ANNEXURE IV

ENVIRONMENT AND SOCIAL MANAGEMENT PLAN

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING PROGRAMME – NEAMATI

1. GENERAL

The Environment and Social Management Plan (ESMP) is required to ensure sustainable development of the proposed terminal on river Brahmaputra both during the construction as well as operational phases. The ESMP is site and time specific. In order to effectively implement ESMP, an institutional framework has been developed and roles and responsibilities of various relevant agencies have been worked out. Capacity development program are also identified and part of the ESMP.

In general, Assam Inland Water Transport Development Society (AIWTDS), (with assistance from Contractor, Third Party Monitoring Consultant /Technical Support & Supervision Consultant) is the responsible entity for ensuring that the mitigation measures as suggested in the ESMP are carried out. A detailed ESMP has been prepared for Neamati terminal. The list provides reference implementing organisation and responsible entity.

COMPONENTS OF EMP

Key components of the EMP are summarized below and explained in detail in the following subsections:

- Mitigation Measures
- Monitoring Measures
- Institutional Arrangement
- Reporting Requirements
- EMP Budget

Site-specific environment and social riverine infrastructure along with the roles and responsibilities of the key persons involved at different phases of the proposed development are described below:

The Environmental and Social Management Plan for Neamati Terminal for construction phase is given in **Table 1.1 and Table 1.2** respectively.

Table 1.1: Environment Management Plan (Construction Phase)

Component	Environmenta I Attribute and potential	Remedial Measure	Monitoring Indicators	Institu Respon Implemen	sibility Supervi
Design	impacts			tation	sion
Development of the Final Design	The design of the infrastructure must be resilient to the Floods	The design must take into consideration the projected rainfall levels as in the Assam State Action Plan on Climate Change (2015- 2020). The Annual rainfall is likely to increase by 10-25 %, and the extreme rainfall days will increase by 5-38%, with the extreme rainfall increase projected to increase between 25 and 150 mm.	Assessment of Design for Resilience	Contractor	TSSC & PMU (AIWTDS +GC)
	Design of the Riverbank Protection	The design of any riverbank protection must be carefully assessed so that the hazards due to Bank failure do not affect the stability of the structure.	Assessment of Design for Resilience	Contractor	TSSC & PMU (AIWTDS +GC)
	Collection and Treatment of Solid and Liquid Waste	The design of bio-digesters at the Terminal must be an adequate size to meet the regular passenger demand. Additional space needs to be made available for setting up additional bio-toilets for the pilgrim / festival. Adequate space must be made available to store municipal solid waste.	Assessment of Capacity of Bio- Digestor Assessment of space for the setting up bio- toilets, Adequate space for storage of Municipal Solid Waste	Contractor	TSSC & PMU (AIWTDS +GC)
	Energy Efficiency	Energy-efficient measures in the terminal buildings will be implemented; Solar power will be used in potential area	Use of Energy efficient Fitting and fixtures	Contractor	TSSC & PMU (AIWTDS +GC)
Pre-Construction A	Activities			1 -	
Field Verification Surveys	Requirement for felling of trees	Permission of tree(s) removal from non-forest area -The GC/ AIWTDS and the Contractor will carry out joint field verification to ascertain whether any tree would be affected and needs to be felled either for the construction activities or for safety purpose. In case any tree must be felledPermissions must be obtained from the Forest Department, Government of Assam. No tree would be felled without permission. At present there is no requirement for felling of trees	Copy of the Permit of the Forest Department, Government of Assam	Contractor	PMU (AIWTDS +GC)and TSSC
Assessment of Impacts due to Changes/Addition s in the Project	Additional Impacts	Site-specific EMP before the commencement of construction -In case of any change in the event of changes/revisions (including addition or deletion) in the project's scope of work or change in the site	Approved copy of the C-EMP	Contractor	(AIWTDS +GC)and TSSC

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		condition. the impacts of the changes need to be assessed. -The Contractor will also prepare site-specific EMP to address these additional impacts. The Site Specific EMP has to be submitted to the PMC for approval. The Construction activities must not start before the approval of site-specific EMP by the PMC.			
Setting up of Plant and Machinery(Batching Plants or concrete mixer location)	source of pollution (air quality, water quality, soil)	Location of Batching Plants -Batching plants will be sited sufficiently away from settlements, agricultural operations, or commercial establishments. Compliance with laws, ordinances, codes, rules, regulations, orders, or declarations -Concrete mixers and batching plants will comply with the requirements of the relevant emission control legislations and -Consent/NOC for all such plants obtained from the State Pollution Control Board will be submitted to the PIU. -The Contractor will not initiate plant/s operation till the required legal clearances are obtained and submitted. In case the concrete is procured from a third party, a valid consent of the plant, along with the latest copy of the Annual report, will be submitted to the PIU before the procurement of any material	Consent to Establish and Operate	Contractor	PMU (AIWTDS +GC)and TSSC
Procurement of Other Construction Vehicles, Equipment and Machinery	pollution and noise	Statutory Compliance:-All Construction equipment¹ and machinery to be used in the project will conform to BS IV standards to be adopted by the Ministry of Road Transport and Highways. The discharge standards promulgated under the Environment Protection Act, 1986, will be strictly adhered toNoise limits for construction equipment to be procured, such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws, will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986. The Contractor will maintain a record of PUC for all vehicles and machinery used during the contract period.	Certification by Manufacturer of emission and noise levels/ Pollution under Control Certificates, Insurance and Driving License of the driver to be submitted for all vehicles	Contractor	PMU (AIWTDS +GC)and TSSC

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Every agricultural tractor, construction equipment vehicle and combine harvester shall be so manufactured that it complies with the following standards of gaseous pollutants as per rule 115A, after sub-rule (8), of the Central Motor Vehicle Rules, 1989.

		Contractor will finalise the stone	Permission for	Contractor	DMII
Sourcing of construction material	Unsustainable mining practices	-Contractor will finalise the stone quarry /sand mine / borrow area for procurement of construction materials after assessment of the availability of sufficient materials and other logistic arrangements. TheContractor will provide a copy of the Environmental Clearance Certificate of the quarry/sand mine and the Consent to Establish and Operate along with the recent compliance report to the PMU before any such quarry is engagedIn case the contractor decides to use new quarries then the contractor will obtain the environmental clearance and all other permits and licenses and submit the same to the PMU before extracting any material. The contractor will submit a copy of the approval and the rehabilitation plan to the PIU and the Environmental Expert of the PMU ConsultantContractor will also work out haul road network and report to the Environmental Expert of the PMC. They will inspect and in turn report to PMU before approval.	Permission for mining/ quarrying of materials from the Mining Department, District Administration and District Level Environment Appraisal Committee	Contractor	PMU (AIWTDS +GC)and TSSC
Identification of water sources for construction	Adverse impact on water resources	If the contractor will source water requirements for construction form groundwater, prior permission from the Ground Water Board is required. A copy of the permission will be submitted to PIU prior to the initiation of construction. A flow meter must be installed, and the records of water used for construction must I be maintained. The usage of groundwater must be recorded. The contractor can use fresh groundwater sources after the required treatment for drinking. Even if water is sourced from third parties, the above provisions must be followed. -If the river water is used, the permission of the Irrigation department must be obtained	Permission from the Ground Water Board for Groundwater usage Permission of the Irrigation /Water Resources Department in case of River water is used.	Contractor	PMU (AIWTDS +GC)and TSSC
Environmental monitoring of baseline conditions of air, noise, water, and soil	To establish baseline environmental conditions and ascertain the impacts during the construction phase	Environmental monitoring to be carried out through recognised ² Laboratory as per the locations specified in the environmental monitoring plan in Table 2.1	Submission of test results to PMU	Contractor	PMU (AIWTDS +GC)and TSSC
EMP Implementation Training	Lack of awareness of EMP can lead	-Project manager and all key workers will be required to undergo EMP implementation, including	-Certificate of Completion (Safeguards	Contractor	PMU (AIWTDS

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² (National Accreditation Board for Testing and Calibration Laboratories (NABL) Accredited /Ministry of Environment Forest and Climate Change (MoEF&CC) / respective State Pollution Control Board (SPCB's)).

	to irresponsible behaviour resulting in an Irreversible impact to the environment, workers, and community.	spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labour laws, applicable environmental laws, etc. Additional modules for Dolphin Protection. - All new personnel joining the work need to undergo induction training. All personnel joining work after a break of more than 15 days need to undergo refresher.	Compliance Orientation) -Posting of EMP at worksitesMaintaining Records of training both induction and refresher -Submission of the Training records to the PIU every month		+GC)and TSSC
	Deployment of EHS Officer and OHS Officer	Deploy qualified personnel and management committee. - Contractor must depute qualified EHS personnel in the start of the project to conduct training to all the personnel and effective monitoring of mitigation measures during construction. The name and functions of the responsible EHS persons and their relevant expertise must be notified in the Quarterly Report -If an EHS person resigns/ replaced/replaced or the team has been enlarged, the same must be reported to the Bank within 15 days of the incident	Submission of records of the availability of the EHS personnel onsite in the Monthly Report and Quarterly Report	Contractor	PMU (AIWTDS +GC)and TSSC
Legal compliance	Environmental legal noncompliance may	-Obtain all consents, clearances (CTE/CTO from ASPCB), permits NOCs etc., before start of construction worksEnsure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (Refer Table 3.1 in this report) -Following consents are required-Tree cutting-local authority -Storage, handling, and transport of hazardous materials-ASPCBSand mining, quarries, borrow areas- Department of mines and GeologyAcknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs etcInclude in detailed design drawings and documents all conditions and provisions; if necessary	Copy of the Permit/ Consent to be submitted with QPR to PMU	Contractor	PMU (AIWTDS +GC)and TSSC
Preparation of Method Statement	Occupational Health Safety and Community Health Safety Impacts	Carry out a Hazard Identification and Risk Assessment for all tasks presented in the Method Statement Prepare occupational health and safety plan, including COVID-19 H&S Plan Prepare Community Health Safety Plan to ensure that the community/ are segregated from the construction area Prepare a Debris/spoils management plan, Waste Management Plan.	- Occupational Health and Safety Plan (including HIRA) to be integrated with Method Statement - Community Health Safety Plan - Debris/spoils management plan, Waste Management Plan	Contractor	PMU (AIWTDS +GC)and TSSC

Construction Stage	Impact of Aquatic Species and Dolphins	Construction Planning must be carried out so that No-construction (stop the construction activities) in the water part between Mid- March to Mid-June) Construction activities must not be planned on the waterside during the monsoon period.	Construction Scheduling	Contractor	PMU (AIWTDS +GC)and TSSC
Clearing and grubbing for site Preparation (Terminal Site, Base camp, Construction Camp & Labour camp)	Landscape and Aesthetics	Permission of tree(s) removal from non-forest area -Vegetation will be removed from the construction zone before the commencement of civil works. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is avoided or minimized. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from the Environmental Expert of the Consultant. The contractor, under any circumstances, will not cut or damage trees. Trees identified under the project and have received permission of felling from the Forest Dept will only be felled. - Compensatory afforestation must be carried out per the Tree Felling permission provisions.	Verification of number of trees felled; Copy of NOC from forest dept.	Contractor	PMU (AIWTDS +GC)and TSSC
	Loss of topsoil. Loss of natural resources (Earth/soil) in area where the Constrctionca mp is setup	•Top soil (15 cm) would be stripped and kept separately in stockpiles for use in landscaping. • At least 10% of the acquired area for construction purposes must be kept for stockpiling of fertile topsoil •Precautions must be taken while stockpiling. The slope of the stockpile shall not exceed 1:2 (V:H) to retain soil & allow percolation of H₂O and the edges of the pile shall be protected by silt fencing. The piles shall be covered with gunny bags/tarpaulin. The maximum height of the stockpiles shall be kept less than 2 m •Excavated materials would be preferably used for site filling for land reclamation to construct the terminal	Site verification	Contractor	PMU (AIWTDS +GC)and TSSC
Transporting Construction Materials and Haul Road Management	Impacts on air quality and safety	-Contractor will maintain all hauls roads (existing or built for the project), which are used for transporting construction materials, equipment, and machineries as précised. All vehicles delivering fine materials to the site will be covered to avoid spillage of materials or being blown away during the transportation. -Only major roads will be used by the contractor's vehicles or any of his sub-contractor or materials	Complaints from local community Visual observation in Site reports Monitoring of the air quality in the worksite and material storage area	Contractor	PMU (AIWTDS +GC)and TSSC

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		suppliersRoads, which are part of the works, will be kept clear of all dust/mud or other extraneous materials dropped by such vehiclesContractor will arrange for regular water sprinkling for dust suppression of all roads and surfacesThe unloading of materials at construction sites in/close to settlements will be restricted to daytime onlyAll stockpiles will be covered/protected to prevent dust generation			
	Impacts on Water Quality	- Boats/ Vessels carrying construction material must not be overloaded Loading and unloading activities must ensure that spillage does not occur loose and friable material transported by boat must be covered - Construction material must not be stored at the Neamati Site	Site Reports	Contractor	PMU (AIWTDS +GC)and TSSC
	Community Safety due to movement of Constriction Vehicles	- Construction material shall be stored within the construction area to prevent accessibility issue with the community - Schedule transportation of the construction material so that heavy vehicles do not cause inconvenience to the local population and people on site; - Drive vehicles in a considerate manner; - Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic aids - Notify affected area by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.	Site Reports Complaints form Local people on disturbance	Contractor	PMU (AIWTDS +GC)and TSSC
Storage of Construction Material	Potential for waterlogging	-The contractor will ensure that no construction materials like earth, stone, sand, or appendage are disposed of so as not to block the flow of water of any water course and cross drainage channelsThe contactor must not dump any excavated material into the riverThe contractor will take all necessary measures to prevent the blockage of water flowThe stockpiled material must be prevented from erosion and deposition in the drainage channel from sites where these are stocked for construction.	Complaints of water logging	Contractor	PMU (AIWTDS +GC)and TSSC
	Water Pollution from Storage	Run-off from a material stockpile can also contaminate water. To prevent the contamination of the	-Site visit Report	Contractor	PMU (AIWTDS

of Construction Material	construction material, the following measures must be adopted; - The quantum of construction material at the Neamati site must be minimal as possible -The runoff from the construction material storage yard must be channelled through peripheral drains -The peripheral drains must be connected to sedimentation tanks (holding tanks excavated in the ground) of adequate capacity All sedimentation tanks and peripheral drains must be cleaned before the monsoon.	-Number of sedimentation tanks installed Records of surface water quality MonitoringNo visible Sedimentation to nearby drainages, nallahs or waterbodies due to civil works		+GC)and TSSC
Water Pollution from Fuel and Lubricants	- The contractor will ensure that all construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery, and equipment maintenance are in accordance with the provisions stated in (Annexure 19: Environmental Codes of Practice & Other Plans) -Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refuelling areas as per the design provided.	-Number of Oil interceptors installedRecords of surface water quality Monitoring No visible degradation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU (AIWTDS +GC)and TSSC
Pollution of water bodies from domestic activities	-Wastewater from domestic activities such as bathing and washing at the camp site must be treated. -The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering streams, water bodies or the irrigation system The liquid waste from the construction camp must be treated and disposed ofIn the absence of construction camp if the contractor takes a rental accommodation must be channelized to the nearest municipality drain. In the absence of a municipality drain, a septic tank and a soak pit system of adequate capacity must be constructedStagnation of water should not be allowed at any place near the campsite as a precaution against vector-borne disease. Wastewater from the Neamati Worksite An adequate number of toilets must be provided Bio-toilets of adequate capacity must be provided for the workers based on no of users.	-Adequate number of toilets as per no of labours - Records of surface water quality Monitoring; -No visible degradation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU (AIWTDS +GC)and TSSC

	Degradation of water quality due to construction activity	- All equipment will be adequately maintained to prevent potentially hazardous or toxic products from leaking or spilling. This includes hydraulic fluid, diesel, gasoline and other petroleum productsRefer Annexure Dolphin Conservation Plan Select a construction methodology that is least disturbing and appropriate for the in-situ soil condition. Schedule construction works to complete the construction work before the onset of the monsoon. Schedule the construction works during the low water level period – ensure that works are completed during the same period before the onset of monsoon Inspection and maintenance of disturbed areas where mobilisation and barrier installation occur for sediment control measuresWashing of vehicles and equipment must not be carried out in rivers or nearby places.	(i) Construction methodology for waterside construction -Schedule of construction works to ensure completion of the works before monsoon/ develop a Monsoon Management Plan -Records of inspection of the sedimentation chamber -Effectiveness of water management measuresNo visible degradation of water quality	Contractor	PMU (AIWTDS +GC)and TSSC
	Water Pollution from Fuel and Lubricants and hazardous waste	 Avoid/minimise storage of fuels, chemicals, and lubricants near the river/water; ensure no spillage A temporary secured hazardous material handling and waste storage area must be provided at the construction site. As part of a design feature, a permanently secured ('bunded') impermeable surface and dykes capable of carrying 110% volume of materials for accidental spills or leakage must be constructed and maintained. Fuel transfer through decanting is prohibited. The use of a transfer pump with the proper fitting is suggested. The storage area should be covered. Dispose of any wastes generated by construction activities as per the guidance presented in Annexure 19 Environment Codes of Practices & other Plans and Conduct surface quality inspection and monitoring according to the EMP. Contractors will have emergency spill equipment available whenever working near or on the water. 	quality - No of spills reported -Field observation -Water quality monitoring reports	Contractor	PMU (AIWTDS +GC)and TSSC
Construction on the landside	Deterioration of air quality from fugitive sources	Prevent Dust Generation -The soil/earth must be transported by covering the haulage vehicles with tarpaulin or any other good quality material.	Complaints from sensitive receptors. Quarterly environmental monitoring report for	Contractor	PMU (AIWTDS +GC)and TSSC

Use of Plant, Equipment Machinery and Vehicle	Emissions from Construction Vehicles, Equipment and Machineries (Generation of Exhaust Gases) lead to the deterioration of air quality	-Dust suppression measures by water sprinkling on worksites and temporary service and access roads. -All construction workers must be provided with pollution masks to mitigate the effect of dust generation on the health of workers. -Construction Material must be transported in covered dump trucks to the project site. This must not be stockpiled at the project site - Clean wheels and undercarriage of haul trucks before leaving the construction site. - Loading and unloading of construction materials must be made at designated locations with provisions of water sprinkling. -Construction vehicles, machinery & equipment must be regularly serviced and maintained and would have a valid PUC certificate -Don't allow non-project vehicle access in the work area, limit soil disturbance and prevent access by barricading and security personnel. -Traffic detours and diversions must be designed to minimise bottlenecks and ensure smooth traffic. -Air pollution monitoring must be carried out at specified locations as described in the monitoring plan to verify that the contractor follows air pollution norms and that the air quality at the construction site does not exceed the prescribed limits. -The contractor will take every precaution to reduce the level of dust from batching Plant/Cement Storage/, construction sites involving earthwork by a sprinkling of water, encapsulation of dust source and by the erection of screens/barriers. -All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement. -The contractor will provide necessary certificates to confirm that all Plants, equipment, machinery, and vehicle used in construction conform to relevant dust emission control legislation. -No open burning of bitumen or preparation of hot mix is allowed. -No burning of firewood is allowed in the construction camp. The Contractor must make provisions for LPG cylinders.	- Heavy equipment and machinery with air pollution control devices Latest Six-Monthly Compliance Report to ASPCB - Valid Consent to Establish and Consent to Operate Certification that vehicles are compliant with Air Act - Quarterly environment air points of a making the project.	Contractor	PMU (AIWTDS +GC)and TSSC
		Contractor must make provisions for			

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Noise pollution leads to	(Protection) Act, 1986. The contractor will ensure that all vehicles, equipment, and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of PCB. -The Contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the project. Valid PUC must be maintained throughout the construction period Monitoring results will also be submitted to PMU Consultant and PIU as per the monitoring plan. -Contractor will ensure that all vehicles, equipment, and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of CPCB emission standards The Contractor will confirm the following:		Contractor	PMU (AIWTDS
inconvenience for the people	- All plants and equipment used in construction (including third-party plants and equipment) must conform to the MoEF&CC/ CPCB noise standards All vehicles and equipment used in construction will be fitted with exhaust silencers Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked, and if found defective will be replacedThe activities must be carried out during the daytime. Night-time activities may be carried out in an emergency, but all measures mentioned in the mitigation measures for night work must be strictly adhered to Limits for construction equipment used in the project, such as concrete mixers, cranes (moveable), vibrators and saws, must not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986Maintenance of vehicles, equipment and machinery must be regular and up to the satisfaction of the Environmental Expert of the PMU Consultant to keep noise levels at a minimum No noisy construction activities will be permitted around educational institutes/health centres (silence zones) up to 100 m from the	- Complaints from sensitive receptors Use of silencers in noise-producing equipment and sound barriers.		+GC)and TSSC

		sensitive receptors, i.e., schools, health centres and hospitals between 9.00 am to 6.0 pm. -Restriction on Honking at the project site -Traffic management plans prepared during the construction mobilization period must also be implemented during the construction stage. Effective traffic management must be taken care of in sensitive locations, major built-up areas, and along important highway junctions. - Barricading (Temporary noise barrier) around the construction site to minimize the noise level -Monitoring must be carried out at the construction sites as per the monitoring schedule, and results will be submitted to PMC and PMU. -The Environmental expert of PMC will be required to inspect regularly to ensure the compliance of EMP.			
	Vibration from the works.	-No explosives should be used in construction activitiesOnly mechanical equipment must be used to prevent Chances of damage from vibration.	-Site verification	Contractor	PMU (AIWTDS +GC)and TSSC
	Contamination of Soil	-Ensure all equipment, vehicles and other sources of fuels and lubricants will be collected and contained to avoid soil/ groundwater contaminationFuel must be stored in proper bounded and covered areasAll spills and collected petroleum products must be disposed of in accordance with the provisions mentioned in Annexure on Emergency Spill Control Procedure -Maintenance and refuelling of vehicles, machinery and other construction equipment must be carried out on an impervious surface so that spillage of fuels and lubricants does not contaminate the groundThe runoff from the maintenance yard must lead to a peripheral drain and pass through an oil-water Separator		Contractor	PMU (AIWTDS +GC)and TSSC
Safety aspects during the execution of works	Community Health Safety risks in Work Zones	The Contractor must ensure that: -The construction zone is hard Barricaded with MS Barricades of a height of 3.0 mThe construction site must be access controlled, and the workers must be provided valid identification cards to allow entryConstruction material must be stored in the barricaded area. If temporary storage is required (for 1- 2 days) outside the demarcated construction area, the same must be discussed with the community. Hard Barricading with proper signages	-Barricading of the worksites -Traffic management Plan construction works, including number of permanent signages, barricades and flagmen on the worksite -Number of signages placed at the project location.	Contractor	PMU (AIWTDS +GC)and TSSC

	must be put to prevent the entry of commuters in the areas. The permission of the Environmental Officer is essential. -To prevent the dust from the construction area affecting the sensitive receptor/ commuters' green screens may be used over and above the Hard Barricading at the advice of the Environment Officer of the PMC -Refer Annexure for details of safety practices for construction Phase	-Regular reporting of the measures in the Quarterly Report		
Occupational Health Safety: Personal Safety Measures for Labour	The contractor will provide: -Comply with all national, state and local labour laws (refer Table 1A: Social Management Plan -Develop and implement site- specific occupational health and safety (OHS) plan, which will include measures such as (a) excluding the public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OHS Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents -Barricading of all excavation carried out for construction. For deep excavation -shoring and bracing must be provided Movement of equipment and machinery near the deep excavation of soft soil must be prohibited Flagmen must accompany all movement of equipment and vehicle insideAll vehicles and equipment must be fitted with reverse horns, alarms etcProtective clothing as may be appropriate to the risk involved in the activities being undertaken by the labourProtective clothing must be as per the BIS standards -Earplugs for workers exposed to loud noise, and workers working in concrete mixing operations and other high-noise-generating operations -Adequate safety measures for workers during the handling of materials at the site are taken upAll tools, tackle, lifting instruments, and cranes must have valid load certification. The tools and tackle must be regularly inspected by the Environment Officer / OHS officer of the PMUThe contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangways, stairwells,	-Site-specific OHS PlanEquipped first-aid stationsMedical insurance coverage for workersNumber of accidentsSupplies of potable drinking water Clean eating areas where workers are not exposed to hazardous or noxious substances record of H&S orientation trainings - personal protective equipment % of moving equipment outfitted with audible back-up alarms; -permanent sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposalCompliance to core labour laws	Contractor	PMU (AIWTDS +GC)and TSSC

excavations, trenches and safe means of entry and egress. -All precautions must be taken for working at helights. -The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour OC as for the contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour OC as for the ILLO Convention No. OC as for the ILL				
-All precautions must be taken for working at heightsThe contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILD) Convention No. 62 as far as those are applicable to this contractEnsure that qualified first aid is always provided. Equipped first-aid stations must be easily accessible throughout the site Provide medical insurance coverage for workers The Contractor will not employ adhoc work procedures, follow best & contract will not employ adhoc work procedures, follow best & contract will foot ment work-related accidents. Provide qualified & easily accessible first-aid facilities all times at all sites Secure all installations from unauthorised intrusion and accident risks Adequate illumination would be provided as the during work is being carried out -Rest area for workers would be provided with drinking water and protected from the elements of nature - Barrier structures are of sufficient height to prevent waves or overflows from flooding in the enclosed area. Regular inspection must be carried out for the coffer dam to ensure no water fleakage in the construction area During working in River, workers must be made aware of risks of water depth, currents, and dangerous areas of water fleakage in the construction area During working in River, workers must be made aware of risks of water depth, currents, and dengerous areas of water fleakage in the construction area During working in River, workers must be made aware of risks of water fleath be risked of the water, and fishing must be strictly prohibited. A beat must be made aware to respect to the contract of the property marked by provided uding to potent and lifegurards must be made available during the period of dworking platform must be provided uding to position of the water Life-saving equipment and lifegurards must be made available during the period of dworking in water Life-saving equipment and		excavations, trenches and safe		
working at heights. -The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract. -Ensure that qualified first aid is always provided. Equipped first-aid stations must be easily accessible throughout the stricture of the contract. -The Contractor will not employ adhoe work procedures, follow best & acceptable work practices -The Contractor will not employ adhoe work procedures, follow best & acceptable work practices -The contractor will document work-related accidents. Provide qualified & assily accessible first-aid facilities all times at all sites. -Secure all installations from unauthorised intrusion and accident risks. -Adequate illumination would be provided at site during evening and night time till the work is being carried out -Rest area for workers would be provided with drinking water and protected from the elements of an appropriate of the provided with drinking water and protected from the elements of an appropriate provided with drinking water and protected from the elements of an appropriate provided with drinking water and protected from the elements of an appropriate structures are of sufficient height to prevent waves or overflows from flooding in the enclosed area. Regular inspection must be carried out for the coffer dam to ensure no water leakage in the construction area. -During working in River, workers must be made aware of risks of water depth, currents, and dangerous areas of water must be properly marked by fixed or floating barricades and signage of danger. Workers must also be made aware of the protection of the biodiversity of the water, and fishing must be strictly prohibited. A beat must be made aware of the protection of the biodiversity of the water, and fishing must be made aware of the protection of the biodiversity of the water and fishing must be strictly prohibited. A beat must be made aware of the protecti		means of entry and egress.		
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		compliance of the use of PPE with		

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		zero tolerance. These will be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilisation and will be approved by the Safety Officer of PIU.			
	Injuries/fatalitie s to the employees	Accident/Incident Reporting for SHE -The PIU must carry out an awareness campaign for the Do's and Do nots in construction sitesNear misses must be recorded and reported on a regular basis -Fortnightly meetings must be held with employees to make them aware of unsafe acts and practices.	-Record of near misses - Record of fatalities - No of workers' meetings -Labour Law Compliance Report generated through Labour Law Compliance system	Contractor	PMU (AIWTDS +GC)and TSSC
Sanitation, Health & Safety	Unhygienic and unsafe living and working condition.	 Hygiene in the camps would be maintained by providing good sanitation and cleaning facilities. Camp would be well ventilated with adequate provision for illumination, kitchen and safe drinking water. Proper drainage to be maintained around the sites to avoid water logging. Proper sanitation with toilet and bathing facilities would be provided at the sites and labour camps. Wastewater generated from these facilities would be disposed through septic tanks and soak pit Preventive medical care to be provided to workers Segregated solid waste would be disposed of at municipal solid waste disposal location. LPG will be used for cooking in construction camps Provision would be made for day crèche for children First aid facilities, with room, personnel and ambulance would be available at the site. Also, tieup with local hospitals would be done to handle emergency case, if any. Rest area would be provided at the site where workers can rest after lunch Working hours of labourers would not exceed the standard norms as per Factory Act Wastewater from construction site would not be allowed to be accumulated. Septic tanks/soak pits would be provided for its disposal. 	Site Verification	Contractor	PMU (AIWTD S+GC)a nd TSSC

Table 2.2 Social Management Plan

Component	Social Attribute and	Remedial Measure	Monitoring	Institut Respons	
	potential impacts		Indicators	Implemen tation	Supervi sion
Health & Safety	Accident and Incident risk from construction activities and safety of workers Impact on Social life of nearby community	-Local labour would preferably be employed for constructionSite would be barricaded and would have security guardsRegister would be maintained for entry to the construction sites. No unauthorized person would be allowed to enter the siteA board in local language at entrance of site would display name of project, area and hazards associated for public awareness -Rest area for workers would be providedContractors would adopt and maintain safe working practices. SOPs would be prepared and followed for all activities under supervision of site engineer -Complete medical check-up would be done for workers prior to joining and after six months of joining -Emergency telephone nos. of hospitals, ambulance and doctors would be displayed in first aid room. -Working hours of labour should not exceed norms as per state factory law -Maintenance and repair of any local village road used for the project activities should be carried out both before and end of construction by contractor.	-Regular health check-up of the workers -Training on communicable diseases.	Contractor	PMU (AIWTDS+ GC)and TSSC
Labour Influx	- STD, HIV/AIDS to local community Increased demand and competition for local social and health services -Social conflicts between the local community and the construction migrant workersIncreased illicit behaviour and crime against women, which is a real threat for Assam where gender-	-Specifications on employment of local workforce including women should be reflected in the civil works bidding documents and subsequent contracts to ensure that the contractors fulfil these commitments. Locals including women may be screened further for skills, and adequate orientations can be provided to recruit for the work. AIWTDS can prepare a roster of interested workers and their skills -The project contractor needs to prepare a site-specific Labour Influx Management Plan and/or a Workers' Camp Management PlanSecurity personnel will be deployed at the construction sites, and emergency nos. including contact details of local law enforcement officers, project's helpline no., existing	- Awareness training for applicable regulatory regulationsThe Indian Factories Act, 1948 and State Rules,	Contractor	PMU (AIWTDS+ GC)and TSSC

	based violence is rampant -Increase competition for jobs and have an impact on wage distribution	state-run women helpline nos. will be prominently displayed at the site. The contractors will ensure that an Internal Complaints Committee (ICC) for each establishment is set-up to meet their corporate requirement and legal mandate under the Sexual Harassment at the Workplace Act, 2013. Health problems of the workers should be taken care of by providing basic health-care' facilities through health centres temporarily set up for the construction camp. The health centre should have the requisite staff, free medicines and minimum medical facilities to tackle first-aid requirements or minor accidental cases, linkage with nearest higher order hospital to refer patients of major illnesses and critical cases. - Awareness camps on HIV/AIDS for both, construction workers and neighbouring villages must be organised at regular intervals by NGOs empanelled with NACO. -It is expected that among the women workers there will be mothers with infants and small children. The provision of a day care crèche as per the Building and Other Construction Workers (regulation of employment and conditions of service) act, 1996 is the contractor's responsibility. The crèche should be provided with trained women to look after the children. -In case work schedule extents up till night, it should be ensured that women workers are exempted night shifts.			
Gender Based Violence	There might be a possibility of gender-based violence arising from the inflow of migrant workers/ labours.	 Code of Conduct shall be signed by the workers. Integration of GBV into existing strategy, Grievance Redressal Mechanism, safety talks, tool box meeting and regular trainings for the workers. Identification of GBV focal points through community consultations. Trainings shall be arranged for the workers on Occupational Health and Safety. Identification of Hot Spots for GBV within the project including construction sites and labour camps alongside local communities, schools, vocational training centers, liquor shops, migrant laborers' residing in rented accommodations within 	-Regular Training shall be conducted. -IEC material should be displayed at site -Awareness Campaign	Contractor	PMU (AIWTDS+ GC)and TSSC

		the villages. - Both men and women labours shall be made aware about the applicable rules and regulations. - Formation of a committee comprising of representatives from local NGOs/ CBOs, police, academia, advocate, etc. with at least 70% women members. The committee shall meet every quarter in order to address the problems faced by the labours/ locals. Consultation with women's groups should also be held during construction and operation phases to listen to their issues and concerns regarding labour, health and safety etc. as well as			
Community Health and Safety	With the inflow of migrant workers and their interaction with the local population, health issues among the local community might emerge. Health problems like STIs, HIV/AIDS, Hepatitis B&C, Tobacco chewing, Tuberculosis etc. might spread in the area because of this floating population	to solicit their ideas on various community initiatives. Regular medical camps can be conducted amongst the labours and the local population to make them aware about HIV/AIDS and associated factors. Awareness on health issues like HIV/AIDS, Tuberculosis, Hepatitis B & C, Sexually Transmitted Infections, Dengue, Chikungunya, Malaria, Tobacco control, etc., shall be conducted periodically. District AIDS and Prevention Control Unit (DAPCU), District level Agency for the implementation of National Health Mission and Employee's State Insurance Corporation (ESIs) Hospital shall be liasoned for the same. Community based meetings, consultations in camp, distribution of leaf lets, IEC tools (outreach programmes, campaigns, awareness through newspapers, TV's, etc.), posters, banners. Use of mobile phones shall be banned during driving and construction activities.	- Regular health check-up of the workers -Training on communicable diseases	Contractor	PMU (AIWTDS+ GC)and TSSC

2. ENVIRONMENT MONITORING PLAN

Environmental Monitoring Programme is to ensure that the intended environmental protection goals are achieved and result in desired benefits of the project. The same will be included in tender / bid document. The broad objectives of the environment monitoring program are:

- To monitor impacts on the surrounding environment and the effectiveness of mitigation measures during the construction and operation phase.
- To ensure that the environmental control systems, installed are effective.
- Comply to the provisions of relevant environmental regulations.

The parameters to be monitor, frequency of monitoring, number of samples, locations and responsibility of monitoring is given in **Table- 2.1.**

Table 2.1: Summary of Environmental Monitoring Programme : Construction and Operation Phase

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
1.	River Water		monitoring	Odinpics		
1.	Physico- chemical parameters	pH, EC, TDS, Turbidity, Phosphates, Nitrates, Sulphates, Chlorides.	For three seasons in construction phase; Turbidity, DO and salinity will be monitored once every week at 3 locations: near the Berth, channel and records of monitoring will be maintained during construction phase If DO level goes 4.0 mg/l, then its causes will be investigated, and corrective actions will be taken For two seasons in operation	Surface Water Upstream- 2 • Downstream- 2 • Near Project site- 1 Ground water- 2 near the project site	As per AIWTDS directions	Contractor
	Biological Parameters	Light penetration, Chlorophyll, Primary Productivity, Phytoplankton's, Zooplanktons	phase except monsoon For three seasons in construction phase For two seasons in operation phase except monsoon	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor
2.	Sediments					
	Physico- Chemical Parameters	Texture, pH, Sodium, Potassium, Phosphate, Chlorides, Sulphates, Hg, Pb, Fe, Cu, Zn, Cd	For three seasons in construction phase For two seasons in operation phase except monsoon	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
	Biological parameters	Benthic Micro- fauna, Benthic Macro-fauna	For three seasons in construction phase. For two seasons in operation phase except monsoon	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor
3.	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ and NO ₂	 For three seasons in construction phase and one season for operation phase. Twice a week for four consecutive weeks per season. 	Upwind- 2 Downwind- 2 Near Project site- 1	As per AIWTDS directions	Contractor
4.	Noise Quality	Equivalent Noise Level	During peak construction activities	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
5.	Soil Quality	N, P, K and Heavy metals	2 samples premonsoon season and 2 samples postmonsoon in construction phase and one season during operation phase	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
6.	Dolphin study	Assessment and presence of Dolphins, survival etc.	Once per year		As per AIWTDS directions	AIWTDS

^{*}Note: All the Samples to be collected as per standard norms. Parameters and components may vary as per requirement.

3. BUDGET FOR EMP

Tentative Environment budget has been prepared for design, construction and operation phase of the project which includes the cost of environmental structures like septic tank & soak pit, Air Pollution Control System at terminal, environmental monitoring, training, awareness and technical support for establishment, enhancement measures and environmental guidelines. Environmental budget for Neamati terminal with detailed break-up of costs for construction phase is given in **Table-3.1**.

Table 3.1: Summary of Environmental Budget- Construction Stage

S. No.	Particulars	Stages	Costs Covered By
A.	Monitoring Measures		
4	Mater Ovelite Manitories	Pre –Construction	Contractor
1	Water Quality Monitoring	Construction	Contractor
2	Dialogical Manitorina	Pre –Construction	Contractor
2	Biological Monitoring	Construction	Contractor
2	Codimental Physics Chemical	Pre –Construction	Contractor
3	Sediments: Physico Chemical	Construction	Contractor
4	Sadimenta: Biological	Pre –Construction	Contractor
4	Sediments: Biological	Construction	Contractor
E	Ambient Air Quelity	Pre –Construction	Contractor
5	Ambient Air Quality	Construction	Contractor
6	Noise Quality	Pre –Construction	Contractor
6	Noise Quality	Construction	Contractor
7	Soil Quality	Pre –Construction	Contractor
7	Soil Quality	Demobilisation	Contractor
	Groundwater	Pre –Construction	Contractor
		Construction	Contractor
8		Camp/Kitchen During Construction	Contractor
		Decommissioning	Contractor
	Subtotal (A)		
B.	Capacity Building		
1	General environmental awareness; environmental and social sensitivity of the project influence area; Key findings of the EIA; Mitigation measures; EMP; Plans and Protocols Social and cultural values of the area. (1 day)	Training for Selected staff of AIWTDS, supervisor, and contractors, Vessel Operators (at the beginning of Contract)	TSSC
2	Training for Ghat management	Section officers/ Vessel operators/ Masters/ Khalasi , Ghat officers, Ghat Maintenance workers etc.(At Beginning of Construction)	Contractor
3	Community issues; Awareness of transmissible diseases; social and cultural values.	Construction Crew (once every six months)	Contractor
4	EMP; Waste disposal, Cultural values and social sensitivity.	Once every year or as directed by the PIU	Contractor
5	Road/waterway safety; Defensive driving/sailing; Waste disposal;	Drivers; boat/launch crew, (once every year)	Contractor
6	Camp operation; Waste disposal; Natural resource conservation; Housekeeping.	Camp staff (once every quarter)	Contractor

S. No.	Particulars	Stages	Costs Covered By
7	Construction Implementation requirements; handling situations for important flora / fauna especially Dolphin; Physical Cultural resources;	PIU; supervisor Selected crew members and contractors (once every six months)	Contractor
8	Health and safety equipment on board and in terminals	Selected crew members and Vessel operators/ Masters/ Khalasi etc.	Contractor
9	Environment Management tracking System	AIWTDS	Contractor
	Subtotal (B)		
C.	Construction Contractor EMP Implementation		
5.	Water Sprinkling Measures for Dust Suppression	Construction	The cost is integrated as part of the civil work cost
6	Development and Implementation of the Dolphin Management Plan of Contractor	Construction	The cost is integrated as part of the civil work cost
7	Providing, fixing, maintaining, shifting & refixing, barricading of minimum 2.0m height at stipulated active site of the same project site, made with angle iron frame of 50x50x5mm and GI sheet of 0.63mm thick including primer painted initially, painting, lettering & border with reflective paint at the time of every shifting, traffic diversion arrangement, safety guard, suitable lightning arrangement during night, complete in all respect till completion of the project as per technical specification and direction of Engineer-In-charge and same shall be possessed by the contractor after completion of the Project	Construction	The cost is integrated as part of the civil work cost
8	Supplying and fixing of cautionary and or informative signs boards including the cost of posts, fixtures, fixing, foundation, fitting and fixing. Sheeting will be made of encapsulated lens type of retro-reflective type and message / borders will be screen printed complete as per screen specification in IRC SP 55: 2001. To be made available at all time at the work sites as required and directed by the engineer	Construction	The cost is integrated as part of the civil work cost

S. No.	Particulars	Stages	Costs Covered By
9	Supplying and fixing of flashing beacon warning lights including the cost of posts, fixtures, fixing, foundation, fitting and fixing, cost of material , labour, loading, unloading, lead, lift, shifting, transportation etc. and as per specification in IRC SP 55: 2001	Construction	The cost is integrated as part of the civil work cost
10	Provision and maintenance of Bio toilets with 1 male and 1 female units including cost of material , labour, loading, unloading, lead, lift, transportation, shifting etc. And shall be made available at worksite at the direction of the PIU. The facility shall complete with water arrangement, privacy, lighting arrangement. The WC and /urinals should be made of stainless Steel and the partitions should be made of aluminium framework with FRP panels. The bio-digester tank should be approved by Defence Research & Development Organisation (DRDO)or any other competent agency. The whole toilet shall be mounted on MS framework with skids; Overhead water tank shall be made of HDPE with proper arrangement of ball cock and mosquito proof cover. These should also be provided with two dustbin for wet and dry waste. The bio-digester toilets shall be mounted on skids and shall not require any creation of permanent structure so that they can be shifted from one worksite to another	Construction	The cost is integrated as part of the civil work cost
11	Provision of Helmets (IS CODE 2925: 1984), Safety Shoes (IS CODE 5852: 1996), Googles (*IS CODE 5983: 1980), Reflective Jackets, mitten/gloves (IS 2573), safety nose masks to all personnel (including temporary labour) involved in the worksites	Construction	The cost is integrated as part of the civil work cost
12	Provision of First Aid Kits for worksites	Construction	Civil works contract
13	Provision and maintenance of waste collection bins in sets of 2 (blue and green) for collection of municipal solid waste generated at the worksite including cost of material, labour, loading,	Construction	The cost is integrated as part of the civil work cost

S. No.	Particulars	Stages	Costs Covered By
	unloading, lead, lift, shifting, transportation etc.		
14	Environment, Health & Safety Engineer/Supervisor having Bachelors in Env Science / Management/ B. Tech (Env Eng.)	Construction	The Manpower Cost is integrated into the cost of the Civil Works
15	Diploma in Central Labour Institute / Regional Labour Institute (Mandatory)	Construction	The Manpower Cost is integrated into the cost of the Civil Works
	River bank protection through plantation (Erosion management)	Construction	Contractor
	Subtotal (C)		
D	PIU EMP Implementation cost		
1	EMP Supervision Cost	Construction	PIU/AIWTDS Cost
2	Equipment	Construction	PIU /AIWTDSCost

4. BUDGET FOR SMP

The various activities for social management under the subproject which needs to be undertaken by the contractor are given in **Table 4.1**.

Table 4.1: Summary of Social budget (construction phase)

Item of SMP	Duration
Training for contractor staff on labour laws	Actual, before and during the
such as Building and Other Construction	project implementation time
Workers (Regulation of Employment and	
Conditions of Service) Act, 1996;	
The Bonded Labour System (Abolition) Act,	
1976;	
The Workmen's Compensation Act, 1923;	
The Contract Labour (Regulation & Abolition)	
Act, 1970 and Rules;	
The Child Labour (Prohibition and	
Regulation) Act, 1986;	
The Indian Factories Act, 1948 and State	
Rules;	
Public Liability and Insurance Act, 1991;	
The new labour Act like The Code on Social	
Security, 2020 and The Code on Wages,	
2019,	

Item of SMP	Duration
Social safeguards training including training	Actual, before and during the
of staff on GRM.	project implementation time
GBV training (SEA and SH)	
Environmental Health and Safety Officer	Actual, during the project
and Social Development Specialist hired by	implementation
contractor, for on-site supervision	

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING PROGRAMME - APHALAMUKH

1. GENERAL

The Environment and Social Management Plan (ESMP) is required to ensure sustainable development of the proposed terminal on river Brahmaputra both during the construction as well as operational phases. The ESMP is site and time specific. In order to effectively implement ESMP, an institutional framework has been developed and roles and responsibilities of various relevant agencies have been worked out. Capacity development program are also identified and part of the ESMP.

In general, Assam Inland Water Transport Development Society (AIWTDS), (with assistance from Contractor, Third Party Monitoring Consultant /Technical Support & Supervision Consultant) is the responsible entity for ensuring that the mitigation measures as suggested in the ESMP are carried out. A detailed ESMP has been prepared for Aphalamukh terminal. The list provides reference implementing organisation and responsible entity.

COMPONENTS OF EMP

Key components of the EMP are summarized below and explained in detail in the following subsections:

- Mitigation Measures
- Monitoring Measures
- Institutional Arrangement
- Reporting Requirements
- EMP Budget

Site-specific environment and social riverine infrastructure along with the roles and responsibilities of the key persons involved at different phases of the proposed development are described below:

The Environmental and Social Management Plan for Aphalamukh Terminal for construction phase is given in **Table 1.1 and Table 1.2** respectively.

Table 1.1: Environment Management Plan (Construction Phase)

Component	Environmental Attribute and	Remedial Measure	Monitoring	Institut Respons	
	potential impacts		Indicators	Implement ation	Supervi sion
Design				0.00	
Development of the Final Design	The design of the infrastructure must be resilient to the Floods	The design must take into consideration the projected rainfall levels as in the Assam State Action Plan on Climate Change (2015- 2020). The Annual rainfall is likely to increase by 10-25 %, and the extreme rainfall days will increase by 5-38%, with the extreme rainfall increase projected to increase between 25 and 150 mm.	Assessment of Design for Resilience	Contractor	TSSC & PMU (AIWTDS +GC)
	Design of the Riverbank Protection	The design of any reclamation and riverbank protection must be carefully assessed so that the hazards due to Bank failure do not affect the stability of the structure.	Assessment of Design for Resilience	Contractor	TSSC & PMU (AIWTDS +GC)
	Collection and Treatment of Solid and Liquid Waste	The design of bio-digesters at the Terminal must be an adequate size to meet the regular passenger demand. Additional space needs to be made available for setting up additional bio-toilets for the pilgrim / festival. Adequate space must be made available to store municipal solid waste.	Assessment of Capacity of Bio- Digestor Assessment of space for the setting up bio- toilets, Adequate space for storage of Municipal Solid waste	Contractor	TSSC & PMU (AIWTDS +GC)
	Energy Efficiency	Energy-efficient measures in the terminal buildings will be implemented; Solar power will be used in potential area	Use of Energy efficient Fitting and fixtures	Contractor	TSSC & PMU (AIWTDS +GC)
Pre-Construction A	ctivities			1 -	
Field Verification Surveys	Requirement for felling of trees	Permission of tree(s) removal from non-forest area -The GC/ AIWTDS and the Contractor will carry out joint field verification to ascertain whether any tree would be affected and needs to be felled either for the construction activities or for safety purpose. In case any tree must be felledPermissions must be obtained from the Forest Department, Government of Assam. No tree would be felled without permission. At present there is no requirement for felling of trees	Copy of the Permit of the Forest Department, Government of Assam	Contractor	PMU (AIWTDS +GC)and TSSC
Assessment of Impacts due to Changes/Addition	Additional Impacts	Site-specific EMP before the commencement of construction	Approved copy of the C-EMP	Contractor	PMU (AIWTDS +GC)and

	1			1	
s in the Project		 In case of any change in the event of changes/revisions (including addition or deletion) in the project's scope of work or change in the site condition. the impacts of the changes need to be assessed. The Contractor will also prepare site-specific EMP to address these additional impacts. The Site Specific EMP has to be submitted to the PMC for approval. The Construction activities must not start before the approval of site-specific EMP by the PMC. 			TSSC
Setting up of Plant and Machinery(Batching Plants or concrete mixer location)	Potential source of pollution (air quality, water quality, soil)	Location of Batching Plants -Batching plants will be sited sufficiently away from settlements, agricultural operations, or commercial establishments. Compliance with laws, ordinances, codes, rules, regulations, orders, or declarations -Concrete mixers and batching plants will comply with the requirements of the relevant emission control legislations and -Consent/NOC for all such plants obtained from the State Pollution Control Board will be submitted to the PIU. -The Contractor will not initiate plant/s operation till the required legal clearances are obtained and submitted. In case the concrete is procured from a third party, a valid consent of the plant, along with the latest copy of the Annual report, will be submitted to the PIU before the procurement of any material	Consent to Establish and Operate	Contractor	PMU (AIWTDS +GC)and TSSC
Procurement of Other Construction Vehicles, Equipment and Machinery	Potential for air pollution and noise	Statutory Compliance:-All Construction equipment¹ and machinery to be used in the project willconform toBS IV standards to be adopted by the Ministry of Road Transport and Highways. The discharge standards promulgated under the Environment Protection Act, 1986, will be strictly adhered toNoise limits for construction equipment to be procured, such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws, will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986.	Certification by Manufacturer of emission and noise levels/ Pollution under Control Certificates, Insurance and Driving License of the driver to be submitted for all vehicles	Contractor	PMU (AIWTDS +GC)and TSSC

¹Every agricultural tractor, construction equipment vehicle and combine harvester shall be so manufactured that it complies with the following standards of gaseous pollutants as per rule 115A,after sub-rule (8), of the Central Motor Vehicle Rules, 1989.

The Contractor will maintain a record of PUC for all vehicles and machinery used during the contract	
period.	3

Sourcing of construction material	Unsustainable mining practices	-Contractor will finalise the stone quarry /sand mine / borrow area for procurement of construction materials after assessment of the availability of sufficient materials and other logistic arrangements. The Contractor will provide a copy of the Environmental Clearance Certificate of the quarry/sand mine and the Consent to Establish and Operate along with the recent compliance report to the PMU before any such quarry is engagedIn case the contractor decides to use new quarries then the contractor will obtain the environmental clearance and all other permits and licenses and submit the same to the PMU before extracting any material. The contractor will submit a copy of the approval and the rehabilitation plan to the PIU and the Environmental Expert of the PMU ConsultantContractor will also work out haul road network and report to the Environmental Expert of the PMC. They will inspect and in turn report to PMU before approval.	Permission for mining/ quarrying of materials from the Mining Department, District Administration and District Level Environment Appraisal Committee	Contractor	PMU (AIWTDS +GC)and TSSC
Identification of water sources for construction	Adverse impact on water resources	If the contractor will source water requirements for construction form groundwater, prior permission from the Ground Water Board is required. A copy of the permission will be submitted to PIU prior to the initiation of construction. A flow meter must be installed, and the records of water used for construction must I be maintained. The usage of groundwater must be recorded. The contractor can use fresh groundwater sources after the required treatment for drinking. Even if water is sourced from third parties, the above provisions must be followed. -If the river water is used, the permission of the Irrigation department must be obtained	Permission from the Ground Water Board for Groundwater usage Permission of the Irrigation /Water Resources Department in case of River water is used.	Contractor	PMU (AIWTDS +GC)and TSSC
Environmental monitoring of baseline conditions of air, noise, water, and soil	To establish baseline environmental conditions and ascertain the impacts during	Environmental monitoring to be carried out through recognised ² Laboratory as per the locations specified in the environmental monitoring plan in Table2.1	Submission of test results to PMU	Contractor	PMU (AIWTDS +GC)and TSSC

²(National Accreditation Board for Testing and Calibration Laboratories (NABL) Accredited /Ministry of Environment Forest and Climate Change (MoEF&CC) / respective State Pollution Control Board (SPCB's)).

the		
construction		
phase		

EMP Implementation Training	Lack of awareness of EMP can lead to irresponsible behaviour resulting in an Irreversible impact to the environment, workers, and community.	-Project manager and all key workers will be required to undergo EMP implementation, including spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labour laws, applicable environmental laws, etc. Additional modules for Dolphin Protection. - All new personnel joining the work need to undergo induction training. All personnel joining work after a break of more than 15 days need to undergo refresher.	-Certificate of Completion (Safeguards Compliance Orientation) -Posting of EMP at worksitesMaintaining Records of training both induction and refresher -Submission of the Training records to the PIU every month	Contractor	PMU (AIWTDS +GC)and TSSC
	Deployment of EHS Officer and OHS Officer	Deploy qualified personnel and management committee. - Contractor must depute qualified EHS personnel in the start of the project to conduct training to all the personnel and effective monitoring of mitigation measures during construction. The name and functions of the responsible EHS persons and their relevant expertise must be notified in the Quarterly Report -If an EHS person resigns/ replaced/replaced or the team has been enlarged, the same must be reported to the Bank within 15 days of the incident	Submission of records of the availability of the EHS personnel onsite in the Monthly Report and Quarterly Report	Contractor	PMU (AIWTDS +GC)and TSSC
Legal compliance	Environmental legal noncompliance may	-Obtain all consents, clearances (CTE/CTO from ASPCB), permits NOCs etc., before start of construction worksEnsure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (Refer Table 3.1 in this report) -Following consents are required-Tree cutting-local authority -Storage, handling, and transport of hazardous materials-ASPCBSand mining, quarries, borrow areas- Department of mines and GeologyAcknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs etcInclude in detailed design drawings and documents all conditions and provisions; if necessary	Copy of the Permit/ Consent to be submitted with QPR to PMU	Contractor	PMU (AIWTDS +GC)and TSSC
Preparation of Method Statement	Occupational Health Safety and Community Health Safety	Carry out a Hazard Identification and Risk Assessment for all tasks presented in the Method Statement Prepare occupational health and	- Occupational Health and Safety Plan (including HIRA) to be	Contractor	PMU (AIWTDS +GC)and TSSC
	Impacts	safety plan, including COVID-19 H&S	integrated with		
		Plan Prepare Community Health Safety Plan to ensure that the community/ are segregated from the construction area Prepare a Debris/spoils management plan, Waste Management Plan.	Method Statement - Community Health Safety Plan - Debris/spoils management plan, Waste Management Plan		3

	Impact of	Construction Planning must be	Construction	Contractor	PMU
	Aquatic	carried out so that No-construction (Scheduling	Contractor	(AIWTDS
	Species and	stop the construction activities) in			+GC)and
	Dolphins	the water part between Mid- March to			TSSC
		Mid-June)			
		Construction activities must not be			
		planned on the waterside during the			
		monsoon period.			
Construction Stage			T	•	
Clearing and	Landscape and	Permission of tree(s) removal from	Verification of	Contractor	PMU
grubbing for site	Aesthetics	non-forest area	number of trees		(AIWTDS
Preparation		-Vegetation will be removed from the	felled; Copy of		+GC)and
(Terminal Site,		construction zone before the commencement of civil works. All	NOC from forest		TSSC
Base camp,			dept.		
Construction		works will be carried out such that			
Camp & Labour		the damage or disruption to flora other than those identified for cutting			
camp)		is avoided or minimized. Only ground			
		cover/shrubs that impinge directly on			
		the permanent works or necessary			
		temporary works will be removed			
		with prior approval from the			
		Environmental Expert of the			
		Consultant.			
		The contractor, under any			
		circumstances, will not cut or			
		damage trees. Trees identified under			
		the project and have received			
		permission of felling from the Forest			
		Dept will only be felled.			
		- Compensatory afforestation must			
		be carried out per the Tree Felling			
		permission provisions.			
	Loss of topsoil.	•Top soil (15 cm) would be stripped	Site verification	Contractor	PMU
	Loss of	and kept separately in stockpiles for			(AIWTDS
	natural	use in landscaping.			+GC)and
	resources	• At least 10% of the acquired area			TSSC
	(Earth/soil)) in	for construction purposes must be			
	area where the	kept for stockpiling of fertile topsoil Precautions must be taken while			
	Constrctioncam	stockpiling. The slope of the stockpile			
	p is setup	shall not exceed 1:2 (V:H) to retain			
		soil & allow percolation of H ₂ O and			
		the edges of the pile shall be			1
		protected			1
		by silt fencing. The piles shall			1
		be covered with gunny bags/			1
		tarpaulin. The maximum height			
		of the stockpiles shall be kept			1
		less than 2 m			1
		 Excavated materials would be 			1
		preferably used for site filling for land			1
_		reclamation to construct the terminal		<u> </u>	
Transporting	Impacts on air	-Contractor will maintain all hauls	Complaints from	Contractor	PMU
Construction	quality and	roads (existing or built for the	local community		(AIWTDS
Materials and Haul	Safety	project), which are used for	Visual observation		+GC)and

Road Management		transporting construction materials, equipment, and machineries as précised. All vehicles delivering fine materials to the site will be covered to avoid spillage of materials or being blown away during the transportation. Only major roads will be used by the contractor's vehicles or any of his sub-contractor or materials suppliers. -Roads, which are part of the works, will be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. -Contractor will arrange for regular water sprinkling for dust suppression of all roads and surfaces. -The unloading of materials at construction sites in/close to settlements will be restricted to daytime only. -All stockpiles will be covered/protected to prevent dust Generation	in Site reports Monitoring of the air quality in the worksite and material storage area		TSSC
	Impacts on Water Quality	Boats/ Vessels carrying construction material must not be overloaded. Loading and unloading activities must ensure that spillage does not occur. loose and friable material transported by boat must be covered	Site Reports	Contractor	PMU (AIWTDS +GC)and TSSC
Storage of Construction Material	Potential for waterlogging	-The contractor will ensure that no construction materials like earth, stone, sand, or appendage are disposed of so as not to block the flow of water of any water course and cross drainage channels. -The contactor must not dump any excavated material into the river. -The contractor will take all necessary measures to prevent the blockage of water flow. -The stockpiled material must be prevented from erosion and deposition in the drainage channel from sites where these are stocked for construction.	Complaints of water logging	Contractor	PMU (AIWTDS +GC)and TSSC
	Water Pollution from Storage of Construction Material	Run-off from a material stockpile can also contaminate water. To prevent the contamination of the construction material, the following measures must be adopted; -The runoff from the construction material storage yard must be channelled through peripheral drains -The peripheral drains must be connected to sedimentation tanks (holding tanks excavated in the ground) of adequate capacity All sedimentation tanks and peripheral drains must be cleaned before the monsoon.	-Site visit Report -Number of sedimentation tanks installed Records of surface water quality MonitoringNo visible Sedimentation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU (AIWTDS +GC)and TSSC
	Water Pollution	- The contractor will ensure that all	-Number of Oil	Contractor	PMU

from Fuel and Lubricants	construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery, and equipment maintenance are in accordance with the provisions stated in (Annexure 19: Environmental Codes of Practice & Other Plans) -Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refuelling areas as per the design provided.	interceptors installedRecords of surface water quality Monitoring No visible degradation to nearby drainages, nallahs or waterbodies due to civil works		(AIWTDS +GC)and TSSC
Pollution of water bodies from domestic activities	-Wastewater from domestic activities such as bathing and washing at the camp site must be treated. -The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering streams, water bodies or the irrigation system. The liquid waste from the construction camp must be treated and disposed ofIn the absence of construction camp if the contractor takes a rental accommodation must be channelized to the nearest municipality drain. In the absence of a municipality drain, a septic tank and a soak pit system of adequate capacity must be constructed. -Stagnation of water should not be allowed at any place near the campsite as a precaution against vector-borne disease. Wastewater from the Aphalamukh Worksite An adequate number of toilets must be provided Bio-toilets of adequate capacity must be provided for the workers based on no of users. The supernatant from the Biodigestor must be discharged into the soak pits. The Supernatant from the. bio-toilets must be tested at periodic intervals to meet discharge standards Collection of Food waste and kitchen waste from Construction Camp -All waste arising from the project is to be stored and disposed of as per the provisions of Annexure 19-Environment Codes of Practices & other Plans or as directed by EHS Specialist of the PMU In the case of rented	-Adequate number of toilets as per no of labours - Records of surface water quality Monitoring; -No visible degradation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU (AIWTDS +GC)and TSSC

be made with the Municipal corporation for the disposal of the waste. Collection and Disposal of Food Waste from the Aphalamukh Construction Site Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out. Impact on aquatic life and dolphins Impact on aquatic life and dolphins on activities in the water part between Mid- March to Mid-June) Impact on aquatic life and dolphins on activities in the water part between Mid- March to Mid-June) Impact on aquatic life and dolphins on activities in the water part between Mid- March to Mid-June) Impact on aquatic life and dolphins on activities in the water part between Mid- March to Mid-June) Impact on aquatic life and dolphins on activities in the water part between Mid- March to Mid-June) Impact on aquatic life and dolphins on and fish communities that could locally still be present in the area are not unnecessarily damaged Impact on advantage on the provided in the life of aquatic fauna monitoring and disposing of the Solid waste to Dolphin Aquatic Manal Managemen Plan Impact on aquatic life and dolphins of transporting in a life of aquatic fauna monitoring and disposing of the Solid waste to Contractor Dolphin / Aquatic Manal Managemen Plan Impact on aquatic life and dolphins of transporting and disposing of the Solid waste to Contractor Dolphin / Aquatic Manal Managemen Plan Impact on aquatic life and dolphins of the Dolphin / Aquatic Manal Managemen Plan Impact on aquatic life and dolphins of the Dolphin / Aquatic Manal Managemen Plan Impact on aquatic life and dolphins of the Dolphin / Aqu	-			T	•	,
the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out. Impact on aquatic life and dolphins Impact on aquatic life and carried out so that No-construction Period (stop the construction Period out so that No-construction Period (stop the construction Period (stop the construction Period out so that No-construction Period out so that No-construction Period (stop the construction Period out so that No-construction Period out Sole Manal Management Poliphin / Aquatic Manal Management			corporation for the disposal of the waste. Collection and Disposal of Food Waste from the Aphalamukh Construction Site			
Impact on aquatic life and dolphins -Construction Planning must be carried out so that No-construction Period (stop the construction activities in the water part between Mid- March to Mid-June) -The river area in which the piling is planned advisable to carefully determine drop sites before anchor placement to ensure that Dolphin and fish communities that could locally still be present in the area are not unnecessarily damaged -Before piling starts, Dolphin Watch must be carried out in the river for one hour. Piling must commence if dolphins are not spotted Before starting piling, allow some time for aquatic fauna to displace -Contractor PMU (AIWTDS Hanal Management Plan 2. Logs for recording watch and ward for dolphins / turtles during the piling 3. Log for aquatic fauna monitoring			the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to			
rrom the piling area. -Piling must be stopped for some time if any dolphin/turtle/RET species are sighted in the activity area -Noise-reducing devices like mufflers ,enclosures baffles must be fitted with the equipment as much as feasible. -Fish exclusion devices must be installed in the water column around the pile driving area to prevent fish access -Geo Textile synthetic sheet curtains &turbidity traps must be placed around construction areas to prevent the movement of sediments and construction waste -Aquatic ecology monitoring must be carried out before the start of construction and after completion of construction and after completion of construction activities on aquatic life. -If, despite the introduction of preventive measures, fish kills or impact on aquatic life is observed, then the work will stop immediately, and the methods will be reviewed and corrected. -If drilling is carried out Polymer-based mud instead of bentonite to be used as drilling fluid with proper		aquatic life and	-Construction Planning must be carried out so that No-construction Period (stop the construction activities in the water part between Mid- March to Mid-June) -The river area in which the piling is planned advisable to carefully determine drop sites before anchor placement to ensure that Dolphin and fish communities that could locally still be present in the area are not unnecessarily damaged -Before piling starts, Dolphin Watch must be carried out in the river for one hour. Piling must commence if dolphins are not spotted Before starting piling, allow some time for aquatic fauna to displace from the piling areaPiling must be stopped for some time if any dolphin/turtle/RET species are sighted in the activity areaNoise-reducing devices like mufflers ,enclosures baffles must be fitted with the equipment as much as feasibleFish exclusion devices must be installed in the water column around the pile driving area to prevent fish access -Geo Textile synthetic sheet curtains &turbidity traps must be placed around construction areas to prevent the movement of sediments and construction waste -Aquatic ecology monitoring must be carried out before the start of construction and after completion of construction activities on aquatic lifeIf, despite the introduction of preventive measures, fish kills or impact on aquatic life is observed, then the work will stop immediately, and the methods will be reviewed and correctedIf drilling is carried out Polymer-based mud instead of bentonite to be	Dolphin / Aquatic Manal Management Plan 2. Logs for recording watch and ward for dolphins / turtles during the piling 3. Log for aquatic	Contractor	(AIWTDS +GC)and

Degradation of Water Quality due to land reclamation	storage of polymer at designated storage areas. Drill cutting and spent drilling mud must not be disposed in the river - All equipment will be adequately maintained to prevent potentially hazardous or toxic products from leaking or spilling. This includes hydraulic fluid, diesel, gasoline and other petroleum products. -The piling activities must be carried out in the shortest possible timeframe. -Select a construction methodology that is least disturbing and appropriate for the in-situ soil condition. - The reclamation work in the river must be undertaken during the low flow period -Schedule construction works to complete the construction work before the onset of the monsoon. -Turbidity traps/curtains/ Geo-Textile synthetic sheet curtains would be placed around the piling and construction area to prevent the movement of sediments and construction waste.	-Regular monitoring of site - Water quality tests	Contractor	PMU (AIWTDS +GC)and TSSC
Degradation of water quality due to construction activity	Select a construction methodology that is least disturbing and appropriate for the in-situ soil condition. Schedule construction works to complete the construction work before the onset of the monsoon. Schedule the construction works during the low water level period – ensure that works are completed during the same period before the onset of monsoon. Inspection and maintenance of disturbed areas where mobilisation and barrier installation occur for sediment control measures. -Washing of vehicles and equipment must not be carried out in rivers or nearby places.	(i) Construction methodology for waterside construction -Schedule of construction works to ensure completion of the works before monsoon/ develop a Monsoon Management Plan -Records of inspection of the sedimentation chamber -Effectiveness of water management measuresNo visible degradation of water quality	Contractor	PMU (AIWTDS +GC)and TSSC
Water Pollution from Fuel and Lubricants and hazardous waste	- Avoid/minimise storage of fuels, chemicals, and lubricants near the river/water; ensure no spillage - A temporary secured hazardous material handling and waste storage area must be provided at the construction site. As part of a design feature, a permanently secured ('bunded') impermeable surface and dykes capable of carrying 110% volume of materials for accidental spills or leakage must be constructed and maintained.	- No of spills reported -Field observation -Water quality monitoring reports	Contractor	PMU (AIWTDS +GC)and TSSC

		Fuel transfer through decanting is prohibited. The use of a transfer pump with the proper fitting is suggested. -The storage area should be covered. - Dispose of any wastes generated by construction activities as per the guidance presented in Annexure 19 Environment Codes of Practices & other Plans and - Conduct surface quality inspection and monitoring according to the EMP. - Contractors will have emergency spill equipment available whenever working near or on the water.			
Construction on the landside	Deterioration of air quality from fugitive sources	Prevent Dust Generation -The soil/earth must be transported by covering the haulage vehicles with tarpaulin or any other good quality material. -Dust suppression measures by water sprinkling on worksites and temporary service and access roads. -All construction workers must be provided with pollution masks to mitigate the effect of dust generation on the health of workers. -Construction Material must be transported in covered dump trucks to the project site. This must not be stockpiled at the project site - Clean wheels and undercarriage of haul trucks before leaving the construction site. - Loading and unloading of construction materials must be made at designated locations with provisions of water sprinkling. -Construction vehicles, machinery & equipment must be regularly serviced and maintained and would have a valid PUC certificate -Don't allow non-project vehicle access in the work area, limit soil disturbance and prevent access by barricading and security personnel. -Traffic detours and diversions must be designed to minimise bottlenecks and ensure smooth traffic. -Air pollution monitoring must be carried out at specified locations as described in the monitoring plan to verify that the contractor follows air pollution norms and that the air quality at the construction site does not exceed the prescribed limits.	- Complaints from sensitive receptors Quarterly environmental monitoring report for ambient air, noise, water, and soil	Contractor	PMU (AIWTDS +GC)and TSSC
Use of Plant, Equipment Machinery and Vehicle	Emissions from Construction Vehicles, Equipment and Machineries	-The contractor will take every precaution to reduce the level of dust from batching Plant/Cement Storage/, construction sites involving earthwork by a sprinkling of water,	- Heavy equipment and machinery with air pollution control devices. - Latest Six-Monthly	Contractor	PMU (AIWTDS +GC)and TSSC

(Generation of Exhaust Gases) lead to the deterioration of air quality	encapsulation of dust source and by the erection of screens/barriers. -All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement. -The contractor will provide necessary certificates to confirm that all Plants, equipment, machinery, and vehicle used in construction conform to relevant dust emission control legislation. -No open burning of bitumen or preparation of hot mix is allowed. -No burning of firewood is allowed in the construction camp. The Contractor must make provisions for LPG cylinders. -Compliance with laws, ordinances, codes, rules, regulations, orders, or declarations -All vehicles, plants and machinery used during construction must conform to the emission standards promulgated under the Environment (Protection) Act, 1986. The contractor will ensure that all vehicles, equipment, and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of PCB. -The Contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the project. Valid PUC must be maintained throughout the construction period Monitoring results will also be submitted to PMU Consultant and PIU as per the monitoring plan. -Contractor will ensure that all vehicles, equipment, and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of CPCB emission standards	Compliance Report to ASPCB - Valid Consent to Establish and Consent to Operate Certification that vehicles are compliant with Air Act - Quarterly environmental monitoring report for ambient air, noise, water and soil		
Noise pollution leads to inconvenience for the people	The Contractor will confirm the following: - All plants and equipment used in construction (including third-party plants and equipment) must conform to the MoEF&CC/ CPCB noise standards. - All vehicles and equipment used in construction will be fitted with exhaust silencers. - Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked, and if found defective will be replaced.	- Complaints from sensitive receptors Use of silencers in noise-producing equipment and sound barriers.	Contractor	PMU (AIWTDS +GC)and TSSC

Vibration from the works.	minimum. - No noisy construction activities will be permitted around educational institutes/health centres (silence zones) up to 100 m from the sensitive receptors, i.e., schools, health centres and hospitals between 9.00 am to 6.0 pm. -Restriction on Honking at the project site -Traffic management plans prepared during the construction mobilization period must also be implemented during the construction stage. Effective traffic management must be taken care of in sensitive locations, major built-up areas, and along important highway junctions. - Barricading (Temporary noise barrier) around the construction site to minimize the noise level -Monitoring must be carried out at the construction sites as per the monitoring schedule, and results will be submitted to PMC and PMU. -The Environmental expert of PMC will be required to inspect regularly to ensure the compliance of EMP. No explosives should be used in construction activities. -Only mechanical equipment must be used to prevent Chances of damage from vibration. -If a mechanical vibrator/ pneumatic hammer is used within 100 m of the archaeological property, advice must	-Complaints from sensitive receptors, Archaeology deptSite verification -Availability of trained man-power (archaeologist) at	Contractor	PMU (AIWTDS +GC)and TSSC
	during the daytime. Night-time activities may be carried out in an emergency, but all measures mentioned in the mitigation measures for night work must be strictly adhered to. - Limits for construction equipment used in the project, such as concrete mixers, cranes (moveable), vibrators and saws, must not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. -Maintenance of vehicles, equipment and machinery must be regular and up to the satisfaction of the Environmental Expert of the PMU Consultant to keep noise levels at a minimum. - No noisy construction activities will			

	Contamination of Soil	Ensure all equipment, vehicles and other sources of fuels and lubricants will be collected and contained to avoid soil/ groundwater contamination. -Fuel must be stored in proper bounded and covered areas. -All spills and collected petroleum products must be disposed of in accordance with the provisions mentioned in Annexure on Oil & Waste Storage -Maintenance and refuelling of vehicles, machinery and other construction equipment must be carried out on an impervious surface so that spillage of fuels and lubricants does not contaminate the ground. -The runoff from the maintenance yard must lead to a peripheral drain and pass through an oil-water Separator		Contractor	PMU (AIWTDS +GC)and TSSC
Safety aspects during the execution of works	Community Health Safety risks in Work Zones	The Contractor must ensure that: -The construction zone is hard Barricaded with MS Barricades of a height of 3.0 mThe construction site must be access controlled, and the workers must be provided valid identification cards to allow entryConstruction material must be stored in the barricaded area. If temporary storage is required (for 1-2 days) outside the demarcated construction area, the same must be discussed with the community. Hard Barricading with proper signages must be put to prevent the entry of commuters in the areas. The permission of the Environmental Officer is essentialTo prevent the dust from the construction area affecting the sensitive receptor/ commuters' green screens may be used over and above the Hard Barricading at the advice of the Environment Officer of the PMC	-Barricading of the worksites -Traffic management Plan construction works, including number of permanent signages, barricades and flagmen on the worksite -Number of signages placed at the project locationRegular reporting of the measures in the Quarterly Report	Contractor	PMU (AIWTDS +GC)and TSSC
	Occupational Health Safety: Personal Safety Measures for Labour	The contractor will provide: -Comply with all national, state and local labour laws (refer Table 1A : Social Management Plan -Develop and implement site-specific occupational health and safety (OHS) plan, which will include measures such as (a) excluding the public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OHS Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related	-Site-specific OHS PlanEquipped first-aid stationsMedical insurance coverage for workersNumber of accidentsSupplies of potable drinking water Clean eating areas where workers are not exposed to hazardous or	Contractor	PMU (AIWTDS +GC)and TSSC

accidents	noxious substances.	
-Barricading of all excavation carried	- record of H&S	
out for construction. For deep	orientation trainings	
excavation -shoring and bracing must	- personal protective	
be provided	equipment.	
Movement of equipment and	- % of moving	
machinery near the deep excavation	equipment outfitted	
of soft soil must be prohibited.	with audible back-up	
- Flagmen must accompany all	alarms;	
movement of equipment and vehicle	-permanent sign	
inside.	boards for	
-All vehicles and equipment must be	hazardous areas	
fitted with reverse horns, alarms etc.	such as energized	
-Protective clothing as may be	electrical devices	
appropriate to the risk involved in the	and lines, service	
activities being undertaken by the	rooms housing high	
labour.	voltage equipment,	
-Protective clothing must be as per	and areas for	
the BIS standards	storage and	
-Earplugs for workers exposed to	disposal.	
loud noise, and workers working in	-Compliance to core	
concrete mixing operations, piling	labour laws	
and other high-noise-generating		
operations		
-Adequate safety measures for		
workers during the handling of		
materials at the site are taken up.		
-All tools, tackle, lifting instruments,		
and cranes must have valid load		
certification. The tools and tackle		
must be regularly inspected by the		
Environment Officer / OHS officer of		
the PMU.		
-The contractor will comply with all		
regulations regarding safe		
scaffolding, ladders, working		
platforms, gangways, stairwells,		
excavations, trenches and safe		
means of entry and egress.		
-All precautions must be taken for		
working at heights.		
-The contractor will comply with all		
the precautions as required for		
ensuring the safety of the workmen		
as per the International Labour		
Organization (ILO) Convention No.		
62 as far as those are applicable to		
this contract.		
-Ensure that qualified first aid is		
always provided. Equipped first-aid		
stations must be easily accessible		
throughout the site.		
- Provide medical insurance		
coverage for workers.		
-The Contractor will not employ ad-		
hoc work procedures, follow best &		
acceptable work practices		
-The contractor will document work-		
related accidents. Provide qualified &		
easily accessible first-aid facilities all		
times at all sites.		
-Secure all installations from		
unauthorised intrusion and accident		
risks.		

				1	1
		-Adequate illumination would be provided at site during evening and night time till the work is being carried out -Rest area for workers would be provided with drinking water and protected from the elements of nature - Barrier structures are of sufficient height to prevent waves or overflows from flooding in the enclosed area. Regular inspection must be carried out for the coffer dam to ensure no water leakage in the construction areaDuring working in River, workers must be made aware of risks of water depth, currents, and dangerous areas of water must be properly marked by fixed or floating barricades and signage of danger. Workers must also be made aware of the protection of the biodiversity of the water, and fishing must be strictly prohibited. A boat must be made available at the site to transport labour and materials and be well-maintained for emergencies. Workers must not be allowed to dip or bathe in rivers. A suitable working platform must be provided during construction works in waterLife-saving equipment and lifeguards must be made available during the period of working in waterThe Contractor will mark 'hard hat' and 'no smoking' and other 'high-risk areas and enforce non-compliance of the use of PPE with zero tolerance. These will be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilisation and will be approved by the Safety Officer of PIU.			
	Injuries/fatalitie s to the employees	Accident/Incident Reporting for SHE -The PIU must carry out an awareness campaign for the Do's and Do nots in construction sitesNear misses must be recorded and reported on a regular basis - Fortnightly meetings must be held with employees to make them aware of unsafe acts and practices.	-Record of near misses - Record of fatalities - No of workers' meetings -Labour Law Compliance Report generated through Labour Law Compliance system	Contractor	PMU (AIWTDS +GC)and TSSC
Sanitation, Health & Safety	Unhygienic and unsafe living and working condition.	 Hygiene in the camps would be maintained by providing good sanitation and cleaning facilities. Camp would be well ventilated with adequate provision for illumination, kitchen and safe drinking water. Proper drainage to be maintained around the sites to avoid water logging. Proper sanitation with toilet and 	Site Verification	Contractor	PMU (AIWTD S+GC)a nd TSSC

	Latter 1-200 - 11 Lat
	bathing facilities would be
	provided at the sites and labour
	camps. Wastewater generated
	from these facilities would be
	disposed through septic tanks and
	soak pit
	Preventive medical care to be
	provided to workers
	Segregated solid waste would be
	disposed of at municipal solid
	waste disposal location.
	LPG will be used for cooking in
	construction camps
	Provision would be made for day
	crèche for children
	First aid facilities, with room,
	personnel and ambulance would
	be available at the site. Also, tie-
	up with local hospitals would be
	done to handle emergency case,
	if any.
	Rest area would be provided at
	the site where workers can rest
	after lunch
	Working hours of labourers would
	not exceed the standard norms as
	per Factory Act
	Wastewater from construction site
	would not be allowed to be
	accumulated. Septic tanks/soak
	pits would be provided for its
	disposal.
L	

Table 1.2 Social Management Plan

Component	Social Attribute and	Remedial Measure	Monitoring Indicators	Institut Respons	
	potential impacts		mulcators	Implemen tation	Supervi sion
Health & Safety	Accident and Incident risk from construction activities and safety of workers Impact on Social life of nearby community	-Local labour would preferably be employed for constructionSite would be barricaded and would have security guardsRegister would be maintained for entry to the construction sites. No unauthorized person would be allowed to enter the siteA board in local language at entrance of site would display name of project, area and hazards associated for public awareness -Rest area for workers would be providedContractors would adopt and maintain safe working practices.	-Regular health check-up of the workers -Training on communicable diseases.	Contractor	PMU (AIWTDS+ GC)and TSSC

	would room.	gency telephone nos. of als, ambulance and doctors be displayed in first aid			
Labour Influx -	not ex factory -Maint local project carried of con	enance and repair of any village road used for the tactivities should be dout both before and end struction by contractor.	- Awareness training	Contractor	PMI I
HIV// local comr Incre dema comp local healt -Soci betw local comr the cons migra work -Incre beha crime wome is a for wher base is rar -Incre comp jobs an i wage	AIDS to should works subse that to commodification for social and his services and conflicts een the munity and truction ant ers. eased illicitivour and exagainst en, which real threat Assam e genderd violence mpant ease betition for and have defined and have defined to button staff, minim tackle	laints Committee (ICC) for establishment is set-up to their corporate requirement egal mandate under the I Harassment at the blace Act, 2013. In problems of the workers of the taken care of by ing basic health-care esthrough health centres rarily set up for the uction camp. The health should have the requisite	- Awareness training for applicable regulatory regulationsThe Indian Factories Act, 1948 and State Rules,	Contractor	PMU (AIWTDS+ GC)and TSSC

		with nearest higher order hospital to refer patients of major illnesses and critical cases. - Awareness camps on HIV/AIDS for both, construction workers and neighbouring villages must be organised at regular intervals by NGOs empanelled with NACO. -It is expected that among the women workers there will be mothers with infants and small children. The provision of a day care crèche as per the Building and Other Construction Workers (regulation of employment and conditions of service) act, 1996 is the contractor's responsibility. The crèche should be provided with trained women to look after the children. -In case work schedule extents up till night, it should be ensured that women workers are exempted night shifts.			
Gender Based Violence	There might be a possibility of gender-based violence arising from the inflow of migrant workers/ labours.	 Code of Conduct shall be signed by the workers. Integration of GBV into existing strategy, Grievance Redressal Mechanism, safety talks, tool box meeting and regular trainings for the workers. Identification of GBV focal points through community consultations. Trainings shall be arranged for the workers on Occupational Health and Safety. Identification of Hot Spots for GBV within the project including construction sites and labour camps alongside local communities, schools, vocational training centers, liquor shops, migrant laborers' residing in rented accommodations within the villages. Both men and women labours shall be made aware about the applicable rules and regulations. Formation of a committee comprising of representatives from local NGOs/ CBOs, police, academia, advocate, etc. with at least 70% women members. The committee shall meet every quarter in order to address the problems faced by the labours/ locals. Consultation with women's groups should also be held during construction and operation phases to listen to their issues 	-Regular Training shall be conductedIEC material should be displayed at site -Awareness Campaign	Contractor	PMU (AIWTDS+ GC)and TSSC

	and concerns regarding labour, health and safety etc. as well as to solicit their ideas on various community initiatives.			
With the inflow of migrant workers and their interaction with the local population, health issues among the local community might emerge. Health problems like STIs, HIV/AIDS, Hepatitis B&C, Tobacco chewing, Tuberculosis etc. might spread in the area because of this floating population	- Regular medical camps can be conducted amongst the labours and the local population to make them aware about HIV/AIDS and associated factors Awareness on health issues like HIV/AIDS, Tuberculosis, Hepatitis B & C, Sexually Transmitted Infections, Dengue, Chikungunya, Malaria, Tobacco control, etc., shall be conducted periodically District AIDS and Prevention Control Unit (DAPCU), District level Agency for the implementation of National Health Mission and Employee's State Insurance Corporation (ESIs) Hospital shall be liasoned for the same Community based meetings, consultations in camp, distribution of leaf lets, IEC tools (outreach programmes, campaigns, awareness through newspapers, TV's, etc.), posters, banners. Use of mobile phones shall be banned during driving and construction activities.	- Regular health check-up of the workers -Training on communicable diseases	Contractor	PMU (AIWTDS+ GC)and TSSC

2. ENVIRONMENT MONITORING PLAN

Environmental Monitoring Programme is to ensure that the intended environmental protection goals are achieved and result in desired benefits of the project. The same will be included in tender / bid document. The broad objectives of the environment monitoring program are:

- To monitor impacts on the surrounding environment and the effectiveness of mitigation measures during the construction and operation phase.
- To ensure that the environmental control systems, installed are effective.
- Comply to the provisions of relevant environmental regulations

The parameters to be monitor, frequency of monitoring, number of samples, locations and responsibility of monitoring is given in **Table- 2.1**

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
1.	River Water	,				
	Physico- chemical parameters	pH, EC, TDS, Turbidity, Phosphates, Nitrates, Sulphates, Chlorides.	For three seasons in construction phase; Turbidity, DO and salinity will be	Surface Water Upstream- 2 • Downstream- 2 • Near Project site- 1	As per AIWTDS directions	Contractor

S.	Aspects	Parameters to	Frequency	No. of Samples	Location	Responsibility
No.	7.00000	be monitored	of			ooponoisiity
			monitoring			
			monitored	Ground water-2		
			once every	near the project		
			week at 3	site		
			locations:			
			near the			
			Berth,			
			channel and records of			
			monitoring			
			will be			
			maintained			
			during			
			construction			
			phase If DO			
			level goes			
			4.0 mg/l, then			
			its causes will			
			be			
			investigated, and			
			corrective			
			actions will			
			be taken			
			For two			
			seasons in			
			operation			
			phase except			
	Dielegiaal	Light	monsoon	I In atra are 0	Λ	Contractor
	Biological	Light	For three	Upstream- 2 Downstream- 2	As per AIWTDS	Contractor
	parameters	penetration, Chlorophyll,	seasons in construction	Near Project site-	directions	
		Primary	phase	1	unections	
		Productivity,	For two	•		
		Phytoplankton's,	seasons in			
		Zooplanktons	operation			
			phase except			
			monsoon			
2.	Sediments	l = '	· -		T .	
	Physico-	Texture, pH,	For three	Upstream- 2	As per	Contractor
	chemical	Sodium,	seasons in	Downstream- 2	AIWTDS	
	parameters	Potassium,	construction phase	Near Project site-	directions	
		Phosphate,	μιαδε	1		

	Chlorides, Sulphates, Hg, Pb, Fe, Cu, Zn, Cd	For two seasons in operation phase except monsoon			
Biological parameters	Benthic Micro- fauna, Benthic Macro-fauna	For three seasons in construction phase. For two	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
			seasons in operation phase except monsoon			
3.	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ and NO ₂	 For three seasons in constructi on phase and one season for operation phase. Twice a week for four consecutive weeks per season. 	Upwind- 2 Downwind- 2 Near Project site- 1	As per AIWTDS directions	Contractor
4.	Noise Quality	Equivalent Noise Level	During peak construction activities	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
5.	Soil Quality	N, P, K and Heavy metals	2 samples pre-monsoon season and 2 samples post-monsoon in construction phase and one season during operation phase	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
6.	Dolphin study	Assessment and presence of Dolphins, survival etc.	Once per year		As per AIWTDS directions	AIWTDS

*Note: All the Samples to be collected as per standard norms. Parameters and components may vary as per requirement.

3. BUDGET FOR EMP

Tentative Environment budget has been prepared for design, construction and operation24

phase of the project which includes the cost of environmental structures like septic tank & soak pit, Air Pollution Control System at terminals, monitoring, enhancement measures, training and awareness and technical support for establishment, enhancement measures and environmental guidelines. Environmental budget for Aphalamukh terminal is detailed break-up of costs is given in **Table- 3.1**

Table 3.1 Summary of Environmental Budget- Construction Stage

S.No.	Particulars	Stages	Costs Covered By
Α.			
Λ.		Pre -Construction	Contractor
1	Water Quality Monitoring	Construction	Contractor
		Pre -Construction	Contractor
2	Biological Monitoring	Construction	Contractor
		Pre -Construction	Contractor
3	Sediments: Physico Chemical	Construction	Contractor
		Pre -Construction	Contractor
4	Sediments: Biological	Construction	Contractor
		Pre -Construction	Contractor
5	Ambient Air Quality	Construction	Contractor
		Pre -Construction	Contractor
6	Noise Quality	Construction	Contractor
	0.11.0	Pre -Construction	Contractor
7	Soil Quality	Demobilisation	Contractor
		Pre -Construction	Contractor
		Construction	Contractor
8	Groundwater	Camp/Kitchen During Construction	Contractor
		Decomissioning	Contractor
	Subtotal (A)		
B.			•
1	General environmental awareness; environmental and social sensitivity of the project influence area; Key findings of the EIA; Mitigation measures; EMP; Plans and Protocols Social and cultural values of the area. (1 day)	Training for Selected staff of AIWTDS, supervisor, and contractors, Vessel Operators (at the beginning of Contract)	TSSC
2	Training for Ghat management'	Section officers/ Vessel operators/ Masters/ Khalasi , Ghat officers, Ghat Maintenance workers etc.(At Beginning of Construction)	Contractor
3	Community issues; Awareness of transmissible diseases; social and cultural values.	Construction Crew (once every six months)	Contractor
4	EMP; Waste disposal, Cultural values and social sensitivity.	Once every year or as directed by the PIU	Contractor
5	Road/waterway safety; Defensive driving/sailing; Waste disposal;	Drivers; boat/launch crew, (once every year)	Contractor 25

	T		
6	Camp operation; Waste disposal; Natural resource conservation; Housekeeping.	Camp staff (once every quarter)	Contractor
7	Construction Implementation requirements; handling situations for important flora / fauna especially Dolphin; Physical Cultural resources;	PIU; supervisor Selected crew members and contractors (once every six months)	Contractor
8	Health and safety equipment on board and in terminals	Selected crew members and Vessel operators/ Masters/ Khalasi etc.	Contractor
9	Environment Management tracking System	AIWTDS	Contractor
	Subtotal (B)		
C.	Construction Contractor EMP Implemenation		
5.	Water Sprinkling Measures for Dust Supression	Construction	The cost is integrated as part of the civil work cost
6	Development and Implementation of the Dolphim Management Plan of Contractor	Construction	The cost is integrated as part of the civil work cost
7	Providing, fixing, maintaining, shifting & refixing, barricading of minimum 2.0 mtr height at stipulated active site of the same project site, made with angle iron frame of 50x50x5mm and GI sheet of 0.63mm thick including primer painted initially, painting, lettering & border with reflective paint at the time of every shifing, traffic diversion arrangement, safety guard, suitable lightning arrangement during night, complete in all respect till completion of the project as per technical specification and direction of Engineer-Incharge and same shall be possessed by the contractor after completion of the Project	Construction	The cost is integrated as part of the civil work cost
8	Supplying and fixing of cautionary and or informationary signssign boards including the cost of posts, fixtures, fixing, foundation, fitting and fixing. Sheeting will be made of encapsulated lens type of retro-reflective type and message / borders will be screen printed complete as per screen specification in IRC SP 55: 2001. To be made available at all time at the work sites as required and directed by the engineer	Construction	The cost is integrated as part of the civil work cost
9	Supplying and fixing of flashing beacon warning lights including the cost of posts, fixtures, fixing, foundation, fitting and fixing, cost of material, labour, loading, unloading, lead, lift, shifting, transportation etc. and as per specification in IRC SP 55: 2001	Construction	The cost is integrated as part of the civil work cost
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10	Provision and maintenance of Bio toilets with 1 male and 1 female units including cost of material, labour, loading, unloading, lead, lift, transportation, shifting etc. And shall be made available at worksite at the direction of the PIU. The facility shall complete with water arrangement, privacy, lighting arrangement. The WC and /urinals should be made of stainless Steel and the partitions should be made of aluminium framework with FRP panels. The bio-digester tank should be approved by Defence Research & Development Organisation (DRDO) or any other competent agency. The whole toilet shall be mounted on MS framework with skids; Overhead water tank shall be made of HDPE with proper arrangement of ball cock and mosquito proof cover. These should also be provided with two dustbin for wet and dry waste. The bio-digester toilets shall be mounted on skids and shall not require any creation of permanent structure so that they can be shifted from one worksite to another	Construction	The cost is integrated as part of the civil work cost
11	Provision of Helmets (IS CODE 2925 : 1984) , Safety Shoes (IS CODE 5852 : 1996), Googles (*IS CODE 5983 : 1980), Reflective Jackets, mitten/ gloves (IS 2573) , safety nose masks to all personnel (including temporary labour) involved in the worksites	Construction	The cost is integrated as part of the civil work cost
12	Provision of First Aid Kits for worksites	Construction	Civil works contract
13	Provision and maintenance of waste collection bins in sets of 2 (blue and green) for collection of municipal solid waste generated at the worksite including cost of material, labour, loading, unloading, lead, lift, shifting, transportation etc.	Construction	The cost are integrated as part of the civil work cost
14	Environment, Health & Safety Engineer/Supervisor having Bachelors in Env Science / Management/ B.Tech (Env Engg.)	Construction	The Manpower Cost is integrated into the cost of the Civil Works
15	Diploma in Central Labour Institute / Regional Labour Institute (Mandatory)	Construction	The Manpower Cost is integrated into the cost of the Civil Works
	River bank protection through plantation (Erosion management)		Contractor

4. BUDGET FOR SMP

The various activities for social management under the subproject to be undertaken by the contractor are given in **Table 4.1.**

Table 4.1: Summary of Social Budget (construction phase)

Item of SMP	Duration
Training for contractor staff on labour laws	Actual, before and during the
such as Building and Other Construction	project implementation time
Workers (Regulation of Employment and	
Conditions of Service) Act, 1996;	
The Bonded Labour System (Abolition) Act,	
1976;	
The Workmen's Compensation Act, 1923;	
The Contract Labour (Regulation & Abolition)	

Item of SMP	Duration
Act, 1970 and Rules;	
The Child Labour (Prohibition and	
Regulation) Act, 1986;	
The Indian Factories Act, 1948 and State	
Rules;	
Public Liability and Insurance Act, 1991;	
The new labour Act like The Code on Social	
Security, 2020 and The Code on Wages,	
2019,	
Social safeguards training including training	
of staff on GRM.	project implementation time
GBV training (SEA and SH)	
Environmental Health and Safety Officer	Actual, during the project
and Social Development Specialist hired by	implementation
contractor, for on-site supervision	

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING PROGRAMME- NORTH GUWAHATI

1. GENERAL

The Environment and Social Management Plan (ESMP) is required to ensure sustainable development of the proposed terminal on river Brahmaputra both during the construction as well as operational phases. The ESMP is site and time specific. In order to effectively implement ESMP, an institutional framework has been developed and roles and responsibilities of various relevant agencies have been worked out. Capacity development program are also identified and part of the ESMP.

In general, Assam Inland Water Transport Development Society (AIWTDS), (with assistance from Contractor, Third Party Monitoring Consultant /Technical Support & Supervision Consultant) is the responsible entity for ensuring that the mitigation measures as suggested in the ESMP are carried out. A detailed ESMP has been prepared for North Guwahati terminal. The list provides reference implementing organisation and responsible entity.

COMPONENTS OF EMP

Key components of the EMP are summarized below and explained in detail in the following subsections:

- Mitigation Measures
- Monitoring Measures
- Institutional Arrangement
- Reporting Requirements
- EMP Budget

Site-specific environment and social riverine infrastructure along with the roles and responsibilities of the key persons involved at different phases of the proposed development are described below:

The Environmental Management Plan for North Guwahati Terminal for construction and Social Management Plan is detailed in **Table -1.1 and Table- 1.2**,

Table 1.1: Environment Management Plan (Construction Phase)

Component	Environment al Attribute	Remedial Measure	Monitoring Indicators	Institutio Responsi	
	and potential impacts			Implementat ion	Supervi sion
Desig		•			
Developmen t of the Final Design	The design of the infrastructure must be resilient to the Floods	The design must take into consideration the projected rainfall levels as in the Assam State Action Plan on Climate Change (2015- 2020). The Annual rainfall is likely to increase by 10-25 %, and the extreme rainfall days will increase by 5-38%, with the extreme rainfall increase projected to increase between 25 and 150 mm.	Assessment of Design for Resilience	Contractor	TSSC & PMU (AIWTDS +GC)
	Collection and Treatment of Solid and Liquid Waste	The design of bio-digesters at the Terminal must be an adequate size to meet the regular passenger demand. Additional space needs to be made available for setting up additional bio-toilets for the pilgrim / festival. Adequate space must be made available to store municipal solid waste.	Assessment of Capacity of Bio- Digestor Assessment of space for the setting up bio- toilets, Adequate space for storage of Municipal Solid waste	Contractor	TSSC & PMU (AIWTDS +GC)
	Energy Efficiency	Energy-efficient measures in the terminal buildings will be implemented; Solar power will be used in potential area	Use of Energy efficient Fitting and fixtures	Contractor	TSSC & PMU (AIWTDS +GC)
Pre-Construct	ion Activities				I
Field Verification Surveys	Requirement for felling of trees	Permission of tree(s) removal from non- forest area -The GC/ PMU and the Contractor will carry out joint field verification to ascertain whether any tree would be affected and needs to be felled either for the construction activities or for safety purpose. In case any tree must be felledPermissions must be obtained from the Forest Department, Government of Assam. No tree would be felled without permission. At present there is no requirement for felling of trees for the proposed construction at North Guwahati	Copy of the Permit of the Forest Department, Government of Assam	Contractor	PMU (AIWTDS +GC)and TSSC
Assessment of Impacts due to Changes/Ad ditions in the Project	Additional Impacts	Site-specific EMP before the commencement of construction -In case of any change in the event of changes/revisions (including addition or deletion) in the project's scope of work or change in the site condition. the impacts of the changes need to be assessedThe Contractor will also prepare site-specific EMP to address these additional impacts. The Site Specific EMP has to be submitted to the PMC for approval. The Construction activities must not start before the approval of site-specific EMP by the PMC.	Approved copy of the C-EMP	Contractor	PMU (AIWTDS +GC)and TSSC
Setting up of Plant and Machinery	Potential source of pollution (air	Location of Batching Plants	Consent to Establish and Operate	Contractor	PMU (AIWTDS

(Batching Plants or concrete mixer location)	quality, water quality, soil)	-Batching plants will be sited sufficiently away from settlements, agricultural operations, or commercial establishments. Compliance with laws, ordinances, codes, rules, regulations, orders, or declarations -Concrete mixers and batching plants will comply with the requirements of the relevant emission control legislations and -Consent/NOC for all such plants obtained from the State Pollution Control Board will be submitted to the PIU.			+GC)and TSSC
		operation till the required legal clearances are obtained and submitted. In case the concrete is procured from a third party, a valid consent of the plant, along with the latest copy of the Annual report, will be submitted to the PIU before the procurement of any material			
Procurement of Other Construction Vehicles, Equipment and Machinery	Potential for air pollution and noise	Statutory Compliance: All Construction equipment¹ and machinery to be used in the project will conform to BS IV standards to be adopted by the Ministry of Road Transport and Highways. The discharge standards promulgated under the Environment Protection Act, 1986, will be strictly adhered to. -Noise limits for construction equipment to be procured, such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws, will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986. The Contractor will maintain a record of PUC for all vehicles and machinery used during the contract period.	Certification by Manufacturer of emission and noise levels/ Pollution under Control Certificates, Insurance and Driving License of the driver to be submitted for all vehicles	Contractor	PMU (AIWTDS +GC)and TSSC
Sourcing of construction material	Unsustainable mining practices	-Contractor will finalise the stone quarry /sand mine / borrow area for procurement of construction materials after assessment of the availability of sufficient materials and other logistic arrangements. The Contractor will provide a copy of the Environmental Clearance Certificate of the quarry/sand mine and the Consent to Establish and Operate along with the recent compliance report to the PMU before any such quarry is engagedIn case the contractor decides to use new quarries then the contractor will obtain the environmental clearance and all other permits and licenses and submit the same to the PMU before extracting any material. The contractor will submit a copy of the approval and the rehabilitation plan to the PMU and the Environmental Expert of the PMU Consultant.	Permission for mining/ quarrying of materials from the Mining Department, District Administration and District Level Environment Appraisal Committee	Contractor	PMU (AIWTDS +GC)and TSSC

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Every agricultural tractor, construction equipment vehicle and combine harvester shall be so manufactured that it complies with the following standards of gaseous pollutants as per rule 115A,after sub-rule (8), of the Central Motor Vehicle Rules, 1989.

		-Contractor will also work out haul road network and report to the Environmental Expert of the PMC. They will inspect and in turn report to PMU before approval.			
Identification of water sources for	Adverse impact on	If the contractor will source water requirements for construction form groundwater, prior permission from the Ground Water Board is required. A copy of the permission will be submitted to PIU prior to the initiation of construction. A flow meter must be installed, and the records of water used for construction must I be maintained. The usage of groundwater must be recorded.	Permission from the Ground Water Board for Groundwater usage	Contractor	PMU (AIWTDS +GC)and TSSC
sources for construction	water resources	The contractor can use fresh groundwater sources after the required treatment for drinking. Even if water is sourced from third parties, the above provisions must be followed. -If the river water is used, the permission of the Irrigation department must be obtained	Permission of the Irrigation Water Resources Department in case of River water is used.		
Environment al monitoring of baseline conditions of air, noise, water, and soil	To establish baseline environmental conditions and ascertain the impacts during the construction phase	out through recognised ² Laboratory as	Submission of test results to PMU	Contractor	PMU (AIWTDS +GC)and TSSC
EMP Implementati on Training	Lack of awareness of EMP can lead to irresponsible behaviour resulting in an Irreversible impact to the environment, workers, and community.	-Project manager and all key workers will be required to undergo EMP implementation, including spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labour laws, applicable environmental laws, etc. Additional modules for Dolphin Protection and Cultural Heritage Management - All new personnel joining the work need to undergo induction training. All personnel joining work after a break of more than 15 days need to undergo refresher.	-Certificate of Completion (Safeguards Compliance Orientation) -Posting of EMP at worksitesMaintaining Records of training both induction and refresher -Submission of the Training records to the PIU every month	Contractor	PMU (AIWTDS +GC)and TSSC
	Deployment of EHS Officer and OHS Officer	Deploy qualified personnel and management committee. - Contractor must depute qualified EHS personnel in the start of the project to conduct training to all the personnel and effective monitoring of mitigation measures during construction. The name and functions of the responsible EHS persons and their relevant expertise must be notified in the Quarterly Report -If an EHS person resigns/ replaced/replaced or the team has been	Submission of records of the availability of the EHS personnel onsite in the Monthly Report and Quarterly Report	Contractor	PMU (AIWTDS +GC)and TSSC

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² (National Accreditation Board for Testing and Calibration Laboratories (NABL) Accredited /Ministry of Environment Forest and Climate Change (MoEF&CC) / respective State Pollution Control Board (SPCB's)).

	enlarged, the same must be reported to the Bank within 15 days of the incident			
Environmental legal noncomplianc e may	-Obtain all consents, clearances (CTE/CTO from ASPCB), permits NOCs etc., before start of construction worksEnsure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (Refer Table 3.1 in this report) -Following consents are requiredTree cutting-local authority -Storage, handling, and transport of hazardous materials-ASPCBSand mining, quarries, borrow areas- Department of mines and GeologyAcknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs etcInclude in detailed design drawings and documents all conditions and provisions; if necessary	Copy of the Permit/ Consent to be submitted with QPR to PMU	Contractor	PMU (AIWTDS +GC)and TSSC
Damage / disturbance to artifacts	Construction Contractors to follow these measures in conducting any excavation work. -Create awareness among the workers, supervisors and engineers about the chance finds during excavation work. -Stop work immediately to allow further investigation if any finds are suspectedInform State Archaeological Department if a find is suspected and taking any action, they require to ensure its removal or protection in situ.	-Chance Find Protocol -Awareness training for workers	Contractor	PMU (AIWTDS +GC)and TSSC
Occupational Health Safety and Community Health Safety Impacts	Carry out a Hazard Identification and Risk Assessment for all tasks presented in the Method Statement Prepare occupational health and safety plan, including COVID-19 H&S Plan Prepare Community Health Safety Plan to ensure that the community/ pilgrims are segregated from the construction area Prepare a Debris/spoils management plan, Waste Management Plan.	- Occupational Health and Safety Plan (including HIRA) to be integrated with Method Statement - Community Health Safety Plan - Debris/spoils management plan, Waste Management Plan	Contractor	PMU (AIWTDS +GC)and TSSC
Impact of Aquatic Species and Dolphins	Construction Planning must be carried out so that No-construction /piling (stop the construction activities) in the water part between Mid- March to Mid-June) Construction activities must not be planned on the waterside during the monsoon period. Construction schedule should ensure that no work is planned during the monsoon in the water part.	Construction Scheduling	Contractor	PMU (AIWTDS +GC)and TSSC
Stage Landscape and Aesthetics	Permission of tree(s) removal from non- forest area -Vegetation will be removed from the construction zone before the	Verification of number of trees felled; Copy of NOC	Contractor	PMU (AIWTDS +GC)and TSSC
	Damage / disturbance to artifacts Damage / disturbance to artifacts Occupational Health Safety and Community Health Safety Impacts Impact of Aquatic Species and Dolphins Stage Landscape and	Environmental legal noncomplianc e may -Obtain all consents, clearances (CTE/CTO from ASPCB), permits NOCs etc., before start of construction worksEnsure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (Refer Table 3.1 in this report) -Following consents are required-Tree cutting-local authority -Storage, handling, and transport of hazardous materials-ASPCBSand mining, quarries, borrow areas-Department of mines and GeologyAcknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs etcInclude in detailed design drawings and documents all conditions and provisions; if necessary - Construction Contractors to follow these measures in conducting any excavation work Create awareness among the workers, supervisors and engineers about the chance finds during excavation work Stop work immediately to allow further investigation if any finds are suspected Inform State Archaeological Department if a find is suspected and taking any action, they require to ensure its removal or protection in situ. - Occupational Health Safety and Community - Health Safety Impacts - Carry out a Hazard Identification and Risk Assessment for all tasks presented in the Method Statement - Prepare occupational health and safety plan, including COVID-19 H&S Plan - Prepare Community Health Safety Plan to ensure that the community/ pilgrims are segregated from the construction area - Prepare a Debris/spoils management plan, - Waste Management Plan. - Construction Planning must be carried out so that No-construction /piling (stop the construction activities must not be planned on the waterside during the monsoon period. Construction schedule should ensure that no work is planned during the monsoon in the water part. - Vegetation will be removed from the	Environmental legal Properties of the incident Environmental legal Cobtain all consents, clearances (CTE/CTO from ASPCB), permits NOCs etc., before start of construction works. Ensure that all necessary approvals for construction (Refer Table 3.1 in this report) Following consents are required- Tree cutting-local authority Storage, handling, and transport of hazardous materials-ASPCB. Sand mining, quarries, borrow areas- Department of mines and Geology. Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs etc. Include in detailed design drawings and documents all conditions and provisions; if necessary Damage / disturbance to artifacts Construction Contractors to follow these measures in conducting any excavation work. Create awareness among the workers, supervisors and engineers about the chance finds during excavation work. Stop work immediately to allow further investigation if any finds are suspected. Inform State Archaeological Department if a find is suspected and taking any action, they require to ensure its removal or protection in situ. Coccupational Health Safety and Community Health Safety Plan including COVID-19 H&S Plan Prepare occupational health and safety plan, including COVID-19 H&S Plan Prepare a Debris/Spoils management plan, Waste Management Plan. Construction Planning must be carried out so that No-construction reconstruction area Prepare a Debris/Spoils management plan, Waste Management Plan. Construction activities) in the water part between Mid- March to Mid-June) Construction activities must not be planned on the waterside during the monsoon in the water side during the monsoon in the water part. Endadacepe and Permission of tree(s) removal from nonforest area Pregistation will be removed from the construction of public planning the construction period. Construction before the	Environmental consents, clearances (CTE/CTO Copy of the Permit Construction works and Community Construction works are may construction to be obtained by contractor are in place before start of construction works. Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (Refer Table 3.1 in this report) -Following consents are required -Tree cutting-local authority -Storage, handling, and transport of hazardous materials -ASPCB. -Sand mining, quarries, borrow areas-Department of mines and GeologyAcknowledge in writing and provisions; if necessary concomments all conditions and provisions; if necessary concomments are suspended on the dealed design drawings and documents all conditions and provisions; if necessary concomments are conducting any excavation work. -Create awareness among the workers, supervisors and engineers about the chance finds during excavation work. -Create awareness among the workers, supervisors and engineers about the chance finds during excavation work. -Stop work immediately to allow further investigation if any finds are suspected. -Inform State Archaeological Department if a find is suspected and taking any action, they require to ensure its removal or protection in situ. -Coccupational Health Safety Plan including COVID-19 H&S Plan Prepare community Health Safety Plan to ensure that the community pligrins are segregated from the construction area Prepare a Debnis/spoils management plan, Waste Management Plan. -Construction activities in the water part between Mid-March to Mid-June) Construction activities in the water part between Mid-March to Mid-June) Construction activities in the water part between Mid-March to Mid-June) Constructi

camp, Construction Camp & Labour camp)		disruption to flora other than those identified for cutting is avoided or minimized. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from the Environmental Expert of the Consultant. The contractor, under any circumstances, will not cut or damage trees. Trees identified under the project and have received permission of felling from the			
		Forest Dept will only be felled Compensatory afforestation must be carried out per the Tree Felling permission provisions.			
	Loss of topsoil. Loss of natural resources (Earth/soil) in area where the Constrctionca mp is setup	•Top soil (15 cm) would be stripped and kept separately in stockpiles for use in landscaping. • At least 10% of the acquired area for construction purposes must be kept for stockpiling of fertile topsoil •Precautions must be taken while stockpiling. The slope of the stockpile shall not exceed 1:2 (V:H) to retain soil & allow percolation of H₂O and the edges of the pile shall be protected by silt fencing. The piles shall be covered with gunny bags/tarpaulin. The maximum height of the stockpiles shall be kept less than 2 m •Excavated materials would be preferably used for site filling for land reclamation to construct the terminal	Site verification	Contractor	PMU (AIWTDS +GC)and TSSC
Transporting Construction Materials and Haul Road Management	Impacts on air quality and safety	-Contractor will maintain all hauls roads (existing or built for the project), which are used for transporting construction materials, equipment, and machineries as précised. All vehicles delivering fine materials to the site will be covered to avoid spillage of materials or being blown away during the transportation. -Only major roads will be used by the contractor's vehicles or any of his subcontractor or materials suppliersRoads, which are part of the works, will be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. -Contractor will arrange for regular water sprinkling for dust suppression of all roads and surfaces. -The unloading of materials at construction sites in/close to settlements will be restricted to daytime only. -All stockpiles will be covered/protected to prevent dust generation	Complaints from local community Visual observation in Site reports Monitoring of the air quality in the worksite and material storage area	Contractor	PMU (AIWTDS +GC)and TSSC
	Impacts on Water Quality	Boats/ Vessels carrying construction material must not be overloaded. Loading and unloading activities must ensure that spillage does not occur. loose and friable material transported by boat must be covered	Site Reports	Contractor	PMU (AIWTDS +GC)and TSSC

	Community Safety due to movement of Constractio Vehicles	- Constraction material shall be stored within the construction area to prevent accessibility issue with the community - Schedule transportation of the constraction material so that heavy vehicles do not cause inconvenience to the local population and people on site; - Drive vehicles in a considerate manner; - Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic aids - Notify affected area by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.	Site Reports Complaints form Local people on disturbance	Contractor	PMU (AIWTDS +GC)and TSSC
Storage of Construction Material	Potential for waterlogging	-The contractor will ensure that no construction materials like earth, stone, sand, or appendage are disposed of so as not to block the flow of water of any water course and cross drainage channelsThe contactor must not dump any excavated material into the riverThe contractor will take all necessary measures to prevent the blockage of water flowThe stockpiled material must be prevented from erosion and deposition in the drainage channel from sites where these are stocked for construction.	Complaints of water logging	Contractor	PMU (AIWTDS +GC)and TSSC
	Water Pollution from Storage of Construction Material	Run-off from a material stockpile can also contaminate water. To prevent the contamination of the construction material, the following measures must be adopted; -The runoff from the construction material storage yard must be channelled through peripheral drains -The peripheral drains must be connected to sedimentation tanks (holding tanks excavated in the ground) of adequate capacity All sedimentation tanks and peripheral drains must be cleaned before the monsoon.	-Site visit Report -Number of sedimentation tanks installed Records of surface water quality MonitoringNo visible Sedimentation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU (AIWTDS +GC)and TSSC
	Water Pollution from Fuel and Lubricants	- The contractor will ensure that all construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery, and equipment maintenance are in accordance with the provisions stated in (Annexure 19: Environmental Codes of Practice & Other Plans) -Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refuelling areas as per the design provided.	-Number of Oil interceptors installedRecords of surface water quality Monitoring No visible degradation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU (AIWTDS +GC)and TSSC
	Pollution of water bodies	-Wastewater from domestic activities such as bathing and washing at the	-Adequate number of toilets	Contractor	PMU (AIWTDS

	from domestic activities	camp site must be treated. -The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering streams, water bodies or the irrigation system The liquid waste from the construction camp must be treated and disposed ofIn the absence of construction camp if the contractor takes a rental accommodation must be channelized to the nearest municipality drain. In the absence of a municipality drain, a septic tank and a soak pit system of adequate capacity must be constructed. -Stagnation of water should not be allowed at any place near the campsite as a precaution against vector-borne disease. Wastewater from the North Guwahati Worksite -An adequate number of toilets must be provided Bio-toilets of adequate capacity must be provided for the workers based on no of users. The supernatant from the Bio-digestor must be discharged into the soak pits. The Supernatant from the. bio-toilets must be tested at periodic intervals to meet discharge standards Collection of Food waste and kitchen waste from Construction Camp -All waste arising from the project is to be stored and disposed of as per the provisions of Annexure 19- Environment Codes of Practices & other Plans or as directed by EHS Specialist of the PMU In the case of rented accommodation, arrangements must be made with the Municipal corporation for the disposal of the waste. Collection and Disposal of Food Waste from the North Guwahati Construction Site Adequate space must be provided in the Construction Site for the storage of Solid Waste	as per no of labours - Records of surface water quality Monitoring; -No visible degradation to nearby drainages, nallahs or waterbodies due to civil works		+GC)and TSSC
		Adequate space must be provided in the Construction Site for the storage of Solid			
Construction activities in Waterside	Degradation of Water Quality due to piling activities	-The piling work in the river must be undertaken during low-flow periodsTurbidity traps/curtains/ Geo-Textile synthetic sheet curtains would be placed around piling and construction areas to prevent sediments and construction waste movement.	-Construction methodology for waterside construction -Schedule of construction works to ensure completion of the works before monsoon/ develop a Monsoon Management Plan	Contractor	PMU (AIWTDS +GC)and TSSC

			- Records of Works inspection		
	Impact on aquatic life and dolphins	-Construction Planning must be carried out so that No-construction Period (stop the construction activities in the water part between Mid- March to Mid-June) -The river area in which the piling is planned advisable to carefully determine drop sites before anchor placement to ensure that Dolphin and fish communities that could locally still be present in the area are not unnecessarily damaged -Before piling starts, Dolphin Watch must be carried out in the river for one hour. Piling must commence if dolphins are not spotted Before starting piling, allow some time for aquatic fauna to displace from the piling areaPiling must be stopped for some time if any dolphin/turtle/RET species are sighted in the activity area -Noise-reducing devices like mufflers ,enclosures baffles must be fitted with the equipment as much as feasibleFish exclusion devices must be installed in the water column around the pile driving area to prevent fish access -Geo Textile synthetic sheet curtains &turbidity traps must be placed around piling and construction areas to prevent the movement of sediments and construction waste -Aquatic ecology monitoring must be carried out before the start of construction and after completion of construction activities on aquatic life Effect of piling during the construction period will be managed by the adoption of vibratory piling and the usage of bubble curtains to disperse the fauna and reduce the noise level -If, despite the introduction of preventive measures, fish kills or impact on aquatic life is observed, then the work will stop immediately, and the methods will be reviewed and correctedIf drilling is carried out Polymer-based mud instead of bentonite to be used as drilling fluid with proper storage of polymer at designated storage areas. Drill cutting and spent drilling mud must not be disposed in the river - All equipment will be adequately maintained to prevent potentially hazardous or toxic products from leaking or spilling. This includes hydraulic fluid, diesel, gasoline and oth	Preparation of the Dolphin / Aquatic Manal Management Plan 2. Logs for recording watch and ward for dolphins / turtles during the piling 3. Log for aquatic fauna monitoring	Contractor	PMU (AIWTDS +GC)and TSSC
1	Degradation	Select a construction methodology that is	(i) Construction	Contractor	PMU

	construction activity	Schedule construction works to complete the construction work before the onset of the monsoon. Schedule the construction works during the low water level period –ensure that works are completed during the same period before the onset of monsoon. Inspection and maintenance of disturbed areas where mobilisation and barrier installation occur for sediment control measures. -Washing of vehicles and equipment must not be carried out in rivers or nearby places.	waterside construction -Schedule of construction works to ensure completion of the works before monsoon/ develop a Monsoon Management Plan -Records of inspection of the sedimentation chamber -Effectiveness of water management measuresNo visible degradation of water quality		+GC)and TSSC
	Water Pollution from Fuel and Lubricants and hazardous waste	- Avoid/minimise storage of fuels, chemicals, and lubricants near the river/water; ensure no spillage - A temporary secured hazardous material handling and waste storage area must be provided at the construction site. As part of a design feature, a permanently secured ('bunded') impermeable surface and dykes capable of carrying 110% volume of materials for accidental spills or leakage must be constructed and maintained. Fuel transfer through decanting is prohibited. The use of a transfer pump with the proper fitting is suggestedThe storage area should be covered Dispose of any wastes generated by construction activities as per the guidance presented in Annexure 19- Environment Codes of Practices & other Plans and - Conduct surface quality inspection and monitoring according to the EMP Contractors will have emergency spill equipment available whenever working near or on the water.	- No of spills reported -Field observation -Water quality monitoring reports	Contractor	PMU (AIWTDS +GC)and TSSC
Construction on the landside	Deterioration of air quality from fugitive sources	Prevent Dust Generation -The soil/earth must be transported by covering the haulage vehicles with tarpaulin or any other good quality materialDust suppression measures by water sprinkling on worksites and temporary service and access roadsAll construction workers must be provided with pollution masks to mitigate the effect of dust generation on the health of workersConstruction Material must be transported in covered dump trucks to the project site. This must not be stockpiled at the project site - Clean wheels and undercarriage of haul trucks before leaving the construction site.	- Complaints from sensitive receptors. - Quarterly environmental monitoring report for ambient air, noise, water, and soil	Contractor	PMU (AIWTDS +GC)and TSSC

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- Loading and unloading of construction	
materials must be made at designated	
locations with provisions of water sprinkling.	
-Construction vehicles, machinery &	
equipment must be regularly serviced and	
maintained and would have a valid PUC	
certificate	
-Don't allow non-project vehicle access in	
the work area, limit soil disturbance and	
prevent access by barricading and security	
personnel.	
-Traffic detours and diversions must be	
designed to minimise bottlenecks and ensure smooth traffic.	
-Air pollution monitoring must be carried out	
at specified locations as described in the	
monitoring plan to verify that the contractor	
follows air pollution norms and that the air	
quality at the construction site does not	
exceed the prescribed limits.	
Use of Plant, Emissions -The contractor will take every precaution to Contractor	PMU
Equipment from reduce the level of dust from batching	(AIWTDS
Machinery Construction Plant/Cement Storage/, construction sites	+GC)and
and Vehicle Vehicles, involving earthwork by a sprinkling of water,	TSSC
Equipment encapsulation of dust source and by the	
and erection of screens/barriers.	
Machineries -All the plants will be sited at least 1 km in	
(Generation of the downwind direction from the nearest	
Exhaust human settlement.	
Gases) lead -The contractor will provide necessary	
to the certificates to confirm that all Plants,	
deterioration of six quality description approximation conform to release in equipment and	
of air quality construction conform to relevant dust machinery with	
emission control legislation. Also are a facilities with air pollution	
-No open burning of bitumen or preparation control devices.	
of not mix is allowed.	
-No burning of firewood is allowed in the Monthly	
construction camp. The Contractor must Compliance	
make provisions for LPG cylinders. Report to	
-Compliance with laws, ordinances, codes, ASPCB	
rules, regulations, orders, or declarations	
-All vehicles, plants and machinery used to Establish and	
during construction must conform to the Consent to	
emission standards promulgated under the Operate.	
Environment (Protection) Act, 1986. The - Certification	
contractor will ensure that all vehicles, equipment, and machinery used for that vehicles are	
construction are regularly maintained and compliant with	
confirm that pollution emission levels Air Act Ougstock	
comply with the relevant requirements of - Quarterly	
PCR environmental	
-The Contractor will submit PLIC certificates monitoring	1
for all vehicles/ equipment/machinery used report for	
for the project. Valid PLIC must be ambient air,	
maintained throughout the construction noise, water and	1
period soil	1
Monitoring results will also be submitted to	
PMU Consultant and PIU as per the	
monitoring plan.	1
-Contractor will ensure that all vehicles,	1
equipment, and machinery used for	
construction are regularly maintained and	
confirm that pollution emission levels	
comply with the relevant requirements of	
CPCB emission standards	

to inconv for the	The Contractor will confirm the following: All plants and equipment used in construction (including third-party plants and equipment) must conform to the MoEF&CC/CPCB noise standards. All vehicles and equipment used in construction will be fitted with exhaust silencers. Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked, and if found defective will be replaced. The activities must be carried out during the daytime. Night-time activities may be carried out in an emergency, but all measures mentioned in the mitigation measures for night work must be strictly adhered to. Limits for construction equipment used in the project, such as concrete mixers, cranes (moveable), vibrators and saws, must not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. -Maintenance of vehicles, equipment and machinery must be regular and up to the satisfaction of the Environmental Expert of the PMU Consultant to keep noise levels at a minimum. - No noisy construction activities will be permitted around educational institutes/health centres (silence zones) up to 100 m from the sensitive receptors, i.e., schools, health centres and hospitals between 9.00 am to 6.0 pm. -Restriction on Honking at the project site -Traffic management plans prepared during the construction stage. Effective traffic management must be taken care of in sensitive locations, major built-up areas, and along important highway junctions. - Barricading (Temporary noise barrier) around the construction site to minimize the noise level -Monitoring must be carried out at the construction sites as per the monitoring schedule, and results will be submitted to PMC and PIU. -The Environmental expert of PMC will be required to inspect regularly to ensure the compliance of EMP.	- Complaints from sensitive receptors Use of silencers in noise-producing equipment and sound barriers.	Contractor	PMU (AIWTDS +GC)and TSSC
the wo	rks. construction activities. -Only mechanical equipment must be used to prevent Chances of damage from vibration. -If a mechanical vibrator/ pneumatic hammer is used within 100 m of the archaeological property, advice must be obtained from the State archaeological department for precautions.	from sensitive receptors, Archaeology deptSite verification -Availability of trained manpower		(AIWTDS +GC)and TSSC

		-The Contractor must employee an archaeologist to monitor the sites during the rock-cutting and piling activities.	(archaeologist) at site		
	Contaminatio n of Soil	Ensure all equipment, vehicles and other sources of fuels and lubricants will be collected and contained to avoid soil/ groundwater contamination. -Fuel must be stored in proper bounded and covered areas. -All spills and collected petroleum products must be disposed of in accordance with the provisions mentioned in Annexure 17 Emergency Spill Control Procedure. -Maintenance and refuelling of vehicles, machinery and other construction equipment must be carried out on an impervious surface so that spillage of fuels and lubricants does not contaminate the ground. -The runoff from the maintenance yard must lead to a peripheral drain and pass through an oil-water separator		Contractor	PMU (AIWTDS +GC)and TSSC
Safety aspects during the execution of works	Community Health Safety risks in Work Zones	The Contractor must ensure that: -The construction zone is hard Barricaded with MS Barricades of a height of 3.0 m. -The construction site must be access controlled, and the workers must be provided valid identification cards to allow entry. -Construction material must be stored in the barricaded area. If temporary storage is required (for 1-2 days) outside the demarcated construction area, the same must be discussed with the community. Hard Barricading with proper signages must be put to prevent the entry of commuters/pilgrims in the areas. The permission of the Environmental Officer is essential. -To prevent the dust from the construction area affecting the sensitive receptor/commuters' green screens may be used over and above the Hard Barricading at the advice of the Environment Officer of the PMC	-Barricading of the worksites -Traffic management Plan construction works, including number of permanent signages, barricades and flagmen on the worksite -Number of signages placed at the project locationRegular reporting of the measures in the Quarterly Report	Contractor	PMU (AIWTDS +GC)and TSSC
	Occupational Health Safety: Personal Safety Measures for Labour	The contractor will provide: -Comply with all national, state and local labour laws (refer Table 8.2: Social Management Plan)Develop and implement site-specific occupational health and safety (OHS) plan, which will include measures such as (a) excluding the public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OHS Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents -Barricading of all excavation carried out for construction. For deep excavation -shoring and bracing must be provided	-Site-specific OHS PlanEquipped first- aid stationsMedical insurance coverage for workersNumber of accidentsSupplies of potable drinking water Clean eating areas where workers are not exposed to hazardous or	Contractor	PMU (AIWTDS +GC)and TSSC

Movement of equipment and machinery near the deep excavation of soft soil must be prohibited.

- Flagmen must accompany all movement of equipment and vehicle inside.
- -All vehicles and equipment must be fitted with reverse horns, alarms etc.
- -Protective clothing as may be appropriate to the risk involved in the activities being undertaken by the labour.
- -Protective clothing must be as per the BIS standards
- -Earplugs for workers exposed to loud noise, and workers working in concrete mixing operations, piling and other highnoise-generating operations
- -Adequate safety measures for workers during the handling of materials at the site are taken up.
- -All tools, tackle, lifting instruments, and cranes must have valid load certification. The tools and tackle must be regularly inspected by the Environment Officer / OHS officer of the PMU.
- -The contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangways, stairwells, excavations, trenches and safe means of entry and egress.
- -All precautions must be taken for working at heights.
- -The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract.
- -Ensure that qualified first aid is always provided. Equipped first-aid stations must be easily accessible throughout the site.
- Provide medical insurance coverage for workers
- -The Contractor will not employ ad-hoc work procedures, follow best & acceptable work practices
- -The contractor will document work-related accidents. Provide qualified & easily accessible first-aid facilities all times at all sites.
- -Secure all installations from unauthorised intrusion and accident risks.
- -Adequate illumination would be provided at site during evening and night time till the work is being carried out
- -Rest area for workers would be provided with drinking water and protected from the elements of nature
- Barrier structures are of sufficient height to prevent waves or overflows from flooding in the enclosed area.
- -During working in River, workers must be made aware of risks of water depth, currents, and dangerous areas of water must be properly marked by fixed or floating barricades and signage of danger. Workers must also be made aware of the protection of the biodiversity of the water, and fishing

noxious

- substances.
 record of H&S
- orientation trainings
- personal protective equipment.
- % of moving equipment outfitted with audible back-up alarms:
- -permanent sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.
- -Compliance to core labour laws

		must be strictly prohibited. A boat must be made available at the site to transport labour and materials and be well-maintained for emergencies. Workers must not be allowed to dip or bathe in rivers. A suitable working platform must be provided during construction works in water. -Life-saving equipment and lifeguards must be made available during the period of working in water. -The Contractor will mark 'hard hat' and 'no smoking' and other 'high-risk areas and enforce non-compliance of the use of PPE with zero tolerance. These will be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilisation and will be approved by the Safety Officer of PIU. Please refer Annexure 23 for Safety Measures during Construction Phase.			
	Injuries/fataliti es to the employees	Accident/Incident Reporting for SHE -The PMU must carry out an awareness campaign for the Do's and Do nots in construction sitesNear misses must be recorded and reported on a regular basis - Fortnightly meetings must be held with employees to make them aware of unsafe acts and practices.	-Record of near misses - Record of fatalities - No of workers' meetings -Labour Law Compliance Report generated through Labour Law Compliance system	Contractor	PMU (AIWTDS +GC)and TSSC
	Cultural & Heritage Resources	- Adequate signs must be displayed in the access route for the devotees towards this cultural heritage and templesWarning signs about the construction activities must be provided to warm commuters/ pilgrims Regular supervision by an archaeologist to identify the impact on these archaeological properties from vibration -Make workers aware of chance finds and archaeological heritage - Make workers aware of controlled vibration when working within 100 m of the site	i. No of training for workers on precautions against vibration ii. Report by the Archaeologist in the Quarterly report.	Contractor	PMU (AIWTDS +GC)and TSSC
Sanitation, Health & Safety	Unhygienic and unsafe living and working condition.	 Hygiene in the camps would be maintained by providing good sanitation and cleaning facilities. Camp would be well ventilated with adequate provision for illumination, kitchen and safe drinking water. Proper drainage to be maintained around the sites to avoid water logging. Proper sanitation with toilet and bathing facilities would be provided at the sites and labour camps. Wastewater generated from these facilities would be disposed through septic tanks and soak pit Preventive medical care to be provided to workers 	Site Verification	Contractor	PMU (AIWTD S+GC)a nd TSSC

 Segregated solid waste would be disposed of at municipal solid waste disposal location. LPG will be used for cooking in construction camps Provision would be made for day crèche for children First aid facilities, with room, personnel and ambulance would be available at the site. Also, tie-up with local hospitals would be done to handle emergency case, if any. Rest area would be provided at the site where workers can rest after lunch Working hours of labourers would not exceed the standard norms as per Factory Act Wastewater from construction site would not be allowed to be accumulated. Septic tanks/soak pits would be provided for its disposal. 		
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Table 1.2 - Social Management Plan

Component	Social Attribute and potential impacts	Remedial Measure	Monitoring Indicators	Institutional Responsibility	
				Implemen tation	Supervi sion
Health & Safety	Accident and Incident risk from construction activities and safety of workers Impact on Social life of nearby community	-Local labour would preferably be employed for constructionSite would be barricaded and would have security guardsRegister would be maintained for entry to the construction sites. No unauthorized person would be allowed to enter the siteA board in local language at entrance of site would display name of project, area and hazards associated for public awareness -Rest area for workers would be providedContractors would adopt and maintain safe working practices. SOPs would be prepared and followed for all activities under supervision of site engineer -Complete medical check-up would be done for workers prior to joining and after six months of joining -Emergency telephone nos. of hospitals, ambulance and doctors would be displayed in first aid room. -Working hours of labour should not exceed norms as per state factory law -Maintenance and repair of any local village road used for the project activities should be carried out both before and end	-Regular health check-up of the workers -Training on communicable diseases.	Contractor	PMU (AIWTDS+ GC)and TSSC
Labour Influx	- STD, HIV/AIDS to	of construction by contractor. -Specifications on employment of local workforce including women	- Awareness training for applicable	Contractor	PMU (AIWTDS+
	local community Increased demand and	should be reflected in the civil works bidding documents and subsequent contracts to ensure that the contractors fulfil these	regulatory regulations.		GC)and TSSC
	competition for	commitments. Locals including	Factories Act, 1948		

local social and health services -Social conflicts between the local community and the construction migrant workers. -Increased illicit behaviour and crime against women, which is a real threat for Assam where genderbased violence is rampant -Increase competition for jobs and have an impact on wage distribution

women may be screened further for skills, and adequate orientations can be provided to recruit for the work. AIWTDS can prepare a roster of interested workers and their skills

- -The project contractor needs to prepare a site-specific Labour Influx Management Plan and/or a Workers' Camp Management Plan.
- -Security personnel will be deployed at the construction sites, and emergency nos. including contact details of local law enforcement officers, project's helpline no., existing state-run women helpline nos. will be prominently displayed at the site. The contractors will ensure that an Internal Complaints Committee (ICC) for each establishment is set-up to meet their corporate requirement and legal mandate under the Sexual Harassment at the Workplace Act, 2013.
- -Health problems of the workers should be taken care of by providing basic health-care' facilities through health centres temporarily set up for the construction camp. The health centre should have the requisite staff, free medicines and minimum medical facilities to tackle first-aid requirements or minor accidental cases, linkage with nearest higher order hospital to refer patients of major illnesses and critical cases.
- Awareness camps on HIV/AIDS for both, construction workers and neighbouring villages must be organised at regular intervals by NGOs empanelled with NACO.
- -It is expected that among the women workers there will be mothers with infants and small children. The provision of a day care crèche as per the Building and Other Construction Workers (regulation of employment and conditions of service) act, 1996 is the contractor's responsibility. The crèche should be provided with trained women to look after the children.
- -In case work schedule extents up till night, it should be ensured that women workers are exempted night shifts.

and State Rules.

Gender Based	There might	- Code of Conduct shall be signed by the workers.	-Regular Training	Contractor	PMU (AIWTDS+
Gender Based Violence	There might be a possibility of gender-based violence arising from the inflow of migrant workers/ labours.	signed by the workers. Integration of GBV into existing strategy, Grievance Redressal Mechanism, safety talks, tool box meeting and regular trainings for the workers. Identification of GBV focal points through community consultations. Trainings shall be arranged for the workers on Occupational Health and Safety. Identification of Hot Spots for GBV within the project including construction sites and labour camps alongside local communities, schools, vocational training centers, liquor shops, migrant laborers' residing in rented accommodations within the villages. Both men and women labours shall be made aware about the applicable rules and regulations. Formation of a committee comprising of representatives from local NGOs/ CBOs, police, academia, advocate, etc. with at least 70% women members. The committee shall meet every	-Regular Training shall be conductedIEC material should be displayed at site -Awareness Campaign	Contractor	PMU (AIWTDS+ GC)and TSSC
		quarter in order to address the problems faced by the labours/ locals. Consultation with women's groups should also be held during construction and operation phases to listen to their issues and concerns regarding labour, health and safety etc. as well as to solicit their ideas on various community initiatives.			
Community Health and Safety	With the inflow of migrant workers and their interaction with the local population, health issues among the local community might emerge. Health problems like STIs, HIV/AIDS, Hepatitis B&C, Tobacco chewing, Tuberculosis etc. might spread in the area because of this floating population	- Regular medical camps can be conducted amongst the labours and the local population to make them aware about HIV/AIDS and associated factors Awareness on health issues like HIV/AIDS, Tuberculosis, Hepatitis B & C, Sexually Transmitted Infections, Dengue, Chikungunya, Malaria, Tobacco control, etc., shall be conducted periodically District AIDS and Prevention Control Unit (DAPCU), District level Agency for the implementation of National Health Mission and Employee's State Insurance Corporation (ESIs) Hospital shall be liasoned for the same Community based meetings, consultations in camp, distribution of leaf lets, IEC tools (outreach programmes, campaigns, awareness through newspapers, TV's, etc.), posters, banners. Use of mobile phones shall be banned during driving and	- Regular health check-up of the workers -Training on communicable diseases		PMU (AIWTDS+ GC)and TSSC

	construction activities.		

2. ENVIRONMENT MONITORING PLAN

Environmental Monitoring Programme is to ensure that the intended environmental protection goals are achieved and result in desired benefits of the project. The same will be included in tender / bid document. The broad objectives of the environment monitoring program are:

- To monitor impacts on the surrounding environment and the effectiveness of mitigation measures during the construction and operation phase.
- To ensure that the environmental control systems, installed are effective.
- Comply to the provisions of relevant environmental regulations.

The parameters to be monitored, frequency of monitoring, number of samples, locations and responsibility of monitoring is given in **Table 2.1**

Table 2.1 Summary of Environmental Monitoring Programme: Construction Phase

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
1.	River Water		monitoring	Campies		
1.	Physico-chemical parameters	pH, EC, TDS, Turbidity, Phosphates, Nitrates, Sulphates, Chlorides.	For three seasons in construction phase; Turbidity, DO and salinity will be monitored once every week at 3 locations: near the Berth, channel and records of monitoring will be maintained during construction phase If DO level goes 4.0 mg/l, then its causes will be investigated, and corrective actions will be taken For two seasons in operation phase except monsoon	Surface Water Upstream- 2 • Downstream- 2 • Near Project site- 1 Ground water- 2 near the project site	As per AIWTDS directions	Contractor
	Biological parameters	Light penetration, Chlorophyll, Primary Productivity, Phytoplanktons, Zooplanktons		Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor
2.	Sediments	Tardina all	Can Abasa	l lin atria a co. O	Λ	O a material and a ma
	Physico- chemical parameters	Texture, pH, Sodium, Potassium, Phosphate, Chlorides, Sulphates, Hg, Pb, Fe, Cu, Zn, Cd	For three seasons in construction phase For two seasons in operation phase except monsoon	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor
	Biological parameters	Benthic Meio- fauna, Benthic Macro-fauna	For three seasons in construction phase.	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
			For two seasons in operation phase except monsoon			
3.	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ and NO ₂	- For three seasons in construction phase and one season for operation phase Twice a week for four consecutive weeks per season.	Upwind- 2 Downwind- 2 Near Project site- 1	As per AIWTDS directions	Contractor
4.	Noise Quality	Equivalent Noise Level	During peak construction activities	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
5.	Soil Quality	N, P, K and Heavy metals	2 samples premonsoon season and 2 samples postmonsoon in construction phase and one season during operation phase	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
6.	Dolphin study	Assessment and presence of Dolphins, survival etc.	Once per year		As per AIWTDS directions	Contractor

^{*}Note: All the Samples to be collected as per standard norms. Parameters and components may vary as per requirement.

3. BUDGET FOR EMP

Tentative Environment budget has been prepared for design, construction and operation phase of the project which includes the cost of environmental structures like septic tank & soak pit, Air Pollution Control System at terminals, monitoring, enhancement measures, training and awareness and technical support for establishment, enhancement measures and environmental guidelines. Environmental budget for North Guwahati Terminal during construction phase along with detailed break-up of costs for construction phase is given at **Table- 3.1.**

Table-3.1Summary of Environmental Budget- Construction Stage

S. No.	Particulars	Stages	Costs Covered By
A.	Monitoring Measures		
1	Water Quality Monitoring	Pre -Construction	Contractor
ı	water Quality Monitoring	Construction	Contractor
2	Piological Manitoring	Pre -Construction	Contractor
2	Biological Monitoring	Construction	Contractor
2	Sediments: Physico	Pre -Construction	Contractor
3	Chemical	Construction	Contractor
4	Codimenta, Dialogical	Pre -Construction	Contractor
4	Sediments: Biological	Construction	Contractor
_	Analisma Ain Constitut	Pre -Construction	Contractor
5	Ambient Air Quality	Construction	Contractor
		Pre -Construction	Contractor
6	Noise Quality	Construction	Contractor
	0 11 0 111	Pre -Construction	Contractor
7	Soil Quality	Demobilisation	Contractor
		Pre -Construction	Contractor
		Construction	Contractor
8	Groundwater	Camp/Kitchen During	Civil works
		Construction	contract
		Decommissioning	
	Subtotal (A)		
B.	Capacity Building		
1	General environmental awareness; environmental and social sensitivity of the project influence area; Key findings of the EIA; Mitigation measures; EMP; Plans and Protocols Social and cultural values of the area. (1 day)	Training for Selected staff of AIWTDS, supervisor, and contractors, Vessel Operators (at the beginning of Contract)	TSSC
2	Training for Ghat management'	Section officers/ Vessel operators/ Masters/ Khalasi , Ghat officers, Ghat Maintenance workers etc.(At Beginning of Construction)	Contractor
3	Community issues; Awareness of transmissible diseases; social and cultural values.	Construction Crew (once every six months)	Contractor
4	EMP; Waste disposal, Cultural values and social sensitivity.	Once every year or as directed by the PIU	Contractor
5	Road/waterway safety; Defensive driving/sailing; Waste disposal;	Drivers; boat/launch crew, (once every year)	Contractor
6	Camp operation; Waste disposal; Natural resource conservation; Housekeeping.	Camp staff (once every quarter)	Contractor

S. No.	Particulars	Stages	Costs Covered By
7	Construction Implementation requirements; handling situations for important flora / fauna especially Dolphin; Physical Cultural resources;	PIU; supervisor Selected crew members and contractors (once every six months)	Contractor
8	Health and safety equipment on board and in terminals	Selected crew members and Vessel operators/ Masters/ Khalasi etc.	Contractor
9	Environment Management tracking System	AIWTDS	Contractor
C.	Subtotal (B) Construction Contractor EMP Implementation		
5.	Water Sprinkling Measures for Dust Suppression	Construction	The cost is integrated as part of the civil work cost
6	Development and Implementation of the Dolphin Management Plan of Contractor	Construction	The cost is integrated as part of the civil work cost
7	Providing, fixing, maintaining, shifting & refixing, barricading of minimum 2.0m height at stipulated active site of the same project site, made with angle iron frame of 50x50x5mm and GI sheet of 0.63mm thick including primer painted initially, painting, lettering & border with reflective paint at the time of every shifting, traffic diversion arrangement, safety guard, suitable lightning arrangement during night, complete in all respect till completion of the project as per technical specification and direction of Engineer-Incharge and same shall be possessed by the contractor after completion of the Project	Construction	The cost is integrated as part of the civil work cost
8	Supplying and fixing of cautionary and or informative signs boards including the cost of posts, fixtures, fixing, foundation, fitting and fixing. Sheeting will be made of encapsulated lens type of retro-reflective type and message / borders will be screen printed complete as per screen specification in IRC SP 55: 2001. To be made available at all time at the	Construction	The cost is integrated as part of the civil work cost

S. No.	Particulars	Stages	Costs Covered By
	work sites as required and directed by the engineer		
9	Supplying and fixing of flashing beacon warning lights including the cost of posts, fixtures, fixing, foundation, fitting and fixing, cost of material, labour, loading, unloading, lead, lift, shifting, transportation etc. and as per specification in IRC SP 55: 2001	Construction	The cost is integrated as part of the civil work cost
10	Provision and maintenance of Bio toilets with 1 male and 1 female units including cost of material, labour, loading, unloading, lead, lift, transportation, shifting etc. And shall be made available at worksite at the direction of the PIU. The facility shall complete with water arrangement, privacy, lighting arrangement. The WC and /urinals should be made of stainless Steel and the partitions should be made of aluminium framework with FRP panels. The bio-digester tank should be approved by Defence Research & Development Organisation (DRDO) or any other competent agency. The whole toilet shall be mounted on MS framework with skids; Overhead water tank shall be made of HDPE with proper arrangement of ball cock and mosquito proof cover. These should also be provided with two dustbin for wet and dry waste. The bio-digester toilets shall be mounted on skids and shall not require any creation of permanent structure so that they can be shifted from one worksite to another	Construction	The cost is integrated as part of the civil work cost
11	Provision of Helmets (IS CODE 2925 : 1984) , Safety Shoes (IS CODE 5852 : 1996), Googles (*IS CODE 5983 : 1980), Reflective Jackets, mitten/ gloves (IS 2573) , safety nose masks to all personnel (including	Construction	The cost is integrated as part of the civil work cost

S. No.	Particulars	Stages	Costs Covered By
	temporary labour) involved in the worksites		
12	Provision of First Aid Kits for worksites	Construction	Civil works contract
13	Provision and maintenance of waste collection bins in sets of 2 (blue and green) for collection of municipal solid waste generated at the worksite including cost of material , labour, loading, unloading, lead, lift, shifting, transportation etc.	Construction	The cost is integrated as part of the civil work cost
14	Environment, Health & Safety Engineer/Supervisor having Bachelors in Env Science / Management/ B. Tech (Env Eng.)	Construction	The Manpower Cost is integrated into the cost of the Civil Works
15	Diploma in Central Labour Institute / Regional Labour Institute (Mandatory)	Construction	The Manpower Cost is integrated into the cost of the Civil Works

4. BUDGET FOR SMP

The various activities for social management under the sub project to be undertaken by the contractor are given in **Table 4.1.**

Table 4.1: Summary of Social budget (construction phase)

Item of SMP	Duration
Training for contractor staff on labour laws	
such as Building and Other Construction	project implementation time
Workers (Regulation of Employment and	
Conditions of Service) Act, 1996;	
The Bonded Labour System (Abolition) Act,	
1976;	
The Workmen's Compensation Act, 1923;	
The Contract Labour (Regulation & Abolition)	
Act, 1970 and Rules;	
The Child Labour (Prohibition and	
Regulation) Act, 1986;	
The Indian Factories Act, 1948 and State	
Rules;	
Public Liability and Insurance Act, 1991;	
The new labour Act like The Code on Social	
Security, 2020 and The Code on Wages,	
2019,	
Cooled cofequency training including training	Actual before and during the
Social safeguards training including training	_
of staff on GRM.	project implementation time
GBV training (SEA and SH)	

Item of SMP	Duration
Environmental Health and Safety Officer	Actual, during the project
and Social Development Specialist hired by	implementation
contractor, for on-site supervision	_

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING PROGRAMME- UMANANDA

1. GENERAL

The Environment and Social Management Plan (ESMP) is required to ensure sustainable development of the proposed terminal on river Brahmaputra both during the construction as well as operational phases. The ESMP is site and time specific. In order to effectively implement ESMP, an institutional framework has been developed and roles and responsibilities of various relevant agencies have been worked out. Capacity development program are also identified and part of the ESMP.

In general, Assam Inland Water Transport Development Society (AIWTDS), (with assistance from Contractor, Third Party Monitoring Consultant / Technical Support & Supervision Consultant) is the responsible entity for ensuring that the mitigation measures as suggested in the ESMP are carried out. A detailed ESMP has been prepared for Umananda terminal. The list provides reference implementing organisation and responsible entity.

COMPONENTS OF EMP

Key components of the EMP are summarized below and explained in detail in the following subsections:

- Mitigation Measures
- Monitoring Measures
- Institutional Arrangement
- Reporting Requirements
- EMP Budget

Site-specific environment and social riverine infrastructure along with the roles and responsibilities of the key persons involved at different phases of the proposed development are described below:

The Environmental Management Plan for Umananda Terminal for construction phase is given in **Table -1.1**, Social Management Plan in **Table 1.2** and environment budget in Table-2.

Table-1.1 Environment and Social Management Plan

Component	Environmenta	Remedial Measure	Monitoring	Institutional Resp	onsibility
	I Attribute and potential impacts		Indicators	Implementation	Supervi sion
Design					•
Development of the Final Design	The design of the infrastructure must be resilient to the Floods	The design must take into consideration the projected rainfall levels as in the Assam State Action Plan on Climate Change (2015- 2020). The Annual rainfall is likely to increase by 10-25 %, and the extreme rainfall days will increase by 5-38%, with the extreme rainfall increase projected to increase between 25 and 150 mm.	Assessment of Design for Resilience	Contractor	TSSC & PMU
	Design of the Riverbank Protection	The design of any reclamation and riverbank protection must be carefully assessed so that the hazards due to Bank failure do not affect the stability of the structure.	Assessment of Design for Resilience	Contractor	TSSC & PMU
	Collection and Treatment of Solid and Liquid Waste	The design of biodigesters at the Terminal must be an adequate size to meet the regular passenger demand. Additional space needs to be made available for setting up additional biotoilets for the pilgrim / festival. Adequate space must be made available to store municipal solid waste.	Assessment of Capacity of Bio- Digestor Assessment of space for the setting up bio- toilets, Adequate space for storage of Municipal Solid waste	Contractor	TSSC & PMU
	Energy Efficiency	Energy-efficient measures in the terminal buildings will be implemented; Solar power will be used in potential area	Use of Energy efficient Fitting and fixtures	Contractor	TSSC & PMU
Pre-Construction A	Activities			I o	D
Field Verification Surveys	Requirement for felling of trees	Permission of tree(s) removal from non-forest area -The GC/ PMU and the Contractor will carry out joint field verification to ascertain whether any tree would be affected and needs to be felled either for the construction activities or for safety purpose In case any tree must be felledPermissions must be obtained from the Forest	Copy of the Permit of the Forest Department, Government of Assam	Contractor	PMU , GC and TSSC

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		Department, Government of Assam. No tree would be felled without permission. At present there is no requirement for felling of trees			
Assessment of Impacts due to Changes/Addition s in the Project	Additional Impacts	Site-specific EMP before the commencement of construction -In case of any change in the event of changes/revisions (including addition or deletion) in the project's scope of work or change in the site condition. the impacts of the changes need to be assessedThe Contractor will also prepare site-specific EMP to address these additional impacts. The Site Specific EMP has to be submitted to the PMC for approval. The Construction activities must not start before the approval of site-specific EMP by the PMC.	Approved copy of the C-EMP	Contractor	PMU , GC and TSSC
Setting up of Plant and Machinery (Batching Plants or concrete mixer location)	Potential source of pollution (air quality, water quality, soil)	Location of Batching Plants -Batching plants will be sited sufficiently away from settlements, agricultural operations, or commercial establishments. Compliance with laws, ordinances, codes, rules, regulations, orders, or declarations -Concrete mixers and batching plants will comply with the requirements of the relevant emission control legislations and - Consent/NOC for all such plants obtained from the State Pollution Control Board will be submitted to the PIU. -The Contractor will not initiate plant/s operation till the required legal clearances are obtained and submitted. In case the concrete is procured from a third party, a valid consent of the plant, along with the latest copy of the Annual report, will be submitted to the PIU before the procurement of any material	Consent to Establish and Operate	Contractor	PMU, GC & TSSC
Procurement of	Potential for air	Statutory Compliance:-All	Certification by	Contractor	PMU, GC
Other Construction	pollution and noise	Construction equipment ¹ and	Manufacturer of		& TSSC

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¹ Every agricultural tractor, construction equipment vehicle and combine harvester shall be so manufactured that it complies with the following standards of gaseous pollutants as per rule 115A,after sub-rule (8), of the Central Motor Vehicle Rules, 1989.

Vahiolos	<u> </u>	machinany to be used in the	omingion and	1	
Vehicles, Equipment and Machinery		machinery to be used in the project will conform to BS IV standards to be adopted by the Ministry of Road Transport and Highways. The discharge standards promulgated under the Environment Protection Act, 1986, will be strictly adhered to. -Noise limits for construction equipment to be procured, such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws, will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment	emission and noise levels/ Pollution under Control Certificates, Insurance and Driving License of the driver to be submitted for all vehicles		
		(Protection) Rules, 1986. The Contractor will maintain a record of PUC for all vehicles and machinery used during the contract periodContractor will finalise the stone quarry /sand mine /	Permission for mining/ quarrying	Contractor	PMU, GC & TSSC
Sourcing of construction material	Unsustainable mining practices	borrow area for procurement of construction materials after assessment of the availability of sufficient materials and other logistic arrangements. TheContractor will provide a copy of the Environmental Clearance Certificate of the quarry/sand mine and the Consent to Establish and Operate along with the recent compliance report to the PMU before any such quarry is engaged. -In case the contractor decides to use new quarries then the contractor will obtain the environmental clearance and all other permits and licenses and submit the same to the PMU before extracting any material. The contractor will submit a copy of the approval and the rehabilitation plan to the PIU and the Environmental Expert of the PMU Consultant. -Contractor will also work out haul road network and report to the Environmental Expert of the PMC. They will inspect and in turn report to PMU before approval.	of materials from the Mining Department, District Administration and District Level Environment Appraisal Committee	Contractor	
Identification of water sources for construction	Adverse impact on water resources	-If the contractor will source water requirements for construction form groundwater, prior permission	Permission from the Ground Water Board for	Contractor	PMU, GC & TSSC

		from the Ground Water Board is required. A copy of the permission will be submitted to PIU prior to the initiation of construction. -A flow meter must be installed, and the records of water used for construction must I be maintained. The usage of groundwater must be recorded. -The contractor can use fresh groundwater sources after the required treatment for drinking. Even if water is sourced from third parties, the above provisions must be followedIn case, the river water is used, the permission of the Irrigation department must be	Permission of the Irrigation /Water Resources Department in case of River water is used.		
Environmental monitoring of baseline conditions of air, noise, water, and soil	To establish baseline environmental conditions and ascertain the impacts during the construction	Environmental monitoring to be carried out through recognised ² Laboratory as per the locations specified in the environmental monitoring plan in Table 8.4	Submission of test results to PMU	Contractor	PMU, GC & TSSC
EMP Implementation Training	phase Lack of awareness of EMP can lead to irresponsible behaviour resulting in an Irreversible impact to the environment, workers, and community.	-Project manager and all key workers will be required to undergo EMP implementation, including spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labour laws, applicable environmental laws, etc. Additional modules for Dolphin Protection and Cultural Heritage Management - All new personnel joining the work need to undergo induction training. All personnel joining work after a break of more than 15 days need to undergo refresher.	-Certificate of Completion (Safeguards Compliance Orientation) -Posting of EMP at worksitesMaintaining Records of training both induction and refresher -Submission of the Training records to the PIU every month	Contractor	PMU, GC & TSSC
	Deployment of EHS Officer and OHS Officer	Deploy qualified personnel and management committee. - Contractor must depute qualified EHS personnel in the start of the project to conduct training to all the personnel and effective monitoring of mitigation measures during	Submission of records of the availability of the EHS personnel onsite in the Monthly Report and Quarterly Report	Contractor	PMU, GC & TSSC

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² (National Accreditation Board for Testing and Calibration Laboratories (NABL) Accredited /Ministry of Environment Forest and Climate Change (MoEF&CC) / respective State Pollution Control Board (SPCB's)).

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		construction. The name and functions of the responsible EHS persons and their relevant expertise must be notified in the Quarterly Report -If an EHS person resigns/ replaced/replaced or the team has been enlarged, the same must be reported to the Bank within 15 days of the incident			
Legal compliance	Environmental legal noncompliance may	-Obtain all consents, clearances (CTE/CTO from ASPCB), permits NOCs etc., before start of construction worksEnsure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (Refer Table 3.1 in this report) -Following consents are requiredTree cutting-local authority -Storage, handling, and transport of hazardous materials-ASPCBSand mining, quarries, borrow areas- Department of mines and GeologyAcknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs etcInclude in detailed design drawings and documents all conditions and provisions; if necessary	Copy of the Permit/ Consent to be submitted with QPR to PMU	Contractor	PMU, GC & TSSC
Chance finds	Damage / disturbance to artifacts	Construction Contractors to follow these measures in conducting any excavation work. -Create awareness among the workers, supervisors and engineers about the chance finds during excavation work. -Stop work immediately to allow further investigation if any finds are suspected. -Inform State Archaeological Department if a find is suspected and taking any action, they require to ensure its removal or protection in situ.	-Chance Find Protocol -Awareness training for workers	Contractor	PMU, GC & TSSC
Preparation of Method Statement	Occupational Health Safety and Community Health Safety Impacts	Carry out a Hazard Identification and Risk Assessment for all tasks presented in the Method Statement Prepare occupational health and safety plan, including COVID-19 H&S Plan	- Occupational Health and Safety Plan (including HIRA) to be integrated with Method Statement - Community Health Safety Plan	Contractor	PMU, GC & TSSC

	Impact of Aquatic Species and Dolphins	Prepare Community Health Safety Plan to ensure that the community/ pilgrims are segregated from the construction area Prepare a Debris/spoils management plan, Waste Management Plan. Construction Planning must be carried out so that No- construction /piling (stop the construction activities) in the water part between Mid- March to Mid-June) Construction activities must	- Debris/spoils management plan, Waste Management Plan Construction Scheduling	Contractor	PMU, GC & TSSC
		not be planned on the waterside during the			
		monsoon period.			
Construction Stage				0	DMIL CO
Clearing and grubbing for site Preparation (Terminal Site, Base camp, Construction Camp & Labour camp)	Landscape and Aesthetics	Permission of tree(s) removal from non-forest area -Vegetation will be removed from the construction zone before the commencement of civil works. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is avoided or minimized. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from the Environmental Expert of the Consultant. The contractor, under any circumstances, will not cut or damage trees. Trees identified under the project and have received permission of felling from the Forest Dept will only be felled. - Compensatory afforestation must be carried out per the Tree Felling permission provisions.	Verification of number of trees felled; Copy of NOC from forest dept.	Contractor	PMU, GC & TSSC
	Loss of topsoil. Loss of natural resources (Earth/soil)	•Top soil (15 cm) would be stripped and kept separately in stockpiles for use in landscaping. • At least 10% of the acquired area for construction purposes must be kept for stockpiling of fertile topsoil •Precautions must be taken while stockpiling. The slope of the stockpile shall not exceed 1:2 (V:H) to retain soil & allow percolation of H ₂ O and the edges of the pile shall be protected by silt fencing. The piles shall be covered with gunny bags/	Site verification	Contractor	PMU, GC & TSSC

Transporting	Impacts on air	tarpaulin. The maximum height of the stockpiles shall be kept less than 2 m •Excavated materials would be preferably used for site filling for land reclamation to construct the terminal -Contractor will maintain all	Complaints from	Contractor	PMU, GC
Construction Materials and Haul Road Management	quality and safety	hauls roads (existing or built for the project), which are used for transporting construction materials, equipment, and machineries as précised. All vehicles delivering fine materials to the site will be covered to avoid spillage of materials or being blown away during the transportation. -Only major roads will be used by the contractor's vehicles or any of his subcontractor or materials suppliersRoads, which are part of the works, will be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. -Contractor will arrange for regular water sprinkling for dust suppression of all roads and surfaces. -The unloading of materials at construction sites in/close to settlements will be restricted to daytime only. -All stockpiles will be covered/protected to prevent dust generation	local community Visual observation in Site reports Monitoring of the air quality in the worksite and material storage area		& TSSC
	Impacts on Water Quality	- Boats/ Vessels carrying construction material must not be overloaded Loading and unloading activities must ensure that spillage does not occur loose and friable material transported by boat must be covered - Construction material must not be stored at the Umananda Site	Site Reports	Contractor	PMU, GC & TSSC
Storage of Construction Material	Potential for waterlogging	-The contractor will ensure that no construction materials like earth, stone, sand, or appendage are disposed of so as not to block the flow of water of any water course and cross drainage channelsThe contactor must not dump any excavated material into the riverThe contractor will take all necessary measures to prevent the blockage of water flow.	Complaints of water logging	Contractor	PMU, GC & TSSC

		-The stockpiled material must be prevented from erosion and deposition in the			
		drainage channel from sites where these are stocked for construction.			
	Water Pollution from Storage of Construction Material	Run-off from a material stockpile can also contaminate water. To prevent the contamination of the construction material, the following measures must be adopted; - The quantum of construction material at the Umananda site must be minimal as possible -The runoff from the construction material storage yard must be channelled through peripheral drains -The peripheral drains must be connected to sedimentation tanks (holding tanks excavated in the ground) of adequate capacity All sedimentation tanks and peripheral drains must be cleaned before the monsoon.	-Site visit Report -Number of sedimentation tanks installed Records of surface water quality MonitoringNo visible Sedimentation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU, GC & TSSC
f	Water Pollution from Fuel and Lubricants	- The contractor will ensure that all construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery, and equipment maintenance are in accordance with the provisions stated in (Annexure 19: Environmental Codes of Practice & Other Plans) -Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refuelling areas as per the design provided.	-Number of Oil interceptors installedRecords of surface water quality Monitoring No visible degradation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU, GC & TSSC
l l	Pollution of water bodies from domestic activities	-Wastewater from domestic activities such as bathing and washing at the camp site must be treatedThe Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering streams, water bodies or the irrigation system The liquid waste from the construction camp must be treated and disposed ofIn the absence of	-Adequate number of toilets as per no of labours - Records of surface water quality Monitoring; -No visible degradation to nearby drainages, nallahs or waterbodies due to civil works	Contractor	PMU, GC & TSSC

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		construction camp if the			
		contractor takes a rental			
		accommodation must be			
		channelized to the nearest			
		municipality drain. In the			
		absence of a municipality			
		drain, a septic tank and a			
		soak pit system of adequate			
		capacity must be constructed.			
		-Stagnation of water should			
		not be allowed at any place			
		near the campsite as a			
		precaution against vector-			
		borne disease.			
		Wastewater from the			
		Umananda Worksite			
		An adequate number of			
		toilets must be provided			
		Bio-toilets of adequate			
		capacity must be provided for			
		the workers based on no of			
		users.			
		The supernatant from the			
		Bio-digestor must be			
		discharged into the soak pits.			
		The Supernatant from the.			
		bio-toilets must be tested at			
		periodic intervals to meet			
		discharge standards			
		Collection of Food waste			
		and kitchen waste from			
		Construction Camp			
		_			
		-All waste arising from the			
		project is to be stored and			
		disposed of as per the			
		provisions of Annexure 19-			
		Environment Codes of			
		Practices & other Plans or as			
		directed by EHS Specialist of			
		the PMU			
		In the case of rented			
		accommodation,			
		arrangements must be made			
		with the Municipal corporation			
		for the disposal of the waste.			
		Collection and Disposal of			
		Food Waste from the			
		Umananda Construction			
		Umananua Construction	Ī		
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ĺ		Adequate space must be			
		Adequate space must be			
		Adequate space must be provided in the Construction			
		Adequate space must be provided in the Construction Site for the storage of Solid			
		Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be			
		Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river			
		Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting			
		Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid			
		Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be			
Construction	Degradation of	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out.		Contractor	DMII CC
Construction	Degradation of	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out.	-Construction	Contractor	PMU, GC
activities in	Water Quality	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out. -The piling work in the river must be undertaken during	methodology for	Contractor	PMU, GC & TSSC
	Water Quality due to piling	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out.	methodology for waterside	Contractor	
activities in	Water Quality	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out. -The piling work in the river must be undertaken during low-flow periodsTurbidity traps/curtains/ Geo-	methodology for waterside construction	Contractor	
activities in	Water Quality due to piling	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out. -The piling work in the river must be undertaken during low-flow periods.	methodology for waterside construction -Schedule of	Contractor	
activities in	Water Quality due to piling	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out. -The piling work in the river must be undertaken during low-flow periodsTurbidity traps/curtains/ Geo-Textile synthetic sheet	methodology for waterside construction	Contractor	
activities in	Water Quality due to piling	Adequate space must be provided in the Construction Site for the storage of Solid Waste No Solid waste should be discharged into the river Mechanisms of transporting and disposing of the Solid waste to Guwahati must be carried out. -The piling work in the river must be undertaken during low-flow periodsTurbidity traps/curtains/ Geo-	methodology for waterside construction -Schedule of	Contractor	

	construction areas to prevent sediments and construction waste movement.	completion of the works before monsoon/ develop a Monsoon Management Plan - Records of Works inspection		
Impact aquatic dolphin	life and be carried out so that No-	Preparation of the Dolphin / Aquatic Manal Management Plan 2. Logs for recording watch and ward for dolphins / turtles during the piling 3. Log for aquatic fauna monitoring	Contractor	PMU, GC & TSSC

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Degradation of Water Quality due to land reclamation	-If, despite the introduction of preventive measures, fish kills or impact on aquatic life is observed, then the work will stop immediately, and the methods will be reviewed and correctedIf drilling is carried out Polymer-based mud instead of bentonite to be used as drilling fluid with proper storage of polymer at designated storage areas. Drill cutting and spent drilling mud must not be disposed in the river - All equipment will be adequately maintained to prevent potentially hazardous or toxic products from leaking or spilling. This includes hydraulic fluid, diesel, gasoline and other petroleum productsThe piling activities must be carried out in the shortest possible timeframeSelect a construction methodology that is least disturbing and appropriate for the in-situ soil condition The reclamation work in the river must be undertaken during the low flow period - Schedule construction works to complete the construction work before the onset of the monsoonTurbidity traps/curtains/ Geo-Textile synthetic sheet curtains would be placed around the piling and construction area to prevent the movement of sediments	-Regular monitoring of site - Water quality tests	Contractor	PMU, TSSC and GC
Degradation of water quality due to construction activity	Select a construction methodology that is least disturbing and appropriate for the in-situ soil condition. Schedule construction works to complete the construction work before the onset of the monsoon. Schedule the construction works during the low water level period –ensure that works are completed during the same period before the onset of monsoon. - Inspection and maintenance of disturbed areas where mobilisation and barrier installation occur for sediment control measures.	(i) Construction methodology for waterside construction -Schedule of construction works to ensure completion of the works before monsoon/ develop a Monsoon Management Plan -Records of inspection of the sedimentation chamber -Effectiveness of water management measures.	Contractor	PMU, GC and TSSC

	-Washing of vehicles and equipment must not be carried	-No visible degradation of		
Degradation of water quality due to the coffer dam	out in rivers or nearby places. Erect the coffer dam to form an enclosed construction area with the least disturbance. Prohibit the discharge of turbid water directly into the river. All silt-laden water from the coffer dam must be pumped to a settling tank. Develop a settling tank of adequate capacity, and allow sufficient time to settle the distributed solids before pumping out water from the coffer dam; only clear/clarified water shall be pumped back into the river. Clear the work site after completion/ before monsoon at least to pre-project conditions; ensure that there are no materials, debris, spills etc., and before removal of temporary barriers/coffer dam/ before monsoon; and -Impervious material or clayey soil in gunny bags to be used. Outer area of the coffer dam must be covered with thick plastic sheets to minimise turbidity.	water quality -Water quality monitoring reports -No visible degradation of water quality	Contractor	PMU, GC and TSSC
Water Pollution from Fuel and Lubricants and hazardous waste	- Avoid/minimise storage of fuels, chemicals, and lubricants near the river/water; ensure no spillage - A temporary secured hazardous material handling and waste storage area must be provided at the construction site. As part of a design feature, a permanently secured ('bunded') impermeable surface and dykes capable of carrying 110% volume of materials for accidental spills or leakage must be constructed and maintained. Fuel transfer through decanting is prohibited. The use of a transfer pump with the proper fitting is suggestedThe storage area should be covered Dispose of any wastes generated by construction activities as per the guidance presented in Annexure 19	- No of spills reported -Field observation -Water quality monitoring reports	Contractor	PMU, GC and TSSC

		Environment Codes of Practices & other Plans and - Conduct surface quality inspection and monitoring according to the EMP Contractors will have emergency spill equipment available whenever working near or on the water.			
Construction on the landside	Deterioration of air quality from fugitive sources	Prevent Dust Generation -The soil/earth must be transported by covering the haulage vehicles with tarpaulin or any other good quality materialDust suppression measures by water sprinkling on worksites and temporary service and access roadsAll construction workers must be provided with pollution masks to mitigate the effect of dust generation on the health of workersConstruction Material must be transported in covered dump trucks to the project site. This must not be stockpiled at the project site - Clean wheels and undercarriage of haul trucks before leaving the construction site Loading and unloading of construction materials must be made at designated locations with provisions of water sprinklingConstruction vehicles, machinery & equipment must be regularly serviced and maintained and would have a valid PUC certificate -Don't allow non-project vehicle access in the work area, limit soil disturbance and prevent access by barricading and security personnelTraffic detours and diversions must be designed to minimise bottlenecks and ensure smooth trafficAir pollution monitoring must be carried out at specified locations as described in the monitoring plan to verify that the contractor follows air pollution norms and that the air quality at the construction site does not exceed the prescribed limits.	- Complaints from sensitive receptors Quarterly environmental monitoring report for ambient air, noise, water, and soil	Contractor	PMU, GC and TSSC
Use of Plant, Equipment	Emissions from	-The contractor will take every precaution to reduce	- Heavy	Contractor	PMU, GC and
Machinery and Vehicle	Construction Vehicles,	the level of dust from batching Plant/Cement	equipment and machinery with air		TSSC

Equipment and Machineries (Generation of Exhaust Gases) lead to the deterioration of air quality

Storage/, construction sites involving earthwork by a sprinkling of water, encapsulation of dust source and by the erection of screens/barriers.
-All the plants will be sited at

- -All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement.
- -The contractor will provide necessary certificates to confirm that all Plants, equipment, machinery, and vehicle used in construction conform to relevant dust emission control legislation.
- -No open burning of bitumen or preparation of hot mix is allowed.
- -No burning of firewood is allowed in the construction camp. The Contractor must make provisions for LPG cylinders.
- -Compliance with laws, ordinances, codes, rules, regulations, orders, or declarations
- declarations
 -All vehicles, plants and machinery used during construction must conform to the emission standards promulgated under the Environment (Protection) Act, 1986. The contractor will ensure that all vehicles, equipment, and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of PCB.
- -The Contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the project. Valid PUC must be maintained throughout the construction period

Monitoring results will also be submitted to PMU Consultant and PIU as per the monitoring plan.

monitoring plan.
-Contractor will ensure that all vehicles, equipment, and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of CPCB emission standards

pollution control devices.

- Latest Six-Monthly Compliance Report to ASPCB
- Valid Consent to Establish and Consent to Operate.
- Certification that vehicles are compliant with Air Act
- Quarterly environmental monitoring report for ambient air, noise, water and soil

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Noise pollution	The Contractor will confirm		Contractor	PMU, GC
leads to	the following:			and
inconvenience	 All plants and equipment 			TSSC
for the people	used in construction			
	(including third-party plants			
	and equipment) must			
	conform to the MoEF&CC/			
	CPCB noise standards.			
	- All vehicles and equipment			
	used in construction will be			
	fitted with exhaust silencers.			
	- Servicing of all construction			
	vehicles and machinery will			
	be done regularly and during			
	routine servicing operations,			
	the effectiveness of exhaust			
	silencers will be checked, and			
	if found defective will be			
	replaced.			
	-The activities must be			
	carried out during the			
	daytime. Night-time activities			
	may be carried out in an			
	emergency, but all measures			
	mentioned in the mitigation			
	measures for night work must			
	be strictly adhered to.			
	- Limits for construction			
	equipment used in the			
	project, such as concrete			
	mixers, cranes (moveable),	 Complaints from 		
	vibrators and saws, must not	sensitive		
		receptors.		
	exceed 75 dB (A) (measured	 Use of silencers 		
	at one meter from the edge of	in noise-producing		
	equipment in the free field),	equipment and		
	as specified in the	sound barriers.		
	Environment (Protection)	courta barrioro.		
	rules, 1986.			
	-Maintenance of vehicles,			
	equipment and machinery			
	must be regular and up to the			
	satisfaction of the			
	Environmental Expert of the			
	PMU Consultant to keep			
	noise levels at a minimum.			
	- No noisy construction			
	activities will be permitted			
	around educational			
	institutes/health centres			
	(silence zones) up to 100 m			
	from the sensitive receptors,			
	i.e., schools, health centres			
	and hospitals between 9.00			
	am to 6.0 pm.			
	-Restriction on Honking at the			
	project site			
	-Traffic management plans			
	prepared during the			
	construction mobilization			
	period must also be			
	implemented during the			
	construction stage. Effective			
	traffic management must be			
	taken care of in sensitive			
	locations, major built-up			
	areas, and along important			
	highway junctions.			
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		- Barricading (Temporary noise barrier) around the construction site to minimize the noise level -Monitoring must be carried out at the construction sites as per the monitoring schedule, and results will be submitted to PMC and PIUThe Environmental expert of PMC will be required to inspect regularly to ensure the compliance of EMP.			
	Vibration from the works.	No explosives should be used in construction activities. -Only mechanical equipment must be used to prevent Chances of damage from vibration. -If a mechanical vibrator/ pneumatic hammer is used within 100 m of the archaeological property, advice must be obtained from the State archaeological department for precautions. -The Contractor must employee an archaeologist to monitor the sites during the rock-cutting and piling activities.	-Complaints from sensitive receptors, Archaeology deptSite verification -Availability of trained man- power (archaeologist) at site	Contractor	PMU, GC and TSSC
	Contamination of Soil	Ensure all equipment, vehicles and other sources of fuels and lubricants will be collected and contained to avoid soil/ groundwater contaminationFuel must be stored in proper bounded and covered areasAll spills and collected petroleum products must be disposed of in accordance with the provisions mentioned in Annexure -Oil & Waste Storage -Maintenance and refuelling of vehicles, machinery and other construction equipment must be carried out on an impervious surface so that spillage of fuels and lubricants does not contaminate the groundThe runoff from the maintenance yard must lead to a peripheral drain and pass through an oil-water separator		Contractor	PMU, GC and TSSC
Safety aspects during the execution of works	Community Health Safety risks in Work Zones	The Contractor must ensure that: -The construction zone is hard Barricaded with MS Barricades of a height of 3.0 m.	-Barricading of the worksites -Traffic management Plan construction works, including number of	Contractor	PMU, GC and TSSC

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-Earplugs for workers
exposed to loud noise, and
workers working in concrete
mixing operations, piling and
other high-noise-generating
operations
-Adequate safety measures
for workers during the
handling of materials at the
site are taken up.
-All tools, tackle, lifting
instruments, and cranes must
have valid load certification.
The tools and tackle must be
regularly inspected by the Environment Officer / OHS
officer of the PMU.
-The contractor will comply
with all regulations regarding
safe scaffolding, ladders,
working platforms, gangways,
stairwells, excavations,
trenches and safe means of
entry and egress.
-All precautions must be
taken for working at heights.
-The contractor will comply
with all the precautions as
required for ensuring the
safety of the workmen as per
the International Labour
Organization (ILO)
Convention No. 62 as far as
those are applicable to this
contract.
-Ensure that qualified first aid
is always provided. Equipped
first-aid stations must be
easily accessible throughout the site.
- Provide medical insurance
coverage for workers.
-The Contractor will not
employ ad-hoc work
procedures, follow best &
acceptable work practices
-The contractor will document
work-related accidents.
Provide qualified & easily
accessible first-aid facilities
all times at all sites.
-Secure all installations from
unauthorised intrusion and
accident risks.
-Adequate illumination would
be provided at site during
evening and night time till the
work is being carried out
-Rest area for workers would
be provided with drinking
water and protected from the
elements of nature
- Barrier structures are of
sufficient height to prevent
WOULDO OF OLORFICING From
waves or overflows from
flooding in the enclosed area. Regular inspection must be

areas for storage and disposal. -Compliance to core labour laws

1		T		
	carried out for the coffer dam to ensure no water leakage in the construction area. -During working in River, workers must be made aware of risks of water depth, currents, and dangerous areas of water must be properly marked by fixed or floating barricades and signage of danger. Workers must also be made aware of the protection of the biodiversity of the water, and fishing must be strictly prohibited. A boat must be made available at the site to transport labour and materials and be well-maintained for emergencies. Workers must not be allowed to dip or bathe in rivers. A suitable working platform must be provided during construction works in water. -Life-saving equipment and lifeguards must be made available during the period of working in water. -The Contractor will mark 'hard hat' and 'no smoking' and other 'high-risk areas and enforce non-compliance of			
	enforce non-compliance of the use of PPE with zero tolerance. These will be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilisation and will be approved by the Safety Officer of PIU.			
Injuries/fatalitie s to the employees	Accident/Incident Reporting for SHE -The PIU must carry out an awareness campaign for the Do's and Do nots in construction sitesNear misses must be recorded and reported on a regular basis - Fortnightly meetings must be held with employees to make them aware of unsafe acts and practices.	-Record of near misses - Record of fatalities - No of workers' meetings -Labour Law Compliance Report generated through Labour Law Compliance system	Contractor	PMU, GC and TSSC
Cultural & Heritage Resources	- Adequate signs must be displayed in the access route for the devotees towards this cultural heritage and templesWarning signs about the construction activities must be provided to warm commuters/ pilgrims Regular supervision by an archaeologist to identify theimpact on these archaeological properties from vibration	i. No. of training for workers on precautions against vibration ii. Report by the Archaeologist in the Quarterly report.	Contractor	PMU, GC and TSSC

		-Make workers aware of chance finds and archaeological heritage - Make workers aware of controlled vibration when working within 100 m of the site			
Sanitation, Health & Safety	Unhygienic and unsafe living and working condition.	 Hygiene in the camps would be maintained by providing good sanitation and cleaning facilities. Camp would be well ventilated with adequate provision for illumination, kitchen and safe drinking water. Proper drainage to be maintained around the sites to avoid water logging. Proper sanitation with toilet and bathing facilities would be provided at the sites and labour camps. Wastewater generated from these facilities would be disposed through septic tanks and soak pit Preventive medical care to be provided to workers Segregated solid waste would be disposed of at municipal solid waste disposal location. LPG will be used for cooking in construction camps Provision would be made for day crèche for children First aid facilities, with room, personnel and ambulance would be available at the site. Also, tie-up with local hospitals would be done to handle emergency case, if any. Rest area would be provided at the site where workers can rest after lunch Working hours of labourers would not exceed the standard norms as per Factory Act Wastewater from construction site would not be allowed to be accumulated. Septic tanks/soak pits would be provided for its disposal. 	Site Verification	Contractor	PMU, GC and TSSC

Component	Social Attribute and	Remedial Measure		Institutional Re	
	potential impacts	. 51.1		Implementation	Supervision
	ident, Incident and Safe		Duilding and Other	Contractor	DMIL CC
1.1 Health &	Accident and Incident risk from construction	 -Local labour would preferably be employed 	Building and Other Construction	Contractor	PMU, GC and TSSC
Safety	activities and safety	for construction.	Workers		una 1000
•	of workers	-Site would be	(Regulation of		
	Impact on Social life.	barricaded and would	Employment and		
		have security guards.	Conditions of		
		-Register would be	Service) Act, 1996,		
		maintained for entry to the construction sites.			
		No unauthorized			
		person would be			
		allowed to enter the			
		site.			
		-A board in local			
		language at entrance of			
		site would display name of project, area and			
		hazards associated for			
		public awareness			
		-Rest area for workers			
		would be provided.			
		-Contractors would			
		adopt and maintain safe working practices.			
		SOPs would be			
		prepared and followed			
		for all activities under			
		supervision of site			
		engineer			
		-Complete medical check-up would be			
		done for workers prior			
		to joining and after six			
		months of joining			
		-Emergency telephone			
		nos. of hospitals, ambulance and doctors			
		would be displayed in			
		first aid room.			
		-Working hours of			
		labour should not			
		exceed norms as per state factory law			
		-Maintenance and			
		repair of any local			
		village road used for the			
		project activities should			
		be carried out both			
		before and end of			
		construction by contractor.			
Labour	-Risk of Gender	-Specifications on	-Contract Labour	Contractor	TSSC & PMU
Influx	based violence, STD,	employment of local	Act, 1970; and		
	HIV/AIDS to local	workforce including	-Inter-State		
	community Increased	women should be	Migrant		
	demand and	reflected in the civil	Workers Act, 1979		
	competition for local	works bidding documents and	Workers Accommodation:		
		uocumento and	Accommodation.		

social and health subsequent contracts to Processes and services ensure that the Standards (A -Social conflicts contractors fulfil these guidance note by between the local commitments. Locals IFC and EBRD) community and the including women may construction migrant be screened further for workers. skills, and adequate -Increased illicit orientations can be behaviour and crime provided to recruit for the work. AIWTDS can women, against which is a real threat prepare a roster of for Assam where interested workers and gender-based their skills violence is rampant -The project contractor -Increase competition needs to prepare a sitefor jobs and have an specific Labour Influx impact on wage Management Plan distribution and/or a Workers' Camp Management Plan. -Security personnel will be deployed at the construction sites, and emergency nos. including contact details of local law enforcement officers, project's helpline no., existing state-run women helpline nos. will be prominently displayed at the site. The contractors will ensure that an Internal Complaints Committee for (ICC) each establishment is set-up to meet their corporate requirement and legal mandate under the Sexual Harassment at the Workplace Act, 2013. -Health problems of the workers should be taken care of by providing basic healthcare' facilities through health centres temporarily set up for the construction camp. The health centre should have the requisite staff, free medicines and minimum medical facilities to tackle firstaid requirements or minor accidental cases. linkage with nearest higher order hospital to refer patients of major illnesses and critical cases. - Awareness camps on HIV/AIDS for both, construction workers

V C C C C C C C C C	and neighbouring villages must be organised at regular intervals by NGOs empanelled with NACO. -It is expected that among the women workers there will be mothers with infants and small children. The provision of a day care crèche as per the Building and Other Construction Workers (regulation of employment and conditions of service) act, 1996 is the contractor's responsibility. The crèche should be provided with trained women to look after the childrenIn case work schedule extents up till night, it should be ensured that women workers are exempted night shifts.	
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2. ENVIRONMENT MONITORING PLAN

Environmental Monitoring Programme is to ensure that the intended environmental protection goals are achieved and result in desired benefits of the project. The same will be included in tender / bid document. The broad objectives of the environment monitoring program are:

- To monitor impacts on the surrounding environment and the effectiveness of mitigation measures during the construction and operation phase.
- To ensure that the environmental control systems, installed are effective.
- Comply to the provisions of relevant environmental regulations.

The parameters to be monitor, frequency of monitoring, number of samples, locations and responsibility of monitoring is given in **Table- 2.1**

Table-2.1 Summary of Environmental Monitoring Programme: Construction Phase

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
1.	River Water					

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
	Physico- chemical parameters	pH, EC, TDS, Turbidity, Phosphates, Nitrates, Sulphates, Chlorides.		Surface Water Upstream- 2 • Downstream- 2 • Near Project site- 1 Ground water- 2 near the project site	As per AIWTDS directions	Contractor
			For two seasons in operation phase except monsoon			
	Biological parameters	Light penetration, Chlorophyll, Primary Productivity, Phytoplankton's, Zooplanktons	For three seasons in construction phase For two seasons in operation phase except monsoon	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor
2.	Sediments			1	<u> </u>	1
	Physico- chemical parameters	Texture, pH, Sodium, Potassium, Phosphate, Chlorides, Sulphates, Hg,	For three seasons in construction phase	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor
	Did in	Pb, Fe, Cu, Zn, Cd	seasons in operation phase except monsoon	Libratus es C		
	Biological parameters	Benthic Micro- fauna, Benthic Macro-fauna	For three seasons in construction phase. For two seasons in operation	Upstream- 2 Downstream- 2 Near Project site- 1	As per AIWTDS directions	Contractor

S. No.	Aspects	Parameters to be monitored	Frequency of monitoring	No. of Samples	Location	Responsibility
			phase except monsoon			
3.	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ and NO ₂	- For three seasons in construction phase and one season for operation phase Twice a week for four consecutive weeks per season.	Upwind- 2 Downwind- 2 Near Project site- 1	As per AIWTDS directions	Contractor
4.	Noise Quality	Equivalent Noise Level	During peak construction activities	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
5.	Soil Quality	N, P, K and Heavy metals	2 samples premonsoon season and 2 samples postmonsoon in construction phase and one season during operation phase	Construction site- 1 Labour Camp- 2	As per AIWTDS directions	Contractor
6.	Dolphin study	Assessment and presence of Dolphins, survival etc.	Once per year		As per AIWTDS directions	AIWTDS

^{*}Note: All the Samples to be collected as per standard norms. Parameters and components may vary as per requirement.

3. BUDGET FOR EMP

Tentative Environment budget has been prepared for design, construction and operation phase of the project which includes the cost of environmental structures like septic tank & soak pit, Air Pollution Control System at terminals, monitoring, enhancement measures, training and awareness and technical support for establishment, enhancement measures and environmental guidelines. The summary of the environmental budget is given below.

Table 3.1 Summary of Environmental Budget- Construction Stage

S. No.	Particulars	Stages	Costs Covered By
A.	Monitoring Measures		
1	Water Quality Monitoring	Pre -Construction	Contractor

S. No.	Particulars	Stages	Costs Covered By
		Construction	Contractor
2	Biological Monitoring	Pre -Construction	Contractor
2	Biological Monitoring	Construction	Contractor
3	Sediments: Physico	Pre -Construction	Contractor
3	Chemical	Construction	Contractor
4	Sediments: Biological	Pre -Construction	Contractor
4	Sediments. Biological	Construction	Contractor
5	Ambient Air Quelity	Pre -Construction	Contractor
5	Ambient Air Quality	Construction	Contractor
6	Noise Quality	Pre -Construction	Contractor
6	Noise Quality	Construction	Contractor
7	0-11-0	Pre -Construction	Contractor
7	Soil Quality	Demobilisation	Contractor
		Pre -Construction	Contractor
		Construction	Contractor
8	Groundwater	Camp/Kitchen During Construction	Civil works contract
		Decommissioning	
	Subtotal (A)		
B.	Capacity Building		
1	General environmental awareness; environmental and social sensitivity of the project influence area; Key findings of the EIA; Mitigation measures; EMP; Plans and Protocols Social and cultural values of the area. (1 day)	Training for Selected staff of AIWTDS, supervisor, and contractors, Vessel Operators (at the beginning of Contract)	TSSC
2	Training for Ghat management'	Section officers/ Vessel operators/ Masters/ Khalasi , Ghat officers, Ghat Maintenance workers etc.(At Beginning of Construction)	Contractor
3	Community issues; Awareness of transmissible diseases; social and cultural values.	Construction Crew (once every six months)	Contractor
4	EMP; Waste disposal, Cultural values and social sensitivity.	Once every year or as directed by the PIU	Contractor
5	Road/waterway safety; Defensive driving/sailing; Waste disposal;	Drivers; boat/launch crew, (once every year)	Contractor
6	Camp operation; Waste disposal; Natural resource conservation; Housekeeping.	Camp staff (once every quarter)	Contractor

S. No.	Particulars	Stages	Costs Covered By
7	Construction Implementation requirements; handling situations for important flora / fauna especially Dolphin; Physical Cultural resources;	PIU; supervisor Selected crew members and contractors (once every six months)	Contractor
8	Health and safety equipment on board and in terminals	Selected crew members and Vessel operators/ Masters/ Khalasi etc.	Contractor
9	Environment Management tracking System	AIWTDS	Contractor
	Subtotal (B)		
C.	Construction Contractor EMP Implementation		
5.	Water Sprinkling Measures for Dust Suppression	Construction	The cost is integrated as part of the civil work cost
6	Development and Implementation of the Dolphin Management Plan of Contractor	Construction	The cost is integrated as part of the civil work cost
7	Providing, fixing, maintaining, shifting & refixing, barricading of minimum 2.0m height at stipulated active site of the same project site, made with angle iron frame of 50x50x5mm and GI sheet of 0.63mm thick including primer painted initially, painting, lettering & border with reflective paint at the time of every shifting, traffic diversion arrangement, safety guard, suitable lightning arrangement during night, complete in all respect till completion of the project as per technical specification and direction of Engineer-Incharge and same shall be possessed by the contractor after completion of the Project	Construction	The cost is integrated as part of the civil work cost
8	Supplying and fixing of cautionary and or informative signs boards including the cost of posts, fixtures, fixing, foundation, fitting and fixing. Sheeting will be made of encapsulated lens type of retro-reflective type and message / borders will be screen printed complete as per screen specification in IRC SP 55: 2001. To be made available at all time at the	Construction	The cost is integrated as part of the civil work cost

S. No.	Particulars	Stages	Costs Covered By
	work sites as required and directed by the engineer		
9	Supplying and fixing of flashing beacon warning lights including the cost of posts, fixtures, fixing, foundation, fitting and fixing, cost of material, labour, loading, unloading, lead, lift, shifting, transportation etc. and as per specification in IRC SP 55: 2001	Construction	The cost is integrated as part of the civil work cost
10	Provision and maintenance of Bio toilets with 1 male and 1 female units including cost of material, labour, loading, unloading, lead, lift, transportation, shifting etc. And shall be made available at worksite at the direction of the PIU. The facility shall complete with water arrangement, privacy, lighting arrangement. The WC and /urinals should be made of stainless Steel and the partitions should be made of aluminium framework with FRP panels. The bio-digester tank should be approved by Defence Research & Development Organisation (DRDO)or any other competent agency. The whole toilet shall be mounted on MS framework with skids; Overhead water tank shall be made of HDPE with proper arrangement of ball cock and mosquito proof cover. These should also be provided with two dustbin for wet and dry waste. The bio-digester toilets shall be mounted on skids and shall not require any creation of permanent structure so that they can be shifted from one worksite to another	Construction	The cost is integrated as part of the civil work cost
11	Provision of Helmets (IS CODE 2925 : 1984) , Safety Shoes (IS CODE 5852 : 1996), Googles (*IS CODE 5983 : 1980), Reflective Jackets, mitten/ gloves (IS 2573) , safety nose masks to all personnel (including	Construction	The cost is integrated as part of the civil work cost

S. No.	Particulars	Stages	Costs Covered By
	temporary labour) involved in the worksites		
12	Provision of First Aid Kits for worksites	Construction	Civil works contract
13	Provision and maintenance of waste collection bins in sets of 2 (blue and green) for collection of municipal solid waste generated at the worksite including cost of material , labour, loading, unloading, lead, lift, shifting, transportation etc.	Construction	The cost is integrated as part of the civil work cost
14	Environment, Health & Safety Engineer/Supervisor having Bachelors in Env Science / Management/ B. Tech (Env Eng.)	Construction	The Manpower Cost is integrated into the cost of the Civil Works
15	Diploma in Central Labour Institute / Regional Labour Institute (Mandatory)	Construction	The Manpower Cost is integrated into the cost of the Civil Works
	Subtotal (C)		_
D	PIU/AIWTDS EMP Implementation cost		
1	EMP Supervision Cost	Construction	PIU Cost
2	Equipment	Construction	PIU Cost

4. BUDGET FOR SMP

The various activities for social management under the subproject to be undertaken by the contractor are given in **4.1**

Table 4.1: Summary for Social Budget (Construction phase)

Item of SMP	Duration
Training for contractor staff on labour laws	Actual, before and during the
such as Building and Other Construction	project implementation time
Workers (Regulation of Employment and	
Conditions of Service) Act, 1996;	
The Bonded Labour System (Abolition) Act,	
1976;	
The Workmen's Compensation Act, 1923;	
The Contract Labour (Regulation & Abolition)	
Act, 1970 and Rules;	
The Child Labour (Prohibition and	
Regulation) Act, 1986;	
The Indian Factories Act, 1948 and State	
Rules;	
Public Liability and Insurance Act, 1991;	
The new labour Act like The Code on Social	
Security, 2020 and The Code on Wages,	
2019,	

Item of SMP	Duration
Social safeguards training including training	Actual, before and during the
of staff on GRM.	project implementation time
GBV training (SEA and SH)	
Environmental Health and Safety Officer and Social Development Specialist hired by	
contractor, for on-site supervision	Implementation