EXECUTIVE SUMMARY

INTRODUCTION

The Ministry of Road Transport and Highways (MORTH), Government of India hasproposed "Bharatmala Pariyojana" an Umbrella scheme of road development project through National Highways Authority of India (NHAI), National Highway, IndustrialDevelopment Corporation Ltd (NHIDCL) and State Public Works Departments (PWD) at an estimated cost of INR 5,35,000 crores. This is the second largest highways constructionproject in the country after NHDP, where in almost 50,000 km of roads are targeted acrossthe country.

DESCRIPTION OF THE PROJECT

The project is starting from Sasaram and ends at Arrah. Total Length: 130.8 km. The whole stretch is further divided as stated below:

i. The proposed highway along with spur road starts from village Gangauli 24°55'13.21"N 84°8'23.72"E and ends at village Dhanupara 25°35'2.82"N 84°43'5.09"E in Rohtas and Bhojpur district in the state of Bihar. Total length 84 Km with Spur road of 11.8 km. Scope of present report is confined to (Ch. 0+000 to Ch. 84+000) for highway &(Ch. 0+000 to Ch. 11+800) for spur road.

ii. The proposed Bypass (Ara-patna ring road) starts at village Madhopur 25°33'1.80"N 84°55'34.53"E and end at village Garha 25°31'44.81"N 84°36'4.89"E of Patna and Bhojpur district respectively in the state of Bihar. Bypass road of 35 km. Scope of present report is confined to (Ch. 0+000 to Ch. 35+000).

Project Highway Alignment (Greenfield) of 84 km and proposed RoW is 45 m with spur road (Kayampur Spur) of 11.8 km. Bypass Road/Ring Road (Arrah bypass) of35 km and proposed RoW is 60 m.

This is a green field alignment and is proposed for 4-Lane.The proposed length of the highway is about 130.8 kms. The road passes through Rohtas, Bhojpur&Patnadistrict through important villages/towns like Bikramganj, Karakat, Nasariganj, Rajpur, Akorhi Gola, Dehri,Koilwar, Udwant nagar, Piro, Charpokhari, Garhani, Tarari, Bihta, Naubatpur in the state of Bihar.

Salient features of the project:

S.no	Parameters/Issues	Description
1.	Length (km)	130.8 (Sasaram- Arrah) 84 km (Ara-patna by road) 35km (Patna-Kayamnagar Spur)11.8km
2.	Total land acquired (ha)	559.089

3.	Govt. land (ha)	10
4.	Pvt. Land (ha)	519.089
5.	Forest land (ha)	30
6.	Area under protected/ important or sensitive species of flora or fauna/Wildlife Sanctuary	The alignment does not pass through any wild life sanctuary, protected area and its eco sensitive zone.
7.	No. of trees	8448
8.	No. of structure to be impacted due to proposed alignment	20
9.	No. of structure to be constructed	i.Major Bridges (03) ii.Minor Bridges (25) iii.Fly over (03) iv.VUP (15) v.LVUP (20) vi.SVUP (56) vii.ROB (02) viii.Elevated (02) ix.PUP (02) x.Box Culverts (69) xi.Grade separater (02) xii.MNB Cum SVUP (11) xiii.MNB Cum LVUP (03)
10.	Total water requirement	3500 KL/day water will be extracted from surface sources. The ground water will be abstracted for camp site after obtaining the permission from competent authority.
11.	RoW	Total length of the project is **130.8 Km** (approx.) Project Highway Alignment (Greenfield) of 84 km and proposed **RoW is 45 m** with spur road (Kayampur Spur) of 11.8 km. Bypass Road/Ring Road (Arrah bypass) of 35 km and proposed **RoW is 60 m** as per the requirement keeping in view the fully access controlled Highway with 4-lane dual carriage way configuration

12.	Construction material	Cement (Cum)- 16477 Sand (Cum)-24716 Agg.(Cum)-49434
13.	Connectivity	The proposed alignment is connected with Sasaram-Arrah-Patna- Patar-Kayamnagar.
14.	Project cost (cr.)	2973.43

DESCRIPTION OF THE ENVIRONMENT

The baseline data was generated during post-monsoon season of 2021 i.e. October to December, 2021. The baseline data has been provided in chapter 4 of this report which shows the values of almost all of the parameters are well within the prescribed limits.

Attribute	Baseline status
Ambient Air Quality	Ambient Air Quality Monitoring reveals that the minimum & maximum Concentrations of PM10 for all the 8 AAQ monitoring stations were found to be in the range 58.28 µg/m3 (at AAQ2-Baligaon -19+300) to 87.88 µg/m3 (at AAQ6-Bihta -4+500). The result of PM2.5 reveals that the minimum concentration of 24.48 µg/m3 (at AAQ3- Kaupa -CH 38+500) to 57.96 µg/m3 (at AAQ1-. Suara -00+500). The gaseous pollutants SO2 and NOx were within the prescribed CPCB limit of 80 µg/m3. For residential and rural areas at all stations. The minimum & maximum concentrations of SO2 were found to be 6.13 µg/m3 (AAQ8-Udawantnagar -31+800) to 17.66 µg/m3 (AAQ6-Bihta -4+500). The minimum & maximum concentrations of NO2 were found to be 9.52 µg/m3 (AAQ8-Udawantnagar -31+800) to 26.56 µg/m3 (AAQ6-Bihta -4+500). The minimum & maximum concentrations of CO were found to be 0.12 µg/m3 (AAQ4- Repura -58+500) to 1.56 µg/m3. (AAQ6- Bihta -4+500).
Noise Levels	Noise monitoring were carried out at 8 locations. The results of the monitoring program indicated that both the daytime and night time

	levels of noise were well within the prescribed limits of NAAQS to marginal rise in PM levels some locations monitored due to increase in vehicle density.
Water Quality	8 Groundwater samples were analyzed and concluded that: The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by Indian Standards IS: 10500.
Soil Quality	Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH. In the study area, variations in the pH of the soil were found to be slightly neutral to alkaline (7.21 to 7.72). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 298-448 µmhos/cm. Water holding capacity from 28.90 to 38.41(%) by mass.
Ecology and Biodiversity	There are no ecologically sensitive areas present in the study area.

10.4 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

- Slight change in the micro-climate of the area is expected due to Heat Island Effect.
- There will be a marginal rise in PM levels during the construction activities, which shall again be within prescribed limit after the construction activities are over.
- The area is likely to experience a marginal increase in noise level due to increase in vehicle density after construction of the road.
- Contamination to water bodies may result due to spilling of construction materials, oil, grease, fuel and paint etc. This will be more prominent in case of locations where the project road crosses rivers, canals, nallahs, etc. Mitigation measures have been planned to avoid contamination of these water bodies.
- Diversion of forest land has been envisaged for this project. Hence, Forest Clearance under the purview of Forest (Conservation) Act, 1980 is required. The application of forest clearance is under process. Adequate compensatory afforestation has been planned as a mitigation measure. The project road doesn't cross any Protected Area. Since the project road is a green field project, acquisition of land shall be required.

- During the construction of the proposed project, the topography may change marginally due to cuts & fills for project road and construction of project related structures etc.
- Provision of construction yard for material handling will also alter the existing topography.

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

Detailed analyses of the alternatives have been conducted taking into account both with and without project. Comparative analysis of all the alternatives has also been conducted. The proposed development of the road is likely to have a positive impact on the economic value of the region. However, there are certain environment and social issues that need to be mitigated for sustainable development.

Three alternatives were studies and the first one was found out to be most suitable.

ENVIRONMENTAL MONITORING PROGRAM

Regular monitoring of important and crucial environmental parameters is of immenseimportance to assess the status of environment during operation of the proposed project.

With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the project and suitable mitigating steps could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficacy of control measures can only be determined by monitoring.

ADDITIONAL STUDIES

The various additional studies have been undertaken for the project including Public Consultation, Risk assessment and Social Impact Assessment/ R&R Action Plans. Public consultation is a continuous process and has been carried out at all stages throughout the project road. To ascertain the views of the affected families to be recorded and has been included in the Social Impact Assessment report.

BENEFITS OF THE PROJECT

The proposed highway starts from village Gangauli and ends at village Dhanupara inRohtas and Bhojpur district in the state of Bihar. The proposed Bypass (Ara-patna ringroad) starts at village Madhopur end at village Garhain Patna and Bhojpur district respectively in the state of Bihar under Bharatmala Pariyojana by the Government of India. The proposed access controlled project with new alignment has been envisaged through an area which shall have the advantage of

simultaneous development as well as shall result in a shorter distance to travel. The project will enhance economic development in the area through industrial areas (Patna, Bhojpur, and Muzaffarpur), Agriculture (Market access), commercial development and consequent employment.The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic. The proposed road would act as the prime artery for the economic flow to this region. It will enhance opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as way side amenities. Vehicle operating cost will also bereduced due to improved road quality. The compensatory plantation and road side plantation shall further improve the air quality of the region.

ENVIRONMENT MANAGEMENT PLAN

Project specific environmental management plan have been prepared for ensuring theimplementation of the proposed measures during construction phase of the project, implementation and supervision responsibilities. The cost for environmental management during construction has been indicated in EMP. The project impacts and management plan suggested thereof are summarized in the chapter.

The Environmental Management Plan (EMP) has been designed within the framework of various regulatory requirements on environmental and Socio-economic aspects aiming at the following:

- Minimize disturbance to native flora and fauna, if any.
- Prevent and to attenuate air, water, soil and noise pollution, if any.
- Encourage the socio-economic development.

The environmental management plan (EMP) would, therefore, consists of following maincomponents:

- To integrate potential impacts (positive or negative), environmental mitigation measures, implementation schedule, and monitoring plans.
- To describe the potential environmental impacts and proposed management associated with each stage of the project development.
- To control environmental impacts to levels within acceptable standards, and to minimizepossible impact on the community and the workforce of foreseeable risks during the construction and subsequent operational phases of the project.

CONCLUSION

Based on the EIA study and surveys conducted for the Project, it can be safely concluded that associated potential adverse environmental impacts can be mitigated to an acceptable level by adequate implementation of the measures as stated in the EIA Report. Adequate provisions shall be made in the Project to cover the environmental mitigation and monitoring requirements, and their associated costs as suggested in environmental budget. The proposed project shall improve Road efficiency and bring economic growth. In terms of air and noise quality, the project shall bring considerable improvement to possible exposurelevels to population.