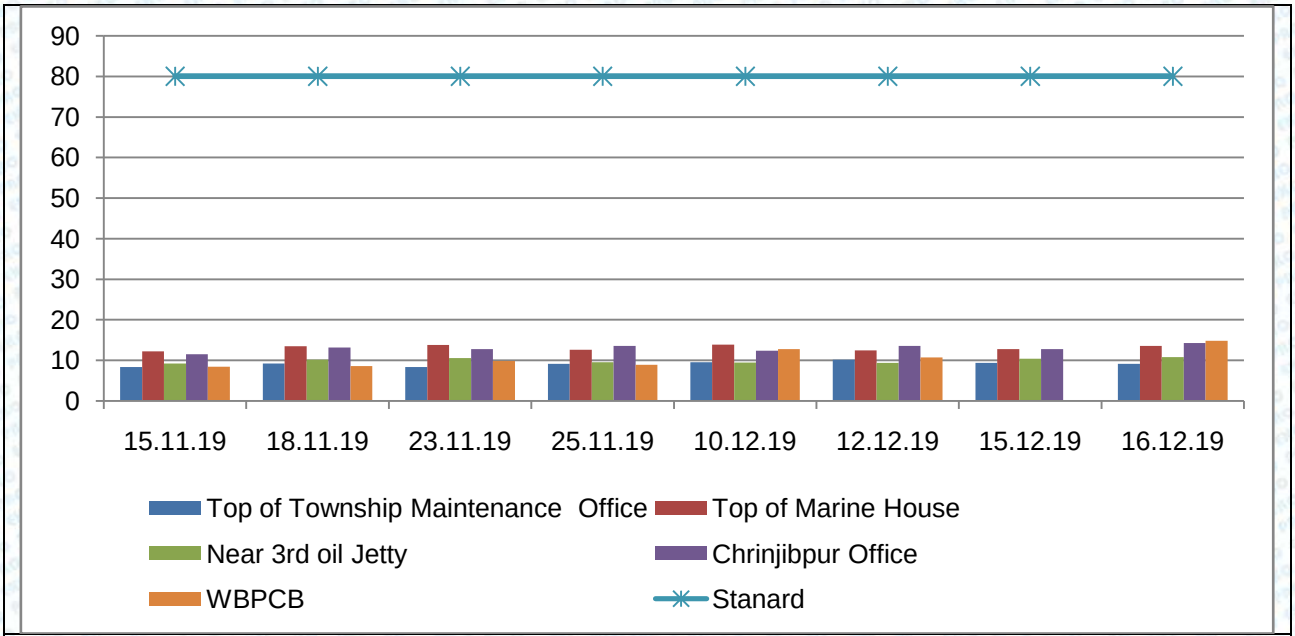


Figure 2.4: So2

The SO_2 concentration varies between 8.36 µg/m³to 14.3 µg/m³during the study period (October to December 2019), which is far below that national ambient air quality standard (< 80µg/M3) of NAAQS: 2012.The source of SO_2 in the study area is mainly from burning fuels containing sulfur. Other anthropogenic sources are emissions from domestic burning and vehicles Exposure to sulfur dioxide in the ambient air has been associated with reduced lung function, increased incidence of respiratory symptoms and diseases, irritation of the eyes, nose, and throat.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

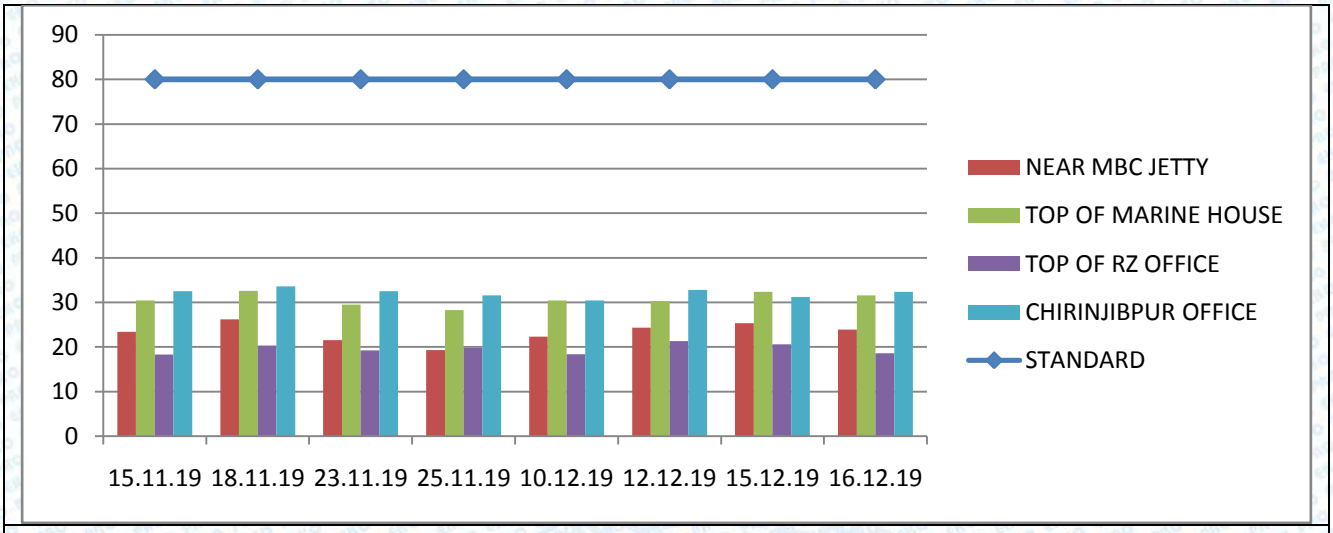


Figure 2.5: NO_{X2}

The NO_2 concentration varies between 18.3 µg/m³to 32.8 µg/m³ in post monsoon season. The values of Nitrogen dioxide were found well below the NAAQ standard. The primary sources of NO_2 are motor vehicles, electric utilities, and other industrial and residential sourcesthat burn fuels. NO_2 is one of the main ingredients involved in the formation of ground level zone, which can trigger serious respiratory problems.

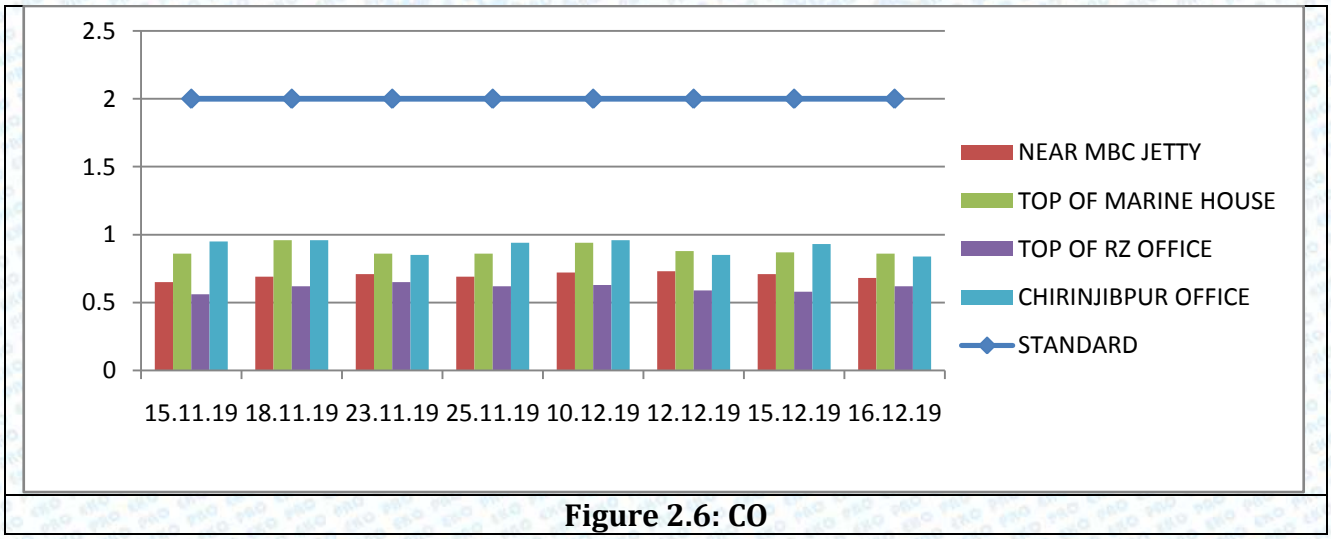


Figure 2.6: CO

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

The CO concentration varies between 0.56 µg/m^{3}to 0.96 µg/m^3 in post monsoon season. The values of CO were found well below the NAAQ standard.

2.7 Air Quality Monitoring Site Photograph

AAQ1: Near MBC Jetty

AAQ2: Top of Marine House

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

AAQ3: Top of RZ Office (Township)	AAQ4: Chrinjibpur Office

3. Ambient Noise Quality

3.1 Selection of Monitoring Station

Ambient Noise Quality Monitoring stations were set up at twelve locations for the period of October to December 2019. The monitoring station were setup by filed visit, identify the source noise, sensitive location of the site and official discussion with the Haldia Dock Complex officials. The monitoring locations are given in **Table 3.1**

Table 3.1: Monitoring Station of Ambient Noise Quality

S.NO	STATION CODE	LOCATION	LATITUDE	LONGITUDE
1	NQ-1	Chrinjibpur OB Gate	22°03'08.89"N	88°05'47.98"E
2	NQ-2	GC Berth Main Gate	22°02'45.86"N	88°05'12.08"E
3	NQ-3	Jawahar Tower Main Gate	22°01'05.98"N	88°04'02.71"E
4	NQ-4	MBC Jetty / Floating Jetty	22°01'11.83"N	88°04'34.53"E
5	NQ-5	CJB Gate	22°03'01.71"N	88°05'53.14"E
6	NQ-6	Lock Gate	22°01'29.11"N	88°05'06.40"E
7	NQ-7	Marine House	22°01'31.80"N	88°05'17.26"E
8	NQ-8	Master Control	22°02'02.16"N	88°05'25.13"E
9	NQ-9	Port Hospital (Township)	22°01'25.96"N	88°03'44.03"E
10	NQ-10	Cluster 4/61 (Township)	22°01'06.30"N	88°03'38.53"E
11	NQ-11	DAV School (Township)	22°01'25.33"N	88°03'34.30"E
12	NQ-12	Gate No.4 (Township)	22°01'35.06"N	88°03'54.55"E

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Figure 3.1 Ambient Noise Quality Location

3.2 Sampling Methodology and Parameter Selection

Noise monitoring has been carried out with using sound level meter ((HTC SL 1352) at monthly basis, in post monsoon season. (October - December, 2019). Noise level monitoring was carried out for 24 hours. Noise levels measured over a given period of time of interval, enable to describe scenario of noise using statistical techniques.

a) Leq (d)

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

b) Leq(n)
c) L10
d) L50
e) L90
f) Lmax
g) Lmin
h) Ldn
i)

- Lday: Average noise levels between 6.00 hrs to 22.00hrs
- Lnight: Average noise levels between 22.00 hrs to 6.00hrs.

3.3. Sampling Techniques with Standards

The HTC make sound level meter was used to record the sound data and the model number of used device is SL 1352 i.e. designed on the basis of "Type 2" professional requirements. The instrument has a frequency weighting of "A" type and allows the user to select Slow or Fast mode of measurement. A built-in Data Logger can record all the important Sound Level parameters in Non-Volatile Flash memory for 24 hours making detailed field data collection very simple. Each record contains the observation of each second, with the detailed data, L_{EQ}, L_{MIN} and L_{MAX} and many others calculations also can be drawn. Sound Pressure Level and Sound Exposure Level (SEL) observed during the recording interval. A built-in Real Time Clock maintains a Date and Time stamp in the recorded data.

Noise survey is conducted in areas where noise exposure is likely to be maximum. Noise level refers to the level of sound. A noise survey involves measuring noise level at selected locations throughout an entire plant or sections to identify noisy areas. This is usually done with a sound level meter (SLM). A reasonably accurate sketch showing the locations of workers and noisy machines is drawn. Noise level measurements are taken at a suitable number of locations around the area. National Ambient Noise Quality Standards as per CPCB is given in Table 3.2 to compression with the observed results.

Table 3-2: Ambient Noise Quality Standards as per CPCB

Type of Area	Limits in dB(A) Leq*	
	Day Time	Night Time
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Silence Zone	50	40

*-dB (A) Leq denotes the time weighted average of the level sound in decibels on scale A which is relatable to human hearing
Source: Pollution Control Acts, Rule and Notifications issued there under, by Pollution Control Law Series: PCLS/02/2006(Fifth Edition) of Central Pollution Control Board, January 2006, pp 926. Day and Night time shall mean from 6:00 a.m. to 10:00 p.m. and 10:00 p.m. to 6:00 a.m. respectively.

3.4 Analytical Result

Table 3.3: Location wise Noise Quality Results

SN	Parameters	NQ-1 Chrinjibpur OB Gate	NQ-2 GC Berth Main Gate	NQ-3 Jawahar Tower Main Gate	NQ-4 MBC Jetty / Floating Jetty	NQ-5 CJB Gate	NQ-6 Lock Gate	NQ-7 Marine House	NQ-8 Master Control	NQ-9 Port Hospital Township	NQ-10 Cluster 4/61 (Township)	NQ-11 DAV School (Township)	NQ-12 Gate no.4 (Township)
1	Leq (d)	66.3	74.9	67.2	74.3	73.5	62.8	64.3	65.8	64.9	65.8	64.7	66.8
2	Leq(n)	49.5	53.8	48.3	55.3	52.3	50.2	48.3	49.8	48.6	47.3	48.3	49.2
3	L10	65.3	73.1	66.3	73.1	72.4	61.4	62.9	64.3	63.2	64.8	63.9	65.1
4	L50	59.3	64.2	58.3	66.8	63.2	57.9	58.3	58.4	57.3	57.9	58.3	59.8
5	L90	51.6	54.9	50.4	56.9	52.9	52.3	50.1	51.8	49.8	49.7	50.4	51.3
6	Lmax	78.3	81.3	85.4	85.3	80.2	75.3	74.3	76.5	77.4	76.5	78.3	78.9
7	Lmin	40.3	45.2	41.6	43.5	43.1	42.3	40.6	39.8	41.2	38.6	39.5	41.7
8	Ldn	57.9	64.4	57.8	65.3	62.9	56.5	56.3	57.8	56.8	56.6	56.5	**58.0**

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

3.5 Interpretation

In the study area, noise source was observed only by vehicular movement & construction activities. High wind velocity in the river front area is another major source for high sound level in the study area. Noise levels were observed below the CPCB standards for Ambient Noise Quality in day time &night time.

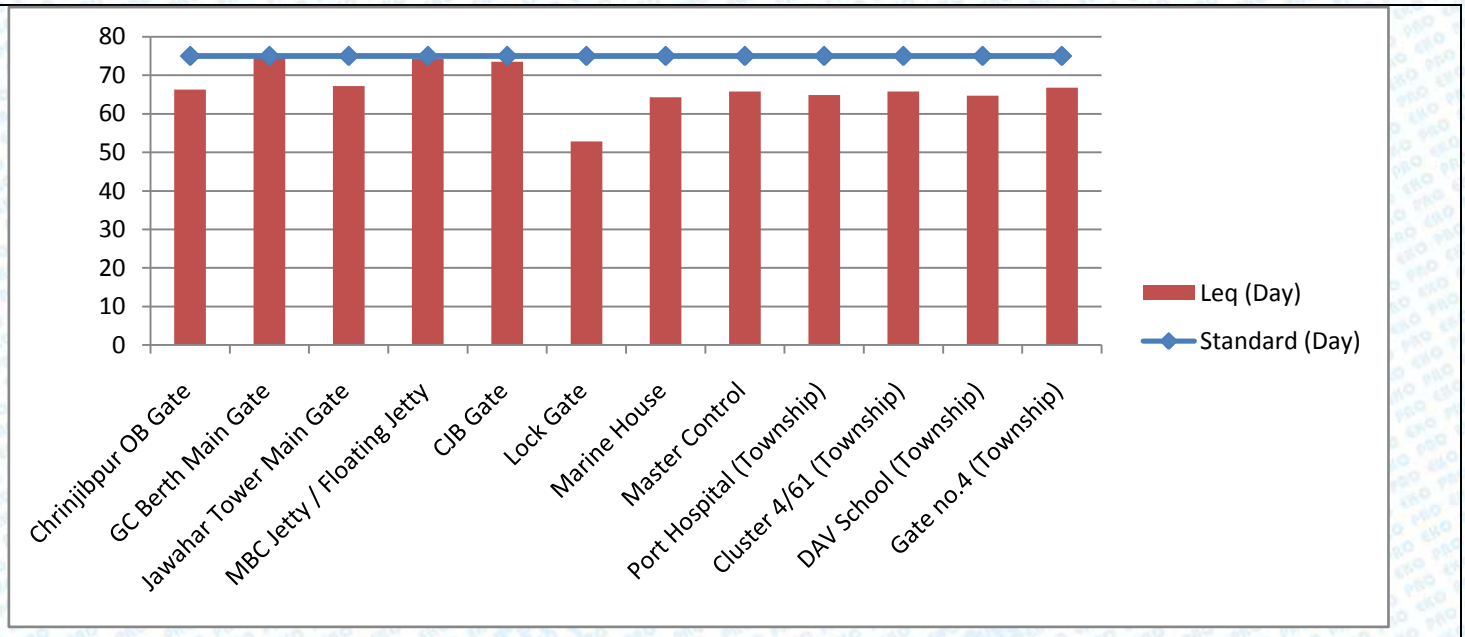


Fig:5 Noise Quality in Day Time

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

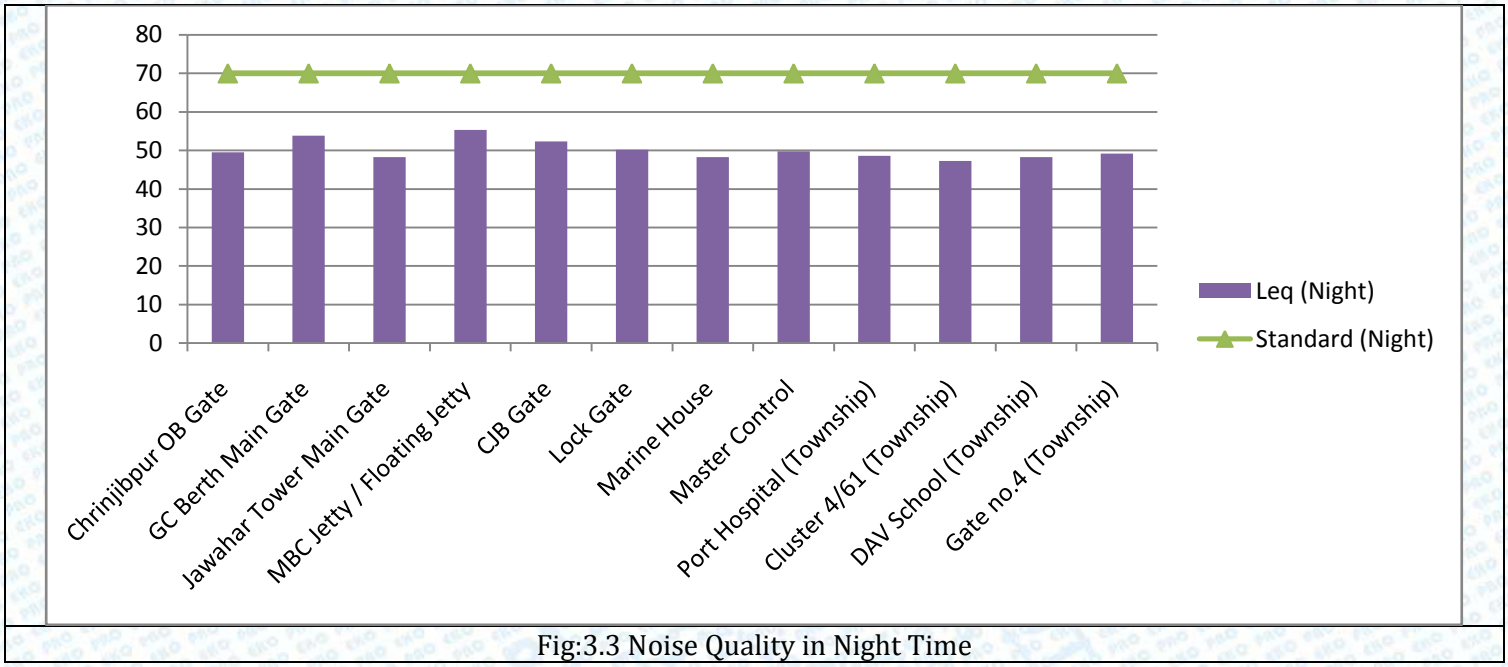
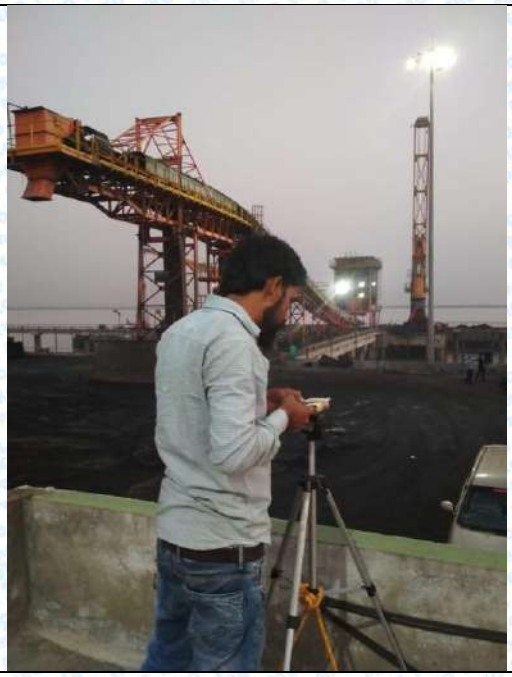


Fig:3.3 Noise Quality in Night Time

3.6 Noise Quality Monitoring Site Photograph

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

N1: ChrinjibPur Main Gate	N2: GC Berth Main Gate Noise
	
N3: Jawahar Tower	N4: MBC Jetty
	
N5: CJB gate	N6: Lock Gate

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

N7: Marine House

N8: Master Control

N9: Port Hospital (Township)

N10: Gate No. 4 (Township)

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

	
N11: DAV Schol (Township)	N12: Cluster 4 Quarter No 61

4. Water Quality

4.1 Selection of Monitoring Station

Water Quality Monitoring stations were set up at four locations. The monitoring stations were setup by filed visit, sensitive location of the site and official discussion with the Halia Dock Complex officials. The monitoring locations are given in **Table 4.1**

Table 4.1: Monitoring Station of Water Quality

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

S.No	STATION CODE	LOCATION	LATITUDE	LONGITUDE
1	WQ-1	Near 1st Oil Jetty	22°01'55.32"N	88°06'03.16"E
2	WQ-2	Near 2nd Oil Jetty	22°01'43.42"N	88°05'50.88"E
3	WQ-3	Near 3rd Oil Jetty	22°01'02.13"N	88°04'32.26"E
4	WQ-4	Near Lock Gate	22°01'19.59"N	88°05'11.12"E

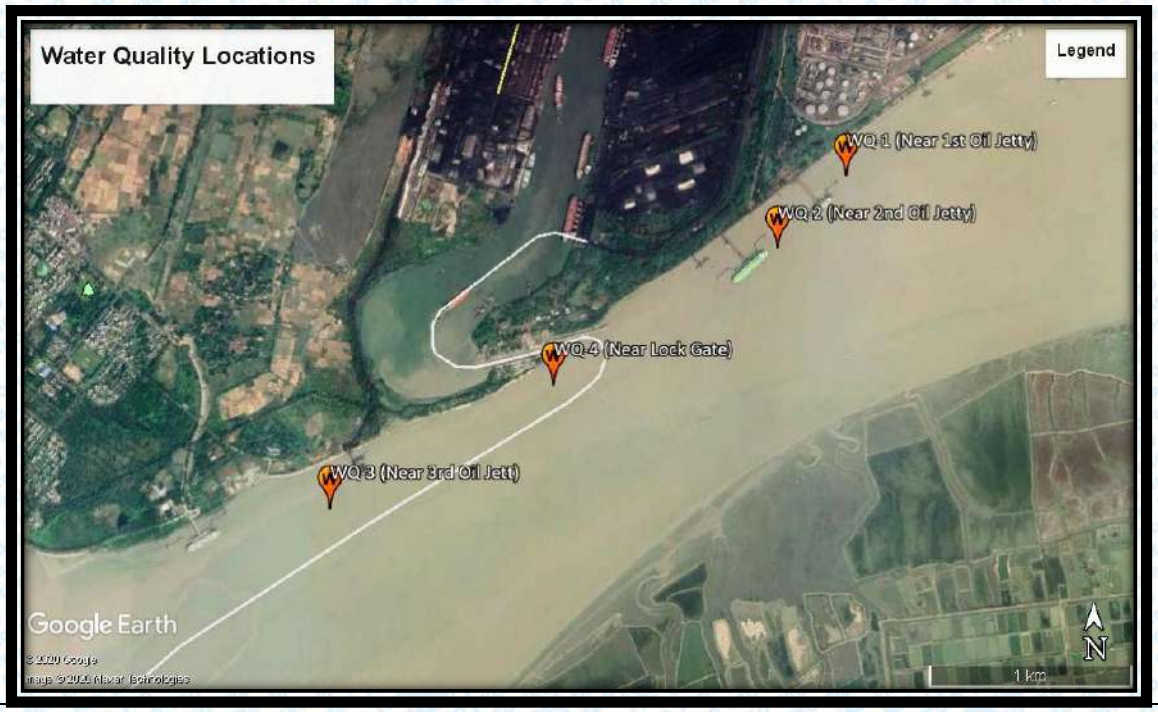


Figure 4.1 Water Quality Location

4.2 Sampling Methodology and Parameter Selection

The parameter selections for the marine sediment quality are described below.

A. Physio-Chemical Parameters

- Colour
- Turbidity
- pH
- Electrical Conductivity (EC)

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

- Total Dissolve Solids (TDS)
- Total Suspended Solid (TSS)
- Floating matters
- Oil & Grease
- Petroleum Hydrocarbons
- Salinity
- Alkalinity as $CaCO_3$
- Total Hardness as $CaCO_3$
- Calcium as Ca
- Magnesium as Mg
- Sodium as Na
- Potassium as K
- Chloride as Cl
- Sulphate as SO_4
- Nitrate as NO_3
- Flouride as F
- Phenolic compound as C_6H_5OH
- Cyanide
- Aluminium
- Arsenic
- Cadmium
- Chromium as Cr^{+6}
- Iron
- Copper
- Lead
- Manganese
- Mercury
- Zinc
- Dissolve Oxygen
- BOD, 27°C 3 days
- COD
- Total coliforms

B. Biological Parameters

- Phytoplankton

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

- Zooplankton
- Shell Fishes
- Fin Fishes
- Chlorophyll Content
- Gross Primary Productivity
- Net Primary Productivity
- Community Respiration

Marine water samples shall be collected at the rate of 2 samples per location (one sample at surface i.e. 0.3 meter depth and another sample form bottom (6 meter to 16 meter depth). Sampling for Marine water quality shall be conducted inside the protected water i.e., within break waters. The analysis of marine water for physico-chemical parameters as per the procedures specified in Standard Methods for the Examination of Water and Wastewater published by American Public Health Association (APHA) and Lab SOP-W/66. Samples for physico-chemical analysis were collected in polyethylene and glass bottle and preserved as per standard procedure. Samples collected for metal content were acidified with 1ml HNO_3. Samples for bacteriological analysis were collected in sterilized bottles. The details sample collection procedures are described in below.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Table 4.2: Sample Collection Procedure

S.No	Parameter	Sample collection	Sample Size	Storage/ Preservation
1	pH, EC, TDS	Grab sampling Plastic container	50 ml	On site analysis
2	Other Physico-Chemical Parametrs	Grab sampling Plastic glass container	2000 ml	As per SOP
3	Oil & Grease	Wide mouth glass container	500 ml	Add HCl to pH>2, refrigeration, 28 days
5	Cyanide	Grab sampling glass container	500 ml	As per SOP
6	BOD	Grab sampling glass container	1000 ml	Cooling between 2 to 5 degree
7	COD	Grab sampling plastic container	100 ml	Add HNO3 to pH <2
8	Heavy Metals	Glass rinsed with 1+1 HNO_3	500 ml	HNO_3 to pH>2; Grab sample; 6 months
9	Biological Sample	Sterilized plastic container	500 ml	As per SOP

.

Plankton

Plankton samples were collected from the surface waters of the study areas by towing a plankton net (mouth diameter 0.35 m) made of bolting silk (No.25 mesh size 48 µm) for half an hour. These samples were preserved in 5% neutralized formalin and used for qualitative analysis. For the quantitative analysis of phytoplankton, the settling method described by Sukhanovo (1978) was adopted. Numerical plankton analysis was carried out using Utermohl's inverted plankton microscope

4.3 Analysis Technique

The analysis techniques were followed by Standard Methods for the Examination of Water and Wastewater published by American Public Health Association (APHA) and Lab SOP-W/66. After the analysis the results were compared as per the SW Class IV (CPCB). The instrument used for the above mention parameters are given below.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Table 4.3: Instrument Used

S. No.	Parameters	Instrument Used
1	pH	pH meter
2	Turbidity	Nephelo Meter
3	Conductivity (at 25^0C)	Conductivity meter
4	Total Dissolve Solids	Gravimetric
5	Alkalinity as $CaCO_3$	Titrimetric Method
6	Total Hardness as $CaCO_3$	TitrimetricMethod
7	Calcium as Ca	Titrimetric Method
8	Magnesium as Mg	Calculation
9	Sodium	Flame Photometric
10	Potassium	Flame Photometric
11	Chloride as Cl	Argentometric
12	Sulphate as SO_4	Turbidimetric
13	Nitrate as NO_3	Spectro photometric
14	Phosphate	Spectrophotometric
15	Fluoride as F	Spectrophotometric
16	Phenolic compound as C_6H_5OH	Spectrophotometric
17	Cyanide	Spectrophotometric/Spot test
18	Dissolve Oxygen	Winkler Method
19	Oil & Grease	Gravimetric
20	Heavy Metal	Induced Couple Plasma- Mass Spectro Meter (ICP-MS)
21	Total Coliform	MPN Method
22	Plankton Study	Microscope

Onsite Parameter Analyses

pH, temperature and conductivity were analyzed at the time of sample collection. For dissolved oxygen, samples were collected in standard BOD bottle and fixed the oxygen by manganese oxide and alkaline iodide immediately after collection of the sample.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

4.4Analytical Result and Interpretation

A. Physio-Chemical Parameters

S. No.	PARAMETERS	UOM	WQ-1 Near Ist Oil Jetty	WQ-2 Near 2nd Oil Jetty	WQ-3 Near 3rd Oil Jetty	WQ-4 Near Lock Gate	CPCB GUIDELINE (CLASS SW-IV)
			19.12.19	19.12.19	19.12.19	19.12.19	
(0.3 Meter Depth)							
1	Colour	Haze n	50	60	60	70	No visible colour
2	Turbidity	NTU	460	476	420	430	–
3	pH	–	7.87	7.91	7.98	7.99	6.5-9.0
4	Conductivity	µs/cm	4914	5180	7133	5157	–
5	Total Dissolved Soild	mg/l	3452	3620	4636	3760	–
6	Total Suspended Soilds	mg/l	574	718	615	229	–
7	Floating Matters	mg/l	0.2	0.25	0.2	0.2	10.0
8	Oil & Grease	mg/l	<4.0	<4.0	<4.0	<4.0	–
9	Petroleum Hydrocarbons	mg/l	<0.01	<0.01	<0.01	<0.01	–
10	Salinity	mg/l	4760	4962	6920	5018	–
11	Alkalinity as CaCO3	mg/l	148	149	140	144	–
12	Total Hardness as CaCO3	mg/l	750	800	956	850	–

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

13	Calcium as Ca	mg/l	90.1	70.1	80.5	70.2	–
14	Magnesium as Mg	mg/l	127.6	97.4	182.3	164	–
15	Sodium as Na	mg/l	889	894	1169	872	–
16	Potassium as K	mg/l	40	39.5	51.1	37.8	–
17	Chloride as Cl	mg/l	1759.5	1669.5	2299.3	1639.5	–
18	Sulphate as SO4	mg/l	278.1	273.3	423.9	279.6	–
19	Nitrate as NO3	mg/l	6.18	7.20	7.68	7.13	–
20	Flouride as F	mg/l	1.25	1.28	1.41	1.36	–
21	Phenolic Compound as C6H5OH	mg/l	<0.001	<0.001	<0.001	<0.001	–
22	Cyanide	mg/l	Absent	Absent	Absent	Absent	–
23	Aluminium	mg/l	26.35	34.6	47.18	32.47	–
24	Arsenic	mg/l	0.016	0.011	0.034	0.096	–
25	Cadmium	mg/l	<0.005	<0.005	<0.005	<0.005	–
26	Chromium as Cr+6	mg/l	<0.05	<0.05	<0.05	<0.05	–
27	Iron	mg/l	26.35	31.15	35.86	17.26	–
28	Copper	mg/l	0.21	0.22	0.31	0.23	–
29	Lead	mg/l	0.165	0.175	0.41	0.239	–
30	Mangnese	mg/l	1.36	1.2	1.62	1.069	–
31	Mercury	mg/l	<0.005	<0.005	<0.005	<0.005	–

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

32	Zinc	mg/l	2.14	0.94	2.97	2.51	–
33	Dissolve Oxygen	mg/l	4.8	4.5	5.1	5.0	3.0
34	BOD, 27°C 3 Days	mg/l	6.0	8.0	4.0	3.0	5.0
35	COD	mg/l	33.6	37.8	25.2	21.7	–
36	Total Coliforms	MPN/100ml	1400	1300	1100	1400	–

In the physico –chemical analysis of the marine water quality from 0.3 meter depth, the pH variation was found from 7.87 to 7.99 , Conductivity is found from 4914 µs/cm to 7133 µs/cm, Magnesium is found from 97.4. mg\l to 182.3 mg\l and Calcium is found from 72.1 mg\l to 90.1 mg\l.

S. No.	PARAMETERS	UOM	WQ-1 Near Ist Oil Jetty	WQ-2 Near 2nd Oil Jetty	WQ-3 Near 3rd Oil Jetty	WQ-4 Near Lock Gate	CPCB GUIDELINES (CLASS IV)
			19.12.19	19.12.19	19.12.19	19.12.19	
(7 Meter Depth)							
1	Colour	Haze n	60	80	70	80	No visible colour
2	Turbidity	NTU	470	520	510	490	–
3	pH	–	7.89	7.82	7.96	7.98	6.5-9.0
4	Conductivity	µs/cm	5163	5298	7536	5429	–
5	Total Dissolved Soild	mg/l	3690	3790	4830	3970	–
6	Total Suspended Soilds	mg/l	610	750	680	240	–

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

7	Floating Matters	mg/l	0.3	0.4	0.4	0.45	10.0
8	Oil & Grease	mg/l	<4.0	<4.0	<4.0	<4.0	–
9	Petroleum Hydrocarbons	mg/l	<0.01	<0.01	<0.01	<0.01	–
10	Salinity	mg/l	4930	5190	7340	5018	–
11	Alkalinity as CaCO3	mg/l	160	152	144	150	–
12	Total Hardness as CaCO3	mg/l	780	820	980	890	–
13	Calcium as Ca	mg/l	95.8	74.1	95.8	75.8	–
14	Magnesium as Mg	mg/l	131.5	154.3	180.1	170.3	–
15	Sodium as Na	mg/l	895	904	1120	893	–
16	Potassium as K	mg/l	42	35.9	56.9	40.1	–
17	Chloride as Cl	mg/l	1850.5	1760.3	2360.9	1740.5	–
18	Sulphate as SO4	mg/l	285.6	290.5	460.8	299.5	–
19	Nitrate as NO3	mg/l	7.23	8.25	8.69	9.14	–
20	Flouride as F	mg/l	1.65	1.98	1.45	1.98	–
21	Phenolic Compound as C6H5OH	mg/l	<0.001	<0.001	<0.001	<0.001	–
22	Cyanide	mg/l	Absent	Absent	Absent	Absent	–
23	Aluminium	mg/l	29.58	36.9	49.5	36.7	–

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

24	Arsenic	mg/l	0.019	0.015	0.042	0.098	–
25	Cadmium	mg/l	<0.005	<0.005	<0.005	<0.005	–
26	Chromium as Cr+6	mg/l	<0.05	<0.05	<0.05	<0.05	–
27	Iron	mg/l	28.69	35.24	38.69	19.58	–
28	Copper	mg/l	0.25	0.29	0.36	0.29	–
29	Lead	mg/l	0.198	0.189	0.425	0.369	–
30	Manganese	mg/l	1.45	1.36	2.45	1.39	–
31	Mercury	mg/l	<0.005	<0.005	<0.005	<0.005	–
32	Zinc	mg/l	3.24	0.98	3.24	2.39	–
33	Dissolve Oxygen	mg/l	4.5	4.2	5.0	4.9	3.0
34	BOD, 27°C 3 Days	mg/l	6.3	9.0	5.0	4.5	5.0
35	COD	mg/l	35.9	40.9	28.9	25.7	–
36	Total Coliforms	MPN/100ml	1600	1400	1200	1600	–

In the physico –chemical analysis of the marine water quality from 7 meter depth, the pH variation was found from 7.89 to 7.98, Conductivity is found from 5163 µs/cm to 7536 µs/cm, Magnesium is found from 131.5 mg\l to180.1mg\l and Calcium is found from 74.1 mg\l to 95.8 mg\l.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

5. Marine Biological Parameters

S.NO.	PARAMETERS		UOM	WQ-1 Near Ist Oil Jetty	WQ-2 Near 2nd Oil Jetty	WQ-3 Near 3rd Oil Jetty	WQ-4 Near Lock Gate
				19.12.19	19.12.19	19.12.19	19.12.19
1	**Phytoplankton**						
	1	Coscinodiscuscentralis	Cells/l	1076	1275	1293	2618
	2	Dinophysiscaudata	Cells/l	1064	1084	880	-
	3	Odontellaaurita	Cells/l	310	708	454	880
	4	Triceratiumbroeckii	Cells/l	740	1100	-	620
	5	Cerataulinapelagica	Cells/l	920	460	520	198
	6	Hemiaulussinensis	Cells/l	182	-	150	281
	7	Ceratiumsp	Cells/l	1100	910	1048	880
	8	Guinardiastriata	Cells/l	1237	840	950	460
	9	Coscinodiscuswailesii	Cells/l	-	750	880	776
	10	Lauderiaannulata	Cells/l	1100	589	-	-
	11	Achnanthessp	Cells/l	916	480	660	550
	12	Striatellaunipunctata	Cells/l	740	660	520	420
	13	Rhizosoleniasp	Cells/l	225	182	199	320

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

2	**Zooplankton**						
	1	Parvocalanussp	Org./m³	160	150	114	182
	2	Centropagesorsini	Org./m³	180	140	159	206
	3	Oithona nana	Org./m³	210	40	88	114
	4	Oithonasp	Org./m³	115	118	216	-
	5	Mysis larvae	Org./m³	40	-	22	15
	6	Oikopleura larvae	Org./m³	120	100	90	101
	7	Oithonaplumifera	Org./m³	150	117	95	80
	8	Centropagessp	Org./m³	170	153	119	110
	9	Copepod nauplii	Org./m³	-	152	180	150
	10	Calanopiaeliptica	Org./m³	136	150	95	100
	11	Temora sp.	Org./m³	144	186	119	132
	12	Tintinnopsissp	Org./m³	65	89	-	75
	13	Calanopiasp	Org./m³	115	-	98	76
	14	Temoraturbinata	Org./m³	122	167	154	-
	15	Pseudodiaptomussp	Org./m³	-	78	87	93
3	**Shell Fishes (No Shrimps and Crabs were found)**						
4	**Fin Fishes**		-	Not found	Not found	Not found	Not found
5	**Chlorophyll Content**		-	Not found	Not found	Not found	Not found
6	**Light Penetration**		-	Not found	Not found	Not found	Not found

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

7	**Gross Primary Productivity**	-	Not found	Not found	Not found	Not found
8	**Net Primary Productivity**	-	Not found	Not found	Not found	Not found
9	**Community Repiration**	-	Not found	Not found	Not found	Not found

4.5 Interpretation

A total number of 13 Phytoplankton species were found, out of which the higher number of Phytoplankton is Coscinodiscus centrails and the lowest number of Phytoplankton is Hemiaulus sinensis.

On the other hand, total 15 species were found of Zooplankton, out of which the higher number of Zooplankton is Oithona sp and the lowest number of Zooplankton is Mysis larvae.

No shellfishes and fin fishes were recorded during the marine biological survey carried out in the study area.

In addition, along with the above, some parameters also were not found i.e. shown in table.

6.Marine Sediment Quality

6.1 Selection of Monitoring Station

Sediment Quality Monitoring stations were set up at four locations. The monitoring stations were setup by filed visit, sensitive location of the site and official discussion with the Haldia Dock Complex officials. The monitoring locations are given in **Table 3.1**

Water Quality Location				
1	S 1	Near 1st Oil Jetty	22° 1'55.63"N	88° 5'58.27"E
2	S 2	Near 2nd Oil Jetty	22° 1'46.05"N	88° 5'43.49"E
3	S 3	Near 3rd Oil Jetty	22° 1'03.26"N	88° 4'25.38"E
4	S 4	Near Lock Gate	22° 1'20.72"N	88° 5'06.04"E

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

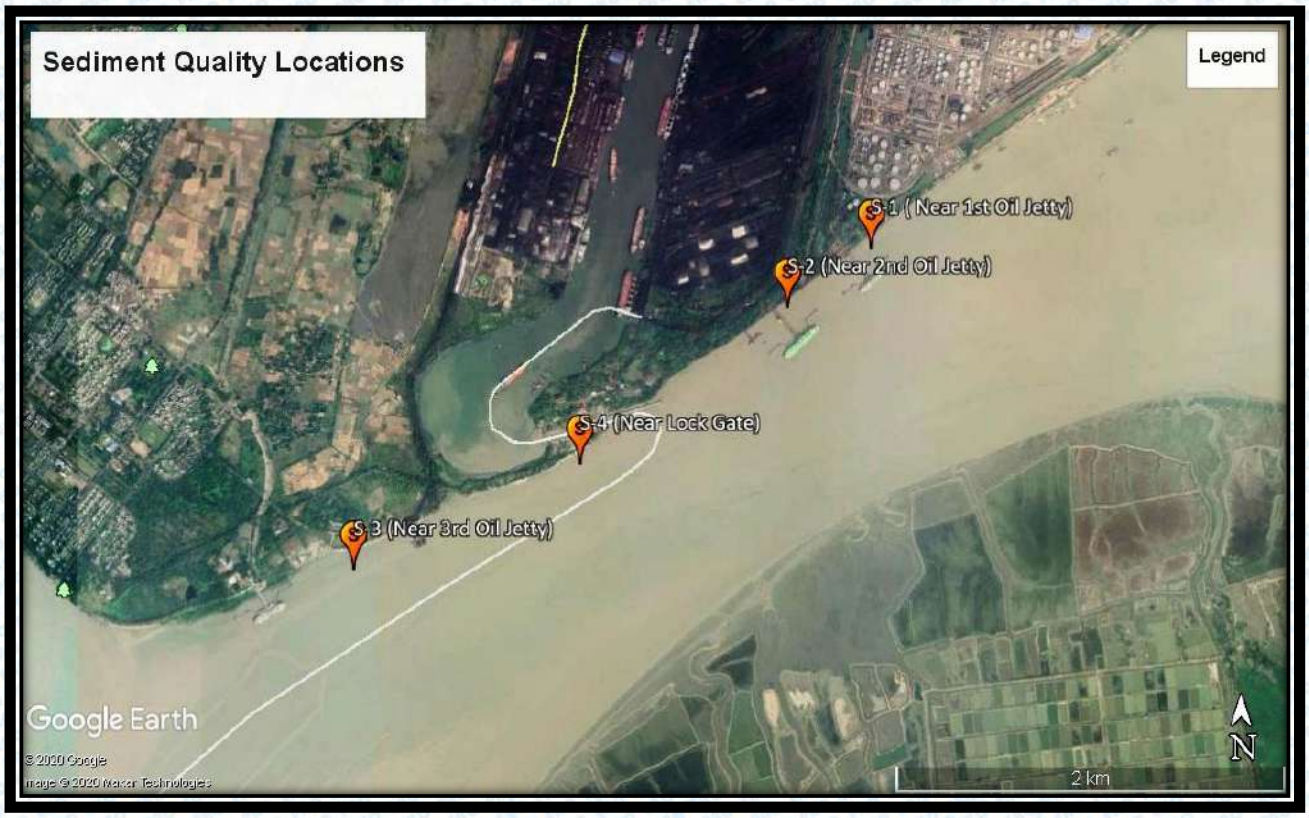


Figure 5.1 Sediment Quality Location

6.2 Sampling Methodology and Parameter Selection

The samples were collected and analyzed as per the procedures specified in Standard existing procedure. Sediment samples are collected as grab sampling procedure. The samples were collected using a Petersen grab sampler from bottom of the river. The collected samples were taken by a fresh plastic container and marked the lab code for physico-chemical analysis. The samples were taken into the laboratory and dry in normal temperature. .

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

The biological analysis for microbenthic, meiobenthic and macrobenthic community structure, samples were also collected using a Petersen grab sampler and collected sample were taken in the sterilized plastic container.

The parameter selections for the marine sediment quality are described below.

C. Physio-Chemical Parameters

- Texture
- pH
- Sodium as Na
- Potassium as K
- Cadmium as Cd
- Copper as Cu
- Lead as Pb
- Zinc as Zn
- Magnesium as Mg
- Arsenic as As
- Phosphate as PO4
- Chloride as Cl
- Sulphate as SO4

D. Biological Parameters

- Meiobenthos
- Microbenthos
- Macrobenthos

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

6.3 Analysis Technique

The samples were analyses in laboratory with the procedures of APHA 22nd Edition and SOP (Standard Operating Procedure) of the Laboratory. For the biological analysis the collected wet sediment samples are sieved with varying mesh sizes for segregating the organisms. Macrobenthos are organisms which are retained in the sieve having mesh size between 0.5 and 1 mm. The term meiofauna loosely defines a group of organisms by their size, larger than microfauna but smaller than macrofauna, rather than a taxonomic grouping. In practice, that is organisms that can pass through a 1 mm mesh but will be retained by a 45 µm mesh. Organisms below size of 45 µm are regarded as microbenthos. The sieved organisms are then stained with Rose Bengal and sorted into different groups. The number of organisms in each grab sample is expressed in number per meter square.

6.4 Analytical Result

A. Physico-chemical Parameter

S.NO.	PARAMETERS	UOM	S-1 Near Ist Oil Jetty	S-2 Near 2nd Oil Jetty	S-3 Near 3rd Oil Jetty	S-4 Near Lock Gate
			19.12.19	19.12.19	19.12.19	19.12.19
1	Texture	–	Silty Clay	Silty Clay	Silty Clay	Silty Clay
2	pH	–	7.12	7.62	7.57	7.88
3	Sodium as Na	mg/kg	982.0	1192.0	1210.0	1179.3
4	Potassium as K	mg/kg	516.0	818.0	820.0	791.4
5	Cadmium as Cd	mg/kg	<1.0	<1.0	<1.0	<1.0
6	Copper as Cu	mg/kg	<1.0	<1.0	<1.0	<1.0
7	Lead as Pb	mg/kg	<1.0	<1.0	<1.0	<1.0

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

8	Zinc as Zn	Mg/kg	2.86	2.70	2.90	2.13
9	Magnesium as Mg	Mg/kg	926.8	966.0	945.0	907.4
10	Arsenic as As	Mg/kg	<1.0	<1.0	<1.0	<1.0
11	Phosphate as PO4	Mg/kg	210.0	213.0	220.0	208.3
12	Chloride as Cl	Mg/kg	640.0	702.0	680.0	675.3
13	Sulphate as SO4	Mg/kg	320.4	348.8	332.7	307.7

7.0 Marine Sediment Quality- Biological Parameters

S.NO.	PARAMETERS	UOM	WQ-1 Near Ist Oil Jetty	WQ-2 Near 2nd Oil Jetty	WQ-3 Near 3rd Oil Jetty	WQ-4 Near Lock Gate
			19.12.19	19.12.19	19.12.19	19.12.19
1	Meiobenthos	Org./10 m^2	NIL	NIL	NIL	NIL
2	Microbenthos	Org./10 m^2	NIL	NIL	NIL	NIL
3	Macrobethos					
3.1	Capitellacapitata	Org./10 m^2	148	44	15	16
3.2	Neantheschingrighattensis	Org./10 m^2	36	45	15	30
3.3	Ceratonereis sp.	Org./10 m^2	110	-	120	130

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

3.4	Nepthyspolybranchia	**Org./10 m²**	132	45	46	149
3.5	Perinereis sp.	**Org./10 m²**	46	32	28	40
3.6	Notocirrusaustralis	**Org./10 m²**	-	164	56	-
3.7	Nereiscapensis	**Org./10 m²**	99	15	66	151

6.5 Interpretation

As per the analysis of Biological parameters of Sediment quality, Meiobenthos and Microbenthos, both were found nil and Marcobenthos found with its 7 species i.e reported above in table

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Sediment Quality Monitoring Site Photograph

S 1: Near 1st Oil Jetty

S 3: Near 3rd Oil Jetty

S 2: Near 2nd Oil Jetty

S 4: Near Lock Gate

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

8.0 Green Belt Survey

8.1 Selection of monitoring station

In the whole proposed project area, stratified random samples were taken to study intensively various ecological parameters so as to understand the ecological structure and functions of the study area. The project area is triangular one. It has been started from Haldia Port office to bank of Ganga River (Fig.- 4 & 5). There are few offices, degraded area, waste land, paddy field and a small village within the study area. Most of the area is blank. But there are thick vegetation near to the river and floating jetty. Four (4) study sites have been randomly selected throughout the proposed area (Table-1). Brief description of study sites are as follows.

Site – 1 - This site is on the bank of Ganga River and near to floating jetty. The bank road is planted by Arica palm. There is open land in parallel to the river. This area is covered by scrubby plants, one or two tress are seen here and there.

Site –II - This site is located beside Haldia Bhawan. A green patch is partly surrounded by a concrete wall. A small pond is within this area. Large tree like *Eucalyptus sp. Bauhinia sp, Lagerostroemia sp.* Etc. are available here. This area is dense and with shrubby plant like *Eupatorium odoratum* species.

Site –III - This site is located behind central garage. A small waste area is seen behind this garage. This area is water lagged. The dominant species of this area is *Typha angustifolia*. Beside this a mangrove fern like *Acrostichium aurious* is also seen. Another species such as *Tamarix troupi, Callistemon sp. Casuarina equsetifolia, Delonix regia, Ficus glomerata* etc. are also seen.

Site –IV - This is a road from township gate to floating jetty. Roadside plantation was both side of the road. One side by *Swetenia macrophyla* and other side is *Delonix regia*. GBH of *Swetenia macrophyla* are varies from 39 cm to 126cm and heights are 4 to 6 m. whereas GBH of *Delonix regia* varies from 36to116cm and heights are 4 to 7m.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No. : 9711159210, 9711159427, SMS/Whatsapp No. : 9711163422; E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

Purnima Chauhan
(Technical Manager)

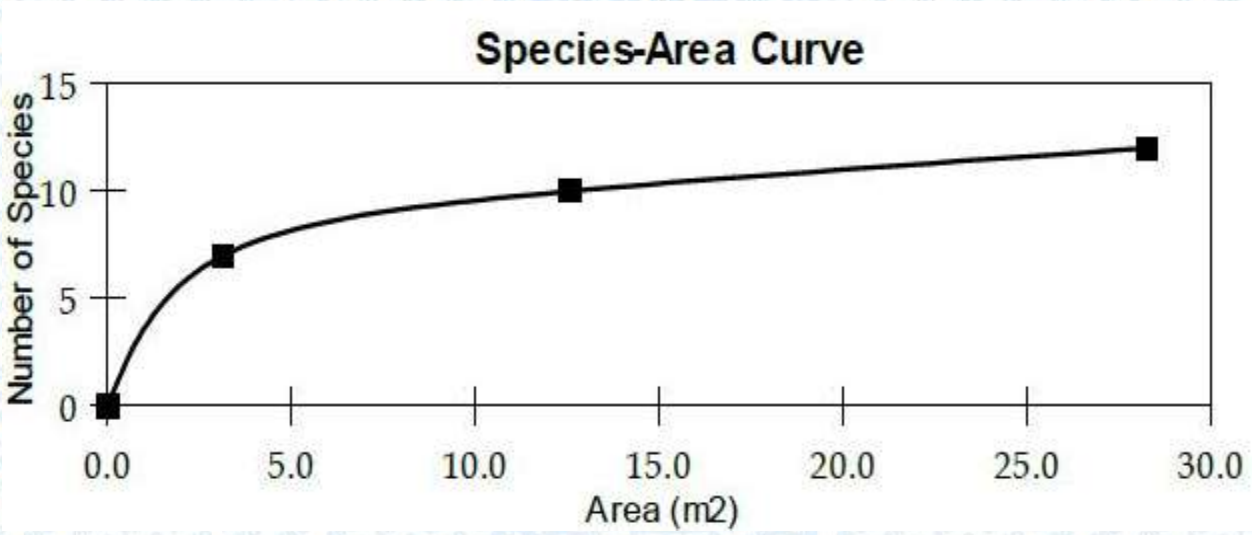
Amit Saxena
(Quality Manager)

8.2 Sampling Methodology

The study of biodiversity in the study area includes the study of flora and qualitative and /or quantitative enumeration and their socio-ecological framework, but also the study of ecosystems and habitat characteristics, of which they are part. The scope of the study covers all these factors along with impact identification and or prediction and conservation measures.

8.3 Analysis Technique

1. **Quantitative enumeration:** The terrain of the proposed study site is flat so quadrate method is adopted for ecological study. The size of quadrate is determined by species-area curve as stated below.



In this case size of tree quadrate is determined 10m x 10m, for shrubs 5m x 5m and for herbs is 1m x 1m.

2. **Ecosystem diversity:** diversity of different habitats (Terrestrial, Aquatic and Ecotone zone) within this ecosystem and their habit characterization is done. Besides species listing other studies like phyto-sociology of plants in different habitats of the study area is done with the following tools. Habitats are treated separately while making such calculations).

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Importance Value Index (IVI = Relative Density + Relative Dominance + Relative Frequency

Relative Frequency (R F) = Frequency of a species x 100/ Total Frequency of all species

Relative Dominance (R Dom) = Dominance of a species x 100/ Total dominance of all Species

Relative Density (R Den) = Density of a species x 100/ Total Density of all species

Species Richness - Species richness is a measure of the number of species found in a sample. Since the larger the sample, the more species we would expect to find, the number of species is divided by the square root of the number of individuals in the sample. This particular measure of species richness is known as D, the Menhinick's index. $D = s \sqrt{N}$

where s equals the number of different species represented in your sample, and N equals the total number of individual organisms in your sample.

Diversity Index - As a measure of species diversity, we will calculate the Shannon Wiener Diversity Index. It turns out that the mathematical relationships hold true whether one is dealing with molecules in solution or species in an ecological community.

$H = \sum (pl) |\ln pl|$

Where (pl) is the proportion of the total number of individuals in the population that are in species "l".

3. Identification and preservation of specimen - An intensive literature survey has been carried out for assemblage of existing information on various uses of the coastal plain and sand dune species at different parts of the coast of Midnapore. Each of the plant material has been assigned a field note books and documented as to Binomials with family, local name, part used and therapeutic uses, plant parts that were identified as useful in ethno-botany were collected, compressed, the voucher specimens have been collected and identified by referring to standard flora (Prain,1903).

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

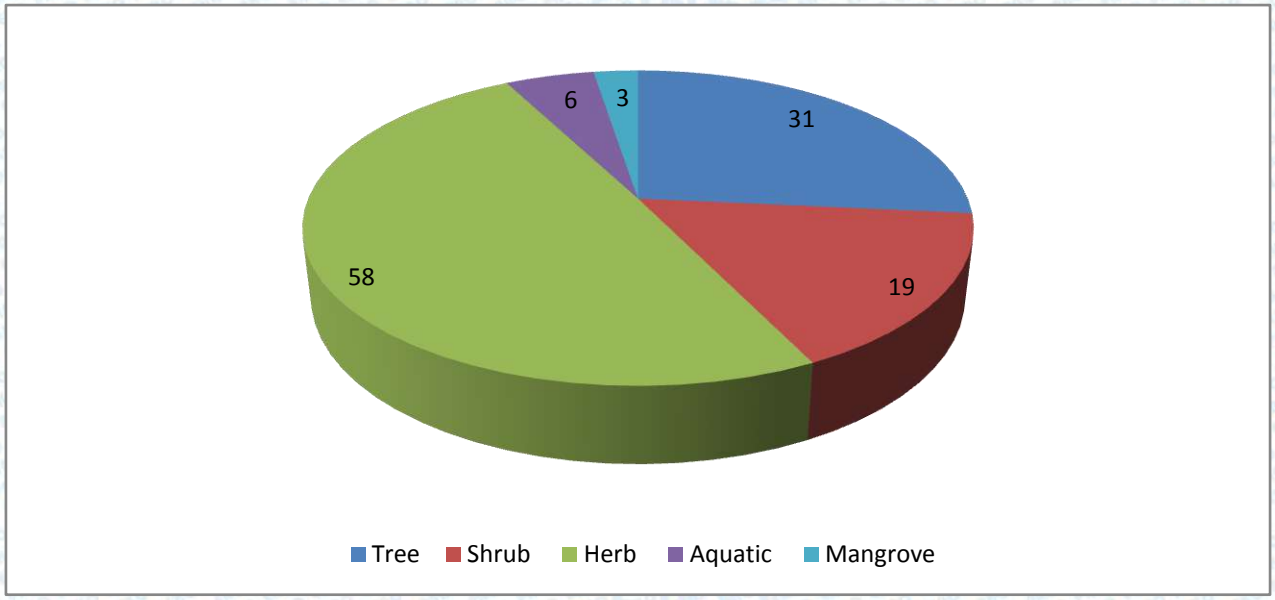
8.4 Analytical results and interpretation

Biodiversity Resources

Floral Diversity

The study area has 31species of trees, 19 species of shrubs and 58 species of herbs (Table-3). There are also 6 aquatic and 3 mangrove species (Table-3D & 3E). Presence of 117 number of plant species (Fig.-1) within only a small part of Haldia Port area is highly diverse in its vegetation composition.

Fig.-1: Vegetation composition of study area



Presence of species like *Enhydra fluctuans (Hincha),Marselia quadrifolia* (Susni), *Ipomoea carnea* and *Commelina benghalnensis* (Kansira**)** etc shows that the ecotone zone in between the water body and the road is rich in diversity. The above-mentioned species are medicinally important and the first two species like *E. fluctuans* and *M. quadrifolia* are commercially important as these are considered as very precious herbs in Bengali kitchens. Species like *Eupatorium odoratum* is considered to be deadly invasive

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

and therefore needs to be controlled in general and not particularly for this project. The only way to manage these species is increasing the frequency of indigenous species.

Heliotropium indicum

In the tree level species like *Albezia lebbek (Siris), Samania saman (Khiris)*, *Borassus flabellifer (Tal), Cocos nucifera (narkel), Azadirachta indica (Neem), Mangifera indica* (Mango)etc. are commercially very important species. Species like *Ficus beghalensis,* and *Ficus religiosa* are considered to be "key stone" species as it provides shelter to many animal as well as plant species. During plantation and rehabilitation work emphasis will be given on plantation of these species so as to compensate the loss to the ecosystem. Presence of a large number of *Roystonea regia* (Plam) is a very interesting aspect of the ecological setting of the study area. It is said that the plantation of this monocot tree species is works as soil binder in bank area. The ecological set up seems to be suitable for such plantation. Therefore, it is necessary to replicate this habitat at least with its structural components.

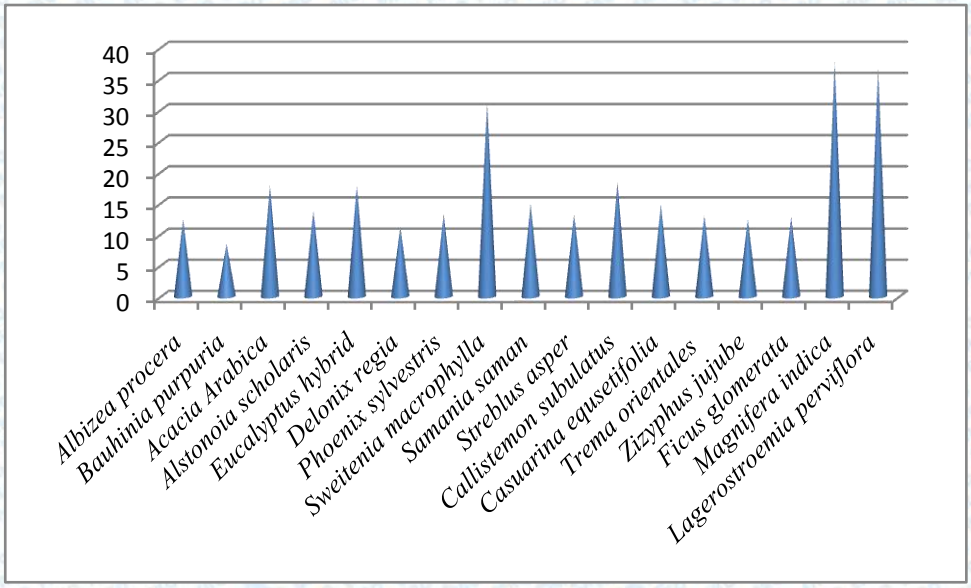
Importance Value Index (IVI) of trees

The IVI results show that within 17 species there are 6 (six) species having importance value more than 15. *Lagerostroemia perviflora* has the highest IVI (Table-4) followed by *Sweitenia macrophylla*. *Bauhinia purpuria* has the lowest IVI followed by *Delonix regia, Zizyphus jujube, Albizea procera.* Importance Value Index is a measure of how dominant a species is in the study area. Here Relative frequency, Relative density and Relative Abundance of the highest IVI value is the dominant species. A graphical presentation is followed of comparative importance values in given in Fig.-2.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Fig.-2: IVI of tree species in the study area



Canopy cover – a 10m /2m rectangle is used for canopy percentage calculations. It has been found that canopy cover is varies from 5% to 30% throughout the study area.

Diversity Index

The Diversity Index (H') of tree species is 1.23. Shrub and herb diversity index are 1.47 and 1.51 respectively. Though there is dense vegetation near and within the township area but less vegetation is outside the township.

Some Important Ecological notes

Coastal morphology shows the natural structure which protects the coastal environment by absorbing energy from wind, tide and wave action. These species are playing a crucial role in protecting the coast from erosion and flooding (Desai, 2000). There are *Ficus benghalnensis* and *Ficus religiosa*. These are keystone species and, therefore support a lot of faunal species. Ecotone zone of the water body supports

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

like *Cassia tora* which in turn is a host plant for butterflies of different species. Swampy marshland behind the Central garage is an ideal habitat for birds, small mammals and reptiles like land monitors, otters etc.

ANNEXURES

TABLE-1: DETAILS OF DIFFERENT STUDY SITES FOR THE ASSESSMENT OF BIODIVERSITY AND ECOLOGICAL STUDY WITHIN HALDIA DOCK AREA.

Sl. No	Site No	Site details	GPS bearing
1	Site – I	The bank of Ganga River and near to floating jetty	22^0 1/ 1// N / 88^0 4/ 17// E
2	Site – II	Beside Haldia Bhawan	22^0 1/ 33// N / 88^0 4/ 52// E
3	Site – III	Behind central garage	22^0 1/ 22// N / 88^0 4/ 14// E
4	Site – IV	Road from township gate to floating jetty	22^0 1/ 29// N / 88^0 4/ 17// E

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

TABLE-2: DETAILS OF DIFFERENT STUDY SITES FOR THE ASSESSMENT OF BIODIVERSITY AND ECOLOGICAL STUDY WITHIN PROPOSED AREA.

Site – 1

Tree

Sl. No.	Name of species	GBH (in cm)	Height (in m)
1	*Acacia arabica*	28	5
2.	*Samania saman*	35	5

Shrub

Sl. No.	Name of species	No.
1	*Clerodendron inflotunatum*	15
2	*Adhatoda vesica*	6
3	*Solanum xanthocarpon*	2
4	*Ipomoea batatas*	6
5	*Cassia alata*	1
6	*Datura stramonium*	3

Herb

Sl. No.	Name of species	No.
1	*Blumea lacera*	13
2	*Hemigraphis hirta*	36
3	*Cyanodon dactylon*	96

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Site –II

Tree

Sl. No.	Name of species	GBH (in cm)	Height (in m)
1	*Bauhinia purpuria*	34	5
2	*Lagerostroemia perviflora*	68	7
3	*Eucalyptus hybrid*	76	12
4	*Eucalyptus hybrid*	110	14
5	*Callistemon subulatus*	40	5
6	*Casuarina equsetifolia*	45	8

Shrub

Sl. No.	Name of species	No.
1	*Clerodendron inflotunatum*	1
2	*Ventilago denticulate*	1
3	*Zizyphus oenopliea*	1
4	*Eupatorium odoratum*	67

Herb

Sl. No.	Name of species	No.
1	*Rungia pectinata*	14
2	*Hemigraphis hirta*	18
3	*Cyanodon dactylon*	24
4	*Vernonia ceneria*	1

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Site –III

Tree

Sl. No.	Name of species	GBH (in cm)	Height (in m)
1	*Delonix regia*	136	8
2	*Delonix regia*	96	9
3	*Eucalyptus hybrid*	70	9
4	*Eucalyptus hybrid*	110	14
5	*Phoenix sylvestris*	55	4

Shrub

Sl. No.	Name of species	No.
1	*Clerodendron inflotunatum*	15
2	*Flacourtia indica*	1

Herb

Sl. No.	Name of species	No.
1	*Rungia pectinata*	9
2	*Blumea lacera*	2
3	*Desmodium triflorum*	15
4	*Cyperus rotundus*	6
5	*Cyanodon dactylon*	5
6	*Evolvulus alsenoides*	13
7	*Evolvulus numularius*	4

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Site –IV

This is a road from township gate to floating jetty. Roadside plantation was both side of the road. One side by *Swetenia macrophyla* and other side is *Delonix regia*. GBH of *Swetenia macrophyla* are varies from 39 cm to 126cm and heights are 4 to 6 m. whereas GBH of *Delonix regia* varies from 36to116cm and heights are 4 to 7m.

TABLE-3: PLANT SPECIES DIVERSITY IN THE STUDY AREA

Table-3A: Tree species

Sl. No.	Scientific name of Plants	Family
1	*Acacia Arabica*	fabaceae
2	*Acacia auriculiformis*	Fabaceae
3	*Albizea procera*	Fabaceae
4	*Alstonia scholaris*	Apocynaceae
5	*Araucaria heterophylla*	Araucariaceae
6	*Azadirachta indica*	Meliaceae
7	*Bauhinia purpuria*	Fabaceae
8	*Borassus fabilifer*	Arecaceae
9	*Callistemon subulatus*	Myrtaceae
10	*Casuarina equsetifolia*	Casuarinaceae
11	*Cocos nucifera*	Arecaceae
12	*Dalbergia sissoo*	Fabaceae

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

13	*Delonix regia*	Fabaceae
14	*Eucalyptus hybrid*	Myrtaceae
15	*Eujenia jambolana*	Myrtaceae
16	*Ficus benghalensis*	Moraceae
17	*Ficus infectoria*	Moraceae
18	*Ficus religiosa*	Moraceae
19	*Lagerstromia perviflora*	Lythraceae
20	*Mangifera indica*	Anacardiaceae
21	*Mymusops elangi*	Sapotaceae
22	*Phoenix sylvestris*	Arecaceae
23	*Roystonea regia*	Arecaceae
24	*Samania saman*	Fabaceae
25	*Saraca asoca*	Fabaceae
26	*Streblus asper*	Moraceae
27	*Swietenia macrophylla*	Meliaceae
28	*Tabernaemonta divaricata*	Apocynaceae
29	*Techtona grandis*	Lamiaceae
30	*Trema orientales*	Urticaceae
31	*Zizyphus jujube*	Rhamnaceae

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Table-3B: Shrub species

Sl. No.	Scientific name of Plants	Family
1	*Adhatoda vesica*	Acanthaceae
2	*Calotropis procera*	Apocynaceae
3	*Cassia alata*	Fabaceae
4	*Clerodendron infortunatum*	Verbenaceae
5	*Datura metal*	Solanaceae
6	*Eupatorium odoratum*	Asteraceae
7	*Euphorbia nerrifolia*	Euphorbiaceae
8	*Ficus hispida*	Moraceae
9	*Flacourtia indica*	Flacourtiaceae
10	*Ipomoea batatas*	Convolvulaceae
11	*Pedilanthus sp.*	Euphorbiaceae
12	*Polyalthia cerasoides*	Fabaceae
13	*Polygonum barbatum*	Polygonaceae
14	*Ricinus communis*	Euphorbiaceae
15	*Solanum xanthocarpon*	Solanaceae
16	*Typha angustifolia*	Typhaceae
17	*Ventilago denticulate*	Rhamnaceae

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

18	*Vitex negundo*	Verbenaceae
19	*Zizyphus oenopliea*	Rhamnaceae

Table-3C: Herb species

Sl. No.	Scientific name of Plants	Family
1	*Aerva aspera*	Amaranthaceae
2	*Ageratum conyzoides*	Asteraceae
3	*Alocasia esculanta*	Liliaceae
4	*Alternanathera philoxeroides*	Amaranthaceae
5	*Alternanathera sessiles*	Amaranthaceae
6	*Amaranthus viridis*	Amaranthaceae
7	*Andropogon aciculatus*	Poaceae
8	*Blumea lacera*	Asteraceae
9	*Boerhavia repens*	Nyctaginaceae
10	*Brachiaria reptans*	Poaceae
11	*Cassia tora*	Malvaceae
12	*Centella asiatica*	Apiaceae
13	*Chenopodium album*	Chenopodiaceae
14	*Chrysopogon aciculatus*	Poaceae

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

15	*Coccinia grandiflora*	Cucurbitaceae
16	*Commelina benghalensis*	Commelinaceae
17	*Commelina diffusa*	Commelinaceae
18	*Croton bonplandianum*	Euphorbiaceae
19	*Crozophora sp.*	Euphorbiaceae
20	*Cuscuta reflexa*	Cucutaceae
21	*Cyanodin dactylon*	Poaceae
22	*Cyperus articulantus*	Cyperaceae
23	*Cyperus corymbosus*	Cyperaceae
24	*Cyperus difformis*	Cyperaceae
25	*Cyperus distans*	Cyperaceae
26	*Cyperus iria*	Cyperaceae
27	*Cyperus kyllinga*	Cyperaceae
28	*Cyperus rotundus*	Cyperaceae
26	*Dactyloctenium egypticum*	Poaceae
30	*Dentella repens*	Rubiaceae
31	*Desmodium triflorum*	Fabaceae
32	*Digitaria sanguinales*	Poaceae
33	*Eclipta alba*	Asteraceae

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

34	*Eclipta protrata*	Asteraceae
35	*Eleusine indica*	Poaceae
36	*Evolvulus alsenoides*	Convolvulaceae
37	*Evolvulus numularius*	Convolvulaceae
38	*Fimbristylis japonicum*	Cyperaceae
39	*Grangea madaraspatana*	Asteraceae
40	*Heliotropium indicum*	Boraginaceae
41	*Hemigraphis hirta*	Acanthaceae
42	*Hygrophila difformis*	Acanthaceae
43	*Ipomoea aquatic*	Convolvulaceae
44	*Mukia scabroides*	Cucurbitaceae
45	*Murdania vaginata*	Commelinaceae
46	*Oldenlandia corymbosa*	Rubiaceae
47	*Oxalis corniculata*	Oxalidaceae
48	*Panicum paludosum*	Poaceae
49	*Paspalidium punctatum*	Poaceae
50	*Perotis indica*	Poaceae
51	*Phyla nodiflora*	Verbenaceae
52	*Polygonum barbetum*	Polygonaceae

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

53	*Ruellia tuberose*	Acanthaceae
54	*Rungia pectinata*	Asteraceae
55	*Solanum nigram*	Solanaceae
56	*Spilanthus acmella*	Asteraceae
57	*Vernonia cineria*	Asteraceae
58	*Wedelia chinensis*	Asteraceae

Table-3D: Aquatic species

Sl. No.	Scientific name of Plants	Family
1	*Colocasia esculentans*	Araceae
2	*Eichorrnia crassipes*	Pontederiaceae
3	*Enhydra fluctuans*	Ateraceae
4	*Lemna perpusilla*	Araceae
5	*Marsilea minuta*	Marsileaceae
6	*Pistia stratiotes*	Araceae

Table-3E: Mangrove species

Sl. No.	Scientific name of Plants	Family
1	*Acanthus volubilis*	Acanthaceae

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

2	*Acrostichium aureum*	Pteridaceae
3	*Tamarix troupii*	Tamaricaceae

TABLE – 4: IVI OF TREE SPECIES IN THE STUDY AREA

Sl. No.	Species	R Den	RF	R Dom.	IVI
1	*Albizea procera*	4.17	5.41	2.84	12.42
2	*Bauhinia purpuria*	2.78	5.41	0.28	8.47
3	*Acacia Arabica*	4.17	5.41	8.24	17.82
4	*Alstonoia scholaris*	4.17	5.41	4.19	13.77
5	*Eucalyptus hybrid*	4.17	5.41	8.24	17.82
6	*Delonix regia*	5.56	5.41	0.2	11.17
7	*Phoenix sylvestris*	4.17	5.41	3.65	13.23
8	*Sweitenia macrophylla*	5.17	6.41	19.59	31.17
9	*Samania saman*	6.95	2.70	5.25	14.9
10	*Streblus asper*	4.17	5.41	3.65	13.23
11	*Callistemon subulatus*	5.56	10.81	1.99	18.36
12	*Casuarina equsetifolia*	8.34	5.41	1.07	14.82
13	*Trema orientales*	6.95	5.41	0.7	13.06
14	*Zizyphus jujube*	8.34	2.70	1.36	12.4

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

15	*Ficus glomerata*	6.95	2.70	3.13	12.78
16	*Magnifera indica*	6.95	9.42	20.6	37.64
17	*Lagerostroemia perviflora*	12.51	10.82	14.05	36.57
		100.08	100.06	100.3	300.44

Photographs of Studied Sites

Photo -1: *Adhatodavesica,* an important medicinal plants.

Photo-2: *Datura metal*, an important medicinal plant.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Photo-3:A water body near Haldia Bhawan

Photo – 4: *Tamarixtroupii*, the salt cedar.

Photo – 5:Wasteland behind central garage

Photo-6: Avenue tree of *S. macrophylla* and *D. regia*

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

Photo-7: large *Albezialebbek* tree

Photo-8: Degraded land with scattered *Acacia arabica*.

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

9.0 Conclusion

Environmental monitoring for the project was performed as per the given schedule in the contract and the sample were carried out for first season i.e.Oct-Dec-2019 and all the monitoring results of this report were checked and reviewed and this report provides an assessment of the most important impacts i.eAir quality, Noise measurements, Marine water quality for Physico –Chemical and Biological parameters and Marine Sediment quality for Physico-Chemical and Biological parameters along with the Green belt survey.

As per the tested and given results, we can say that no exceeded values of results was recorded, only noise monitoring level was recorded at the edge of standard values in few locations but it was found bit lower than standard the cause might be the sea shore as the monitoring site is just nearby of that sea edge, but there was no direct influence of any source.

However, still noise level is not considered as higher as the CPCB standard is 75dB for the industrial zones and the reported values are less than the standard.

Other than noise, the rest things are found in controlled condition and as per the Green belt survey, we came to know that Dock is maintaining very good Green belt in surrounding areas with several of species. The Green belt is found around more than 50% area of Dock premises and it will to help to minimize the level of Environmental parameters.

**********End of Report**********

Purnima Chauhan
(Technical Manager)

Amit Saxena
(Quality Manager)

ANNEXURE – VI

Sl No	Mitigation Measures as per Environmental Management Plan indicated in EIA	Action Taken Report
A	**Air Environment**	
i	Good housekeeping will be maintained in the dock complex to avoid accumulation of dust.	Adequate dust control measures has already taken up to avoid dust accumulation in the project site. Cargo is being unloaded through closed conveyor system directly to the dumper / hyva for transportation. Regular road sweeping system is implemented with adequate water sprinkling system.
ii	Vessels moored at the jetty will switch off their engines.	Agreed.
iii	All internal roads will be paved.	All roads inside the dock area are made of paver block, concreted or bituminous.
iv	A speed limit of 20 kmph will be maintained within the port.	Speed limit is well maintained within the port area. Signages are also displayed in the distinct places.
v	Informatory sign will be provided within the dock complex towards vehicle maintenance, safe drinking and adherence of the emission standards.	Compiled.
vi	Adequate traffic controllers will be provided to ensure free traffic movement within the dock complex.	Adequate traffic controller is provided to avoid road congestion within the project site.
vii	Best possible care will be taken to ensure minimum queuing of trucks outside the dock complex.	Traffic controlling system is implemented in the direction of very minimum queuing of trucks outside of the dock complex.
viii	Suitable preventive measures should be taken to protect workers against dust emanating from port operations.	Nose musk, safety helmet, safety boot and other necessary safety equipments are being provided to the workers time to time. In house safety training are also being conducted for the workers.
ix	Transport vehicles having valid Pollution under Control (PUC) Certificate will only be allowed to ply within the dock complex.	Vehicles with valid Pollution under Control (PUC) Certificate are being allowed inside the dock complex area.
x	Low sulphur fuel will be used by the cargo handling equipments.	Compiled.
xi	Ships shall strictly follow Annex VI of MARPOL (73/78). No ships will be allowed to enter Kolkata Port not following Annex VI of MARPOL 173/78.	Compiled.
xii	Economically unviable old tugs / high fuel consuming cargo handling equipments will be replaced by new equipments.	Compiled.
B	**Noise Environment**	
i	Regular activities will be planned in such a manner that similar activities will be carried out regularly at a fixed time.	Similar activities within the project area are being executed in compliance with the standard protocol.
ii	The equipment/machines will be maintained properly with particular attention to the silencers and mufflers.	Complied.
iii	Old noise producing economically unviable cargo	Complied.

Sl No	Mitigation Measures as per Environmental Management Plan indicated in EIA	Action Taken Report
	handling equipment will be replaced by new low noise producing equipment.	
iv	Ear muffs or other protective devices will be provided to the workers working in noise prone areas.	Complied.
v	A well design green belt will be established within the dock complex to control noise pollution	A thick vegetated well maintained greenbelt has already developed in the periphery as well as inside dock area. Beside this, a mass plantation programme is being taken up by HDC especially during the rainy season.
C	**Water Environment**	
i	All wastewater generated in the dock complex will be treated. Treated water will be used for gardening, greenbelt or for dust suppression within port premises.	Agreed.
ii	Best possible care will be taken to protect the surface water resources in the area.	Agreed.
iii	All steps will be taken to avoid spillage of bulk cargo, oil and other materials into the river.	Agreed.
D	**Land Environment**	
i	To minimize the impact on land environment, the solid wastes likely to be generated will be properly collected and disposed of to maintain hygienic situation in and around the proposed project site.	Generated solid waste is being collected by Haldia Municipal Authority on regular basis.
ii	Shore bins near the jetties will be provided, such shore bins will have four equal compartments to receive biodegradable waste, oily waste, non-biodegradable waste and recyclable waste.	Bins divided in three compartments, biodegradable, non-biodegradable and hazardous were constructed after certain distance. Haldia Municipal Authority is being collected the wastes on regular basis.
iii	Garbage generated in the dock complex will be removed regularly outside port premises.	Generated garbage is being regularly taken outside of the dock area by Haldia Municipal Corporation on regular basis.