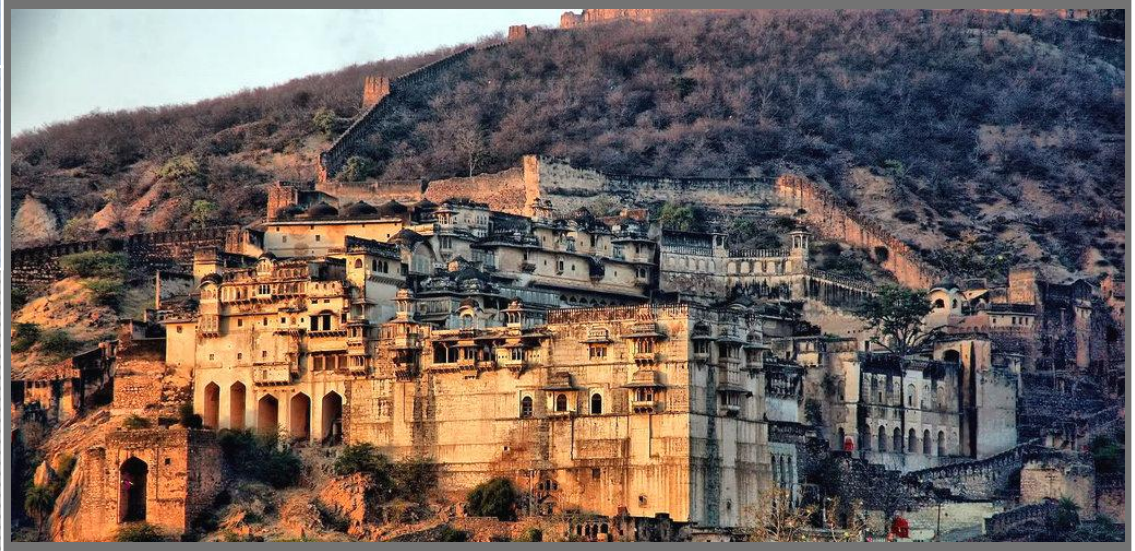
# Executive Summary



Project Proponent : National Highway Authority of India
Ministry of Road, Transport & Highways, Govt. of India

Environmental Consultant : Feedback Infra Private Limited, Gurugram
QCI Certificate:- **NABET/EIA/1821/RA0116 dated 11th Jan 2019**

July-2019

*For National Highway Authority of India*
**Feedback Infra Private Limited**

# 1 EXECUTIVE SUMMARY

The Project shall start from Banda Hera village (Ch. Km 392.800) and near Moondiya village (Ch. Km 452.625) Section of NH-148 N (Total length 59.625 Km), under BHARATMALA PRIYOJANA Lot-4/Pkg-4 in the state of Rajasthan.The project proponent for the Project is National Highways Authority of India (NHAI).

## 1.1 Need of The Project

The Project is a part of the proposed 8-lane access-controlled Greenfield Delhi-Mumbai highway corridor (~1,335 km) interlinking different State & National highways while connecting Delhi to Mumbai. The Project is planned as ambitious high-speed corridors which provide high speed connectivity between states of North India and states of West & South India, more importantly giving a reliable access to the country's prominent economic and social hubs like Mumbai, Delhi, Vadodara, Jaipur and Kota *etc*.

The proposed highway will provide better connectivity to several towns and cities viz. Gurgaon, Alwar, Dausa, Sawai Madhopur, Bundi and Kota. Proposed project will give an infrastructure fillip to the states of Delhi, Haryana, Rajasthan, Gujarat, Madhya Pradesh and Maharashtra.

At present, the connectivity between Delhi and Mumbai is either via NH-48 or via NH-19 & NH-47, which are 4/6 lane. The new proposed highway shall bring down the travel distance by approximately 95 Km (as compared to alternate routes) and result in time savings of over 2 hours. Moreover, the new expressway facility is access controlled and hence will provide good riding quality, better safety, and a reliable infrastructure. All of these elements will result in cost savings and efficiency improvement.

## 1.2 Project Area

The project section is the part of Kota district of Rajasthan state.

## 1.3 Environmental Impact Assessment (EIA) Study

The study methodology for the EIA employs a simplistic approach in which the important environmental issues have been identified before initiation of the baseline study. Based on the identification baseline data was collected during the study period from March to May 2018. This data has analysed to predict and quantify the impacts and suggest best suited mitigation measure to mitigate the identified impacts.

## 1.4 Policy, Legal and Administrative Framework

As part of the project execution, developer shall take the following clearances and NOCs:

- The proposed project is a development of new National Highway, Hence Environmental Clearance will be required under the purview of EIA Notification 2006 & amended thereof.
- Prior permission for tree felling need to be obtained from Forest dept. /District Authorities.
- Need of land acquisition is envisaged to accommodate the proposed development
- Affected households shall be compensated as per entitlement matrix based on Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement Act 2013.

- NOC and Consents under Air & Water Acts for establishing and operating the "Construction Camps" from Rajasthan State Pollution Control Board
- NOC under the Hazardous And Other Wastes (Management and Trans-boundary Movement) Rules, 2016 from SPCB
- PUC certificate for use of vehicles for construction from Transport department
- NOC for ground water extraction for construction and allied works from Central Ground Water Board/Authority

Apart from the above clearances, developer also has to comply with the following:

- Clearance of monitoring consultant for location and layout of Worker's Camp, Equipment yard and Storage yard.
- Clearance of monitoring consultant for Traffic Management Plan for each section of the route after it has been handed over for construction.
- An Emergency Action Plan shall be prepared by the Contractor and approved by the Monitoring consultant for accidents responding to involving fuel & lubricants before the construction starts.

## 1.5 Baseline Environmental Profile

### 1.5.1 Physical Environment

Physical environmental components along the project road are described below.

***Climatology***

According to the CGWB Report 2017, the year in Rajasthan can be divided into three major conventional seasons as follows:

- The Hot- Weather Season (March to end of June)
- Monsoon Season (End of June to September)
- The Cold- Weather Season (October to February)

The India Meteorological Department has further sub-divided the cold season into two divisions, *i.e.*

- The Season of retreating monsoon (October to December)
- The cold season (January to February)

These seasonal variations have been broadly based on temperature and rainfall conditions in different months.

***Physiography and Terrain***

Kota district is located in the south-east of Rajasthan State. Its shape is something like a cross. The land slopes gently from south to north and is drained by the Chambal and its tributaries. Hills are seen in north, south and eastern portions. Bundi district is in West. The Mukandara range of Vindhyan Hills, which is 145 km long, is located in the district. At many places, it has a curious double formation of two separate ridges, running parallel to each other at a distance of more than two kilometers. The portions lying between these ridges are often covered with dense forests.

The proposed road alignment follows mostly plain and rolling terrain. Elevation varies from about 207m above MSL to 283m above MSL.

***Geology***

The project district is not rich in minerals. The building stone is the most important and main mineral found in the Kota district.

The only major mineral found in the Kota district is Lime Stone. This is very important mineral which is being used for cement and for white cement flooring, plaster of Paris and in making fabulous film sets. It is also used in textile industry and building construction.

***Soil***

Soil of the Kota districts is deep black clayey and deep brown clayey and loamy suitable for production of cotton, rapeseed, mustard and wheat.

***Ambient Air Quality (AAQ)***

Ambient air quality monitoring has been done at evenly distributed (6) six locations along the proposed alignment. The results indicate that all air quality parameters are within the standards specified in the NAAQS.

***Ambient Noise Level (ANL)***

Noise monitoring has been carried out once during the entire study period at (6) six locations along the alignment for a period of 24 hours. Day & Night time Leq has been computed from the hourly Leq values as per standards. The Noise quality result show Leq Day time varies from 43.7 to 58.2 dB(A) and Leq Night time varies from 37.0 to 47.8 dB(A).

***Surface Water***

Surface water quality of the entire project str*etc*h has been monitored as per the parameters laid down by Central Pollution Control Board for surface water quality criteria classes A, B, C, D & E. The water quality at all three (3) locations were found satisfactory and can be used for irrigation & industrial propose along the proposed alignment.

***Ground Water***

Keeping in view the importance of ground water to the local population, (6) six representative ground water sampling locations were identified and analysed for assessment of ground water quality. pH ranging from 6.16 to 7.0 in ground water samples taken along the proposed alignment. The chloride content varies from 39.99 to 69.98 mg/l. The Fluoride content in the Kota district is found within 0.43 to 0.61mg/l.

The concentration of Nitrate ranges from 5.01 mg/l to 6.84 mg/l. Nitrate values in major part of the district are within 45 mg/l, the maximum permissible limit in drinking water as prescribed by BIS.

The concentration of iron in ground water has been found to vary from 0.141 to 0.284 mg/l.

### 1.5.2 Biological Environment

***Forest***

The recorded forest area of the state is 32,737 $m^2$, which is 9.57% of its geographical area. The Reserved, Protected and Unclassified forests are 38.11%, 55.64% and 6.25% respectively of the recorded forest area. However, as the digitized boundary of recorded forest area from the state covers only an area of 23,105 $m^2$. (Rajasthan State of Forest Report 2017)

The proposed alignment passing through Mawasa Arandkheda Binyani A protected forest and Barkalaji Reserve forest in kota forest division.

***Protected Areas / Eco-sensitive Zones/ Animal Corridor***

Proposed alignment passing through Darrah Wildlife sanctuary from chainage 422+304 to 425+752 km (Total length 3.448Km.)

### 1.5.3 Social Environment

***Census Profile***

As per census 2011, the state of Rajasthan having 6.9 Cr population, it is witnessed an increase of 1.2 Cr from 2001 population.

***Workforce in Project area***

The people in the villages are mostly engaged in the agricultural work and economy is largely based on agricultural activities. Some people are also working as a labourer in nearby area.

***Educational Institutes***

There is one educational institutes shall get affect due to the proposed development.

***Cultural Properties***

4 no. of Cultural & Religious Properties have not been observed along the project road section.

## 1.6 Public Interactions & Consultation

Public Interactions & consultations were conducted during the project preparations. The main purpose of these consultations was to know the community's reaction to the perceived impact of proposed project on the people at individual and settlement level.

## 1.7 Potential Environmental Impacts

The environmental components are mainly impacted during the construction and operational stages of the project and have to be mitigated for and incorporated in the engineering design. Environmental mitigation measures represent the project's endeavour to reduce its environmental footprint to the minimum possible. These are conscious efforts from the project to reduce undesirable environmental impacts of the proposed activities and offset these to the degree practicable. Enhancement measures are project's efforts to gain acceptability in its area of influence. They reflect the pro-active approach of the project towards environmental management.

### 1.7.1 Impacts on Climate

Slight change in the micro-climate of the area is expected due to Heat Island Effect as unpaved area will be converted into the paved road. However, Impact on the climate conditions from the proposed road project will not be significant in long run as removal of vegetation will be compensated by compensatory plantation to the tune of double the area denuded.

### 1.7.2 Impact on Air Quality

There will be rise in PM levels during the construction activities, which shall again be within prescribed limit after the construction activities are over. The level of CO is likely to be increase, however level shall remain within prescribed standards.

### 1.7.3 Impact on Noise Levels

The area is likely to experience an increment in noise level due to increase in vehicle density after road strengthening. Locations of sensitive receptors were identified and noise barriers in the form of compound wall are proposed at these locations to mitigate the noise level up to acceptable levels.

### 1.7.4 Impact on Water Resources and Quality

The construction and operation of the proposed project roads will not have any major impacts on the surface water and the ground water quality in the area. Design made to avoid physical loss to the water bodies to the extent possible.

Contamination to water bodies may result due to spilling of construction materials, oil, grease, fuel and paint in the equipment yards and asphalt plants. This will be more prominent in case of locations where the project road crosses rivers, nallahs, *etc*. Mitigation measures have been planned to avoid contamination of these water bodies.

### 1.7.5 Impact on Ecological Resources

Trees within ROW are likely to be affected due to the proposed development leading temporally loss of micro ecosystem. However, on the long run the impacts will be compensated in terms of compensatory and avenue plantation.

### 1.7.6 Impact on Land

During the construction of the proposed project, the topography will change 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. The change in topography will also be due to the probable induced developments of the project. Land acquisition is proposed at realignment and bypass locations

## 1.8 Analysis of Alternatives

Detailed analyses of the alternatives have been conducted taking into account both with and without project. The proposed strengthening of the road is likely to have a positive impact on the economic value of the region. However, there are certain environment and social issue, these needs to be mitigated for sustainable development.

## 1.9 Mitigation Avoidance &Enhancement Measures

Mitigation and enhancement measures have been planned for identified adverse environmental impacts. The construction workers camp will be located at least 500 m away from nearby habitations. Construction yard, hot mix plants, *etc*. will also be located more than 500 m away from habitations and in downwind directions. Existing cross drainage structures have been planned to maintain for proper cross drainage. In order to compensate negative impacts on flora due to cutting of trees the project plans compensatory plantation in the ratio of 1:3 *i.e.* for every tree to be cut, two trees will be planted. The project shall also witness the plantation of trees for providing aesthetic beauty and shade. As the space for compensatory plantation might not be adequate along the project road, this plantation shall be taken up by the forest department, after payment of the cost for raising and maintaining the saplings for three years. The project will take an opportunity to provide environmental enhancement measures to improve aesthetics in the project area. The planned environmental enhancement measures include plantation in available clear space in ROW, enhancement of water bodies *etc*. In order to avoid contamination of water bodies during construction Silt fencing, oil interceptors at storage areas and at construction yard have been proposed.

## 1.10 Institutional Requirements & Environmental Monitoring Plan

The responsibility of implementing the mitigation measures lies with Environment Team duly appointed by the Contractor/Concessionaire. The overall supervision of Environmental monitoring works during construction and operation stage shall be carried out by NHAI with the help of the Monitoring Consultant.

To mitigate the potential negative impacts of proposed development and measurement the performance of mitigation measures, an Environmental Monitoring and Management Plan is developed. The formulation of an appropriate environmental monitoring plan and its diligent implementation are keys to overall success for the project.

## 1.11 Environmental Management Plan

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

## 1.12 Environment Impact & Management Matrix

**Table 1-1: Environment Impact & Management Matrix**

| Particulars | Stages | Potential Impacts | Mitigation Measures |
|---|---|---|---|
| **Physiographic Environment** | | | |
| Topography | Preconstruction & Construction | • Slight changes are expected due to development of the road<br>• Impacts are marginal, but permanent. | • Proper planning to keep the land reformation upto bare minimum<br>• No new quarry for the project |
| Geology | Preconstruction & Construction | • Impacts are moderate because of extraction of sand | • No mitigation measure is required. |
| **Climate** | | | |
| Temperature/Rain fall/Humidity | Preconstruction & Construction | • Tree felling will have an impact of micro-climate of the area<br>• Heat island effect due to increase in paved roads<br>• Low spatially restricted short-term impact | • Compensatory plantation of triple of the trees to be cut<br>• With the proposed avenue plantation scheme, the micro climate of the project corridor will be smoothening |
| **Land** | | | |
| Loss of Other Land | Design, Preconstruction & Construction | • Loss of Property & Livelihood | • Compensation as per RAP |
| Induced Development | Preconstruction & Construction | • Insignificant change in the land use pattern | • Civil authorities to plan and guide any induced development using the prevailing regulatory framework |
| **Soil** | | | |
| Soil Erosion | Preconstruction, Construction & Operation | • In Road slopes and spoils<br>• Erosion in excavated areas | • Embankment protection through pitching & turfing<br>• Regular water sprinkling in excavated areas |
| Contamination of Soil | Preconstruction, Construction & Operation | • Scarified bitumen wastes<br>• Oil and diesel spills<br>• Emulsion sprayer and laying of hot mix<br>• Production of hot mix and rejected materials<br>• Residential facilities for the labour and officers | • Hazardous And Other Wastes (Management and Trans-boundary Movement) Rules, 2016<br>• Oil Interceptor will be provided in storage areas for accidental spill of oil and diesel<br>• Rejected material to be laid as directed by monitoring consultant.<br>• Septic tank to be constructed for waste disposal. |
| **Water** | | | |
| Impact on Water Resource | Design, Preconstruction, Construction & Operation | • Depletion of ground water recharge<br>• Contamination from fuel and lubricants & waste | • Provision of Storage/harvesting structure of water, wherever feasible<br>• Oil Interceptor and Septic tank |

| Particulars | Stages | Potential Impacts | Mitigation Measures |
|---|---|---|---|
| | | disposal in camp area<br>• Contamination of surface water system due to run-off from road construction area | in construction camp<br>• Enforcement of Hazardous And Other Wastes (Management and Trans-boundary Movement) Rules, 2016<br>• Both side drain facility to suitably divert the run-off from roads |
| **Air** | | | |
| Dust generation | Preconstruction& Construction | • Shifting of utilities, removal of trees & vegetation, transportation of material | • Regular Sprinkling of Water<br>• Fine materials to be completely covered, during transport and stocking.<br>• Hot mix plant to be installed in down wind direction with at least 1000m distance from nearby settlement.<br>• Regular monitoring of particulate matter in Ambient Air |
| Gaseous pollutants | Preconstruction, Construction & Operation | • Operation of Hot mix plant and vehicle operation for material transportation | • Air pollution Norms will be enforced.<br>• Only PUC certified vehicle shall be deployed<br>• Labourers will be provided with mask.<br>• Regular gaseous pollution monitoring in ambient air |
| Ambient air quality | Operation | • Air pollution from traffic<br>• CO level is likely to increase | • Compliance with statuary regulatory requirements |
| **Noise** | | | |
| Pre-Construction Activity | Pre-Construction | • Man, material and machinery movements<br>• Establishment of labour camps, onsite offices, stock yards and construction plants | • No Horn Zone sign, Speed Barriers near sensitive receptors<br>• Camps will be setup more than 500m away from settlements. |
| Construction Activity | Construction | • Operation of high noise equipment like hot mix plant, diesel generators *etc*.<br>• Community residing near to the work zones. | • Camp will be setup more than 1000m away from the settlements, in down wind direction.<br>• Noise pollution regulation to be monitored and enforced. |
| Operation Stage | Operation | • Indiscriminate blowing of horn near sensitive area | • Restriction on use of horns<br>• No Horn Zone sign. |
| **Ecology** | | | |
| Flora | Preconstruction, Construction | • Loss of vegetation cover<br>• Felling of 434 nos. of trees | • Felling of only unavoidable trees<br>• Compensatory Plantation in the ratio of 1:3 |
| Fauna | Preconstruction, | • Loss of insect, avian and | • Compensatory Plantation |

| Particulars | Stages | Potential Impacts | Mitigation Measures |
|---|---|---|---|
| | Construction & Operation | small mammalian species due to felling of trees<br>• Accidental run over | • Speed breaker, Signage and limit in sensitive areas |
| **Social** | | | |
| Socio Environment | Design, Preconstruction & Construction | • Loss of Property & Livelihood<br>• Loss of CPRs, Religious Structures | • Compensation as per RAP<br>• Relocation of CPRs, Religious Structures to suitable place |
| **Public Health and Road Safety** | | | |
| Health and safety | • Preconstruction, Construction & Operation | • Psychological impacts on project affected people<br>• Migration of worker may lead to sanitation problem creating congenial condition for disease vectors<br>• Discomfort arising of air and noise pollution<br>• Hazards of accident | • Continued consultation with PAPs and the competent authority for speedier settlements of appropriate compensation package and resettlement.<br>• Ensuring sanitary measures at construction camp to prevent water borne disease and vector borne disease.<br>• Provision for appropriate personal protective equipments like earplugs, gloves gumboot, and mask to the work force.<br>• Safe traffic management at construction area.<br>• Drive slow sign and speed barriers near community facilities like school, hospital, *etc*. |

## 1.13 Conclusions

Based on the EIA study and surveys conducted for the Project, it can be 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 exposure levels to population.