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## 10. ENVIRONMENT SCREENING AND PRELIMINARY ENVIRONMENT ASSESSMENT

### 10.1 INTRODUCTION

NHIDCL has appointed M/s Aarvee Associates Architects Engineers & Consultants Pvt. Ltd. for the work of consultancy services for preparation of DPR and Pre-construction services from – (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 & NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi

The LOA for the project was awarded to M/s Aarvee Associates Architects Engineers & Consultants Pvt. Ltd vide Letter No. NHIDCL / Assam / DPR / Silchar Churaibari / 222542 / 2581 and the agreement was signed on 1st September 2023.

### 10.2 PROJECT DESCRIPTION


As per ToR, the scope of the consultancy services comprises of “preparation of DPR and Pre-construction services from – (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 & NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi”

*Table 10-1: Package details*

S. No	Package.	Chainage		Length (km)	Geographic Coordinates		District
		From Km.	To Km.		Start	End	
1	VII	0.000	14.380	14.360	2746699.76N 436018.77E	2751077.61N 423927.10E	Karimganj

### 10.3 PRELIMINARY ENVIRONMENTAL ASSESSMENT

This Report describes the proposed work plan related to environmental aspects and makes desirable modifications, keeping in view the requirement of the Project Road. Standard methods / procedures will be adopted during environmental monitoring analysis and report preparation. The exact sampling locations and number will be finalized during field studies. However, tentative sampling number is provided at this stage. The methodology for carrying out the study and specifications pertaining to environment to be adopted in this project are as follows:

	<b>Consultancy services for preparation of DPR and Pre-Construction services from</b> <b>(i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at</b> <b>Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-</b> <b>Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY</b> <b>ENVIRONMENT</b> <b>SCREENING &amp;</b> <b>ASSESSMENT</b>
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### 10.3.1 Objectives

The major objective of this study is to establish present environmental condition along the project corridor through available data/ information supported by field studies to evaluate the impacts on relevant environmental attributes due to the construction & operation of the proposed project; to recommend adequate mitigation measures to minimize/ reduce adverse impacts and to prepare an Environmental Management Plan (EMP) for timely implementation of the mitigation measures to ensure that the project will result in a high quality and safe road to users in a sustainable and environment-friendly manner. An Environmental Impact Assessment (EIA) study basically includes:

- Establishment of the present environmental scenario.
- Study of the specific activities related to the project;
- Evaluation of the potential environmental impacts.
- Undertake an analysis of alternatives by bringing in environmental considerations into the upstream stages of sub-project planning and design;
- Preparation of Environmental Management Plan that specifies the measures to mitigate adverse impacts and enhance positive impacts of the sub-project on the environment, along with the monitoring, capacity building and institutional arrangements.

### 10.3.2 Need for Environment Impact Assessment


Highway developmental activities should be planned and executed after considering the potential environmental impacts. To minimize these adverse impacts that may be created by highway development projects, the techniques of Environmental Impact Assessment (EIA) become necessary. Identification and assessment of potential environmental impacts should be an integral part of the project life cycle. It should commence early in the planning process of the project to enable a full consideration of alternatives and to avoid later delays and complications.

### 10.3.3 Legal and Environmental Clearance requirements

The increase of environmental concerns has necessitated appropriate tools to protect the environment. India has developed a comprehensive regulatory framework to address environmental and social concerns in relation to development projects. Its wide-ranging enactments cover almost all major issues that need to be addressed in the course of development of infrastructure from a social and environmental perspective. This section describes the institutional set-up and key legislation pertaining to environmental issues.

#### **Institutional Framework**

The Ministry of Environment, Forest and Climate Change (MoEF&CC) to serve as the focal point in the administrative structure for the planning, promotion and coordination of environmental and forestry programmes. The Ministry of Environment and Forests (MoEF) has

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been renamed recently in the year 2014 as Ministry of Environment and Forest and Climate Change (MoEF&CC). The MoEF&CC has overall authority for the administration and implementation of government policies, laws and regulations related to the environment, including conservation, environmental assessment, sustainable development and pollution control. MoEF&CC identifies the need to enact new laws and amend existing environmental legislation when required, in order to continue to conserve and protect the environment. At the state level, the MoEF&CC authority is implemented by the Department of the Environment and the Department of Forest.

In 1976, the 42nd Constitutional Amendment created Article 48A and 51A, placing an obligation on every citizen of the country to attempt to conserve the environment. As a result, a number of laws related to environmental conservation were passed to strengthen existing legislation. Environment (Protection) Act, 1986 is the landmark legislation as it provides for the protection of environment and aims at plugging the loopholes in the other related acts.

The Government of India through specific legislation regulates the environmental management system in India. The Ministries / Statutory Bodies responsible for ensuring environmental compliance by project proponents include:

- The Ministry of Environment & Forests and Climate Change (MoEF&CC).
- Central Pollution Control Board (CPCB).
- Department of Environment in the States.

#### **10.4 APPLICABILITY OF INTERNATIONAL, NATIONAL AND STATE ENVIRONMENTAL NORMS**

The proposed highway development project is attracting various International, National, State, and World Bank environmental laws, rules and regulations. These regulations and rules are helpful in impact mitigation and improvement of the environment. The environmental assessment study will be carried out as per the requirement of the National/State/World Bank environmental guidelines. The applicability of the regulatory norms is given in table below:

*Table 10-2: Applicability of Environmental Regulatory Norms for the Project*


Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
“preparation of DPR and Pre-construction	<ul style="list-style-type: none"> <li>• Right of Way</li> <li>• Land Acquisition</li> <li>• Protected Social</li> </ul>	The Environment (Protection) Act, 1986 and further notifications issued under this Act.	Any act during implementation causing damage to environment.

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
services from – (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 & NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi”	<p>Forestry throughout the Right of Way (RoW)</p> <ul style="list-style-type: none"> <li>Quarries</li> <li>Borrow Areas</li> <li>Establishment of Hot Mix Plants and Batch mix Plants</li> <li>Sensitive Locations (Schools, hospitals, etc.,)</li> <li>Archaeological Sites</li> </ul>		As per the Environment (Protection) Act (EP) 1986, ambient noise levels are to be maintained as stipulated by the Central Pollution Control Board (CPCB) for different categories of areas like, commercial, residential and silence zones, etc., during sub-project construction and operation. Section -3 (2)(iii & iv).
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 – as amended in 1978 & 1988.	Section 3 (2)(a) of the Act and Cess to the Govt. of India as per Table -I & II for consumption of water for domestic, commercial and industrial purposes.
		Forest (Conservation) Act, 1980 – as amended in	Applicable if the project involves any

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
		1988.	activities in the reserved forests, village forests, protected forests and other areas as declared by the state Government. Forest Conservation Act – Chapter –2.4 and Chapter –3.0.
		The Ancient Monuments and Archaeological Sites and Remains Act, 1958, as amended in 2010. Ancient Monuments and Archaeological Sites and Remains Rules, 1959.	Applicable if the project involves any activities in the close proximity (less than 200m) of Ancient Monuments and Archaeological Sites
		Wildlife Protection Act, 1972, amended thereof. The Wildlife (Protection) Rules, 1995.	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land. It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
		Coastal Regulation Zone (CRZ) Notification 1991 as amended till January 2011	Not Applicable
		The Hazardous Wastes (Management and	Materials such as heavy metals, toxic

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
		Handling) Rules, 1989 and subsequent amendments thereof till date.	inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation shall be stored and disposed of as per the Rules. Rule 17, 18 & 19 of the Act.
		The Public Liability Insurance Act, 1991.	Act enables the people to access legal aid to claim compensation in the event of an accident occurred while handling any hazardous substance. So insurance needs to be taken up by the project implementing agencies or contractors. PLI Act: Act 6 of 1991 as amended by Act 11 of 1992.
		Ministry of Environment Forests & Climate Change (MoEF&CC) EIA Notification (New) issued on 14 <sup>th</sup> September, 2006 and subsequent amendments thereof till date.	The proposed project stretch is less than 100 Kms in length. Hence, the project does not attract the Environmental Clearance from MoEF&CC.




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Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
		World Bank Operational Directive and Operational Policies for Environmental Impact Assessment OP:4.01, OP 4.04: Natural Habitats, OP 4.36: Forests, OP 4.11: Operational Policy on cultural property and OP 4.12: Involuntary Resettlement for roads & highways projects.	Applicable in preparation of Environmental assessment report, protection of cultural property, forest clearances etc.
		Noise Pollution (Regulation and Control) Rules, 2000	Applicable Under Rule 3(1) & 4 (1) - Clause 2, 3 & 6.
		Land Acquisition Act 1894 Land Acquisition Act 1989 & RFCTLARR Act, 2013.	Applicable. To set out rules for the acquisition of land by Government.
		Motor Vehicles Act, 1988 Rules of Road Regulations, 1989	Applicable. To enforce highway codes during construction and operation.

A brief description of the relevant laws is given below:

#### EIA Notification, 2006

This is the Indian Government's Guidelines for environmental impact assessment governing all of the development interventions that takes place within the boundaries of India. EIA notification was issued by the Ministry of Environment, Forests and Climate Change (MoEF&CC) in 2006. Under this EIA Notification, the projects listed in Schedule-1 of the Notification require prior environmental clearance. The objective of the notification is to formulate a transparent, decentralized and efficient regulatory mechanism to:

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- Incorporate necessary environmental safeguards at planning stage.
- Involve stakeholders in the public consultation process
- Identify developmental projects based on impact potential instead of the investment criteria

As per EIA Notification, 2006 and amendment thereafter, “Expansion of National Highways greater than 100 Km involving additional Right of Way or land acquisition greater than 40 m on existing alignment and 60 m on re-alignments or bypasses” may require clearance from EAC, MoEF&CC. As per Honorable Supreme court’s direction, 10 km radius from the boundary of wildlife sanctuary will be considered as eco-sensitive zone till the actual radius of the Eco-sensitive zone around the wildlife sanctuary boundary is notified by the state government. The MDR and ODRs do not come in the purview of EIA Notification, 2006.

#### Forest (Conservation) Act, 1980

This Act is of particular significance in case the project corridors require acquisition of forest land outside the RoW of the road corridors as a result of the rehabilitation work proposed. The Indian Forest Act (1927) was amended in 1980 in an attempt to check the rapid deforestation occurring throughout India and the Forest (Conservation) Act, 1980 came into existence. At the state level, the government was empowered to declare reserves and protected forest and was also given the authority to acquire land for extension and preservation of the forests. An advisory Committee was formed to supervise compliance, within other government departments. In December 1996, a Supreme Court Judgment further defined the types of forests to be protected. The Ministry of Environment and Forests in their Corrigendum to Part II, Section 3, Sub-section (i) of Forest (Conservation) Amendment Rules, 2004 issued vide G.S.R. 107(E) dated 9th February, 2004, which explains the procedure for application for diversion of forests land depending on the area involved as follows:

- The proposal involving forest land up to 40 hectares shall be forwarded by the concerned State Government along with its recommendations, to the Chief Conservator or Forests or the Conservator of Forests of the Regional Office of the Ministry of Environment and Forests Government of India.
- The Chief Conservator of Forests/ Conservator of Forests of the Regional Office shall within a period of 45 days of the receipt of the proposal from concerned, decide the diversion of proposal upto 5 Ha.
- If the forest land is more than 5 and upto 40 hectare, The Chief Conservator of Forests/ Conservator of Forests of the Regional Office process, scrutinize and forward diversion proposal along with the recommendations, if any, to Ministry of Environment and Forests, New Delhi for obtaining decision of the Central Government and inform the State Government and the User Agency concerned.

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- The proposal involving more than 40 ha of forest area, shall be forwarded by the concerned State Government along with its recommendations, to the Ministry of Environment and Forests, New Delhi

#### Guidelines for Diversion of Forest Land for Widening or Realignment of Road

As per Forest (Conservation) Act, the roadside plantation within the ROW notified as protected forests for management purposes will need approval from the Central Government under Forest (Conservation) Act, 1980.

The Regional Offices shall be competent to finally dispose of all such proposals irrespective of the area, preferably within 30 days from the date of receipt of the proposal. While the approval, in place of normal provisions for compensatory afforestation, the Regional Offices will stipulate a condition that for every tree cut at least two trees should be planted.

However, if the decision is not ordered by the concerned Regional Office within 30 days of the receipt of fully completed application, the Central Government / State may proceed with the widening/modernization under intimation to the local State Forest Department and Central Government.

All the cases for forest clearance are now required to be applied online on the MoEF&CC website. From there the application will be forwarded to the Nodal Officer of respective state for further processing of application. The user agency will submit the proposal in the prescribed format through the State Forest Department to the concerned Regional Office of the Ministry.

#### Wildlife Protection Act, 1972


The Wildlife Protection Act, 1972 has allowed the government to establish a number of National Parks and Sanctuaries over the past 25 years, to protect and conserve the flora and fauna of the state.

#### The Water (Prevention and Control of Pollution) Act, 1974

The act resulted in the establishment of the Central and State level Pollution Control Boards whose responsibilities include managing water quality and effluent standards, as well as monitoring water quality, prosecuting offenders and issuing licenses for construction and operation of any facility. This will include generation of liquid effluent during construction of road from civil engineering activities or from domestic activities in workers colony. There are specific penalties for violation, which include imprisonment for responsible officials.

#### The Air (Prevention and Control of Pollution) Act, 1981

The act empowers Central and State Pollution Control Boards for managing air quality and emission standards, as well as monitoring air quality, prosecuting offenders and issuing licenses for construction and operation of any facility. Air quality includes noise level standards. There are specific penalties for violation, which include imprisonment for responsible officials. This act has notified National Ambient Air Quality Standard for different regions e.g. Industrial,

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Residential and Sensitive. Air quality during construction and operation phases will be guided by this specific act.

#### Environment (Protection) Act, 1986

This act was passed as an overall comprehensive act “for protection and improvement of environment” Under this act rules have been specified for discharge/emission of effluents and different standards for environmental quality. These include Ambient Noise Standard, Emission from Motor Vehicles, Mass Emission standard for Petrol Driven Vehicles, General Effluent Standards etc. especially important for road project.

#### Fly ash Notification, 2016


According to the Notification No. S.O. 763 (E), dated 14.09.1999 and its amendment thereafter on 27.08.2003 and notification S.O. 2804 (E) dated 3rd November 2009 by Ministry of Environment and Forests, it is mandatory to use fly ash within a radius of 300 kilometers of Thermal Power Plant. No agency, person or organization shall within a radius of 300 kilometers of Thermal Power Plant undertake construction or approve design for construction of roads of flyover embankments in contravention of the guidelines/ specification issued by the Indian Road Congress (IRC) as contained in IRC specification No. SP: 58: 2001. Any deviation from this direction can only be agreed to a technical reason if the same is approved by Chief Engineer (Design) or Engineer-in-chief of the concerned agency or organization or on production of certificate of “Pond ash not available” from the Thermal Power Plant(s) located within 100 kilometers of the site construction. This certificate shall be provided by TPP within two working days from the date of making request for fly ash.

Soil required for top or side cover of embankment of roads or flyovers shall be excavated from the embankment site and it is not possible to do so, only the minimum quantity of the soil required for the purpose shall be excavated from soil borrow area. In either case, the topsoil should be kept or stored separately. Voids created due to soil borrow area shall be filled up with ash with proper compaction and covered with topsoil kept separately as mentioned above. No agency, person or organization shall within a radius of 100 kilometres of coal or lignite based Thermal Power Plant allow reclamation and compaction of low-lying areas with soil. Only pond ash shall be used for compaction. They shall also ensure that such reclamation and compaction is done in accordance with the byelaws, regulation and specification laid down by Authorities.

#### World Bank Safeguard Policies

##### Environmental Assessment – OP 4.01 Requirements

Operational Policy 4.01 (OP 4.01) is one of the ten safeguard policies of the World Bank, which provides the Environmental Assessment (EA) guidance for the lending operations. The OP 4.01 requires the borrower to screen projects upstream in the project cycle for potential impacts. Thereafter, an appropriate EA approach to assess, minimize, enhance and mitigate potentially adverse impacts is selected depending on nature and scale of project. The EA needs to be

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integrated in the project development process such that timely measures can be applied to address identified impacts. The policy requires consultation with affected groups and NGOs to recognize community concerns and the need to address the same as part of EA.

#### Cultural Property – OP 4.11 Requirements

The World Bank's Operational Policy Note 4.11 aims at preserving and avoiding the elimination of structures having archaeological (prehistoric), paleontological, historical, religious and unique natural values. Projects that could significantly damage non-replicable cultural properties are declined for funding and the Bank will in turn assist protection and enhancement of cultural properties encountered in the project rather than leaving that protection to chance.

#### Natural Habitats – OP 4.04 Requirements

Operational Policy 4.04 sets out the World Bank's policy on supporting and emphasizing the precautionary approach to natural resource management and ensuring opportunities for environmentally sustainable development. As per this policy, projects that involve significant conversion or degradation of critical natural habitats are not supported by the Bank. Projects involving noncritical habitats are supported if no alternatives are available and if acceptable mitigation measures are in place.

#### Forests – OP 4.36 Requirements

OP 4.36 sets out specific policy on protection of forests through consideration of forest related impacts of all investment operations, ensuring restrictions for operations affecting critical forest conservation areas, and improving commercial forest practice through use of modern certification systems. The policy requires consultation with local people, the private sector and other stakeholders in forest area.

#### Involuntary Resettlement OP 4.12


This policy describes Bank policy and procedures on involuntary resettlement as well as the conditions the borrowers are expected to meet in operations involving resettlement. The objective of the Bank's policy is to ensure that populations displaced by a project also benefit from the project and that livelihood and standards of living are improved, or at, least restored to earlier levels.

#### Indigenous People OP 4.20 Requirements

The World Bank policy on indigenous peoples, OP/BP 4.20, Indigenous Peoples, underscores the need for Borrowers and Bank staff to identify indigenous peoples, consult with them, ensure that they participate in, and benefit from Bank-funded operations in a culturally appropriate way- and that adverse impacts on them are avoided, or where not feasible, minimized or mitigated.

As per the World Bank's Environmental Safeguard policy, the project coordinating entity or implementing institution carries out Environmental Assessment (EA) during the preparation of each proposed sub-project according to country requirements and the requirements of this policy. The Bank appraises and recommends to strengthen the capabilities of the coordinating



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entity or the implementing institution to (a) screen sub-projects, (b) obtain the necessary expertise to carry out EA, (c) review all findings and results of EA for individual sub-projects, (d) ensure implementation of mitigation measures (including, where applicable, an EMP), and (e) monitor environmental conditions during project implementation. If the Bank is not satisfied that adequate capacity exists for carrying out EA, all Category A sub-projects and, as appropriate, Category B sub-projects including any EA reports are subject to prior review and approval by the Bank.

The purpose of conducting an environmental assessment (EA) is to identify environmental and social consequences of the proposed sub-projects or components, in order to:


- Ensure the identification of potential environmental issues and social concerns early in the implementation of a proposed project to incorporate necessary safeguards in project design to prevent potential adverse impacts by determining appropriate mitigation and compensation measures.
- Minimize risks and enhance positive impacts/benefits;
- Avoid delays and extra costs which may subsequently arise due to unanticipated environmental problems.
- Identify the potential for maximizing environmental resources management and socio-economic benefits to local communities within the scope of the sub project;
- The EA should cover physical-chemical, biological, socio-economic and cultural issues that are likely to arise during upgrading and widening of roads safety risks and appurtenance structures and associated activities as appropriate.

The World Bank has classified the type of projects into following categories depending on the extent of the impact on environment:

**(i) Category A:** A proposed project is classified as Category A, if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. Such project requires full EIA study.

**(ii) Category B:** A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas— including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects.

**(iii) Category C:** A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

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**(iv) Category FI:** A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in sub projects that may result in adverse environmental impacts.

Thus, for Category-A project detail Environmental Assessment would be required. For the project requiring Environmental Clearance from the MoEF&CC, detailed Environmental Impact Assessment would be required in accordance with the Environmental Impact Assessment Notification, 2006 and amended thereafter. For Category-B projects site specific EA is required and a generic environmental management plan (EMP) would be required to be prepared for such project. For Category C projects no study beyond environmental screening is required.

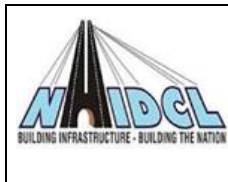
#### Statutory Clearance for Borrow area and stone quarry

Mining of minor minerals such as sand, gravel, clay, marble and other stones will not be allowed in the country without the approval of the Central government. The Honorable Supreme Court, vide its order dated 27.02.2012 in I.A.No.12-13 of 2011 in SLP (C) No.19628-19629 of 2009 titled Deepak Kumar etc. Vs. State of Haryana & Ors. has inter alia ordered that leases of minor mineral including their renewal for an area less than 5 ha be granted by the State / Union Territory only after getting environment clearance (EC) from the Ministry of Environment, Forests and Climate Change (MoEF&CC). In order to ensure compliance of the aforesaid order of the Hon'ble Supreme Court, MoEF&CC issued an OM No.L-11011/47/2011-IA.II(M) dated 18.05.2012 stating inter alia that all mining projects of minor minerals including their renewal, irrespective of the size of the lease would require prior EC and that the projects of minor minerals with lease area less than 5 ha would be treated as Category "B" as defined in EIA Notification, 2006 and will be considered by the respective State Environment Impact Assessment Authorities (SEIAAs) notified by MoEF&CC and following the procedure prescribed under the EIA Notification, 2006. The mining projects having more than 5 Ha of lease area will be categorised as Category A project and will be appraised by Central Committee of MoEF&CC.

Regarding the borrow area for ordinary soil, the Contractor has to obtain environmental clearance from State Environmental Impact Assessment Authority (SEIAA) of MoEF&CC in compliance to the Supreme Court's order and MoEF&CC conditions vide their circular no. L-11011/47/2011-IA.II(M) dated 20th June, 2013. If the area of a borrow area is less than 5 Ha then this will be treated as Category-B-2 Project and will be appraised and approved based of only Form-1. No EIA study will be required for such area. However if the size of the borrow area is more than 5 Ha then it will be categorized as "Category-B1" and therefore will require EIA study, based on which the SEIAA will give clearance for the same.

#### Applicability of Clearances:

##### Environmental Clearance



Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 & NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)

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Environmental Impact Assessment (EIA) Notification issued on 14<sup>th</sup> September 2006 (amended) by the MoEFCC, Govt., of India and as per the amended Notification of the MoEF&CC on 22<sup>nd</sup> August 2013 on Highway projects. New, expansion or modernization of any activity falling within the 32 categories of developmental and industrial activities shall be undertaken in any part of India only after it has been accorded environmental clearance by the MoEF&CC in accordance with the procedures specified in the notification. Among the 32 categories listed in Schedule -1 of Notification, the proposed project will not attract the Environmental Clearance from MoEF&CC since the project stretch does not require land acquisition and the packages are less than 100 Kms in length (See Box -1).

Box -1:

Categorization of projects and activities

- i) All projects and activities are broadly categorized into two categories – Category A and Category B
- ii) Category A: Expansion of National Highways greater than 30 km involving additional right of way greater than 20m involving land acquisition.
- ii) Category B: All State Highway Projects & State Highway expansion projects in hilly terrain (above 1000m AMSL)
- iii) & / or ecologically sensitive areas.
- iv) All projects or activities included as Category 'A' shall require prior environmental clearance from the Central Government in the MOEF on the recommendations of an Expert Appraisal Committee (EAC).
- v) All projects or activities included as Category 'B' will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA).

#### Amended Notification:


As per the amended Notification of the MoEF & CC on 22nd August 2013 on Highway projects - "Expansion of National Highways greater than 100 Km involving additional Right of Way or land acquisition greater than 40 m on existing alignment and 60 m on re-alignments or bypasses" may require clearance from EAC, MoEF & CC.

Also, the proposed highway project needs to get approvals from Andhra Pradesh Pollution Control Board are i.e., No Objection Certificates (NOC), Consent for Establishment (CFE) and Consent for Operation (CFO) for establishment and operation of Hot mix plants, batch mix plants, quarries etc. during the construction phase of the project.

#### Forest Clearance

Forest (Conservation) Act, 1980 (amended in 2003) enacted by Government of India, restricts the de-reservation of forests for use of non-forest purposes. According to the Act, State



	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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Government requires prior approval of GoI for the use of forest land for non-forest purposes (means the breaking up or clearing of any forest land) or for assigning least to any private person or agency not controlled by government. The Forest (Conservation) Rules, 2003 issued under this Act, provide specific procedures to be followed for conversion of forest land for non-forest purposes.


Limited sub-projects may require acquisition of forest land. The forest land conversion will follow the “Guidelines for Diversion of Forest Lands for Non-Forest Purpose” under Forest (Conservation) Act, 1980. Compensatory afforestation is one of the most important conditions stipulated for diversion of forest land. The conditions of forest diversion proposals are summarized in Table 10-3.

*Table 10-3: Conditions of Forest Diversion Proposals*

S. No	Condition of Forest Diversion	Submission of Proposal and seeking permission from
1	Diversion of forest land for small development and public utility projects up to 5 hectares	State Government may authorize the Nodal Officer or any other Officer to submit the proposals directly to the Regional Offices.
2	Diversion of forest land up to 40 hectares and proposals for clearing of naturally grown trees for reforestation	Central Zone, Regional Office of the MoEF&CC, Lucknow.
3	All other proposals (> 40 hectares)	The Secretary, Ministry of Environment & Forests, Government of India.

The other conditions of Forest diversion are:

- Compensatory afforestation is compulsory for conversion.
- Afforestation will be done over an equivalent area of non-forest land.
- As far as possible, the non-forest land for compensatory afforestation should be identified contiguous to or in the proximity of Reserved Forest or Protected Forest. If non-forest lands are not available in the same district other non-forest land may be identified elsewhere in the state.
- Where non-forest lands are not available, compensatory afforestation may be carried out over degraded forest twice in extent to the area being diverted. Conversion of forest lands that are part of National Parks/Sanctuaries and Tiger Reserve areas (notified under Indian Wildlife (Protection) Act, 1972) is not permitted. In exceptional case, the

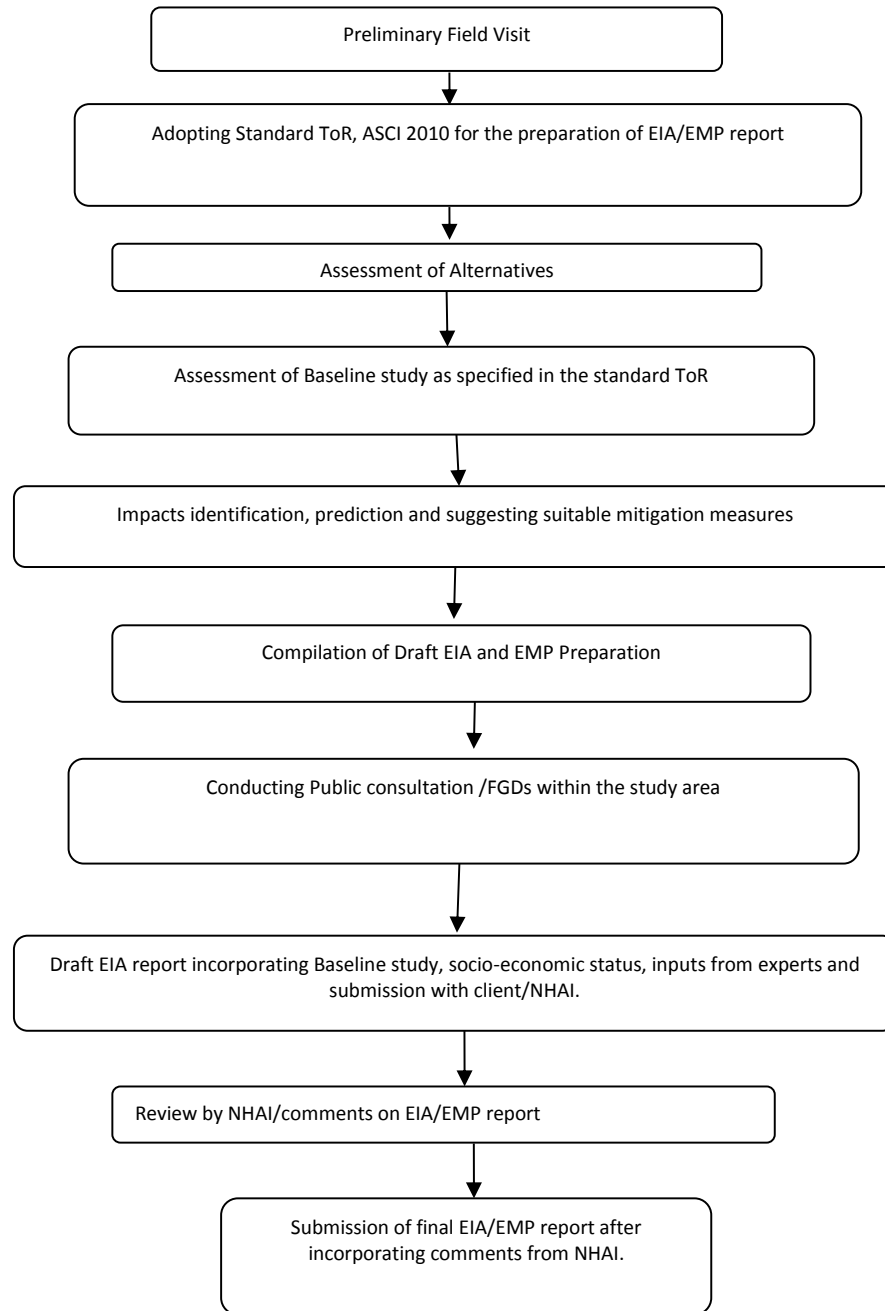
	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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State Government requires consent of the National Board of Wildlife for obtaining approval of the State Legislature for de-notification of the area as a sanctuary.


- Cutting of trees in non-forest land, irrespective of land ownership, also requires permission from the State Forest Department. Afforestation to the extent of two trees per each tree felled is mandatory.

## 10.5 METHODOLOGY TO BE ADOPTED FOR EIA STUDY

The methodology to be adopted for the EIA study is shown below as Flow chart as below:



*Figure 10-1: Flow Chart of Environmental Clearance Process*

	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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## 10.6 SCOPE OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) STUDY

The EIA/EMP report encompasses the findings of the study to identify, predict and evaluate the likely impacts due to the proposed activity and suitable measures to mitigate and minimize the adverse impacts and ameliorate environmental quality in the surrounding region. The environmental safety concerns which can be internalized in the project planning and implementation stages have been identified and suitable measures needed are elicited as Environmental Management Plan (EMP).

Detailed baseline data collection prior to project implementation is under progress for air, noise, water, land, biological and socio-economic environment within the project area. The baseline data for pre-project environmental status will be presented along with identification, prediction and evaluation of impacts due to project activities.

The published literature will be collected from different Govt. Organizations / Institutions, NGOs etc. to assess the baseline environment. The aim will be to collect secondary information to the maximum extent possible. The information on flora like roadside plantation and fauna within the study area will be collected from the Forest Dept., Botanical survey of India, Zoological survey of India and through field verification. Information on wetland, grassland and other ecologically important areas will also be collected.

The information on geology and soil within the study area will be collected from Geological Survey of India. The information on ground water i.e. depth of water table, yield etc. will be collected from the Central Ground Water Authority, Central Water Commission, Survey of India.


District Planning Maps etc. The land use pattern within the study area in general and adjacent to the road in particular will be established through collection of maps/documents from Survey of India, Agriculture Department and Forest Dept. and through field verification.

The climate and meteorology data i.e. temperature, wind speed, wind direction, rainfall, relative humidity, cloud cover and cyclone will be collected from the Meteorological Department. Available information on ambient air quality and water quality will be collected from Central Pollution Control Board (CPCB), Andhra Pradesh Pollution Control Board, Reputed Research Laboratory and Universities. The information on archaeological and historical places, if any, will be collected from Archaeological Survey of India, Dept. of Tourism etc.

### Primary/Secondary Data Collection

#### A) Field Reconnaissance Survey

- Preliminary field survey will be undertaken to identify the critical issues and to examine different alignment options. The following information/documents will be collected during reconnaissance survey.

	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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- Information on location, type and sensitivity of all critical natural habitats such as reserved/protected forest, wildlife sanctuaries/ wildlife migratory route across the road, wetlands, grass land, sacred groves etc.
- Information on sensitive such as location of schools, hospitals, religious, archaeological and historical places.
- Assessment of air quality, noise level, water quality and soil quality monitoring stations as per BIS, CPCB, IRC and MoEF Guidelines.
- Details of roadside plantation i.e. Chainage wise and girth size wise no. of trees.
- Information on industries i.e. pollution status, discharge point/disposal site of effluent/solid waste along the corridor, if any.
- Information on flora and fauna within the study corridor will be collected and verified in the field.

#### **B) Environmental Impact Assessment**


It will include the following:

- The collected primary and secondary data will be compiled to assess the existing baseline environmental condition.
- Prediction of significant impacts
- The assessment of impact during construction and operation phase
- Suggestion of mitigation measures

#### **10.6.1 Generic Structure of EIA report**

In terms of the EIA Notification of the MoEFCC dated 14<sup>th</sup> September 2006, the generic structure of the EIA document shall be as under:

1. Introduction
2. Project Description
3. Approach & Methodology
4. Environmental Regulatory Framework
5. Analysis of Alternatives (Technology and Site)
6. Description of the Environment
7. Anticipated Environmental Impact & Mitigation Measures
8. Environmental Management Plan
9. Environmental Monitoring Plan
10. Environmental Cost Estimates
11. Summary & Conclusions
12. Disclosure of Consultants engaged.

	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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### 10.6.2 Baseline Environmental Conditions


The description of environment presents the Baseline Environmental Status of the project area in terms of its physical, micro-meteorological, chemical, biological, Social and cultural description. The baseline data would help to establish the pre-project environmental status in the project corridor. The possible impacts due to proposed activity will be predicted based on the quantification of project activities.

For the study area, primary Environmental baseline data will be collected by M/s. Aarvee Associates, Hyderabad through laboratory Recognized by Ministry of Environment & Forests, Government of India who will be engaged for the field study of air, water, noise, soil etc. The environmental attributes will be covered for the study include ambient air quality, ground and surface water quality, noise levels, land environment including soil quality, land-use pattern, forest cover, biological environment, socio-economic and health status of the population, demography and quality of life. The primary and secondary data of the stated parameters are being collected and analyzed as per the MoEF EIA Manual for Highways, 2010. References adopted from MoEF EIA Manual for Highways are tabulated below The Details of monitoring station of different environmental attributes is given below

The proposed project is “Consultancy services for preparation of DPR and Pre-Construction services from – (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 & NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutherkandi.” In the State of Assam The references adopted for baseline monitoring and the monitoring stations are provided in the table below. The baseline study is being carried out. The monitoring results shall be detailed out in the EIA report.


*Table 10-4 : References adopted from MoEF&CC EIA Manual for Highways*

S. No	Characteristics	No. of Monitoring Stations	Selection of the parameters
1	Ambient Air Quality Monitoring (Particulate Matter (size less than 10µm) or PM10, Particulate Matter (size less than 2.5µm) or PM2.5, Sulphur dioxide (SO2), Oxides of Nitrogen	08	EIA Guidance Manual for Highways – Prepared by MoEF, 2010 (Page – 17, Section 4.4: Air Environment) <ul style="list-style-type: none"> <li>Baseline data for the parameters – particulate matter size less than 10µm or PM10 µg/m3, particulate matter size less than 2.5µm or PM2.5 µg/m3, Sulphur dioxide (µg/m3), nitrogen dioxide (µg/m3) and carbon monoxide (µg/m3) in the study area should be</li> </ul>

	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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S. No	Characteristics	No. of Monitoring Stations	Selection of the parameters
	(NOX), Carbon Monoxide and Hydrocarbons)		generated for one season other than monsoon as per CPCB norms.
2	Water Quality Monitoring – Surface and Ground water (Physico-Chemical, bacteriological and heavy metals analysis)	14+10	EIA Guidance Manual for Highways – Prepared by MoEF, 2010 (Page – 17, Section 4.3: Water Environment) <ul style="list-style-type: none"> <li>• Details of surface water bodies within right of way and within 500mts from the right of way should be documented along with the present usage.</li> <li>• The samples should be collected and analyzed as per the standard procedures</li> </ul>
3	Noise Quality Monitoring (Leq day, Leq night, Leq min, and Leq max)	16	EIA Guidance Manual for Highways – Prepared by MoEF, 2010 (Page – 17, Section 4.5: Noise Environment) <ul style="list-style-type: none"> <li>• While selecting the monitoring locations specific importance is to be given for sensitive environmental receptors like thickly populated areas, hospitals, schools, wildlife corridors etc.</li> <li>• Hourly monitoring of noise levels (Leq) should be recorded for 24 hours by using integrated noise meter. Noise standards have been designated for different types of land use, i.e. residential, commercial, industrial areas and silence zones as per the Noise Pollution (Regulation and Control) Rules 2000</li> </ul>
4	Soil Quality Monitoring (Physico-Chemical and heavy metals analysis)	10	EIA Guidance Manual for Highways – Prepared by MoEF, 2010 (Page – 17, Section 4.2: Land Environment) <ul style="list-style-type: none"> <li>• The soil profile of the highway alignment should be presented based on the soil series maps of National Bureau of Soil Survey and Land Use.</li> <li>• The suggested parameters for soil analysis</li> </ul>



	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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S. No	Characteristics	No. of Monitoring Stations	Selection of the parameters
			are pH, Electrical conductivity, sand (%), silt (%), clay (%), texture, moisture retention capacity (%), infiltration rate (mm/hour), bulk density (gm/ cc), porosity (%), organic matter (%), nitrogen (mg/1000g), potassium (mg/1000g), phosphorous (mg/1000g), sulphates and sodium sulphates.


*Table 10-5: Details of different Environmental attributes monitoring stations*

Code	Location	Coordinates	
		Latitude	Longitude
Micro Meteorology & Ambient Air Quality Monitoring Locations			
AES	Medal Pt-II	24°50'30.24"N	92°22'3.67"E
AAQ1	Bajantipur Pt-I	24°49'52.43"N	92°45'3.81"E
AAQ2	Sripur Pt-I	24°50'53.69"N	92°37'42.75"E
AAQ3	Kandigram Chaita	24°52'3.19"N	92°30'3.40"E
AAQ4	Medal Pt-II	24°50'30.24"N	92°22'3.67"E
AAQ5	Inathpur	24°50'57.30"N	92°20'35.35"E
AAQ6	Jarapata	24°52'21.11"N	92°15'15.93"E
AAQ7	Patharkandi	24°35'49.29"N	92°19'47.88"E
AAQ8	Ichchailchara	24°26'12.35"N	92°14'52.50"E
Noise Quality Monitoring Locations			
N1	Silchar Bypass	15° 53' 06.30" N	78° 01' 00.99" E
N2	Karimganj-Silchar Road	24°49'50.80"N	92°45'6.79"E
N3	Kalinagar Pt-IV	24°50'0.14"N	92°43'42.09"E
N4	Kandigram Chaita	24°49'45.99"N	92°38'3.63"E
N5	Sarif Nagar Road	24°52'7.33"N	92°30'7.03"E
N6	Longai Road	24°49'56.05"N	92°22'1.23"E



Code	Location	Coordinates	
		Latitude	Longitude
N7	Border Road, Jarapata	24°50'52.17"N	92°20'38.87"E
N8	Umarpur Pt-II	24°52'18.58"N	92°14'54.89"E
N9	Uttarbandarkona	24°47'22.41"N	92°22'42.48"E
N10	Unamgaon	24°44'44.62"N	92°22'27.29"E
N11	Dr APJ Abdul Kalam Road	24°38'41.07"N	92°20'14.98"E
N12	Baithakal TE	24°35'38.30"N	92°19'45.96"E
N13	Chandkhira	24°34'38.62"N	92°18'53.58"E
N14	Shillong-Agartala-Sabrum Road	24°33'35.12"N	92°18'35.22"E
N15	Sibergool	24°32'21.31"N	92°19'41.14"E
N16	Ichailalchhara	24°27'33.43"N	92°18'26.89"E
<b>Surface Water Monitoring Locations</b>			
SW1	Indragarghant	24°50'0.98"N	92°43'41.54"E
SW2	Kalinagar Pt-IV	24°49'37.02"N	92°38'18.33"E
SW3	Kushiyara River	24°51'44.34"N	92°29'3.60"E
SW4	Pumara Bridge Medal Pt-IV	24°50'20.75"N	92°22'1.35"E
SW5	Krishnanagar Pt	24°47'13.51"N	92°22'19.80"E
SW6	Kakra Canal	24°42'23.24"N	92°21'55.99"E
SW7	Umangaon	24°38'21.21"N	92°20'11.38"E
SW8	Bhurguna	24°37'34.01"N	92°20'12.99"E
SW9	Pailamuli	24°36'27.09"N	92°20'1.08"E
SW10	Longai River	24°34'38.87"N	92°18'52.07"E
SW11	Dewlakal Bridge, Chandkhira	24°33'35.60"N	92°18'36.16"E
SW12	Ankapai Punjee	24°32'58.36"N	92°18'55.77"E

Code	Location	Coordinates	
		Latitude	Longitude
SW13	Hatikhira T.E	24°30'12.60"N	92°19'23.78"E
SW14	Ichailalchhara	24°25'46.02"N	92°14'42.59"E
<b>Groundwater Monitoring Locations</b>			
GW1	Bajantipur Pt-1	24°49'52.26"N	92°45'3.85"E
GW2	Sripur Pt-1	24°50'53.47"N	92°37'42.65"E
GW3	Kandigaram Chaita	24°52'2.68"N	92°30'3.45"E
GW4	Medal Pt-II	24°50'29.49"N	92°22'3.72"E
GW5	Inathpur	24°50'56.69"N	92°20'35.48"E
GW6	Jarapata	24°52'20.79"N	92°15'15.93"E
GW7	Krishnanagar Pt	24°47'24.45"N	92°22'31.06"E
GW8	Patharkandi	24°35'48.78"N	92°19'47.91"E
GW9	Dhengarbond	24°32'8.77"N	92°19'44.41"E
GW10	Ichailalchhara	24°26'12.04"N	92°14'52.47"E
<b>Soil Monitoring Locations</b>			
S1	Bajantipur Pt-1	24°49'52.26"N	92°45'3.85"E
S2	Sripur Pt-1	24°50'53.47"N	92°37'42.65"E
S3	Kandigaram Chaita	24°52'2.68"N	92°30'3.45"E
S4	Medal Pt-II	24°50'29.49"N	92°22'3.72"E
S5	Inathpur	24°50'56.69"N	92°20'35.48"E
S6	Jarapata	24°52'20.79"N	92°15'15.93"E
S7	Krishnanagar Pt	24°47'24.45"N	92°22'31.06"E
S8	Patharkandi	24°35'48.78"N	92°19'47.91"E
S9	Dhengarbond	24°32'8.77"N	92°19'44.41"E
S10	Ichailalchhara	24°26'12.04"N	92°14'52.47"E

	<b>Consultancy services for preparation of DPR and Pre-Construction services from</b> <b>(i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at</b> <b>Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-</b> <b>Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY</b> <b>ENVIRONMENT</b> <b>SCREENING &amp;</b> <b>ASSESSMENT</b>
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### 10.6.3 Climatic Conditions and Temperature

#### Assam

Assam has a tropical monsoon climate, characterized by warm summers and mild winters. The state receives heavy rainfall during the monsoon season, which lasts from June to September. The average temperature in Assam ranges from 24°C to 33°C, but can reach up to 40°C in the summer months. The humidity is also high, especially during the monsoon season.

#### Relative Humidity

The relative humidity of Assam is high throughout the year, but it is especially high during the monsoon season (June to September). The average annual relative humidity in Assam is 76.6%, and the average monthly relative humidity ranges from 57% in March to 83% in July.


The high relative humidity in Assam is due to its geographical location. Assam is located in the foothills of the Eastern Himalayas, and it is surrounded by rivers and wetlands. This creates a humid environment, with a lot of water vapor in the air.

#### Floods & Droughts

Floods by nature depend on several factors, one being incessant rains, cyclonic rains in a short period of time crippling natural drainage. However, other factors such as nature of the collecting basin, nature of the streams, type of soil, natural and man-made vegetation, amount of rainfall, obstruction to natural drainage etc. determine the type and extent of floods. The Brahmaputra and the Barak rivers have well-defined stable courses; their natural and manmade banks are capable of carrying flood discharges, with the exception of their delta areas. Floods are often caused by unplanned growth, improper upkeep of drainage systems and mismanagement of discharges from dams, though floods are erroneously thought to be always of natural origin. Assam has historically been prone to drought conditions especially in Barpeta and Cachar. The reasons might be Deficient rainfall during pre-monsoon season, Sandy soils with low water retention capacity.

#### Rainfall

Assam receives an average annual rainfall of 2352 mm, but the distribution of rainfall is uneven across the state. The eastern part of the state, including the districts of Mawsynram, Cherrapunji, and Dhemaji, receives the highest rainfall, with an average of over 4000 mm per year. The western part of the state, including the districts of Goalpara, Dhubri, and Kokrajhar, receives less rainfall, with an average of less than 2000 mm per year. The monsoon season in Assam lasts from June to September, and accounts for over 80% of the state's annual rainfall. The heaviest rainfall occurs during the months of July and August. The non-monsoon season (October to May) is relatively dry, with occasional rainfall from thunderstorms.

	<b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi (Package-VII)</b>	<b>PRELIMINARY ENVIRONMENT SCREENING &amp; ASSESSMENT</b>
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The rainfall in Assam is influenced by a number of factors, including the state's geographical location, topography, and vegetation. The eastern part of the state is located on the windward side of the Meghalaya Plateau, which forces the monsoon winds to rise. This leads to condensation and heavy rainfall. The western part of the state is located on the leeward side of the Meghalaya Plateau, which receives less rainfall.

#### 10.6.4 Air Environment

Standard methods / procedures will be adopted during environmental monitoring analysis and report preparation. After a preliminary reconnaissance of the study region and taking into account the meteorological (predominant wind directions, wind speed), topographic conditions, major settlements & its traffic volume and details on existing industrial activities in the study region, 1 Micro-Meteorology station and different stations has been identified to carry out Ambient Air Quality Monitoring (AAQM) in the study area. The parameters are being monitored in the study area are PM10, PM2.5, SO2, NO2 and CO. The monitoring results will be described with reference to the NAAQ Standards, 2009 and will be presented in draft EIA & EMP (Draft Feasibility) Report.

#### Methodology to be Adopted


In assessing the environmental impact, collection and interpretation of baseline data is of prime importance. The primary data for the study period is being collected for 24 hourly, twice a week for all the 4 weeks as per national guidelines. The criteria followed for selecting the AAQM stations is recommended by IS: 5182 and CPCB.

They are:

- The sampling station had free exposure so that it did not collect air from stagnant pockets.
- It was not obstructed by large structures including hills.
- The sampling point was not directly influenced by any local source of emission.
- It was located at a minimum height of 1.5 m from the ground level.

#### Monitoring and Analytical Procedure

Ambient air quality was monitored for the presence of contaminants existing in the air. In order to evaluate and quantify the air pollution problem, measurements are being carried out for various air pollutants mentioned above. This data will be used not only to evaluate the air quality in the study region but also as the basis to develop programs aiming at preventing the spread of pollutants leading to a risk to human health and general environment. Fine Dust Samplers (FDS) were used for ambient air sampling of selected parameter. The method for the selected parameter are based on the methods recommended by IS: 5182.

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### 10.6.5 Water Environment

Selected physico – chemical parameter along with bacteriological indicators of pollution will be used for describing the baseline status of water environment. Generation of baseline data for water quality covers sources of ground and surface water. The Assessment of water quality in the study area includes

- Surface water quality (IS 2296)
- Ground water quality (IS 10500)

#### Surface Water Quality

During the study period multiple samples will be collected for assessing the water quality. These were identified considering proximity to the project site, their activities and depending upon its utility by the people in the region. The samples are being collected at this stage.

Surface water samples will be analyzed for Temperature, pH, Turbidity, EC, Colour, TSS, TDS, Odour, DO, BOD, COD, TKN, Total Hardness, Sodium, Potassium, Calcium, Magnesium, Ammonia, Chloride, Sulphate, Phosphate, Nitrate, Fluoride, Surfactants, Dissolved Iron, Copper, Zinc, Manganese, Arsenic, Lead, Mercury, Boron, Chromium, Phenols, Cadmium, Total Coliform, Faecal Coliform. The detail analysis will be given after approval of Preliminary EIA Report.


#### Ground Water Quality

Ground Water is one of the main sources of water in the project corridor for domestic, commercial and other irrigation use hence the rate of extraction of ground water is at a massive scale. For assessing the ground water quality in the study area, multiple samples will be collected from the identified bore wells/ dug wells. Selection of samples considered as per the utilization of the people along the proposed widening and improvement project.

Ground water samples will be analysed for Temperature, pH, Turbidity, EC, Colour, TSS, TDS, Odour, DO, BOD, COD, TKN, Total Hardness, Sodium, Potassium, Calcium, Magnesium, Ammonia, Chloride, Sulphate, Phosphate, Nitrate, Fluoride, Surfactants, Dissolved Iron, Copper, Zinc, Manganese, Arsenic, lead, Mercury, Boron, Chromium, Phenols, Cadmium, Total Coliform, Faecal Coliform. The detail analysis will be given after approval of Preliminary EIA report.

### 10.6.6 Noise Environment

Keeping in view of the proposed improvement and widening project, noise monitoring will be carried out at various locations. The locations will be selected based on land use pattern, traffic intersections and diversions along the existing alignment. Precision integrating sound level meter having statistical unit with digital display will be used for ambient noise level monitoring in the present study. The noise quality monitoring is planned and executed as per Protocol for Ambient Level Noise Monitoring. Noise monitoring for 24 hours is being carried out at each

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location during the study period. Noise monitoring locations and noise levels recorded i.e., Leq day, Leq night, Lmin and Lmax to be presented.

The Central Pollution Control Board has specified ambient noise levels for different land use for day and night times. Importance was given to the timing of exposure and areas designated as sensitive. The National ambient noise level standards are given below.

*Table 10-6: The National ambient noise level standards*

Area Code	Category	Limits in Decibels (dB(A))	
		Day Time	Nighttime
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence Zones	50	40

The monitored samples are being analyzed with respect to concerned national standards for the respective categories.

#### 10.6.7 Land Environment

As part of the land environment, soil quality is being studied in detail and the same will be presented after approval of Preliminary EIA report.

#### 10.6.8 Soil Quality

The soil samples of different area along the project stretch will be collected at different locations for assessing the physic-chemical characteristics of the soil in the project area. The quality parameters will include pH, Electrical conductivity, sand, silt, clay, texture, moisture retention capacity, infiltration rate, bulk density, porosity, organic matter, Nitrogen, potassium, phosphorous, Pb, iron and organic carbon.

#### 10.6.9 Land use Pattern

The proposed highway project traverses predominantly through agricultural land and barren land. The objectives of land use studies are:

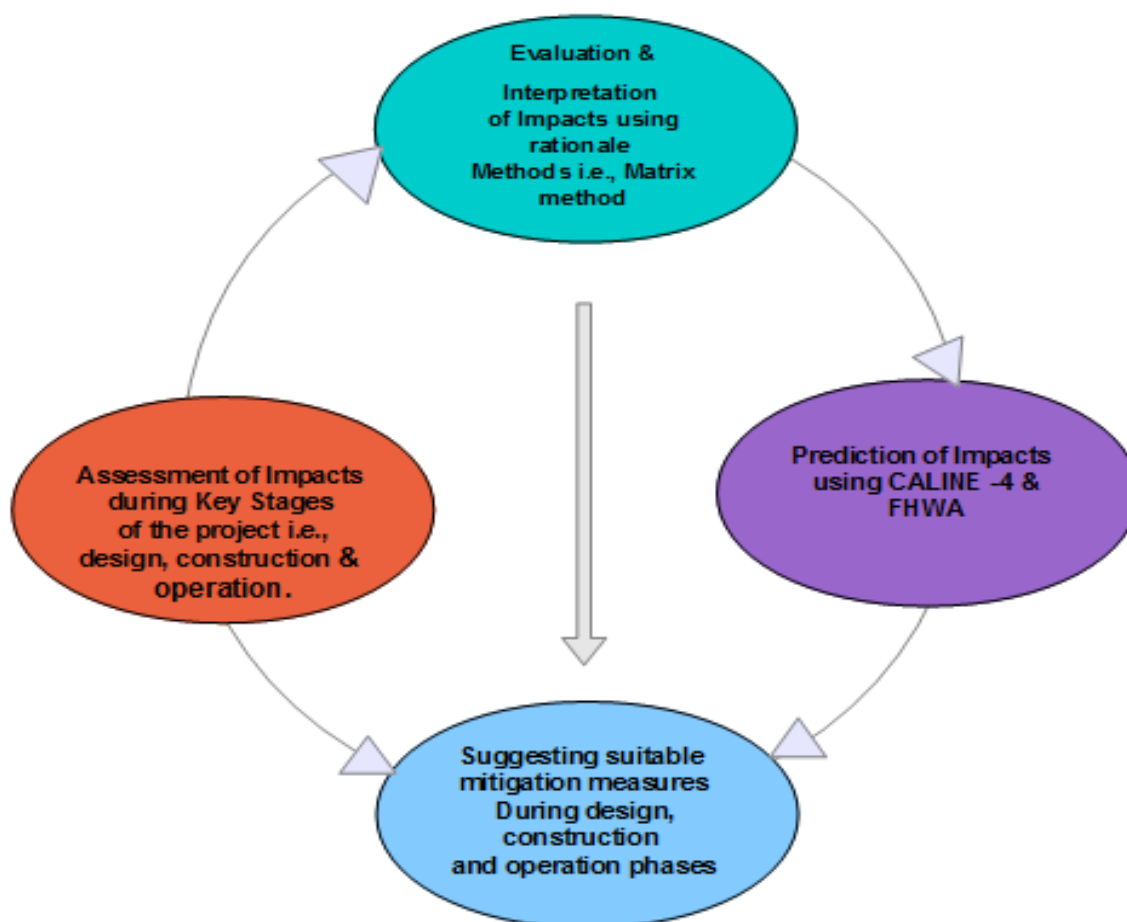
- To determine the present land use pattern.
- To determine the temporal changes in land use pattern over a period.
- To analyses the impact on land use due to proposed site in the study area.

#### Anticipated Environmental Impacts and Mitigation Measures

Pre-Construction services from– (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 & NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutarkandi.in the state of Assam exhibit a symbiotic relationship between the environment and development with both positive and negative and reversible and irreversible impacts. The present chapter will be suggesting the



analysis of the impacts in the proposed rehabilitation and up-gradation project and suggested mitigative measures. The Flow Chart showing the Itinerary of assessment, evaluation & interpretation of impact, prediction of impacts and suggesting suitable measures in Figure 10-2. The project specific impacts assessed will be described in draft EIA & EMP after approval of Preliminary EIA report.




*Figure 10-2 : Itinerary of Assessment of Impacts and Mitigation Measures*

#### Assessment of Impacts in Key Stages of the Project

The proposed project can have impacts or cause impacts in three specific situations as follows:

- Impacts due to Project Design,
- Impacts during Construction, and
- Impacts during Operational stage.

#### Impacts due to Project Design

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The engineering design of the road will be finalized by considering all environmental safeguards. The project envisages natural drainage network, roadways which will have marginal negative impacts of temporary and localized in nature. Land acquisition for road development is minimal of less than 10m. Rehabilitation and upgrading of the existing road is unavoidable and may lead to loss of livelihood for very few projects affected peoples.

#### Impacts during Construction Stage

The construction stage is one of the critical stages of the project which may pose maximum impact on the environment. The major impacts associated in this stage from site clearance to the final BT Stage of the main carriageway will be identified and the appropriate mitigation measures are being suggested.

#### **10.6.10 Impacts during Operation Stage**

The proposed project can harmonize with the surrounding environment and serve multiple users with the following positive impacts.

- To relieve traffic congestion on towns /cities along the proposed stretch.
- To provide effective linkage to their respective state.
- To Increase access to markets, jobs, education, and health services.

However, some of the negative impacts are also associated in this stage. The major impacts envisaged in this stage are increasing of traffic resulting an increase of air as well as noise pollution. To minimize the impacts an appropriate mitigative measures will be suggested.

#### Evaluation and Interpretation of the Impacts

Matrix method will be adopted for the evaluation of impacts. Based on the scoping of the areas and the work being proposed the following key issues were evaluated for this project.


- Preservation of aesthetic and landscape of the area to the possible extent.
- Effective restoration of Burrow areas and quarries.
- Evaluation of Environmental Quality
- Tree removal and tree plantation.
- Sanitation and waste disposal.
- Road safety.
- Protection of flora and fauna.
- Afforestation

The outcome of the results will be interpreted. The interpreted values will be helpful for the decision makers to take appropriate decision in right time.

#### Prediction of The Impacts

As discussed earlier, the major impacts associated with this project are air and noise. The air quality due to vehicular movement is predicted using the CALINEPro software and to predict the cumulative noise impacts, a Federal Highways Administration (FHWA) Noise Model will be



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adopted. The air and noise impacts are aimed to predict the future impacts for “Without and With Project Scenario” by using the traffic study report.

#### Suggesting suitable Mitigation Measures

The mitigation measures are highlighted for the following key issues in the project.

- Soil quality (Topsoil, soil erosion etc.)
- Solid waste or muck disposal
- Air quality
- Water quality (wetlands, water bodies, groundwater etc.)
- Noise quality
- Biological Environment (Flora, fauna, tree plantation and enumeration)
- Socio-economic quality of life
- Safety and health aspects during construction and operation phase.

#### Environmental Management Plan

The Environmental Management Plan (EMP) states the procedure in which the project proponent would carry out the implementation of the mitigation measures and ensure compliance with environmental regulations that are binding on the project. The EMP also specifies the organizational requirements and institutional strengthening necessary for sound environmental management of the project. The major components of the EMP are:

- EMP Implementing Agency
- Monitoring of the EMP implementation
- Training on Environmental management
- Budget for EMP implementation.


The project specific EMP with budgetary provisions will be given after approval of Preliminary EIA Report.

#### **10.6.11 EMP Implementing Agency**

The Project Proponent will establish an Environmental Management Cell (EMC) to supervise and implement the mitigation measures as documented in the EMP. This EMC must also be adequately empowered to discharge the responsibilities as outlined in the EMP. To ensure smooth implementation of EMP the project proponent will have to collaborate with various government agencies like Public Works Department, Revenue Department, State Pollution Control Board, State Forest Department, Police Department and other allied departments.

#### Monitoring of EMP Implementation

The EMP will primarily be implemented by the Project Proponent and Civil Contractor. However, for an effective implementation of EMP, the current project will be monitored two level monitoring. The first one is internally by top management of Contracting Company and the second one by the National Highways wing. The EMC constituted by Contracting Company

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shall be the prime agency for monitoring all the activities during construction and operation phases. National Highways wing under the R&B or supervision consultant appointed by R&B shall supervise all activities and accordingly advise the Contracting Company to improve on areas where any shortcomings are observed. The EMC shall provide all the monitoring results to National Highways wing under the R&B. National Highways wing under the R&B shall keep a record of all information and shall suggest suitable measures to be adopted by Contracting Company if any aspect is found to be deviating from the stipulated values/ standards. Monitoring shall be carried out during construction and operation phase.

#### Budget for EMP Implementation

The design and construction of the project involves several items such as resettlement & rehabilitation, erosion prevention, rehabilitation of borrow areas, tree plantation, safety signage etc., which are included in the contract cost. Only those items that are not covered under the budget for construction will be shown in the EMP implementation budget.

The main components are as follows:

- Setting up of Environment Management Cell
- Tree Plantation
- Environmental monitoring during construction and operation phases
- Conducting awareness programmes
- Capacity building and training during construction and operation phases.