

Environmental Monitoring Report

For the period covering January–June 2018
Project Number: 38412-023
June 2019

India: Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program — Project 1

Prepared by the Flood and River Erosion Management Agency of Assam (FREMAA) for the State Government of Assam and the Asian Development Bank.

This environmental monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

BI-ANNUAL REPORT ON IMPLEMENTATION OF EMP

**Project No 38412
Loan No 2684-IND**

**India: Multitranche Financing Facility –
Assam Integrated Flood and Riverbank Erosion Risk
Management Investment Program**

Reporting Period – January 2018 to June 2018

Submitted by Executing Agency



Flood and River Erosion Management Agency of Assam (FREMAA)

Prepared for FREMAA by Project Management Consultancy (PMC-FREMAA)

This report has been submitted to ADB by the Flood and River Erosion Management Agency of Assam (FREMAA) and is made publicly available in accordance with ADB's public communications policy (2011). It does not necessarily reflect the views of ADB.

**Bi-Annual Report on Implementation of Environmental Management Plan
January 2018 to June 2018**

Table of Contents

1. Introduction	4
1.1. Report Purpose	7
1.2. Project Implementation Progress	9
1.2.1. Provision of compliance	9
2. Incorporation of Environmental Requirements into Project Contractual Agreements	10
3. Summary of Environmental Mitigation and Compensation Measures Implemented	11
3.1. Preparation of site specific EMP	11
3.2. Measures taken to reduce pollution	11
3.3. Status of the mechanisms present for the implementation of EMP	11
4. Summary of Environmental Monitoring	12
4.1. Compliance Inspectors (if relevant)	12
4.1.1. Summary of Inspection Activities	
4.1.2. Mitigation Compliance	
4.1.3. Mitigation Effectiveness	
4.2. Emission Discharge (Source) Monitoring Program (if Relevant)	31
4.3. Ambient Monitoring Program (if Relevant)	31
4.3.1. Summary of Monitoring	
4.3.2. Results	
4.3.3. Assessment	
5. Key Environmental Issues	38
5.1.1. Key Issues Identified	
5.1.2. Action Taken	
5.1.3. Additional Action Required	
6. Conclusion	40
6.1. Overall Progress of implementation of Environmental Management Measures	
6.2. Problems Identified and Actions Recommended	
Appendices	42
1. Ambient Monitoring Results	42

ABBREVIATIONS

ADB – Asian Development Bank
AIFRERMIP – Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program
CBFRML – Community based flood risk management and livelihood
EIA – Environmental impact assessment
EMP – Environmental management plan
EMoP – Environmental Monitoring Plan
FRERM – Flood and riverbank erosion risk management
FREMAA - Flood and River Erosion Management Agency of Assam
MFF – Multitranche financing facility
MIS – Management information system
MoEF&CC – Ministry of Environment Forests and Climate Change
GOI – Government of India
NGOs – Nongovernment organizations
PMU – Project management unit
SEIA – Summary environmental impact assessment
SGOA – State government of Assam
SIO – Subproject implementation office
SPCB – State Pollution Control Board
UNDP – United Nations Development Program
WRD – Water Resources Department

LOAN PROCESSING HISTORY

Approval of PPTA 26 September 2008
Fact-finding Mission 27 January-7 February 2009
Management Review Meeting (MRM) 9 October 2009
Appraisal Mission-1 1-16 February 2010
Appraisal Mission (Final) 27 April – 10 May 2010
Staff Review Meeting (SRM) 29 July 2010
Loan Negotiations for MFF and Tranche 1 7-8 September 2010
Board Circulation 29 September 2010
Board Approval 19 October 2010
Project 1 Approval IV October 2010
Loan Agreement Signing November/December 2010
Loan Effectiveness December/January 2010
Physical Completion Date 31 March 2017
Loan physical completion date 31 July 2017
Loan Closing Date 30 September 2017

1. Introduction :

The Flood and River Erosion Management Agency of Assam (FREMAA) under the state government of Assam is responsible for the implementation of ADB-financed Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program (AIFRERMIP), as agreed jointly between the SGOA, Government of India and ADB, and in accordance with government and ADB's policies and procedures. ADB staff is responsible to support implementation including compliance by FREMAA of their obligations and responsibilities for program implementation in accordance with ADB's policies and procedures.

Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program is likely to affect an area larger than the sites or facilities subject to physical works. The project under the program of Tranche-1 therefore come under **Category A**. Overall, the two subprojects (Dibrugarh, Palasbari and Gumi) are needed primarily to safeguard the people, property and environment from frequent floods of the Brahmaputra River, and strongly supported by the stakeholders. The FREMAA aims to integrate key Environmental Safeguards at all the levels of planning and implementation so that critical natural ecosystem. The flood plains of Brahmaputra and the resources, are not destroyed. Nevertheless, close monitoring during pre construction, during construction and during operation phase will be operationalized so that any unforeseen impact will be detected and mitigation measures provided. Possible negative impacts include those associated with construction, which are temporary and were mitigated through prescribed mitigation measures under the environmental monitoring and management plan under the Project, with the necessary capacity building of the executing agency and outsourcing. This will help in maintaining environmental sustainability along with inclusive economic growth. The FREMAA aims to integrate key Environmental Safeguards at all the levels of planning and implementation so that the natural ecosystem are maintained and are least disturbed.

Sound environmental management is critical to sustainable development and poverty reduction. Without committed efforts to safeguard the environment, pressure will continue to build on the land, forests, water systems, wetlands, and other natural resources on which people depend for their livelihoods. ADB's environmental and social safeguards are cornerstone of its support to inclusive economic growth and environmental sustainability. The objectives of the Safeguard Policy Statement (2009) is to avoid, or when avoidance is not possible, to minimize and mitigate adverse project impacts on the environment and affected people.

The goal of the ADB's Safeguard Policy Statement (SPS) is to promote the environmental and social sustainability of ADB supported projects by protecting people and their environment from potential adverse impacts and enhancing the benefits provided. This goal is integral to achieving environmentally sustainable and socially inclusive growth and poverty reduction in Asia and the Pacific, a defining element of ADB's Long-Term Strategic Framework, Strategy 2020.

In complying with the SPS requirements :

- (i) environmentally sustainable projects are primarily achieved through a good project design during project preparation and effective environmental management during project implementation;
- (ii) integrating environmental considerations into the project feasibility study and design calls for the incorporation of environmental assessment and management into the economic, financial, institutional, social, and technical analysis of a project; and
- (iii) good environmental assessment and management enables the continued improvement of environmental performance throughout the life of a project, and can lead to enhanced economic, financial, and social outcomes.

Provisions for compliance:

The FREMAA aims to integrate key Environmental Safeguards at all the levels of planning and implementation so that critical natural ecosystem and the resources are not destroyed in this biodiversity hotspot. There was a need for recognition and following the compliance with national and state system and regulations on environmental standards by the contractors. Some of the specific environmental parameters were to be monitored periodically to check the compliance. This helps in maintaining environmental sustainability along with inclusive economic growth. Besides above, for achieving the compliance following specific arrangements were made in the contract.

The Contractor shall employ one fulltime inspector for supervising compliance with the environmental management plan. The environmental inspector shall keep one set of current environmental standards and regulations at the site at all times, available for consultation. This was followed in construction phase of Tranche-1.

The environmental inspector shall submit an Environmental Management Plan and a monthly environmental report. The report shall be written in English language in a format acceptable to the Engineer.

Measures for monitoring and preventing pollution of air, water, noise, vehicle, waste. No part of the work shall be started before environmental and safety inspectors and first aid nurse are present at the site.

Other measures like, Borrow pit management, maintenance of access road, compensatory afforestation, emergency response plan, etc are also under the preview of the environmental safeguard measures under the project. This was followed in construction phase of Tranche-1. In the initial stages contractor did not complied the contract conditions as they were not aware of the ADBs SPS 2009. In the later stage, after training by PMC and FREMAA, the contractors' abide by the contract stipulations.

Structural works of the two subproject areas under Tranche-1 are :

Palasbari Sub Project:

Palasbari Reach (completed before June, 2017)

1. Palasbari Erosion Protection under water works below LWL (4.9 Km).
2. Construction of Palasbari Embankment and slope protection work above LWL along Brahmaputra river at Palasbari. (5.1 Km.)

Gumi Reach (completed before December, 2016)

3. Construction of under water and Bank Revetment with loose boulder crates over geobag apron including supply of boulders and wire mesh nets for Gumi erosion Protection works along the Brahmaputra river. (4.5 Km)

Dibrugarh Subproject (completed before June, 2017)

- (i) Raising, Strengthening Upgradation and Construction of Road Works for Dibrugarh Town protection (DTP) Dyke along the Brahmaputra River in Dibrugarh – 8.53 Km,
- (ii) 1.8 km of bank protection through pro-siltation measures along the town protection dykes, (Fabrication and Launching of Porcupines Lot-1, Lot 2, Lot 3 and Lot 4) and
- (iii) Construction of Revetments, Geobag Aprons for Mothola Oakland Bank Area, Dibrugarh Erosion Protection Works from Ch. 000 to ch 2400m

(Kaziranga Sub Project– shifted to Tranche-2)

Table -1. **Achievement of Major Civil Works Packages**

Sl. No.	Description of the work	Physical Progress
1	Palasbari Erosion Protection underwater works below Working Low Water Level (WLWL) with two layers of sand filled geo-bags at apron.	100%
2	Gumi Erosion Protection Works	100%
3	Construction of Palasbari Embankment with black topped road and slope protection works above LWL along the Brahmaputra river	100%
4	Construction of Revetments, Geo-bag Apron, for Mothalla – Oakland bank protection works along the Brahmaputra River, Dibrugarh	100%
5	Raising, Strengthening, Up-gradation and Construction of Road Works for Dibrugarh Town Protection (DTP) Dyke	100%
6	Fabrication, Supply and Installation of Pre-Stressed Concrete (PSC) Porcupines (4 lots) at Oakland and DTP Dyke area.	100%

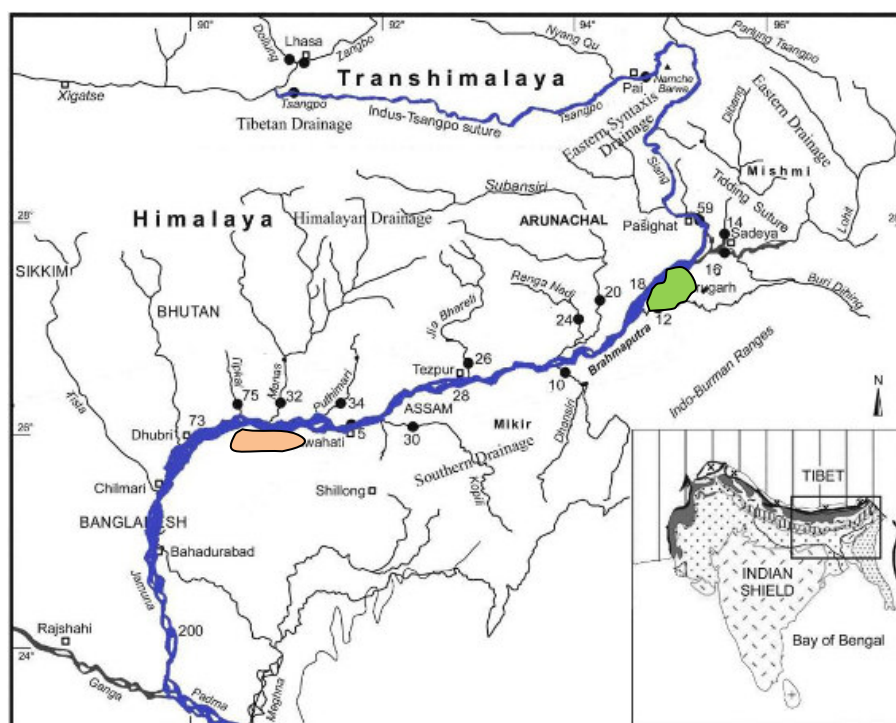
(All civil works completed before 31st July, 2017)

1.1. Report Purpose :

This project at two sub project sites (Dibrugarh, Palashbari and Gumi) in Assam is implemented by FREMAA through Water Resource Department, Assam in accordance with ADB's Safeguard Policy Statement, 2009 and Ministry of Environment, Forest and Climate Change (GOI) Guidelines so as to ensure that all environmental monitoring measures and when ever applicable Environmental mitigation measures as given in Environmental Impact Assessment and subsequent Environmental Management Plans incorporating all the Environmental concerns of the project, even in the operation stage.

The principle objectives of the report are to :

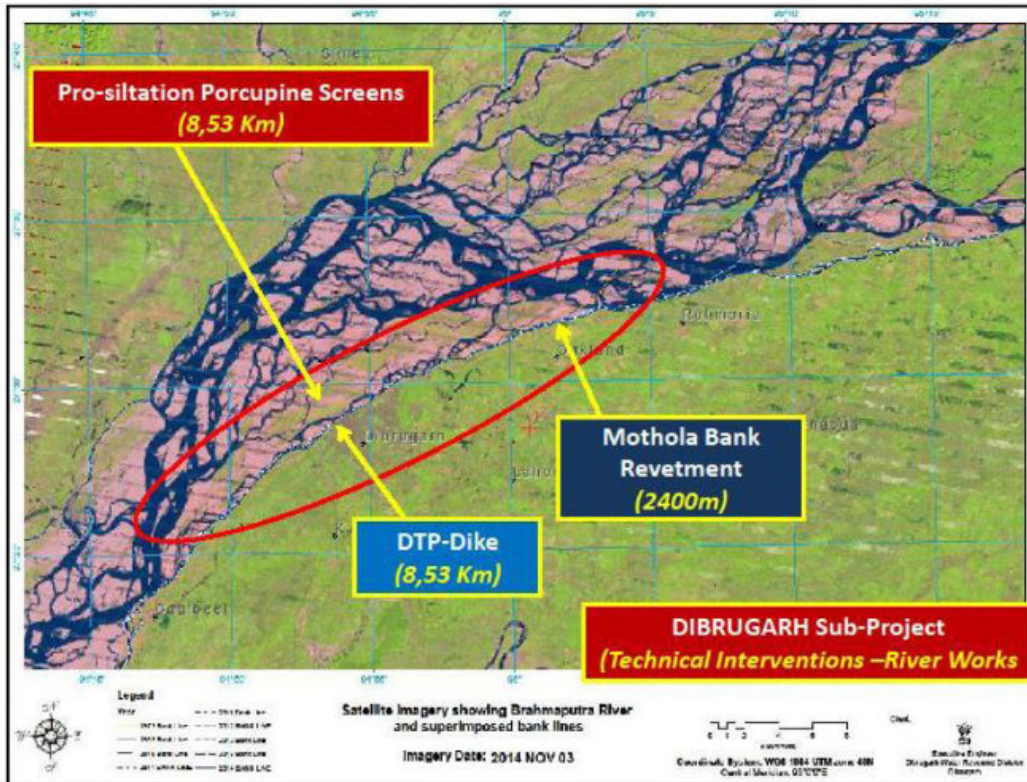
- To ensure environmentally compatible project implementation by avoiding and mitigation of negative impacts that arises from the project during the period January to June, 2018.
- To ensure that EIA recommendations are adequately followed in EMP and EMoP to meet the Environmental Compliances of statutory requirements of MoEF&CC, GOI.



Dibrugarh sub project

Palasbari Sub Project

Map-1. Project sites in Assam along the river Brahmaputra



Map-2. Project sites in Dibrugarh



Map-3. Project sites in Palsbari and Gumi

The Bi Annual Report on the implementation of Environmental Management Plan ending June, 2018 delineates :-

- Environmental Monitoring of the project from January, 2018 to June, 2018 considering the environmental activities along with environmental compliances of statutory requirements of MoEF&CC, GOI and agreement conditions.
- This report also highlights the gaps and deficiencies while executing the environmental management.

1.2. Project Implementation Progress :

Although the effectiveness of the loan started from December, 2010 and January 2011, consideration of the environment safeguard of the project started in the early part of 2013. Construction works started in February-2012 in both the subprojects of Dibrugarh and Palasbari and Gumi. Kaziranga subproject could not be started as required environmental clearance from the standing committee for National Board of Wildlife, MoEF&CC, GOI in 3rd quarter of 2014 and hence, the work shifted to tranche-2. Several meetings, trainings and workshops were conducted jointly by PMC and FREMAA with the contractors and SIO's in the month of April, 2013, May, 2014 and in subsequent months at the respective SIO office and in the site offices of the contractor for generating the awareness about the environmental safeguard and stipulations of the contract document on environment. Physical works completed on 31st July, 2017. Environmental monitoring was carried out during the operation phase from August, 2017 as per the EMP. This report covers monitoring between January 2018 to June 2018.

1.2.1. Provisions for compliance :

The FREMAA aims to integrate key Environmental Safeguards at all the levels so that critical natural ecosystem and the resources are not destroyed in this biodiversity hotspot. There is a need for recognition and following the compliance with national and state system and regulations on environmental standards by the contractors. Some of the specific environmental parameters are to be monitored periodically to check the compliance. This helps in maintaining environmental sustainability along with inclusive economic growth. Besides above, for achieving the compliance following specific arrangements were made in the EMP during the operation phase.

- Measures for monitoring and preventing pollution of air, water, noise, vehicle,
- Other measures like, maintenance of access road, emergency response plan, etc

are also under the preview of the environmental safeguard measures under the project.

2. Incorporation of Environmental Requirements into Project Contractual Agreements(Implemented during construction and operation phase as per EMP)

Manner by which EMP requirements are incorporated into contractual arrangements, such as with contractors or other parties.

Each project requires a suite of environmental safeguards defined by impact mitigations and environmental monitoring requirements that are specific to the project type, scale, activities, and location.

The key design considerations and elements of environmental monitoring are incorporated in the contract agreement enabling with ADB's Safeguard Policies and with environmental compliances of statutory requirements of MoEF&CC, GOI.

FIDIC-BASED BID DOCUMENTS

GC 4.18 Protection of the Environment

Contractor shall protect the environment on and off site and limit damage/nuisance to public from water/soil/air pollution, noise and other adverse impacts.

Section 6, Clause 2.1 - Environment

Contractor must submit EMP for approval, employ full time environmental inspector, and submit monthly reports to Engineer and monitor impacts and the success of mitigation measures.

Section 6, Clause 2.3 – Safety Precautions & Medical Attendance

Contractor shall employ a full time safety inspector, provide safety and first aid equipment, access to nurse and doctor, etc

In terms of allowable pollutant values and occupational health and safety, the laws, standards and regulations in force in India will be the references to be adhered to by the Contractor.

Following the above clause of the ADB contract document were prepared.

• Environmental Management Plan (EMP) Compliance as per Bid Document

2A. Tests to check the ambient environment (during construction and operation stage)

The following parameters are to be monitored with the frequencies described.

For Air Quality : SPM, RSPM, SO₂, NO_x, CO, Pb - With in 100 m of sensitive locations/settlement –Continuous 24- hourly, twice a week, for two weeks once every year (summer).

For Dust & Smoke- Vehicular pollution - Emission records of vehicular pollution of all the vehicles used (updated PUC)

Surface Water - pH, BOD, COD, TDS, TSS, DO, Oil and Grease – from Brahmaputra River - Once during the dry season.

Ground water - pH, BOD,DO, total coliform, As, Cd, Mn and Ground Water levels – Construction site, Rehabilitation site, service areas.

Noise - Noise Level in dB (A) – Near the construction sites and sensitive locations close to embankment – One day hourly measurement, once in six months.

For Operation phase SIOs carried out regular checks on the stipulations mentioned in the EMP except the test of Air, Water, Noise in the completed reaches. Tests of ambient environment were carried out in the month of June 2018 for the period January 2018 to June 2018. Results of the tests reflected in this report.

2.6 Measurement and Payment.

2.6.1 Protecting the Environment:

“The Bill of Quantities contains a separate line item to include all costs for protecting the environment. Cost for complying with all requirements related to construction of labour camps/ancillary sites, strengthening and/or repair of roads, rehabilitation of ancillary sites etc. are deemed to be included in the bill of quantities. Cost for specific activities related to the work, such as stripping and replacing top soil (agricultural soil), dust suppression, water supply, sanitation facilities, camp site waste disposal, control of pollution from leakage and spill of oils and lubricants, safety and warning signs/signals etc., should be included in this line item in the bill of quantities. Payments will be made on the basis of available market rates and prevailing schedule of rates of Government of Assam.”

Final bills of the contractors on implementation of EMP were scrutinised by PMC and FREMAA.

3. Summary of Environmental Mitigation and Compensation Measures Implemented

Based on EMP, may include measures related to air quality, water quality, noise quality, pollution prevention, biodiversity and natural resources, health and safety, physical cultural resources, capacity building and others.

- 3.1.** The implementation of environmental safeguards is satisfactory based onsite visits, reviews reports river morphology, water levels, and discussions with stakeholders. During the implementation, no major safeguard issues were identified and no major gaps in EMP implementation noticed (except the test of ambient environment). Grievance redress mechanisms (GRMs) were established and no complaints were received.

3.2. Measures taken to reduce pollution:

Several measures taken to reduce the environmental pollution during operation phase, some of them are :

- **Air**
 - Checked air quality by PCB approved lab (June, 2018)
- **Noise**
 - Horns not used, unless essential
 - Checked Noise level by PCB approved lab (June, 2018)
- **Surface water quality**
 - Store fuel and lubricants away from the river channels (awareness for the boat man)
 - Checked surface water quality by PCB approved lab (June, 2018)
- **Ground water quality**
 - Checked surface water quality by PCB approved lab (June, 2018)
- **Pollution**
 - Spills of oils on the site and on river regularly checked by SIO
 - Surface discharges monitored

3.3. Status of the mechanisms present for the Implementation of EMP during operation phase(status as on 30.06.2018)

As most of the SIO's doing the ADB supported works for the first time, they do not have the knowledge about the safeguards requirements during operation phase by the ADB. To improve the scenario following Actions were taken:

- Several meetings and training were organized to aware the SIO's on the environmental safeguard of ADB (Strategy and directions), testing of selected environmental parameters, national environmental standards, acts and rules of MoEF&CC, GOI and Government of Assam.
- In all the meetings with SIO's during field visits and review meetings it has been emphasized to carry out the required numbers of tests as per EMP.
- Moreover, special efforts have been made from FREMAA and PMC so that that SIO's adheres to the EMP norms even after completion of the works.
- Terrestrial and aquatic fauna status. (Proposed for September, 2018)

- Benefit assessment of the support during the project as a whole (done by BME team.)
- Fish productivity (September 2018)

4. Summary of Environmental Monitoring

4.1. Compliance Inspection (if relevant)

Following the EMP stipulations, SIO engage his officers to inspect the environmental; safeguards of the project areas and borrow areas. Borrow area converted to fish pond as per borrow area rehabilitation plan and in the rest of the areas top soil were spread properly.

4.1.1. Summary of Inspection Activities

Officers under SIO's monitors the day to day environmental safeguards at the site and reports to the SIO. Moreover, FREMAA also monitors the implementation of the EMP (Table- 2).

Table 2. Showing the site inspections by FREMAA and SIO.

List of Meetings Attended (Period January, 2018 to June, 2018)

No.	Date	Locations	Meetings Results
1	17.03.2018	Gumi	Operation phase monitoring of EMP. Test of Ambient environment date and agency finalized for June, 2018. Fish productivity in the reach.
2	23.03.2018	Palasbari	Operation phase monitoring of EMP. Test of Ambient environment date and agency finalized for June, 2018. Terrestrial and aquatic fauna status.
3	19.06.2018	Dibrugarh	Operation phase monitoring of EMP. Test of Ambient environment dates and agency finalized. Terrestrial and aquatic fauna status.

Table 3. Field visit carried out by the experts of PMC, during January to June, 2018.

No.	Date	Place of visit	Meeting with	Results
-----	------	----------------	--------------	---------

1	17.03.2018	Gumi works	WRD, Villagers, FREMAA	-aquatic migratory birds visited in the reach. -dolphin sighted -fishes found in the reach -crops cultivated in the area
2	23.03.2018	Palasbari embankment and Palasbari Apron	WRD, Villagers, FREMAA	-aquatic migratory birds visited in the reach. -dolphin sighted -fishes found in the reach
3	22.06.2018	DTP Dyke, Mothola Oakland, Dibrugarh	WRD, Villagers, FREMAA	-aquatic migratory birds visited in the reach. -fishes found in the reach

Table 4. Compliance with ADB's Safeguard Requirements – Tranche- I – Environment

Environmental Safeguards :

Environmental Loan Covenants		Responsibility	Status of Compliance
1	All the Project facilities are designed, implemented, operated and maintained in accordance with applicable laws, and regulations of the Government of India, State of Assam and ADB's SPS (2009)	FREMAA, SIO	Under Compliance in accordance with ADB Environmental Policy and SPS Guideline. Acts and rules related to Water, Air, Noise, Environment, Biodiversity of Government of India and Govt. of Assam. (Test of ambient environment carried out in the month of June 2018.)
2	Social and environmental safeguard unit	FREMAA	Under Compliance; comprising of Land acquisition expert, resettlement expert and environmental expert.
3	Monitoring of quality of Air, Water Noise at the project sites	FREMAA, SIO, Contractor	Under Compliance. Within the acceptable limits of the Environmental Standards, Central Pollution Control Board, Ministry of Environment and Forest, GOI. of the projects where tests were already been conducted (During construction phase-- Palasbari Apron and Embankment –

			March, 2017; Gumi – Dec, 2016; Dibrugarh DTP Dyke – Nov, 2016 and Mothola Oakland – Dec, 2016). Operation phase monitoring done in the month of June 2018 in all the 3 reaches.
4	Prepare and implement Environmental Management Plan under all the contract packages of the works	Contractor, SIO, FREMAA,	Under Compliance : EMP's prepared under and submitted to the SIOs. Works completed as per EMP in the later stage of the project.
5	All monitoring and mitigations measures indicated in the EIA and respective EMP are undertaken for the project	SIO, FREMAA	Under Compliance : Any unpredicted environmental impacts monitored by SIO office. So far no issues. Terrestrial and aquatic animals records were kept. Fish records were also kept at SIO office. Sites regularly monitored by SIO for compliance.
6	An environmental assessment and review framework for implementation of minor CBFRM measures	SIO, FREMAA	As highland were not created under CBFRM, but villagers were trained under DDMA's and kits were distributed to cope flood. Other than that ambient environment was monitored.
7	Semi Annual Report on implementation of EMP	FREMAA	Under Compliance : Semi / Bi Annual Report submitted for the period of January, 2018 to June 2018. Compilation going on for the period of July, 2018 to December 2018.

Condition of the embankment :

The overall condition of the embankment is good. No inundation occurred after completion of the embankment in all the three sites (Palasbari, Gumi and Dibrugarh).

DTP Dyke





DTP Dyke



Mothola Oakland - Dibrugarh



Palasbari Embankment



Palasbari Apron works



Gumi Works



4.1.2. Mitigation Compliance :

Following measures were taken to meet the compliance.

- **Pollution monitoring**
 - Air, Water and noise quality monitored till construction phase. Operation phase monitoring of ambient environment carried out in the month of June, 2018.
- **Preservation of trees**
 - Protection of trees for their preservation.
Major trees near the embankment in Dibrugarh DTP Dyke (3 nos) were protected.



- Monitoring of the planted trees.
Survival rate of the planted trees are 80 %. More trees will be planted next monsoon.
- **Labour Camps**
 - Before vacating the camp after the work, SIO inspected the labour camp sites and cleared all the debris from the camp site. Photographs of the are submitted by the contractor in the final report.
- **Borrow area Rehabilitation**
 - All the borrow areas were either rehabilitated or utilized by the community as per the Borrow Area Management Plan. Stringent monitoring required from SIOs office during construction phase to implement all the stipulations given in the Environment Clearance. Borrow area were converted to fish pond as per borrow area rehabilitation plan and in the rest of the areas top soil were spread properly.

		Explanatory comments
Overall Compliance	Good	<ol style="list-style-type: none">1. Labour camp sites properly rehabilitated..2. All the borrow areas were either rehabilitated or utilized by the community as per the Borrow Area Management Plan.3. The environmental standards (Central Pollution Control Board, MoEF&CC, GOI) applicable for the sites are kept at the SIO

		<p>office for reference. This will help SIO to compare the results of the tests of ambient environment.</p> <ol style="list-style-type: none"> 4. Monitoring of the planted trees. Satisfactory survival rate monitored by the Forest Department and district administration. Maintenance of the tree saplings were poor. But supplementary plantation required against the dead saplings. 5. Consultation with fisherman revealed that there was no impact on the fish catch and diversity.
--	--	--



Plantation near DTP Dyke



Palasbari Plantation near embankment and site of rehabilitation

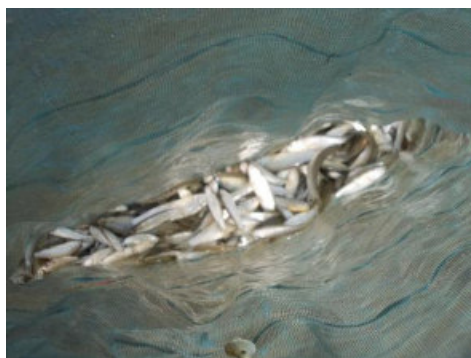


Consultation with Fisherman in the Tranche-1 reach.

During the field visit fisherman were interviewed. List of species found in the reach were recorded.



Fishing activities in Palasbari



Fishing in Gumi Reach

4.1.3. Mitigation Effectiveness

- To monitor the mitigation effectiveness the parameters mentioned in EMP were monitored.
- No complaints were lodged to SIO on environmental pollution by any of the fringe villagers, NGO's or other institutions during the reporting period (January to June, 2018).
- Results of the ambient environmental tests were within the permissible limit of Central Pollution Control Board, MoEF&CC, GOI.

To monitor the mitigation effectiveness the following parameters were monitored.

Table-5 : Mitigation Effectiveness during January to June, 2018

	Palashbari– Embankment and Palashbari–Apron (Test done on 16.06.2018)	Gumi (Test Done on 22/06/2018)	Dibrugarh – DTP Dyke & Mothola Oakland (Test done on 24.06.2018)
Ambient Air quality	Within the permissible limit	Within the permissible limit	Within the permissible limit
Surface Water Quality	Within the permissible limit	Within the permissible limit	Within the permissible limit
Ground water quality	Within the permissible limit	Within the permissible limit	Within the permissible limit

Noise level	Within the permissible limit	Within the permissible limit	Within the permissible limit
Complain lodged by the local residents on Environmental pollution January to June, 2018	No complaints lodged	No complaints lodged	No complaints lodged

Operation Phase ambient test carried out in the month of June, 2018.

		Explanatory comments
Mitigation Effectiveness	Good	<ul style="list-style-type: none"> No complaints were lodged to SIO on environmental pollution by any of the fringe villagers, NGO's or other institutions Results of the ambient environmental tests were within the permissible limit of Central Pollution Control Board, MoEF&CC, GOI. (Test results of Palasbari –24th June, 2018, Gumi – 22nd June, 2018; Dibrugarh – 16th June, 2018) Monthly environmental monitoring of the embankment, Drainage, fish diversity, Birds diversity, discharge, etc reviewed by SIO's.

4.2. Emission Discharge (Source) Monitoring Program (if Relevant)

Not relevant to this project.

4.3. Ambient Environment Monitoring Program (if Relevant)

To monitor the ambient environment the following parameters are to be monitored with the frequencies described in the EMP. All the tests were performed from the Pollution Control Board, Assam and its approved labs during construction stage. Test of ambient environment initiated for operation phase as per EMP done in the month of June, 2018.

- **For Air Quality :**
SPM, RSPM, SO₂, NO_x, - With in 100 m of sensitive locations/ settlement
–Continuous 24- hourly, once every year.
- **Surface Water :**
pH, BOD, COD, TDS, TSS, DO, Oil and Grease – from Brahmaputra River
- Once during the dry season.

- **Ground Water :**
pH, BOD, COD, TDS, TSS, DO, Oil and Grease – from Brahmaputra River
- Once during start of construction phase.
- **Noise :**
Noise Level in dB (A) – Near the sensitive locations close to embankment
– One day hourly measurement, once in six months.

4.3.1. Summary of Monitoring

Table-7 : Ambient Environment Monitoring Plan

Attribute	Parameter	Special Guidance	Standards	Duration	Location
Air	SO ₂ , NO _x , SPM, RSPM, CO, Pb	High volume sampler to be located 50m from the river bank site Downwind direction. Use method specified by PCB, Assam for analysis	Air (prevention and Control of Pollution) Rules, CPCB, 2009	24 hours Sampling	Along the river bank area
Surface Water	pH, BOD, COD, TDS, TSS, DO	Grab sample collected from source and Analyse as per Standard Methods for Examination of Water	Indian Standards for Inland Surface Waters (IS: 2296, 1982)	Grab Sampling	Along the Surface water sources
Noise	Noise levels on dB (A) scale	Equivalent noise levels using an integrated noise level meter kept at a distance of 15 m from the river bank.	MoEF&CC Noise Rules, 2000	Leq in dB(A) of day time and night time	Along the river bank

4.3.3. Results

Results of the specific tests on the selected parameters, for Air Quality, noise, surface water and ground water from Pollution Control Board approved labs provide some indicators to compare them with the baseline information and national permissible standards during the construction phase. The test results of the samples collected lies within permissible limits described in the '*Environmental Standards for Ambient Air, Automobiles, Fuels, Industries and Noise, 2000*' (Central Pollution Control Board) and a minor difference between the baseline and the test results during the work being observed, this suggest that the contractor's activity has complied with the contract stipulations on protection of environment.

For operation phase monitoring, between January to June 2018 tests were carried out in the month of June, 2018 in all the 3 reaches (Dibrugarh, Palasbari and Gumi).

Regular checking of the embankments were carried out by SIO. Following monitoring were also carried out. Reports will be compiled and submitted in the next Bi annual Report July to December, 2018.

- Terrestrial and aquatic fauna status
- Fish productivity
- Cropping pattern
- Soil erosion and siltation
- Visual check on Drainage Congestion
- River Hydrology, Morphology and Sediment Transport

Table 8 : EMP monitoring parameters for operation Phase

Location	Environmental Component	Parameter	Frequency	Remark
Dibrugarh and Gumi; and Palasbari	Fisheries	Fish productivity	Once in a year	TOR developed. The study will be initiated.
Dibrugarh and Gumi; and Palasbari	Cropping Pattern	Survey of existing cropping pattern and effect of change in cropping pattern in the impacted areas	Once in a year	Monthly monitoring done. BME captured in their report.
Dibrugarh and Gumi; and Palasbari	Air Quality	SPM, RSPM, SO ₂ , NO _x , CO, Pb	Once during construction and once after six months of completion of project	Test carried out in June, 2018.
Dibrugarh and Gumi; and Palasbari	Surface Water Quality	pH, BOD, COD, TDS, TSS, DO, Oil & Grease	Once during the dry season.	Test carried out in June, 2018.
Dibrugarh and Gumi; and Palasbari	Ground water and Drinking Water Quality	pH, BOD, DO, total coliform, As, Cd, Mn and water levels		Test carried out in June, 2018.
Dibrugarh and Gumi; and Palasbari	Soil Erosion (inland erosion) and siltation		Once during operation of 1 st year	Monthly checking done by SIOs regularly.

Dibrugarh and Gumi; and Palasbari	Drainage Congestion	Visual check	After one year of construction.	Monthly checking done by SIOs regularly.
Dibrugarh and Gumi; and Palasbari	River Hydrology, Morphology and Sediment Transport	Scientific techniques applicable to the monitoring of these components	Regular	Bathymetric survey done by ISC and SIOs monitor the results. Report will be submitted in next Bi Annual Report July to Dec, 2018.
Dibrugarh and Gumi; and Palasbari	Tree Plantation	Scientific techniques applicable to the monitoring of these components	Regular	Monitored by Forest Department.
Palasbari	Hydrology	Water level, discharge, river cross sections	As per CWC guidelines	SIO's do it regularly.
Palasbari	Morphology	Bank line profiles, Sediment transport, velocity, float tracking	As per CWC guidelines	SIO's do it regularly.

Table-9. Quality of ambient Air at the site

Parameter	DTP Dyke & Mothola Oakland (15 th June, 2018)	Palasbari Apron, & Palasbari Embankment, (24 th June, 2018)	Gumi (22 nd June 2018)
PM 2.5	42	50	53
PM10	82	96	95
NO2	7	9	6
SO2	<5	<5	<5
CO	<1	<1	<1
Pb	<0.01	<0.01	<0.01
Weather	Clear	Clear	Clear

(Ref: Appendix-1)

Table-10. Quality of Noise at the site

Parameter	Dibrugarh DTP Dyke & Mothola Oakland 15 th June, 2018	Palasbari Embankment & Apron 24 th June, 2018				Gumi 22 nd June, 2018		
Location	DTP Dyke	Ch 0.00 m	Ch 1500 m	Ch 3000 m	Ch 4500 m	Ch 3000 m	Ch 1200 m	Ch 50 m
Noise levels on dB (A) scale Day Time	53.9	65.4	65.3	58.4	65.3	54.6	53.2	53.2
Noise levels on dB (A) scale Night Time	44.1	46.8	44.6	44.8	53.8	44.4	43.8	43.2

Table-11. Quality of Ground Water at the site

Parameter	Unit	Dibrugarh DTP Dyke and Mothola Oakland 15 th June, 2018	Palasbari Apron, Embankment 24 th June, 2018	Gumi 22 nd June, 2018
Colour	Hazen	10	5	20
Odour		Un- objectionable	Un- objectionable	Un- objectionable
Turbidity	NTU	3	7	3
pH		6.47	6.6	7.64
Temperature	°C	22.1	22.1	18.2
TDS	mg/l	75	97	130
Oil & Grease	mg/l	<5	<5	<5
Total Hardness as CaCO ₃	mg/l	26	32	47
Chloride as Cl	mg/l	9	9	11.4
Sulphates as SO ₄	mg/l	28	42	47
Phosphates	mg/l	-	-	-
BOD	mg/l	-	<2	-
Lead Pb	mg/l	<0.1	<0.1	<0.1
Arsenic as As	mg/l	<0.01	<0.01	<0.01
Iron as Fe	mg/l	<0.0001	<0.06	0.023
Total Coliform	MNP/100ml	-	Absent	Absent
E.Coli	MNP/100ml	Absent	Absent	Absent

(Ref: Appendix-1)

Table-12. Quality of Surface Water at the site

Parameter	Unit	Palasbari Apron, Embankment 24 th June, 2018
Colour	Hazen	8
pH		7.35
Temperature	°C	22.9
TDS	mg/l	104
Oil & Grease	mg/l	<5
Chloride as Cl	mg/l	9
Phenols	mg/l	<0.005
Selenium Se	mg/l	<0.05
Sulphates as SO ₄	mg/l	28
Copper Cu	mg/l	<0.05
Chromium Cr	mg/l	<0.01
Cyanide CN	mg/l	<0.05
DDT	mg/l	BDL
Detergents	mg/l	<1
Dissolved oxygen	mg/l	6.1
BOD	mg/l	3
Lead Pb	mg/l	<0.1
Iron as Fe	mg/l	<0.06
Fluorides as F	mg/l	<0.1
Total Coliform	MNP/100ml	2000

(Ref: Appendix-1)

Test of ambient environment monitoring sites:





Table 13 : Showing GPS coordinates of the test sites

	Lat	Long
Dibrugarh		
Air	27°29'28.21"N	94°54'56.36"E
Noise	27°29'27.00"N	94°54'54.55"E
Water- ground	27°29'28.17"N	94°54'56.38"E
Palasbari		
Air	26° 7'38.73"N	91°32'35.54"E
Noise 1	26° 8'10.01"N	91°33'37.67"E
Noise 2	26° 7'54.22"N	91°33'2.16"E
Noise 3	26° 7'35.81"N	91°32'28.26"E
Noise 4	26° 7'6.58"N	91°31'33.10"E
Water -Ground	26° 7'26.91"N	91°32'25.36"E
Water -Surface	26° 7'10.48"N	91°31'35.90"E
Gumi		
Air	26° 5'53.75"N	91°20'42.02"E
Noise 1	26° 5'57.49"N	91°20'55.49"E
Noise 2	26° 6'0.52"N	91°21'36.16"E
Noise 3	26° 6'3.12"N	91°21'53.25"E
Water- ground	26° 5'31.92"N	91°20'57.38"E

		Explanatory comments
Ambient Environment condition	Good	<ul style="list-style-type: none"> • Operation phase monitoring performed in the month of June, 2018. • Air qualities are within prescribed limits of CPCB. • Noise levels are within the levels of Residential area and commercial area. • As the surface water at the site contains grease and oils less than 5 ml/l, it indicates that the users following the environmental norms prescribed to reduce water pollution. • For those site where the tests are being conducted in operation phase, the results are within the prescribed limits of the Central Pollution Control Board, MoEF&CC, GOI. • Other monitoring Hydrology, sediment flow, drain congestion, fish diversity, cropping pattern were monitored on regular basis.

4.3.3. Assessment

Table-12.Comparison of ambient Air, Surface water, Ground water and Noise at the site with the baseline data and National Standards.

Ambient Air

Parameter	Limits	DTP Dyke & Mothola Oakland (15 th June, 2018)	Palasbari Apron, & Palasbari Embankment, (24 th June, 2018)	Gumi (22 nd June 2018)
PM 2.5	60	42	50	53
PM10	100	82	96	95
NO2	80	7	9	6
SO2	80	<5	<5	<5
CO	2	<1	<1	<1
Pb	1	<0.01	<0.01	<0.01

Noise

Parameter	Category of the Area / Zone		Dibrugarh DTP Dyke & Mothola Oakland 15 th June, 2018	Palasbari Embankment & Apron 24 th June, 2018				Gumi 22 nd June, 2018		
Location	Limit in dB(A) Leq		DTP Dyke	Ch 0.00 m	Ch 1500 m	Ch 3000 m	Ch 4500 m	Ch 3000 m	Ch 1200 m	Ch 50 m
Noise levels on dB (A) scale Day Time	Industrial Area	75	53.9	65.4	65.3	58.4	65.3	54.6	53.2	53.2
	Commercial area	65								
	Residential area	55								
	Silence Zone	50								
Noise levels on dB (A) scale Night Time	Industrial Area	70	44.1	46.8	44.6	44.8	53.8	44.4	43.8	43.2
	Commercial area	55								
	Residential area	45								
	Silence Zone	40								

Surface water quality

Parameter	Unit	Limits IS:2296 (Class C)	Palasbari Apron, Embankment 24 th June, 2018
Colour	Hazen	300	8
pH		6-9	7.35
Temperature	°C	-	22.9
TDS	mg/l	1500	104
Oil & Grease	mg/l	-	<5
Chloride as Cl	mg/l	600	9
Phenols	mg/l	0.005	<0.005
Selenium Se	mg/l	0.05	<0.05
Sulphates as SO ₄	mg/l	400	28
Copper Cu	mg/l	1.5	<0.05

Parameter	Unit	Limits IS:2296 (Class C)	Palasbari Apron, Embankment 24 th June, 2018
Chromium Cr	mg/l	0.05	<0.01
Cyanide CN	mg/l	0.05	<0.05
DDT	mg/l	-	BDL
Detergents	mg/l	1	<1
Dissolved oxygen	mg/l	4	6.1
BOD	mg/l	<3	3
Lead Pb	mg/l	0.1	<0.1
Iron as Fe	mg/l	0.5	<0.06
Fluorides as F	mg/l	1.5	<0.1
Total Coliform	MNP/100ml	5000	2000

Ground water quality

Parameter	Unit	Limits IS:2296 (Class C)	Dibrugarh DTP Dyke and Mothola Oakland 15 th June, 2018	Palasbari Apron, Embankment 24 th June, 2018	Gumi 22 nd June, 2018
Colour	Hazen	300	10	5	20
Odour		Un- objectionable	Un- objectionable	Un- objectionable	Un- objectionable
Turbidity	NTU	-	3	7	3
pH		6-9	6.47	6.6	7.64
Temperature	°C	-	22.1	22.1	18.2
TDS	mg/l	1500	75	97	130
Oil & Grease	mg/l	-	<5	<5	<5
Total Hardness as CaCO ₃	mg/l	-	26	32	47
Chloride as Cl	mg/l	600	9	9	11.4
Sulphates as SO ₄	mg/l	400	28	42	47
Phosphates	mg/l	-	-	-	-
BOD	mg/l	3	-	<2	-
Lead Pb	mg/l	0.1	<0.1	<0.1	<0.1
Arsenic as As	mg/l	0.2	<0.01	<0.01	<0.01
Iron as Fe	mg/l	0.5	<0.0001	<0.06	0.023
Total Coliform	MNP/100ml	5000	-	Absent	Absent
E.Coli	MNP/100ml	-	Absent	Absent	Absent

		Explanatory comments
Ambient Environment condition	Good	<ul style="list-style-type: none"> Noise level was within the prescribed limit for Residential areas under Dibrugarh and Gumi. Noise level in Palasbari area falls under commercial area. Ground Water quality of the river bank in Dibrugarh, Palasbari and Gumi area were found within the limit. Surface Water quality of the river bank in Palasbari was found within the limit, DO is slightly more. Air quality was within the prescribed standards in all the sites Operation phase monitoring of the ambient air, water and noise initiated. Tests carried out in the month of June, 2018.

5. Key Environmental Issues

5.1.1. Key Issues Identified

- Operation phase monitoring of the completed works is not common in Assam. But after training SIO's started regular monitoring and quarterly reviewing the EMP stipulations.
- Documentation of environmental safeguards was moderately satisfactory.
- SIO's were not aware of the tests to be conducted during operation phase to know the ambient air quality, surface water quality ground water quality and noise levels.
- Frequency of the tests for ambient environment were at per EMoP during construction phase. For operation phase it has to be initiated. All the parameters prescribed in EMoP for the operation phase to be tested. During the meeting and discussion it was explained to SIOs by PMC and FREMAA.
- Checking the PUC of the vehicles plying on the embankment were not possible as implementing agency (DTO) is different
- Monitoring by SIO's improved on safeguard issues but still they need training on ADB's safeguard procedures

5.1.2. Action Taken

- Few meetings and training were organized to aware the SIO's on the environmental safeguard of ADB (Strategy and directions), stipulations of the operation phase EMP, testing of selected environmental parameters, national environmental standards, acts and rules of MoEF&CC, GOI and Government of Assam.
- Monitoring formats developed for keeping records and status of the Borrow areas.
- Check list prepared for the SIOs to check the drainage status, rehabilitation of the camp sites.
- Format developed for the monitoring of survival rate of the compensatory afforestation.
- Plan developed for plantation against dead saplings.
- Operation phase monitoring initiated for :
 - Terrestrial and aquatic fauna status
 - Fish productivity
 - Cropping pattern
 - Soil erosion and siltation
 - Visual check on Drainage Congestion
 - River Hydrology, Morphology and Sediment Transport

5.1.3. Additional Action Required

- Constant monitoring and providing suggestions on the implementation of the operation phase EMP by FREMAA and PMC.
- Frequency of the tests to be maintained as per EMP stipulations.
- Awareness on environmental safeguards –SIO and local residents / fringe communities
- River morphology study and Bathymetric study to know the hydrology along the executed works required to know the impact of the tranche 1 works. Work initiated by ISC and pre monsoon study completed.
- Initiation of fish productivity study to compare the impact of the interventions on the fish production is required.
- Initiate study on Terrestrial and aquatic fauna status, Cropping pattern, Soil erosion and siltation.
- Survival Monitoring of the compensatory afforestation to be strengthened.
- Plantation in the gaps against dead saplings. Protection of the planted saplings.

6. Conclusion

6.1. Overall Progress of implementation of Environmental Management Measures

		Explanatory comments
	Good	<ul style="list-style-type: none">• After the training and meetings the SIO's become aware about the importance of the environmental safeguards during operation phase.• The SIO's started monitoring of operation phase EMPs like Terrestrial and aquatic fauna status, Cropping pattern, Soil erosion and siltation, Visual check on Drainage congestion, etc.• Operation phase monitoring of implementation of EMP during operation phase was initiated in all the Tranche 1 sites. Test of ambient environment done in the month of June 2018.• Test of ambient environment initiated as per EMP during operation phase.• Camp sites were restored as per SIO's satisfaction.• Borrow area were rehabilitated as per the plan.• Awareness carried out for safe use of oil by the boatman.• Monitoring of the drainages throughout the year along the Tranche 1 sites done.

6.2. Problems Identified and Actions Recommended

Problems

- Awareness about the importance of environmental safeguards in the operation phase, particularly in this part of India is very poor.
- Local people have less knowledge on the environmental issues, safeguards; so no grievances reported or registered so far.
- Awareness of the people on lodging complaints of environmental pollution if any was not adequate during construction and operation phase.
- Officials of Water Resource Department do not practice the Environmental Safeguards for the projects during operation phase of the State or Central Government of India, so they are not trained for such implementation of the EMP prescribed measures. Hence the implementation of the EMP were not as per the schedule including the frequency of the tests to be performed, and the parameters of the tests by the SIOs. But at the later stages they were aware of the procedures of EMP.

- Documentation and reporting on environment safeguard were still to be improved. After repeated training and instructions from PMC and FREMAA, this section still required improvement.
- Plantation was done by district administration and (District Rural Development Agency) DRDA in designated sites not under the jurisdiction of WRD. So maintenance and monitoring of the survival rates as per EMP was difficult for WRD.

Actions Recommended

- Regular awareness Training on Environmental Safeguards required for the SIOs for implementation of construction and operation phase EMP.
- Regular reporting to FREMAA on implementation of EMP during operation phase to be strengthened.
- Stringent monitoring to be initiated from SIOs office during construction phase to implement all the stipulations given in the Environment Clearance.
- In future projects or in Tranche 2, following can be thought of :
 - Pre bid awareness workshop on the implementation of EMP for the probable bidders.
 - Awareness/ training on the preparation of EMP budget of the contractor.
 - Qualification and experience of the environment and safety officers to be strictly followed as in the case of civil works.
 - Workshop on implementation of EMP for the awarded contractors and environment and safety officers
 - Exposure of the environment and safety officers to the best sites (on Implementation of EMP) of the nearby project within the state.
 - Compensatory afforestation sites to be monitored and maintained by Forest Department for next 5 years.

Ambient Monitoring Results Dibrugarh- Air Quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एनवायरनमेंटल इंजीनियर और कंसल्टेंट्स

House No-11, Champaknagar, Narayan Path, Bhotapara, Guwahati-781028, www.greentechec.in
Telefax :0361 2300278 Mobile: 9435046677, 9954089052, E-mail: green_pranjal@hotmail.com, info@greentechec.in



TC-5991

TEST REPORT

URL Number: TC599118000000364P			
Test Report No :	GEEC/FL/22/2018/12/21	Date of Reporting:	30/06/2018
Customer Name & Address:	M/S.FREMAA	Lab ID No.:	GEEC/AA/2018/12/21
Project Name:	FREMAA, Dibrugarh Bank protection works	Date of Sampling:	15/06/2018
Sampling Location:	DTP Dyke, Ch 900 m	Ambient Temperature:	Max. Min.
Wind Direction/ Weather Condition:	Calm and Clear		25.0°C 12.5°C
Sampling Condition:	In GF/A, PTFE Filter Paper & Plastic Bottle	Date of Sample Receipt:	16/06/2018
Monitored By:	Mr. Rohan Singh	Test Start Date:	16/06/2018
Equipments Details:	RDS Sampler & ADS PM Sampler	Test End Date:	26/06/2018

AMBIENT AIR QUALITY

Sampling and Analysis carried out as per GEEC/SOP/01

Sl. No.	Parameters	Unit	Results	Limits	Test Method
1	Particulate Matter (PM ₁₀)	µg/m ³	82	100	IS 5182(23)
2	Particulate Matter (PM _{2.5})	µg/m ³	42	60	CPCB Guidelines
3	Sulphur Dioxide (SO ₂)	µg/m ³	< 5	80	IS 5182(2)
4	Nitrogen Dioxide (NO ₂)	µg/m ³	7	80	IS 5182(VI)
5	Carbon Monoxide (CO)	mg/m ³	< 1	2	IS 5182(22)
6	Lead (Pb)	µg/m ³	< 0.01	1	IS 5182(22)

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

Authorised by: Lab -in-Charge

Belinda Lahon
(Dr. Belinda Lahon)

The parameters tested on the specific date are found to be within the NATIONAL AMBIENT AIR QUALITY STANDARDS, CPCB NOTIFICATION DATED 18TH NOVEMBER, 2009.

The results are valid only for the date tested.

The parameters marked with R are not under the control of NABL.

The test report shall not be reproduced in full without written approval of the laboratory.

The report cannot be used as an endorsement in court of law without prior written approval of the laboratory.

Page 1 of 1

मुख्य कार्यालय: बंगला रोड, मेलाहाका, शिवसागर, असम-781046
Head Office: B. P. Chahiba Road, Melahakari, Sivasaagar, Assam-781046
Telefax: 0361 2300278

Dibrugarh- Noise quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एनवायर्नमेंटल इंजीनियर और कंसल्टेंट्स

House No-11 Champaknagar, Narayan Path, Bhetapara, Guwahati-781028, www.greentecheeec.in
Telefax -0361 2300278 Mobile: 9435046677, 9954089052, E-mail green_pranjal@hotmail.com, info@greentecheeec.in



TC-5991

GEEC/FM/47/B

TEST REPORT

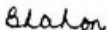
URL NO.: TC599118000000366F

Ref. No.:	GEEC/FL/32/2018/12/14	Date:	30/06/2018
Name of the Industry	M/S.FREMAA	Lab Id	GEEC-SLM/2018/06/14
Address	G S Road, Guwahati, Assam		
Name of the Works:	FREMAA, Dibrugarh Bank protection works		

Noise Level Report

Monitoring Location	DTP Dyke	Date of Monitoring	15/06/2018
Weather /Wind	Calm	Sound Level Meter Model	SL4023 SD
Monitored by:	Mr.Rohan Singh	Sl.No.	629510
Calibration certificate No:	ECLGTEE/2018-19/MECH/427	Calibration valid upto: 16/03/2019	

Measurement Results

Sl.No.	Location	Time Duration	Sound Parameters (dBA)		
			Leq	Lmin	Lmax
1	Around DTP Dyke	Day Time	53.9	38.3	67.4
		Night time	44.1	37.6	58.9
Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.)		Categories of Area/Zone	Limit in dB (A) Leq		
			Day Time	Night Time	
		Industrial Area	75	70	
		Commercial Area	65	55	
		Residential Area	55	45	
		Silence Zone	50	40	
Remark:		Noise level recorded are complied with the CPCB Limit			
Authorised by: Lab-in-Charge  (Dr. Belinda Lahon)					

The results relate only to the item tested.

The test report shall not be reproduced except in full, without written approval of the laboratory.

The test report shall not be used as a certificate in a court of law, without prior written approval of the laboratory.

Page 01 of 01

मुख्य कार्यालय: बीपी चौबिहा रोड, मेलचकन, शिवसगर, असम-785640
Head Office: B.P. Choubiha Road, Melachakan, Shivsagar, Assam-785640
Telefax: 0361 2300278

Dibrugarh – Ground water quality



ग्रीन टेक एनवायर्नमेंटल इंजीनियर और कंसल्टेंट्स GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

नारायण पथ, चम्पक नगर, गुवाहाटी, असम-781028

House No-11 Champaknagar Narayan Path, Bhetapara, Guwahati-781028, www.greentechec.in
Telefax -0361 2300278 Mobile 9435046677, 9954089052, E-mail green_pranjal@hotmail.com info@greentechec.in



TC-5991

TEST REPORT

URL Number: TC599118000000368P					
Ref. No.:		GEEC/FL/23/18/12/22		Date of Reporting: 30/06/2018	
Customer Name & Address:		M/S.FREMAA			
Project Name :		FREMAA, Dibrugarh Bank protection works			
Lab. ID No.:		GEEC/W/18/12/22		Date of Sampling: 15/06/2018	
Sampling Location:		DTP Dyke, Ch 900 m		Sample Receipt Date: 16/06/2018	
Sample Description:		Ground Water - Tube well		Test Start Date: 16/06/2018	
Sample Drawn By:		Mr.Rohan Singh		Test Completion Date: 26/06/2018	
Sample Condition:		Sealed		Sampling Method : GEEC/SOP/2	

Sl. No.	PARAMETERS	METHODS	UNITS	RESULTS	LIMIT IS:2296 (Class C)
1	Colour	IS.3025 Part 4	Hazen	10	300
2*	Odour	IS:3025 Part 5	—	Un-objectionable	Un-objectionable
3	Turbidity	APHA 22 nd EDITION, 2012	NTU	3	—
4	pH	APHA 22 nd EDITION, 2012	—	6.47	6.0 - 9.0
5*	Temperature	APHA 22 nd EDITION, 2012	°C	22.1	—
6	Total Dissolved Solids	APHA 22 nd EDITION, 2012	mg/l	75	1500
7	Oil & Grease	APHA 22 nd EDITION, 2012	mg/l	<5	—
8*	Total Hardness as CaCO ₃	APHA 22 nd EDITION, 2012	mg/l	26	—
9	Chlorides as (Cl)	APHA 22 nd EDITION, 2012	mg/l	9	600
10	Sulphates as (SO ₄)	APHA 22 nd EDITION, 2012	mg/l	28	400
11*	Phosphates	APHA 22 nd EDITION, 2012	mg/l	—	—
12	BOD	IS.3025 (44)	mg/l	—	3.0
13	Lead as Pb	APHA 22 nd EDITION, 2012	mg/l	< 0.1	0.1
14	Arsenic as (As)	APHA 22 nd EDITION, 2012	mg/l	< 0.01	0.2
15	Iron (Fe)	APHA 22 nd EDITION, 2012	mg/l	< 0.0001	0.5
16*	Total coliform	APHA 22 nd EDITION, 2012	MPN/100ml	—	5000
17*	E. Coli	APHA 22 nd EDITION, 2012	MPN/100ml	Absent	—

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

Authorised by: Laboratory In-charge
Blahon
(Dr. B. Lahon)

The results relate only to the item tested.

The parameters marked with # are not under the scope of NABL.

The test report shall not be reproduced except in full, without written approval of the laboratory.

The test report cannot be used as an evidence in a court of law without prior written approval of the laboratory.

मुख्य कार्यालय: कोची चलाहा रोड, मेलाचकर, शिवसागर, असम-781040
Head Office: B. P. Chalaha Road, Melachakar, Sivasagar, Assam-781040
Telefax: 0361 2300278

Palasbari- Air Quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एनवायर्नमेंटल इंजीनियर और कंसल्टेंट्स

House No-11, Champaknagar, Narayan Palh, Bhetapara, Guwahati-781028, www.greentechec.in
Telefax -0361 2300278 Mobile: 9435046677, 9954089052, E-mail: green_granjal@hotmail.com, info@greentechec.in



Format No.: GEEC/FM/48

TEST REPORT

URL Number: TC599119000000344P							
Test Report No. :	GEEC/FL/22/2018/03/02	Date of Reporting:	30/06/2018				
Customer Name & Address:	FREMAA	Lab. ID No.:	GEEC/AA/2018/06/02				
Project Name:	Bank Protection works Palasbari Area	Date of Sampling:	24/06/2018				
Sampling Location:	Palasbari Area near Kalbhog River	Ambient Temperature:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Max.</td> <td>Min.</td> </tr> <tr> <td>24.4°C</td> <td>18.5°C</td> </tr> </table>	Max.	Min.	24.4°C	18.5°C
Max.	Min.						
24.4°C	18.5°C						
Wind Direction/ Weather Condition:	Calm and Clear						
Sampling Condition:	In GF/A, PTFE Filter Paper & Plastic	Date of Sample Receipt:	24/06/2018				
Monitored By:	Mr. Rohan Singh	Test Start Date:	24/06/2018				
Equipments Details:	RDS & ADS PM Sampler	Test End Date:	27/06/2018				

AMBIENT AIR QUALITY

Sampling and Analysis carried out as per GEEC/SOP/01

Sl. No.	Parameters	Unit	Results	Limits	Test Method
1	Particulate Matter (PM ₁₀)	µg/m ³	96	100	IS 5182(23)
2	Particulate Matter (PM _{2.5})	µg/m ³	50	60	CPCB Guidelines
3	Sulphur Dioxide (SO ₂)	µg/m ³	<5	80	IS 5182(2)
4	Nitrogen Dioxide (NO ₂)	µg/m ³	9	80	IS 5182(VI)
5 [#]	Carbon Monoxide (CO)	mg/m ³	<1	2	IS 5182(22)
6 [#]	Lead (Pb)	µg/m ³	<0.01	1	IS 5182(22)

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

Authorised by: Lab -in-Charge

Belinda Lahan

(Dr. Belinda Lahan)

The parameters tested on the specific date are found to be within the NATIONAL AMBIENT AIR QUALITY STANDARDS, CPCB NOTIFICATION DATED 18TH NOVEMBER, 2009.

- * The results relate only to the item tested.
- * The parameters marked with # are not under the scope of NABL.
- * The test report shall not be reproduced except in full, without written approval of the laboratory.
- * The report cannot be used as an evidence in a court of law without prior written approval of the laboratory.

Page 01/01

मुख्य कार्यालय: बीपी चालिहा रोड, मेलाचकर, शिवसागर, असम-785640
Head Office: B. P. Chaliha Road, Melachakar, Sivasagar, Assam-785640
TeleFax: 0361 2300278

Palasbari – Noise quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एनवायर्नमेंटल इंजीनियर और कंसल्टेंट्स

House No-11, Champaknagar, Namyan Path, Bhotapara, Guwahati-781028, www.greentecheeec.in
Telefax -0361 2300278 Mobile: 9435046677, 9954089052, E-mail: green_pranjal@hotmail.com, info@greentecheeec.in



GEEC/FM/47/B

TEST REPORT

URL NO.: TC599119000000346F					
Ref. No.:	GEEC/FL/32/2018/03/02		Date:	30/06/2018	
Name of the Industry	FREMAA		Lab Id	GEEC-SLM/2019/03/02	
Address	G.S. Road, Guwahati				
Name of the Works:	Bank Protection works Palasbari Area				
Noise Level Report					
Monitoring Location		Date of Monitoring	24/06/2018		
Weather /Wind	Calm	Sound Level Meter Model	SL4023 SD		
Monitored by:	Mr. Rohan Singh	Sl.No.	629510		
Calibration certificate No:	ECL/GTEE/2018-19/MECH/427	Calibration valid upto: 16/03/2019			
Measurement Results					
Sl.No.	Location	Time Duration	Sound Parameters (dBA)		
			Leq	Lmin	Lmax
1	ch 0.00 m	Day Time	65.4	64	69
		Night Time	46.8	37.2	55.4
2	ch 1500 m	Day Time	65.3	64	69
		Night Time	44.6	37.2	55.4
3	ch 3000 m	Day Time	58.4	57	65
		Night Time	44.8	37.2	64.4
4	ch 4500 m	Day Time	65.3	64.4	69
		Night Time	53.8	37.2	65.4
Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.)		Categories of Area/Zone	Limit in dB (A) Leq		
			Day Time	Night Time	
		Industrial Area	75	70	
		Commercial Area	65	55	
		Residential Area	55	45	
		Silence Zone	50	40	
Remark:		Noise level recorded are complied with the CPCB Limit			
		Authorised by: Lab-in-Charge <i>Belinda Lahon</i> (Dr. Belinda Lahon)			

The results relate only to the item tested.

The test report shall not be reproduced except in full, without written approval of the laboratory.

The test report cannot be used as evidence in a court of law without prior written approval of the laboratory.

मुख्य कार्यालय: बीपी चालीहा रोड, मेलचक्र, शिवसागर, असम-785640
Page 01/01
Head Office: B. P. Chaliha Road, Melachakar, Sivasagar, Assam-785640
TeleFax: 0361 2300278

Palasbari- Ground water quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एनवायरनमेंटल इंजीनियर और कंसल्टेंट्स

House No-11, Champaknagar, Narayan Path, Bhetapara, Guwahati-781028, www.greentecheeec.in
Telefax -0361 2300278 Mobile: 9435046877, 9954089052, E-mail: green_pranjal@hotmail.com, info@greentecheeec.in



TC-5991

GEEC/FM/49A

TEST REPORT

URL Number: TC599119000000350P					
Ref. No.:		GEEC/FL/23/18/03/04		Date of Reporting:	
				30/06/2018	
Customer Name & Address:		FREMAA			
Project Name :		Bank Protection works Palasbari Area			
Lab. ID No.:		GEEC/W/18/03/04		Date of Sampling:	
				24/06/2018	
Sampling Location:		Tube Well, Palasbari Area		Sample Receipt Date:	
				24/06/2018	
Sample Description:		Ground Water		Test Start Date:	
				24/06/2018	
Sample Drawn By:		Mr.Rohan Singh		Test Completion Date:	
				27/06/2018	
Sample Condition:		Sealed		Sampling Method :	
				GEEC/SOP/2	

Sl. No.	PARAMETERS	METHODS	UNITS	RESULTS	LIMIT IS:2296 (Class C)
1	Arsenic as (As)	IS 3025 Part 37-1988(RA:2014)	mg/l	< 0.01	0.2
2	BOD	IS:3025 Part 44-1993(RA:2014)	mg/l	<2	<3
3	Chloride	IS 3025 Part 32-1988(RA:2007)	mg/l	9	600
4	Colour	IS:3025 Part 4-1983(RA:2017)	Hazen	5	300
5	Iron (Fe)	IS 3025 Part 53 2003(RA:2014)	mg/l	<0.06	0.5
6	Lead	IS 3025 Part 47 2003(RA:2014)	mg/l	<0.1	0.1
7*	Odour	IS:3025 Part 5 1983(RA:2017)	—	Un-objectionable	Un-objectionable
8	Oil & Grease	IS 3025 Part 39 1991(RA:2014)	mg/l	<5	—
9	pH	IS 3025 Part 11 1983(RA:2012)	—	6.6	6.0 - 9.0
10*	Phosphates	APHA 22 nd EDITION, 2012	mg/l	—	—
11	Sulphate	IS 3025 Part 24 1988(RA:2014)	mg/l	42	400
12#	Temperature	—	°C	22.1	—
13	Total Dissolved Solids	IS 3025 Part 16 1984(RA:2012)	mg/l	97	1500
14	Total Hardness as CaCO ₃	IS 3025 Part 21 2009	mg/l	32	—
15	Turbidity	IS 3025 Part 10 1983(RA:2012)	NTU	7	—
16*	Total coliform	APHA 22 nd EDITION, 2012	MPN/100ml	Absent	5000
17*	E. Coli	APHA 22 nd EDITION, 2012	MPN/100ml	Absent	—

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

Authorised by: Laboratory In-charge

B. Lahon
(Dr. B. Lahon)

* The results relate only to the item tested.

* The parameters marked with # are not under the scope of NABL.

* The test report shall not be reproduced except in full, without written approval of the laboratory.

* The test report cannot be used as an evidence in a court of law without prior written approval of the laboratory.

मुख्य कार्यालय बीपी चालिहा रोड, मेलचकर, शिवसागर, असम-785640
Head Office: B. P. Chaliha Road, Melachakar, Sivasagar, Assam-785640
TeleFax: 0361 2300278

Palasbari- Surface water quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एन्वायरनमेंटल इंजीनियर और कंसल्टेंट्स

House No-11, Champaknagar, Narayan Path, Bhatapara, Guwahati-781028, www.greentechec.in
Telefax -0361 2300278 Mobile: 9435046677, 9954089052, E-mail: green_pranjal@hotmail.com, info@greentechec.in



TC-5991

TEST REPORT

URL Number: TC59911900000349P					
Ref. No.:		GEEC/FL/23/18/03/03		Date of Reporting:	
Customer Name & Address:		FREMAA			
Project Name :		Bank Protection works Palasbari Area			
Lab. ID No.:		GEEC/W/18/03/03		Date of Sampling:	
Sampling Location:		Brahmaputra River Palasbari		Sample Receipt Date:	
Sample Description:		Surface Water		Test Start Date:	
Sample Drawn By:		Mr. Rohan Singh		Test Completion Date:	
Sample Condition:		Sealed		Sampling Method :	
				GEEC/SOP/2	

Sl. No.	PARAMETERS	METHODS	UNITS	RESULTS	LIMIT IS:2296 (Class C)
1	BOD	IS:3025 Part 44-1993(RA:2014)	mg/l	3	<3
2	Chloride	IS:3025 Part 32-1988(RA:2007)	mg/l	9	600
3	Colour	IS:3025 Part 4-1983(RA:2017)	Hazen	8	300
4	Copper (Cu)	IS:3025 Part 42-1992(RA:2014)	mg/l	<0.05	1.5
5	Chromium (Cr ⁶⁺)	IS:3025 Part 52-2003(RA:2014)	mg/l	<0.01	0.05
6 [#]	Cyanide (CN)	APHA 22nd EDITION, 2012	mg/l	<0.05	0.05
7 [#]	DDT	APHA 22nd EDITION, 2012	mg/l	BDL	—
8 [#]	Detergents	APHA 22nd EDITION, 2012	mg/l	<1	1
9	Dissolved Oxygen	IS:3025 Part 38-1989(RA:2014)	mg/l	6.1	4
10	Iron (Fe)	IS 3025 Part 53 2003(RA:2014)	mg/l	<0.06	0.5
11	Fluorides as (F)	IS 3025 Part 60 2008(RA:2013)	mg/l	<0.1	1.5
12	Lead	IS 3025 Part 47 2003(RA:2014)	mg/l	<0.1	0.1
13	Oil & Grease	IS 3025 Part 39 1991(RA:2014)	mg/l	<5	—
14	pH	IS 3025 Part 11 1983(RA:2012)	—	7.36	6.0 - 9.0
15	Phenols	IS 3025 Part 43 1992(RA:2014)	mg/l	<0.005	0.005
16 [#]	Selenium (Se)	APHA 22nd EDITION, 2012	mg/l	<0.05	0.05
17	Sulphate	IS 3025 Part 24 1988(RA:2014)	mg/l	28	400
18 [#]	Temperature	—	°C	22.9	—
19	Total Dissolved Solids	IS:3025 Part 16 1984(RA:2012)	mg/l	104	1500
20 [#]	Total coliform	APHA 22 nd EDITION, 2012	MPN/100ml	2000	5000

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

Authorised by: Laboratory In-charge
B. Lahon
(Dr. B. Lahon)

* The results relate only to the item tested.

* The parameters marked with # are not under the scope of NABL.

* The test report shall not be reproduced except in full, without written approval of the laboratory.

* The test report cannot be used as an evidence in any court of law.

Head Office: B. P. Chaliha Road, Melachakar, Sivasagar, Assam-785640
TeleFax: 0361 2300278

Gumi – Air Quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एनवायरनमेंटल इंजीनियर और कंसल्टेंट्स

House No-11, Champaknagar, Narayan Path, Bhatapara, Guwahati-781028 www.greentecheeec.in

Telefax: 0361 2300278 Mobile: 9435046677 9954089052 Email: greentech_e@yahoo.co.in info@greentecheeec.in



TC-5591

TEST REPORT

URL Number: TC599119000000081P					
Test Report No. :		GEEC/FL/22/2018/01/01		Date of Reporting:	
				28/06/2018	
Customer Name & Address:		M/S FREEMA G S Road, Guwahati, Assam		Lab. ID No. :	
				GEEC/AA/2018/01/01	
Project Name:		FREMAA - Bank protection works Gumi area T-1, Kamrup		Date of Sampling:	
				22/06/2018	
Sampling Location:		Gumi 3000m		Ambient Temperature:	
				Max. Min.	
Wind Direction/ Weather Condition:		Calm and Clear		20.2°C 12.7°C	
Sampling Condition:		In GF/A, PTFE Filter Paper & Plastic Bottle		Date of Sample Receipt:	
				22/06/2018	
Monitored By:		Mr. Dilip Deka		Test Start Date:	
				22/06/2018	
Equipments Details:		RDS Sampler & ADS PM Sampler		Test End Date:	
				27/06/2018	
AMBIENT AIR QUALITY					
Sampling and Analysis carried out as per GEEC/SOP/01					
Sl. No.	Parameters	Unit	Results	Limits	Test Method
1	Particulate Matter (PM ₁₀)	µg/m ³	95	100	IS 5182(23)
2	Particulate Matter (PM _{2.5})	µg/m ³	53	60	CPCB Guidelines
3	Sulphur Dioxide (SO ₂)	µg/m ³	<5	80	IS 5182(2)
4	Nitrogen Dioxide (NO ₂)	µg/m ³	6	80	IS 5182(VI)
5*	Carbon Monoxide (CO)	mg/m ³	<1	2	IS 5182(22)
6*	Lead (Pb)	µg/m ³	<0.01	1	IS 5182(22)
***** End of Report*****					
Authorised by: Lab -in-Charge					
 (Dr. Belinda Lahon)					
The parameters tested on the specific date are found to be within the NATIONAL AMBIENT AIR QUALITY STANDARDS, CPCB NOTIFICATION DATED 18TH NOVEMBER, 2009.					

* The results relate only to the item tested

* The parameters marked with # are not under the scope of NABL

* The test report shall not be reproduced except in full, without written approval of the laboratory

* The report cannot be used as an evidence in a court of law without prior written approval of the laboratory

मुख्य कार्यालय बीपी चौमि रोड मेलचकर शिवसागर असम 785649
 Head Office: B. P. Chaliha Road, Melachakar, Sivasagar, Assam-785649
 TeleFax: 0361 2300278

Gumi – Noise quality



GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

ग्रीन टेक एनवायरनमेंटल इंजीनियर और कंसल्टेंट्स

House No-11, Champaknagar, Narayan Path, Bhetapara, Guwahati-781028 www.greentechneec.in

Telephone - 0361 2300278 Mobile - 9435048677 9854289051 E-mail: green_pranjan@yahoo.com, info@greentechneec.in



TC 5991

TEST REPORT					
URL NO TC599119000000002F					
Ref. No.: GEEC/FL/32/2018/01/03		Date: 27/06/2018			
Name of the Industry: M/S FREEMA		Lab Id: GEEC-SLM/2018/01/01			
Address: G S Road, Guwahati, Assam					
Name of the Works: FREMAA - Bank protection works Gumi area T-1, Kamrup					
Noise Level Report					
Monitoring Location		Project Site		Date of Monitoring: 22/06/2018	
Weather /Wind		Calm		Sound Level Meter Model: SL4023 SD	
Monitored by:		Mr Dilip Deka		Sl.No.: 629510	
Calibration certificate No.		ECLGTEE/2018-19/MECH/427		Calibration valid upto: 16/03/2019	
Measurement Results					
Sl.No.	Location	Time Duration	Sound Parameters (dBA)		
			Leq	Lmin	Lmax
1	Ch.3000 m	Day Time	54.6	37.4	64.2
		Night time	44.4	37.2	58.2
2	Ch:1200 M	Day Time	53.2	37.3	69.2
		Night time	43.8	37.2	58.9
3	Ch:50 M	Day Time	53.2	38.4	68.3
		Night time	43.2	38.4	55.9
Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.)		Categories of Area/Zone		Limit in dB (A) Leq	
				Day Time	Night Time
		Industrial Area		75	70
		Commercial Area		65	55
		Residential Area		55	45
Silence Zone		50	40		
Remark:		Noise level recorded are complied with the CPCB Limit			
Authorised by: Lab -in-Charge <i>Blahen</i> (Dr. Belinda Lahon)					

The results relate only to the item tested

The test report shall not be reproduced except in full, without written approval of the laboratory

The test report cannot be used as an evidence in a court of law without prior written approval of the laboratory

Page 01/01

मुख्य कार्यालय बोधो चालिहा रोड मेलाचनगर, शिवसागर, असम-785040
 Head Office: B. P. Chaliha Road, Melachhagar, Shivasagar, Assam-785040
 Telephone: 0361 2300278

Gumi – Ground water quality



ग्रीन टेक एनवायरनमेंटल इंजीनियर और कंसल्टेंट्स GREEN TECH ENVIRONMENTAL ENGINEER & CONSULTANTS

आसाम नगर, चम्पकनगर, गुवाहाटी, असम-781025

House No-11, Champaknagar, Narayan Path, Bhetapara, Guwahati-781025, www.greentechec.in
Telefax -0361 2300278 Mobile: 9435046677, 9954089052, E-mail: green_pranjal@hotmail.com, info@greentechec.in

TC-5991

TEST REPORT

URL Number: TC 599119000000003P					
Ref. No.:		GEEC/FL/23/18/01/02		Date of Reporting: 28/06/2018	
Customer Name & Address:		M/s FREEMA, G S Road, Guwahati, Assam			
Project Name:		FREEMA- Bank protection works T-1 Gumi Kamrup			
Lab. ID No.:		GEEC/W/19/01/01		Date of Sampling: 22/06/2018	
Sampling Location:		Ground Water (Tube Well)		Sample Receipt Date: 22/06/2018	
Sample Description:		Ground Water		Test Start Date: 22/06/2018	
Sample Drawn By:		Mr. Dilip Deka		Test Completion Date: 28/06/2018	
Sample Condition:		Sealed		Sampling Method: GEEC/SQP/2	

Sl. No.	PARAMETERS	METHODS	UNITS	RESULTS	LIMIT IS: 2296 (Class C)
1	Colour	IS 3025 Part 4	Hazen	20	300
2*	Odour	IS 3025 Part 5	-	Un-objectionable	Un-objectionable
3	Turbidity	APHA 22 nd EDITION, 2012	NTU	3	-
4	pH	APHA 22 nd EDITION, 2012	-	7.64	6.0 - 9.0
5*	Temperature	APHA 22 nd EDITION, 2012	°C	18.2	-
6	Total Dissolved Solids	APHA 22 nd EDITION, 2012	mg/l	130	1500
7	Oil & Grease	APHA 22 nd EDITION, 2012	mg/l	<5	-
8*	Total Hardness as CaCO ₃	APHA 22 nd EDITION, 2012	mg/l	47	-
9	Chlorides as (Cl)	APHA 22 nd EDITION, 2012	mg/l	11.4	600
10	Sulphates as (SO ₄)	APHA 22 nd EDITION, 2012	mg/l	47	400
11*	Phosphates	APHA 22 nd EDITION, 2012	mg/l	-	-
12	BOD	IS:3025 (44)	mg/l	-	3.0
13	Lead as Pb	APHA 22 nd EDITION, 2012	mg/l	<0.1	0.1
14	Arsenic as (As)	APHA 22 nd EDITION, 2012	mg/l	<0.01	0.2
15	Iron (Fe)	APHA 22 nd EDITION, 2012	mg/l	0.023	0.5
16*	Total Coliform	High Media Kit	Present/ Absent	Absent	Absent
17*	E. Coli	High Media Kit	Present/ Absent	Absent	Absent

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

Authorised by: Laboratory In-charge

B. Lahori

(Dr. B. Lahori)

- * The results relate only to the item tested.
- * The parameters marked with # are not under the scope of NABL.
- * The test report shall not be reproduced except in full, without written approval of the laboratory.
- * The test report can not be used as an evidence in a court of law without prior written approval of the laboratory.

Page 1 of 1

मुख्य कार्यालय: बी.पी. चालिहा रोड, मेलचकर, शिवसागर असम-785640
Head Office: B. P. Chaliha Road, Melachakar, Sivasagar, Assam-785640
TeleFax: 0361 2300278



Meeting at Palasbari



Meeting at Dibrugarh

