Initial Environmental Examination

August 2015

Uttar Pradesh Major District Roads Improvement Project

Prepared by Uttar Pradesh Public Works Department, Government of India for the Asian Development Bank

CURRENCY EQUIVALENTS

(as on 31st July 2015)

Currency unit	–	Indian rupee (INR)
INR 1.00	=	$ 0.0156
$1.00	=	INR 64.1510

ABBREVIATIONS

AADT	-	Annual Average Daily Traffic
AAQ	-	Ambient Air Quality
ADB	-	Asian Development Bank
AE	-	Assistant Engineer
APTI	-	Air Pollution Tolerance Index
ARAI	-	Automotive Research Association of India
AS	-	Aliganj-Soron Marg
BA	-	Bulandshehar –Anupshehar
BAU	-	Business as Usual
BC	-	Black Carbon
BMTPC	-	Building Material and Technology Promotion Council
BOD	-	Biological Oxygen Demand
BPL	-	Below Poverty Line
BSR	-	Basic Schedule of Rates
CALINE 4	-	California Line Source Dispersion Model Version 4
CAMPA	-	Compensatory Afforestation Fund Management and Planning Authority
CBOs	-	Community Based Organizations
CBR	-	California Bearing Ratio
CFCs	-	Chlorofluorocarbons
CGWA	-	Central Ground Water Authority
CHANGER	-	Calculator for Harmonized Assessment and Normalization of Greenhouse gas Emission for Roads
CL	-	Center line
CNG	-	Compressed Natural Gas
CO	-	carbon monoxide
CoRTN	-	Calculation of Road Traffic Noise
CPCB	-	Central Pollution Control Board
CSC	-	Construction Supervision Consultant
CSIR	-	Council of Scientific and Industrial Research
CRRI	-	Central Road Research Institute
DFO	-	Divisional Forest Officer
DG	-	Diesel Generator
DO	-	Dissolved Oxygen
DP	-	Displaced Persons
DPR	-	Detailed Project Report
DTA	-	Daily Temperature Range
DU	-	Domestic Use
EA	-	Executing Agency
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
EO	-	Environmental Officer
FCA	-	Forest conservation Act

GDP	-	Gross Domestic Product
GFF	-	Glass fiber filter
GHG	-	Green House Gas
GIS	-	Geographic Information System
GLS	-	Ground Level Concentration
GoUP	-	Government of Uttar Pradesh
GRC	-	Grievance Redress Committee
GRM	-	Grievance Redress Mechanism
HA	-	Hussainganj-Hathgaon-Auraiya-Alipur
HCV	-	Heavy Carriage Vehicles
HFL	-	Highest Flood Level
HK	-	Haliyapur-Kurebhar-Bilwai
HMA	-	Hot Mix Asphalt
IBA	-	Important Birds and Biodiversity Area
ICAP	-	Indian Clean Air Program
IEE	-	Initial Environmental Examination
IMD	-	Indian Meteorological Department
IPCC	-	Intergovernmental Panel on Climate Change
IR	-	Irrigation
IRC	-	Indian Road Congress
IS	-	Indian Standard
IUCN	-	International Union for Conservation of Nature and Natural Resources
JE	-	Junior Engineer
KB	-	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg
KL	-	Kilo Liter
KN	-	Kaptainganj-Naurangia
LCV	-	Light Carriage Vehicles
LKO	-	Lucknow
LPD	-	Liter per Day
MB	-	Muzaffarnagar-Baraut
MDRs	-	Major District Roads
MM	-	Mohanlalganj-Maurawan-Unnao Marg
MoEFCC	-	Ministry of Environment, Forests and Climate Change
MoRT&H	-	Ministry of Road Transport and Highways
MOST	-	Media Oriented Systems Transport
NAAQS	-	National Ambient Air Quality Monitoring Standards
NATCO	-	National Atlas and Thematic Mapping Organisation
NBSS & LU	-	National Bureau of Soil Sciences and Land Use mapping
ND	-	Nanau-Dadau
NGO	-	Non Government Organization
NH	-	National Highway
NOx	-	Oxides of Nitrogen
NPV	-	Net Present Value
NTU	-	Nephelometric Turbidity Unit
OC	-	Organic Carbon
ODRs	-	Other District Roads
PCU	-	Passenger Car unit
PF	-	Protected Forest
PH	-	Physically Handicapped (PH)
PI	-	Performance Indicator

PM	-	Particulate Matter
PP	-	Project Proponent
PPE		Personal Provisional Equipment
PPTA	-	Project Preparatory Technical Assistant
PRI	-	Panchayati Raj Institution
PSTP	-	Packaged sewage treatment plants
RCP	-	Representative Concentration Pathways
REA	-	Rapid Environmental Assessment
RO	-	Range Officer
ROADEO	-	Road Emissions Optimization
ROW	-	Right of Way
RP	-	Resettlement Plan
SC	-	Supervision Consultants
SDO	-	Sub Divisional Officer
SEIAA	-	State Environment Impact Assessment Authority
SHE	-	Safety Health & Environment
SIEE	-	Systemic Injury by Environmental Exposure
SPS	-	Safeguard Policy Statement
SO_2	-	Sulphur Dioxide
SOI	-	Survey of India
SPL	-	Sound pressure levels
SPS	-	Safeguard Policy Statement
SPCB	-	State Pollution Control Board
SR	-	Storage of Rain Water
PPTA	-	Project Preparatory Technical Assistance
PUC	-	Pollution under Control
TDS	-	Total Dissolved Solids
TEEMP	-	Transport Emissions Evaluation Model for Projects
ULB	-	Urban Local Bodies
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
UPPCB	-	Uttar Pradesh Pollution Control Board
UPPWD	-	Uttar Pradesh Public Works Department
USAID	-	United State Agency for International Development
USDA	-	United States Department of Agriculture
VRs	-	Village Roads
WHHs	-	Women headed households
WPS	-	With Project Scenario
WW	-	Waste Water

WEIGHTS AND MEASURES

amsl	- Altitude mean sea level
Cum	- Cubic metre
dB (A)	- A-weighted decibel
gm/cm^3	- Gram per centimeter cube
g/km	- Gram per kilometer
g/tkm	- Grams per ton kilometer
gm/cc	- Grams per cubic centimeter
ha	- Hectare

km	-	Kilometer
Km/l	-	Kilometer per litter
km2	-	Square kilometer
Leq	-	Equivalent continuous noise level
µg	-	Microgram
µg/ m^3	-	Microgram per cubic metre
m	-	Meter
mamsl	-	Metres above mean sea level
mg/ kg	-	Milligram per kilogram
mg/l	-	Milligram per liter
mg/ m^3	-	Milligram per cubic meter
MPN	-	Most Probable Number
MW	-	Megawatt
PM 2.5 or 10	-	Particulate Matter of 2.5 micron or 10 micron size
Sqm	-	Square Metre
Tons/ km	-	Tons per kilometer

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EXECUTIVE SUMMARY

1. Uttar Pradesh (UP) is a State located in northern India. It was created on 1 April 1937 as the United Provinces, and was renamed *Uttar Pradesh* in 1950. Lucknow is the administrative capital of Uttar Pradesh. The state is bordered by Rajasthan to the west, Haryana and Delhi to the northwest, Uttarakhand and the Nepal to the north, Bihar to the east, Jharkhand to the southeast, Chhattisgarh to the south and Madhya Pradesh to the southwest. Uttar Pradesh is the Fourth largest Indian State by economy, with a GDP of 7080 billion (US$110 billion). Agriculture and service industries are the largest parts of the state's economy.

2. Demand for road transport has been continuously increasing in the state. The number of annually registered vehicles in the state has increased at an average annual rate of about 10% since2001. As of 2012, there were about 1.7 million vehicles registered in the state. The state has a road network of 299604 Km, out of which 174451 Km is under Uttar Pradesh Public Works Department (PWD). The roads under PWD comprise 7550 Km of National Highways (NHs), 7530 Km of State Highways (SHs), 5761 Km of Major District Roads (MDRs), 3254 Km of Other District Roads (ODRs) and 138702 Km of Village Roads (VRs). Only about 60% of SHs are two-lane (7m). In the entire state 62% of MDRs and 83% of ODRs have widths less than 7m.About 40% of this network is in poor to very poor condition and congested.

3. India has the dubious distinction of leading the world in road accident fatalities. In 2012, there were more than 138,000 people killed on the roads, implying that about 378 lives are being lost every day in India due to road accidents. Uttar Pradesh together with Tamil Nadu has been the largest contributor to the total number of road crash deaths in the country (11.7 percent each), followed by Andhra Pradesh (10.8), Maharashtra (9.6) and Rajasthan (6.9). A total of 22,155 people were injured and 16,149 killed on UP roads in 2012, of which 73 percent died on national and state highways (less than 9 percent of the road network). Almost 50 percent of the people killed on UP Road Network.

A. Project Background

4. Recognizing the importance and need of road improvement in providing momentum for accelerating economic development, Government of Uttar Pradesh has initiated several road improvement projects including externally aided projects. In line with this Govt. of Uttar Pradesh through Department of Economic affairs has requested for loan from Asian Development Bank to the tune of 300 million US Dollar for implementing the Uttar Pradesh Major District Roads investment Programme to upgrade and rehabilitate MDR’s thereby improving connectivity and fostering inclusive growth.

B. Objective of Project

5. Project aims to improve transport efficiency of the state road network, which will contribute to expansion of economic opportunities and poverty reduction. This will be realized by

(i) Improving the state road network,
(ii) Enhanced Safety and level of Service for the road user
(iii) Superior Operation and Maintenance enabling enhanced operational efficiency of Project Roads
(iv) Facilitating safe and appropriate road usage,
(v) Increasing efficiency of transport services including saving in travel time & cost,
(vi) Enhancing UPPWD’S capacity for road asset development and management.

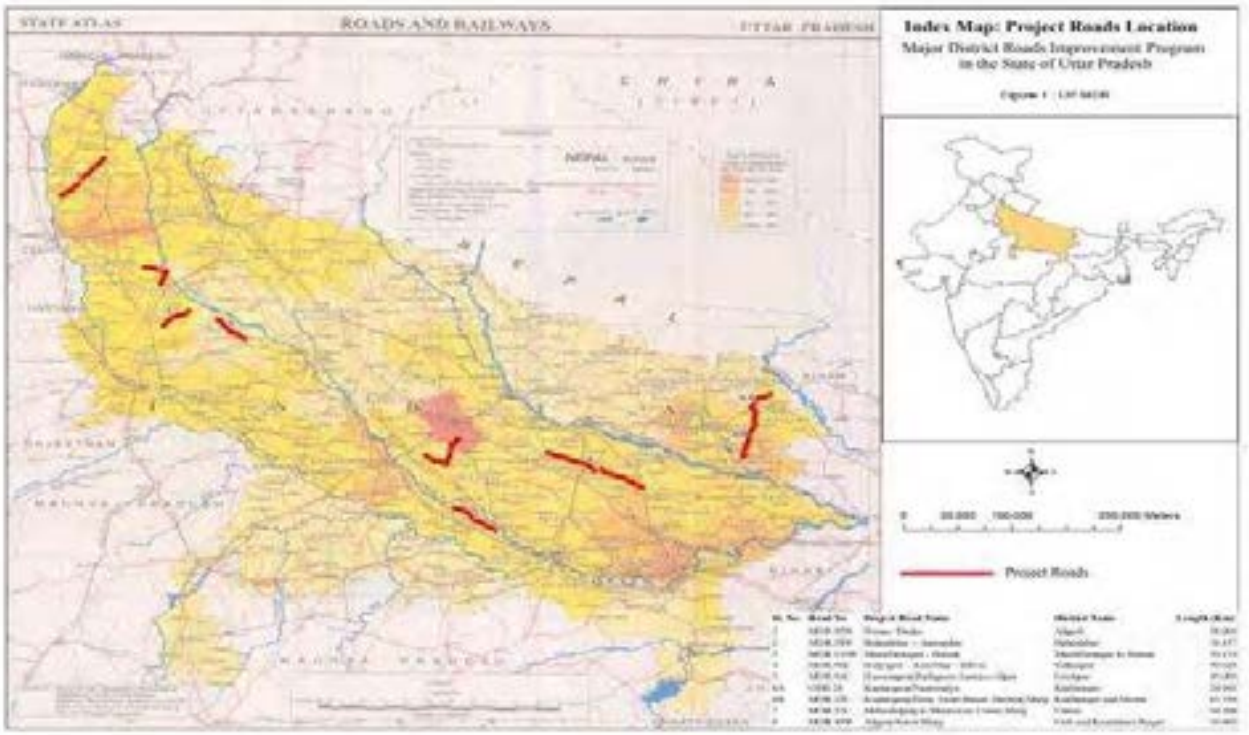
C. Project Roads

6. 08 Roads have been shortlisted by UPPWD after carrying out Prioritization Study of Core Road Network for Rehabilitation and Up-gradation under this project, details of which are given in **Table Es 1 and Fig. Es 1.**

Table Es 1: Project Roads

Sl. No.	Road No	Project Road Name	District Name	Length (Km)	Category (ADB guidelines)
1.	MDR 82W	Nanao- Dadao (ND)	Aligarh	30.00	B
2.	MDR 58W	Bulandshar – Anoopshar (BA)	Bulandshar	36.137	B
3.	MDR 135W	Muzaffarnagar – Baraut (MB)	Muzaffarnagar - Baraut	59.174	B
4	MDR 66E	Haliyapur–Kurebhar – Bilwai (HK)	Sulltanpur	95.628	B
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur (HA)	Fatehpur	49.00	B
6A	ODR24	Kaptanganj-Naurangiya (KN)	Kushinagar	24.041	B
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar-Barhaaj Marg (KB)	Kushinagar and Deoria	61.350	B
7	MDR 52C	Mohanlalganj to Maurawan Unnao Marg (MM)	Unnao	54.100	B
8	MDR 45W	Aliganj-SoronMarg (AS)	Etah and Kanshiram Nagar	35.603	B

Fig. Es 1: Location Map



D. Project Categorization & Environmental Sensitivity

7. On the basis of REA checklist, project has been classified as Category B warranting IEE study. None of the project road is passing through any Protected Area like Wildlife Sanctuary, National Park, Biosphere Reserve, Wildlife Corridor, Eco-sensitive zones, Critically Polluted Areas as identified by CPCB, Reserve Forest, Protected Forest owned by Forest Department. However, vacant spaces on both sides of Nanau-Dadau MDR 82W of length 30km vide Order No. 155 / XIV-331-50 dated 10.02.1960, section starting from chainage km 9.000 to km 31.000 of MDR 135W Muzaffarnagar-Baraut of length 22 km vide Order No. 155 / XIV-331-50 dated 10.02.1960, RoW from Bahera-Chowk at km 33.375 to Alipur-Jita at km 48.675 of length 15.3 km of MDR 81C Hussainganj-Hathgaon-Auraiya-Alipur road vide Notification No. 3278/14-2-43/86 dated 7th August, 1986, start of road to start point of MDR 52C of length 1.3 km of Mohanlalganj to Maurawan-Unnao Marg road have been notified as Protected Forest from management point of view and ownership of the land with PWD.

8. No Notified PAs present within 15 km of Project Roads except Nawabganj Bird Sanctuary located at a distance of 11 km from MM road which is an important habitat for resident and migratory waterfowls. No endangered fauna in the Sanctuary but Greater Spotted Eagle and Sarus Crane are Vulnerable as per the IUCN red list. Sarus Crane spotted in nearby ponds and agrilcultural fields along MDR 52C road during site visit, however, Wildlife officials have confirmed that these are not identified/important avifaunal habitat site.

9. Upper Ganga River (Brijghat –Narora Stretch) declared as a Ramsar site but the project road of BA is outside the wetland boundary. The nearest point is junction of Anoopshahar at km 39.700 which is 900m away from it. The river stretch provides habitat for IUCN Red listed Ganges River Dolphin. The intervening land-use between the project road to the nearest point of River Ganga is a dense settlement of Anoopshahar hence negligible impact is anticipated for which necessary mitigation measures have been suggested. This river stretch is used for cremation and holy baths for spiritual purification. Major threats are sewage discharge, agricultural runoff, and intensive fishing because of which dolphins are not reported at this point as confirmed by forest department and local people

10. The project roads are Major District Roads and other District roads, which are not covered in S.O. 1533 EIA Notification 2006 and subsequent amendments thereof. The roads do not fall under Category “A” or “B” of the notification. Hence, the project does not require prior Environmental Clearance.

E. Initial Environment Examination

11. Initial Environment Examination (IEE) is a process of evaluating the likely environmental impacts of a proposed project or development to lesser extent, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

F. Objective of IEE

12. The IEE study has been carried out with following objective

- Ensuring environmental factors are considered in the decision-making process
- Ensuring that possible adverse environmental impacts are either avoided or minimised and brought to acceptable level.
- More informed decision making by involving public since the beginning of project, informing the public about the proposal, allowing people to examine the

underlying need for a project and giving them opportunity to identify problem and suggesting environment friendly locally available solutions to the identified problem.

- improved integration of projects into their environmental and social setting
- a positive contribution toward achieving sustainability
- Facilitates the design of a monitoring programme to check the adequacy of IEE and Implementation of mitigative measures suggested in EMP.

G. Project Interventions

13. The Existing Project Roads are Proposed to be widened/ Improved from Single lane / Intermediate / two lane to Two Lane Configuration with Paved / Earthen Shoulders, drains, Road signages etc. Except in Muzaffarnagar to Baraut Section where in two stretches from km 19.280 to km 20.280 and km 30.690 to 32.690, 4 lanes Overlay in urban areas with lined drain is proposed. The formation width in general is 12m in open areas and between building lines in built up area. With the intention of segregating the pedestrian from the traffic in urban areas Footpath cum drain has been proposed. The generic configuration proposed is given in **Table Es 2** and typical proposed cross sections are given in **Fig. Es 2 to Fig. Es 4.**

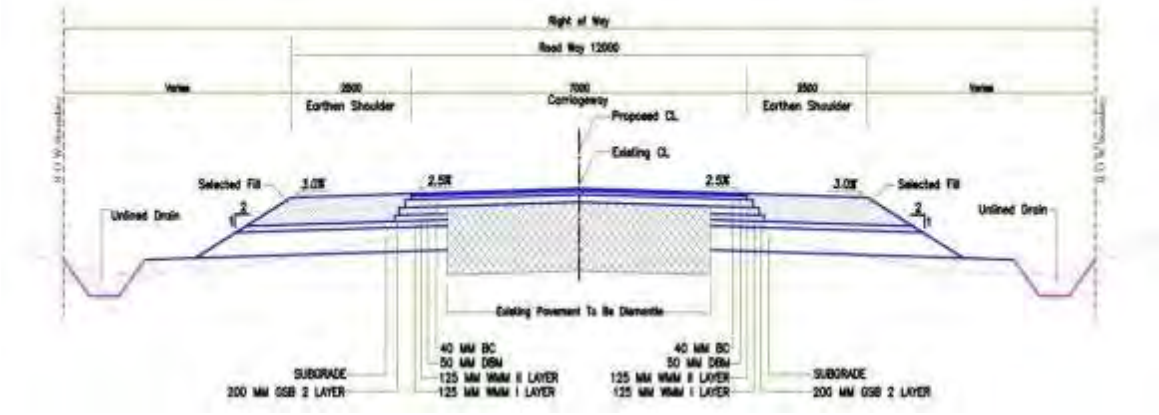


Fig. Es 2: TCS of Two Lane with Earthen Shoulder

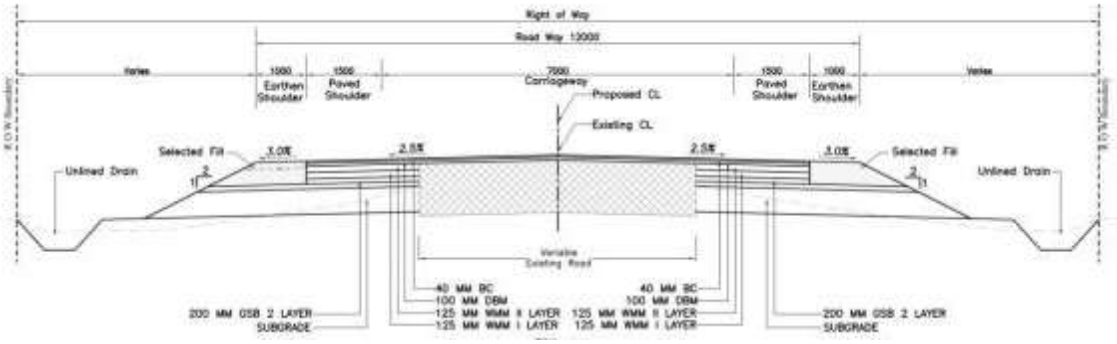


Fig. Es 3: TCS of Two Lane with Paved Shoulder

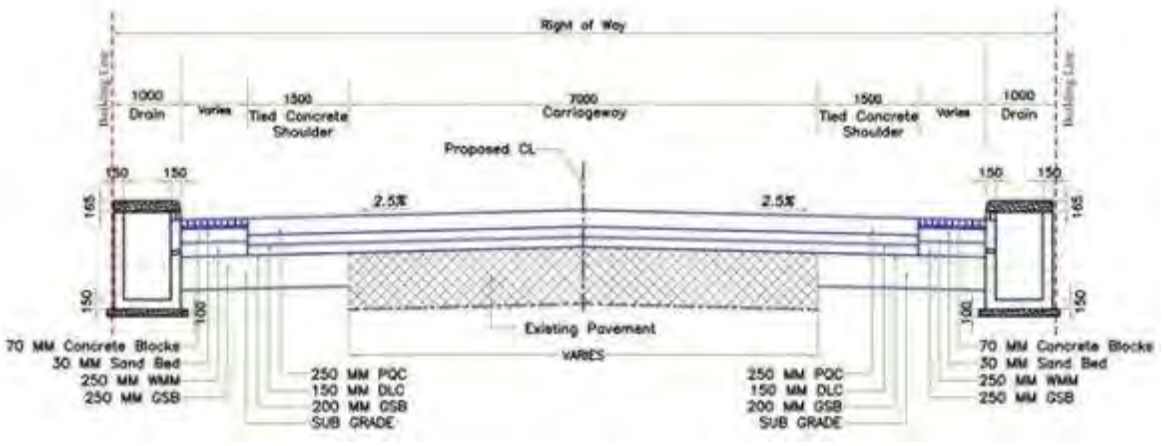


Fig. Es 4: TCS of Reconstruction with Footpath with line drain in Urban Areas

14. Safety features such as elaborate system of signs and markings, cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, protection works viz. retaining walls, turfing of high embankment slopes, km stones, ROW stones, other safety measures, informatory boards, mandatory road signs, and edge line marking etc. are proposed in line with IRC's Codal provision , MoRTH guidelines / Standards and International best practices .

Table Es 2: Generic Configuration
(Configuration of Urban, rural section with earthen shoulder, Paved Shoulder.

S. No.	Parameters	Urban	Rural
1.	Carriageway	2 lane, 2 x 3.50m	2 lane, 2 x 3.50m
2.	Paved Shoulders	1.5 m	NA
3.	Earthen Shoulders	NA	2.5m
4.	Concrete Pavers	Variable between paved shoulders and footpaths.	NA
4.	Drains	2 x 1m wide Footpath cum Rectangular Drain	2x 1.8m wide Unlined Drain

H. Capacity and Level of Service

15. Capacity and design service volumes for various lane configurations are specified in IRC:SP: 73 – 2007, 'Manual for Standards and Specifications for Two-laning of State Highways through Public Private Partnership'. The project stretch passes through plain terrain predominantly. The capacity standards for LoS B and LoS C considered is as given in **Table Es 3**.

Table Es 3: Capacity and Level of Service

S. No	Road	Terrain	Design Service Volume in PCUs per day	
			LOS B	LOS C
1.	2 lane	Plain and Rolling	15000	21000

16. The capacity of two lane road is 15000 PCU/day as per the Table 4 of the IRC: 64-1990 design traffic and it will further increase by 15% by providing 1.5 m paved shoulder on either side as per the Para 10.3 of the IRC: 64-1990.

17. All roads except Bulandshar – Anoopshar (BA MDR 58W) qualify to be two lane with earthen shoulder as Projected PCU are less than 15000 at the opening year 2018. Bulandshar – Anoopshar (BA MDR 58W) is proposed to be upgraded to Two lane with Paved Shoulder configuration as traffic plying on the road at the opening year i.e. 2015 will be more than 15000 PCUs.

I. Description of Environment

18. The baseline has been established for components of valued eco-system from Primary / Secondary data as precursor to evaluation of impact. The brief description of Environment of all the eight roads is given below in **Table Es 4.**

Table Es 4: Description of Environment

PHYSICAL ENVIRONMENT	
Location of the Project Roads	• ***Located*** in the districts of Aligarh (ND-MDR82W), Muzaffarnagar & Baghpat (MB-MDR 135W), Bulandshahar (BA-MDR 58W), Fatehpur (HA-MDR 81C), Sultanpur (HK-MDR 66E), Deoria & Kushinagar (KN-ODR 24 & KB-MDR 25E), Lucknow & Unnao (MM-MDR 52C) and Etah & Kanshiram Nagar (AS-MDR45W) in the State of Uttar Pradesh
Physiography and Topography	The project roads fall under Gangetic Plain in Alluvial plain terrain • With slope being less than 10 m per km; • Elevation varies between 80m to 240m amsl along the project roads.
Geology and Soil	• Most of the Project roads lie in inter-fluvial tract of Ganga and Yamuna. • ***Rock formation-*** Quaternary alluvium of Pliestocene and Holocene age consisting of clays, occasional kankar, sand of various grades and gravels. • ***Soil type:*** Coarse loamy & fine loamy well drained older alluvium to excessively drained sandy younger alluvial soil • ***Soil characteristics:*** well drained to excessively drained with medium to high fertility potential
Drainage	Major river Basins in project roads • Yamuna and Ganga Basin (ND-MDR 82W) • Yamuna sub basin (MB-MDR 135W) • Ganga basin (BA-MDR 58W) • border of Yamuna and Ganga sub basin (HA-MDR 81C) • Gomti sub basin and Ganga basin (HK-MDR 66E) • Ghaghra- Gandak sub basin (KN-ODR 24 & KB-MDR 25E) • Sai sub basin of Ganga basin (MM-MDR 52C) • Kali sub-basin of Ganga basin (AS-MDR45W)
Land use	• Predominant land use along all project roads is agricultural land followed by built –up, vegetation, water bodies etc.
Climate	• The climate of the area in project roads is Tropical monsoon sub humid type with three main seasons viz. summer, monsoon and winter.
Rainfall	• Annual average rainfall of 5 years received by the project roads is 549.8 mm (ND-MDR82W), 557-663 mm (MB-MDR 135W), 600 mm (BA-MDR 58W), 681 mm (HA-MDR 81C), 1007 mm (HK-MDR 66E), 721-1203 mm (KN-ODR 24 & KB-MDR 25E), 634 mm (MM-MDR 52C) and 512-721 mm (AS-MDR45W)
Temperature	• Annual mean minimum and maximum temperature are 18.9°C and 31.2°C as recorded in New Delhi (nearest IMD station to ND, MB, BA and AS) • Annual mean minimum and maximum temperature are 18.3°C and 32°C as

	recorded in Lucknow (nearest IMD station to HA, HK and MM) • Annual mean temperature varies from 19.2^{0}C to 32.0^{0}C as recorded in Gorakhpur (nearest IMD station to KN-ODR 24 & KB-MDR 25E)
Wind	• Annual mean wind speed is 9.5 km/hr as recorded in New Delhi (nearest IMD station to ND, MB, BA and AS) • Annual mean wind speed is 8 km/hr as recorded in Lucknow (nearest IMD station to HA, HK and MM) • Annual mean wind speed is 4.1 km/hr as recorded in Gorakhpur (nearest IMD station to KN-ODR 24 & KB-MDR 25E)
Relative Humidity	• Annual mean relative humidity in the morning is 63% and 42% in the evening as recorded in New Delhi (nearest IMD station to ND, MB, BA and AS) • Annual mean relative humidity in the morning is 68% and 50% in the evening as recorded in Lucknow (nearest IMD station to HA, HK and MM) • Annual mean relative humidity in the morning is 69% and 53% in the evening as recorded in Gorakhpur (nearest IMD station to KN-ODR 24 & KB-MDR 25E)
Surface Water Resources	Canals & river crossings, ponds etc. present within 25 m on either side of CL of the project roads are as mentioned below • ND-5 ponds, 8 canals, 1 nallah, 53 minor streams and Kali river at km 6.910 • MB-6 ponds, 11 canals, 82 small water channels, Hindon crosses at km 30.110 and Krishna at km. 51.650 • BA-2 ponds, 15 canals & 2 nallahs • HA-26 ponds, 4 nallahs, 3 canals and 105 small water channels • HK- 18 ponds, 22 canals & 6 nallahs • KN-5 ponds, 6 canals and Choti Gandak at km 0.200 • KB-8 ponds, 12 canals and Mawan nallah at km 3.200 • MM-27 ponds (including Baknai Badaila Jheel), 14 canals, 2 nallahs & Sai River at km 13.100 • AS-3 canals
Surface Water Quality	• Total 13 samples collected from all project roads • All samples conform to Class C Standards of CPCB Surface Water Quality criteria except in MB road w.r.t BOD & Total Coliform, MM road w.r.t BOD and AS road w.r.t BOD
Ground Water	*Ground Water Resources* • 2 abandoned wells & 102 hand pumps in ND-MDR82W, 128 hand pumps in MB-MDR 135W, 122 hand pumps in BA-MDR 58W, 13 borewells, 226 hand pumps, 2 municipal taps and 23 wells in HA-MDR 81C, 452 hand pumps and 15 wells in HK-MDR 66E, 205 hand pumps, 1 well and 1 Pump set in KN-ODR 24, 297 hand pumps and 5 taps in KB-MDR 25E, 147 hand pumps and 6 wells in MM-MDR 52C and 143 hand pumps in AS-MDR 45W present within 25 m on either side of CL *Ground Water Level* • Varies from 1.9 to 21 mbgl in ND-MDR82W, 2.5 to 9.95 mbgl in MB-MDR 135W, 2 to 14.4 mbgl in BA-MDR 58W, 2.08 to 27.13 mbgl in HA-MDR 81C, 0.98 to 14.58 mbgl in HK-MDR 66E, 1.15 to 4.5 mbgl in KN-ODR 24 & KB-MDR 25E, 0.70 to 15.65 mbgl in MM-MDR 52C and 3 to 12 mbgl in AS-MDR 45W *Stage of GW development*

	• ND-MDR82W with 82.2%, HA-MDR 81C with 67.33%, HK-MDR 66E with 72% and KN-ODR 24 & KB-MDR 25E with 44% fall in Safe Category whereas MB-MDR 135W with 82%,BA-MDR 58W with 71.81%, MM-MDR 52C with 81.21% and AS-MDR 45W with 76% fall in Semi-critical category
Ground Water Quality	• Total 22 samples collected from all project roads • All samples conform to drinking water standards of IS:10500 (2012) except Iron which exceeds the limit (0.30 mg/l) at Rudrapur sample (3.82 mg/l) in KB-MDR 25E and Mangat Khera sample (0.34 mg/l) in MM-MDR 52C
Air quality	• Major air polluting sources along the project roads are brick kilns, sugarcane factories, vehicular traffic and dusty roads • Total 26 monitoring stations along all project roads. • Air quality parameters at all monitoring locations are within the permissible limits except for particulate matter in HA, HK and KNV roads.
Noise quality	Noise monitoring was done at 30 locations. The noise level within prescribed limit in BA, 2 locations in KNV, MM and AS roads whereas exceeds at few locations in ND, MB, HA, HK and KNV roads due to congested areas, poor condition of pavement, industrial and commercial activities.
BIOLOGICAL ENVIRONMENT	
Ecological Resources	*Forest type* • Dry Temperate forest
	Protected Forest (Vacant spaces on both sides of the project roads as mentioned below owned by PWD and managed by Forest Department) • along entire length of ND, from Taoli at km 9.000 to Budhana at km 31.000 along MB, first 0.800 km along MM and from Bahera Chowk at km 33.375 to Alipur Jita at km 48.675 along HA • Kaptanganj to Rudrapur road (MDR 25E) is not a notified PF but SH-1 which crosses the project road near Hata is a notified PF
	Protected Areaswithin 15 km aerial distance • No Notified PAs present except Nawabganj Bird Sanctuary located at a distance of 11 km from MM road which is an important habitat for resident and migratory waterfowls. • No endangered fauna in the Sanctuary but Greater Spotted Eagle and Sarus Crane are Vulnerable as per the IUCN red list • Sarus Crane spotted in nearby ponds and agrilcultural fields along MDR 52C during site visit, however, Wildlife officials have confirmed that these are not identified/important avifaunal habitat site
	Predominant Flora • Arjun, Babool, Neem, Shisam, Peepal, Mango, Bargad, Jamun etc. • Mango, guava and Jackfruit orchards are common along the roads • Trees present within 15 m of CL – 4697 in ND, 10136 in MB, 4277 in BA, 2744 in HA, 10526 in HK, 5005 in KN, 8278 in KB, 8313 in MM and 9012 in AS road
	Predominant Fauna • Peacock, crow, Common Indian Mynah etc. buffalo, cattle, goat, horse, etc. were spotted. Monkeys in groups observed at 2 locations in BA road
	Ramsar Site • Upper Ganga River (Brijghat –Narora Stretch) declared as a Ramsar site but the project road of BA is outside the wetland boundary.The nearest point is

	junction of Anoopshahar at km 39.700 which is 900m away from it • provides habitat for IUCN Red listed Ganges River Dolphin but is not reported at this point as confirmed by forest department and local people
SOCIO- ECONOMIC ENVIRONMENT	
Demographic Profile of Districts within the project roads	
Total Population	The total population of project impacted districts is 35.3 million in which a majority of population falls in the districts of Lucknow (45.89 lakhs), Sultanpur (37.90 lakhs), Aligarh (36.73 lakhs), Kushinagar (35.60 lakhs) Bulandshahar (34.98 lakhs), Unnao (31.10 lakhs) and Deoria (30.98 lakhs) followed by Mazaffarnagar (28.27 lakhs), Fatehpur (26.75 lakhs), Etah (17.61 lakhs Kanshiram Nagar (14.38 lakhs) and Baghpat (13.02 lakhs).
Sex ratio	Sex ratio in the districts of Deoria (1013), Sultanpur (978), Kushinagar (955) and Lucknow (917) is higher than that of UP State. In other districts like Unnao (901), Fatehpur (900), Bulandshahar (892), Muzaffarnagar (886), Kanshiram Nagar (879), Aligarh (876), Etah (863) and Baghpat (858) is lower in comparison to UP state.
Literacy Rate	Out of the twelve impacted districts, Lucknow has the highest literacy rate of 77.29% followed by Bulandshahar (76.23%), Baghpat (73.54%), Deoria (73.53%), Etah (73.27%), Sultanpur (71.14%), Muzaffarnagar (70.11%), Aligarh (69.61%), Fatehpur (68.78%) and Unnao (68.29%) which have higher literacy rate than the State (67.68%) except Kushinagar (67.66%) and Kanshiram Nagar (62.3%).
Socio-economic Profile of Affected Persons (APs)	
Affected Households (AHs)	976 households are affected in all project roads. The census survey reveals that majority households belong to OBC (617) followed by general category (288). No Tribal population in the affected households
Affected Persons (APs)	7103 APs in total being affected by the project roads which includes 3848 (54.17%) males and 3255 (45.83%) females
Educational Status of APs	In all the project roads, a significant percentage of 25.20% of APs are illiterate, 18.95% are Matric (10th standard) and a limited percentage (10.24%) are graduate and above.
Occupational Status of APs	69.67% of APs are doing businesses as their main occupation, 14.24% are engaged in agriculture work, 8.91% are working as laborer, 3.28% are employed in service sector and others working as self-employed,professional and rural artisan

J. Anticipated Environmental Impacts

19. The impacts on components of valued eco-system have been predicted qualitatively by using past experience, past proto type studies, checklists, trend analysis, etc. and quantitatively wherever possible by using models like TEEMP[1], CALINE[2] and CoRTN[3]. The impacts may be short term / long term or biophysical / social / health / economic or direct / indirect / cumulative or local / regional / trans-boundary / global or immediate/long term or temporary/permanent or reversible/irreversible, etc. The predicted impacts and their mitigation measures are given in **Table Es 5.**

[1] *Transport Emissions Evaluation Model for Projects – Software developed by Clean Air Asia. It has been used for modelling & prediction of CO2, NOx and PM.*
[2] *CALINE 4 – It has been used for modelling and prediction of CO.*
[3] *CoRTN - Calculation of ROAD traffic noise – This software has been used for Noise Modelling*

Table Es 5: Summary of potential impacts and mitigation measures

S. No.	Impacts on Environment component	Mitigation
1	**DESIGN STAGE**	
1.1	**Proposed Widening/Improvement**	
	• land acquisition, Loss of fertile agricultural land and Loss of water recharging points • Pavement roughness (6-7 m/km on the higher side) reduces fuel efficiency of vehicles	• Improvement shall be done within the existing RoW to minimize the impacts • Reduction of pavement roughness is predicted to be 2.5 to 3 m/km that would lead to reduction in air and noise pollution
1.2	**Widening of road along with drainage**	
•	• Over topping or flooding of road surface • Accumulation of runoff water along the roads	• 1m wide rectangular drains cum footpath in built up areas of length 268.89 km and 1.8 m wide unlined drains of length 736.30 km in open areas has been proposed in Project Roads. • The Profile of road has been raised at 166 locations for a length of 115.86 km in all Project roads. • 3 major bridges to be retained with minor improvements. 28 minor bridges to be widened, 15 to be retained and 11 to be reconstructed out of 54 minor bridges. Out of 437 culverts, 144 are to be widened and 460 to be reconstructed.
1.3	**Planning for pre-construction activities**	
	Road side utilities like electric poles, water supply line, hand pumps, wells may get impacted	Planning shall be made to remove and relocate the utilities prior to start of construction with prior permission of the competent authority.
1.4	**Design for safety provision**	
	Road improvement may increase the speed of plying vehicles posing increasing threat of accidents	Adequate safety provisions like traffic control devices and road safety features, including retro-reflective warning sign boards near school, hospital, and religious places, sidewalks, road markings, road lighting, crash barriers and speed breakers as per relevant IRC codes and standards are incorporated in the design. Horizontal and Vertical geometry has been improved to the extent possible in line with IRC Guidelines.
2	**CONSTRUCTION & OPERATION STAGE**	
2.1	**Topography**	
	Plain terrain. FRL raised at 166 stretches for 115.86 km of length	No mitigation measures required
2.2	**Micro climate**	
	Increase in temperature due to felling of trees ,construction activities and operation of construction machineries etc.	• Sprinkling of water shall be carried out during construction phase. • Saplings shall be planted on vacant spaces on both sides of roads.
2.3	**Geology**	
	• Extraction of 16.44 lakh cum of stone aggregate and 2.9 lakh cum of sand is required to be done from the rocky areas and river beds. • Illegal or over extraction of sand from river banks may lead	• Quantity of stone aggregates required is negligible compared to the existing available quantities. • Stones & sand will be obtained from existing 15 quarries & 8 mining site that are having all valid permits applicable under law and being managed in environment friendly manner.

S. No.	Impacts on Environment component	Mitigation
	collapse of river banks, loss of adjacent structures, etc.	
2.4	**Natural Hazard- Earth quake**	
•	• Out of 8 roads 7 falls in high & moderate risk zone &1 in low risk zone • May break or cause cracks on pavement, bridge or culverts; disrupt traffic flow; damage to vehicles or life of road users.	• The pavement & cross drainage structures design shall be earthquake resistant
2.5	**Soil**	
	Construction • Loss of productive soil due to change in land use, opening of borrow areas, haulage routes. • Soil erosion along the river banks, road embankment • Soil compaction along haulage routes, agricultural fields • Contamination of soil due to seepage of oil/ fuel or disposal of solid / liquid waste from camps • Operation • Oil spillage from vehicles in case of accidents may contaminate the adjacent agricultural land. Possibility of such an accident is very less.	**Construction** • Improvement Proposals shall be carried out within available ROW and no additional land acquisition is proposed • Construction / labour camp shall be opened up in barren land 1 km away from settlements. It shall not be opened on agricultural land unless inevitable. In such case the top soil shall be stripped, stored and reused. • Slope protection measures shall be taken in the form of turfing/ stone pitching as necessary or as applicable under IRC:56-1974. • MoRTH guidelines on "Earthwork Erosion Control and Drainage" in section 300 shall be followed for selection and management of borrow pits. Restoration shall be done within 6 months. • Construction vehicles and machineries shall move within the ROW Along the construction fronts and in designated areas. • Haulage Road Network shall be identified and approved by CSC and shall avoid the productive land. • The storage area and refueling stations shall be roofed and rainwater drained separately through an oil/grease interceptor prior to final disposal • Operation • A contingency plan shall be prepared to manage oil spill on agricultural land as suggested in the IEE
2.6	**Construction Waste**	
	• Scarified bitumen are harmful for human health • Demolition waste left unattended would create nuisance	• Reuse shall be done based on suitability and approval of Environmental expert of CSC. Disposal of unused bitumen shall be done as per, Hazardous Material (Management, Handling and Trans boundary Movement) rules, 2008 and burial into the ground with an underlying layer of 60 cm layer of clay as specified in EMP.
2.7	**Drainage & Hydrology**	
	Construction Obstructing flow of water due to dumping of construction waste. **Operation** Drainage channels may get clogged due to sediment and aquatic plants	**Construction** • No waste shall be dumped along the banks or in the rivers. • Immediate removal of debris from river bed after pilling. Silt barrier shall be used • Construction of CD structures shall be done during

S. No.	Impacts on Environment component	Mitigation
	during operation.	non –monsoon season **Operation** • Periodical cleaning shall be done before and after heavy showers.
2.8	**Water Environment- Surface and ground water**	
	Construction • Severely impacted ponds are 28 out of 89 • Moderately -49 ponds; low impact-8;negligible impact-4ponds • >50% reclamation of only 1 pond; 4 ponds by 25-50% & 31 ponds by < 25%. • Other impacts would be in terms of siltation and oil contamination (if accidents occur) • Increase in turbidity of river water during bridge construction can harm fishes and smother algae • 24.7 lakh KL water will be extracted from ground water for construction. May lead to conflict with local users • Out of 1816 hand pumps within 15m of CL , 1540 will be impacted **Operation** • Siltation and oil spill (if accidents occur) • Heavy metals from paints may harm aquatic species	**Construction** • Out of 89 ponds, retaining wall (592 m) is proposed for 20 ponds and silt fencing (637 m) shall be done around 49 ponds, intercepting ditches shall be provided along 21 ponds (in 13 ponds the ditch shall be provided along with silt fencing). 9 ponds are identified for enhancement. • Silt fencing of river bank at least up to 5 m either side form the bridge; turbidity curtain & piling protector made of impermeable fabric shall be used along with cover of tarpaulins under the bridge. • Immediate cleaning of debris from river bed • Camps shall be located 1km away from water bodies • Retention areas to contain accidental spills of toxic and hazardous material. • Ready mix concrete and gunny bags / curing admixtures, shall be used to reduce water requirement at site during construction. • Extraction of ground water from Critical, semi critical and over exploited blocks shall be avoided. If inevitable shall be done after taking permission from CGWA; Community GW sources shall be avoided **Operation** • Lead based paints shall be prohibited strictly • Contingency plan shall be prepared to manage oil spill in water bodies as suggested in the IEE. • Relocation and enhancement of hand pumps are proposed
2.9	**Climate change Impact Assessment- Greenhouse Gas emission estimation**	
	The total emission of CO2 as estimated during BAU and WPS for all the project roads individually is less than 100,000 tons per year threshold set by ADB.	• To further offset the emissions compensatory plantations (1:3) shall be done on lands near the roads along with additional road side plantation at 1:2. • Encourage use of clean fuel by setting up CNG stations in towns along the roads. • Maintain road roughness at minimum.
2.10	**Climate Change risk assessment**	
	• Increase on temperature by 2.76^0 C in summer may lead to pavement buckling, rutting softening. • Drought may lead to longitudinal cracks on pavement and soil destabilization • Flood may lead to damage of pavement / bridges/ culverts and drainage problem • Strong wind may lead to damage of road infrastructure	**Construction and operation** • Heat resistant paving materials shall be used; • Adaptation measures involves reconstruction and widening of CD structures, construction of 268.89 km lined and 763.30 km of unlined drains; increase in height of embankment for a length of 115.92 km, turfing for a length of 316.51 km and stone pitching for a length of 14.25 km. Total cost incurred for the adaptation measure is approximately Rs.707.253 Cr. • 1-in-100-year return period shall be considered for the designing of CD structures and embankment height. • The road infrastructure shall be designed, installed

S. No.	Impacts on Environment component	Mitigation
		and material shall be chosen based on the factors like resistance to high wind speed etc.
2.11	**Air Environment**	
	Construction • Fugitive dust emission from construction activities like site clearance, excavation, back-filling and concreting, hauling and dumping of earth & construction spoils • Gaseous emission from construction equipment and vehicular traffic. Inadequate maintenance of vehicles and use of adulterated fuel; Emissions from hot-mix plants. **Operation** • Cumulative CO GLC predicted using CALINE 4 will remain within limit till 2030; PM level exceeds NAAQS limits at 8 locations due to higher baseline concentration in MDR81C, MDR 66E, ODR 24 and MDR 25E.	**Construction** • Construction camp shall be sited more than 1 km in the downwind direction of the nearest settlement; Dust screen shall be used around the crusher to trap dust at sources only; Water sprinkling shall be done on the dust generating sites; PPE for workers • All vehicles, equipment and machinery shall be regularly maintained to ensure that the pollution emission levels conform to the norms; Regular monitoring of air quality parameters as per monitoring plan • Adoption of cold mix technology whenever possible; Hot mix plant shall be established as per SPCB norms **Operation** • Pollution resistant tree species shall be planted (Neem or *Azadirachta Indica*, *cassia fistula* or Amaltas, *ficus religiosa* or peepal, dalbergia *sisoo* or seesam and *Eugenia Jambolana* or Jamun) • Regular monitoring of air quality shall be done as per monitoring plan.
2.12	**Noise Environment**	
	Construction • The resultant maximum noise level for likely to be generated by construction machineries is 100.5 dB(A) **Operation** • Noise is predicted to increase by 5-7 dB(A) as modelled using CoRTN during operation without any mitigation measure	**Construction** • Movable barriers around machineries to attenuate the sound pressure by 10 to 15 dB(A). • It shall also be located around 1km downwind from any habituated area where along with barrier protection the noise level can be reduced to 55 dB(A) • Regular equipment and vehicles maintenance shall be undertaken and placed 1 km away from sensitive areas/ settlements • The noisy construction operations shall not be scheduled during nighttime • PPE for workers • Public notification of construction operations shall incorporate noise considerations. Methods to handle complaints will be specified. **Operation** • On road noise attenuating measures like no horn sign posts, near sensitive receptor shall be provided to attenuate noise. • Sensitive receptors located along the road roads edge without any intervening land use are proposed to be provided with noise barriers of 2m high masonary or hollow concrete block walls. • A combination of noise barriers, along with reduction in speed and presence of building wall shall cumulatively reduce noise levels by 16 dB(A) for recipients inside building • Out of 327 sensitive receptors, noise barriers are

S. No.	Impacts on Environment component	Mitigation
		proposed for 191 schools, colleges and hospitals.
2.13	**Ecological Environment**	
	Construction **Flora** • Approximately, 37873 trees shall be felled due to proposed improvement works in project. • Some trees and ground vegetation will be affected during establishment of construction camps, worker camps, and stockyards for material storage and construction machinery and equipment camps. • Approximately, 78.76ha of protected forest land owned by UPPWD and managed by Forest Department shall be diverted • During construction the rate of accumulation of dust on leaves may increase. It affects the rate of photosynthesis as they receive less light for photosynthesis; this interferes with gas exchange between the leaf and air, and the reduction of leaf stomatal conductance influences plant biomass formation and yield i.e. plant growth and development gets affected **Fauna** • Glare and noise during construction is anticipated in the indirect impact zone between Nawabganj Bird Sanctuary and the project road of MDR 52 C. This may affect the avifaunal species. • Two locations along Bulandshahar and Anoopshahar road (km 23.200 to km 23.400 and km 47 to km 48) where temples exist, people offer food materials as religious offerings to monkeys and this draws them in group to the road. This may lead to human-animal or animal-vehicle conflict during construction as well as operation. • No impact is anticipated on the Ramsar site no. 1574 due to MDR 58W as it is beyond the wetland boundary, the intervening land has the big city of Anoopshahar on it	**Construction** **Flora** • Only those trees shall be cut which will impinge on work and compensatory afforestation shall be done at the ratio of 1:3. • Peepal trees on both side of Aliganj soron road at km 52 in Talli village shall be saved by widening the road within available space. • Avenue plantation shall be carried out as per IRC Code SP: 21:2009 “Guidelines for Landscaping and Tree Plantation” at the ratio of 1:2 as per availability of space along the road near sensitive land uses (sensitive noise receptors, water bodies etc) • No illegal tree felling will be allowed. Contractor will arrange for cooking gas/fuel. • Work on Protected Forest Land shall be started after obtaining permission under Forest Conservation Act 1980. • Regular sprinkling of water shall be done to suppress dust so that it does not accumulate on the leaves **Fauna** • Hot mix plant/ construction camp shall not be located within 1000m of the road stretch from km 46.900 to 47.500 near village Unchagaon Killaespecially during winters (November to February). Also construction activities shall not be carried out during night time. A guard shall be appointed by the contractor to ensure that avifaunal species are not disturbed due to any kind of construction activities. • Project laborers will be made aware of the relevant provision of the Wildlife (Protection) Act 1972 and rules made there under to prevent poaching of game birds and animals. • Precautionary and educative sign boards shall be displayed near the monkey zones mentioning the Do’s and Don’t’s. • Security Guard shall be stationed at Baknai Badaila Jheel • No Construction work shall be carried out from km 45.900 to km 48.500 during winter season from November to February. **Operation** **Flora** • Regular Audit of tree plantation shall be carried and immediate preventive and Corrective measures shall be undertaken. • To avoid glare during night along MDR 52 C Screen plantation from km 45.900 to 48.500 km shall be carried out in vacant spaces within ROW with minimum two rows of plantation i.e. small and medium with thick foliage obstruct vehicle lights. High voltage light shall also not be installed along this particular

S. No.	Impacts on Environment component	Mitigation
	and the river stretch is highly polluted and shallow. **Operation** **Flora** • Positive impact on air quality and aesthetics of road due to plantation of trees **Fauna** • Buffalos and cows are tied in areas designated as cattle sheds adjacent to the paved surface of road or within RoW. This practice shall be discouraged as it makes the animals prone to accidents.	stretch of the road. **Fauna** • Precautionary and Educative sign boards shall be installed at least 100 m before and after the sites near the temples at km 22.9 and km 47 of MDR 58W to discourage people from offering food to monkeys at road side. • Villagers shall be discouraged to keep their cattles at road side through consultation and putting up sign boards along the road in villages.
2.14	**Socio economic Environment**	
	• 7103 persons and 809 households are likely to be impacted • 205 CPRs are likely to be affected including 112 religious properties and 76 government properties. • 58 out of 741 private structures are likely to be displaced and rest would be partially affected. • 45 hot spots have been identified based on criteria like congested settlement, loss of livelihood of economically weaker section, religious place of high importance	• Out of 45 hot spot locations, 17 locations are being saved by restricting widening within the RoW, 19 locations by widening within 10 to 12 m, 6 locations by eccentric widening, 2 locations by improvement within available width and at1 location by relocation of temple within the village. • Compensation for loss of livelihood and structures shall be provided as per government provisions and ADB policy i.e. The Right to Fair Compensation and Transparence in Land Acquisition, Rehabilitation and Resettlement Act, 2013, Direct Land Purchase Policy, 2015 by Government of U.P and ADB's Safeguard Policy Statement (2009).
2.15	**Cumulative and Induced impact**	
	• Brick kilns and jaggery making factories present along the roads; Jaggery factories operate during winter and in winter pollutants does not get dispersed due to temperature inversion increasing the level of pollution (PM, NOx, Sox,CO2) • It will induce a ribbon development along the road; Easy accessibility • Adversely it will also have a slow but significant effect of resource exploitation.	• Construction camps shall be located away from such existing pollution sources, as far as possible so that the immediate cumulative impact can be avoided. • It is not within the scope of User agency to control exploitation of resources.
2.16	**Labour Health &safety**	
	Construction • Labour may face health issues due to pollution / unhygienic conditions/ unsafe water ;Accidents may occur • 562.5 kg/ day municipal solid waste and 77 KLD sewage is likely to be generated from the	• The contractor shall prepare its health, safety and environment (SHE) policy and guidelines and get it approved by the CSC for ensuring proper living facilities, sanitation, water supply, safety, health of the labours in construction and labours camp.

S. No.	Impacts on Environment component	Mitigation
	labour camps.	
2.17	**Road safety**	
	Construction • Accidents may take place due to ignorance of people about route diversions, or excavation on road **Operation** • Past accident data of UP, engineering studies and consultations suggest that road accident are generally caused by Drivers exceeding the speed limits (over speeding); Overloading; Careless overtaking; Reckless driving habits; Unregulated movements of non-motorized vehicles; Lack of traffic safety education; and Poor enforcement of traffic laws and poor road condition.	**Construction** • Traffic management shall be done as per IRC:SP 55-2014 (Guidelines for Safety in Construction Zones). • Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document' **Operation** • Delineators and object markers are provided as per IRC: 79-1989 • The location and type of marking lines, material and color as per IRC: 35-1997,"Code of Practice for Road Markings" • IRC: 67-2012 guidelines for Road Signs; IRC: 8-1980 guidelines for kilometre stones etc have been followed in design • 3.049 km of crash barrier for vehicular safety and 263.917 km of footpath for pedestrian safety are proposed • Safety through people's perception by raising awareness

K. Public Consultation

20. Public participation and community consultation has been taken up as an integral part of Initial Environmental Examination process. Meaningful consultations were carried out since the inception of project using all five basic principles viz. information dissemination, information solicitation, integration, co-ordination and engagement into dialogue. The first tier consultations were carried out at the inception stage before design as part of Environmental Screening stage. The observations / suggestions were included in the Draft Design & Environmental Screening Report. During Second Tier Public Consultation, Draft Design and Environmental Screening Report were shared with Stake holders, wherein the comments/ suggestions/ observations were collected and incorporated in Final Design & Draft IEE, to the extent feasible.

21. During consultation, the key issues that were discussed are:

- Road Safety;
- Drainage and cross drainage;
- Flora;
- Fauna;
- Water Resources – ponds, wells, handpumps, etc.; and
- Environmental Quality.

L. Environmental Management Plan

22. Site specific standalone Environmental Management Plan (EMP) has been formulated outlining the measures to be implemented to avoid / offset the impacts / bring the impact to acceptable levels. Responsibilities have been defined at various levels for implementation & supervision of measures suggested in EMP.

23. *Performance Indicators*: The significant physical, biological and social components

affected at critical locations serve as wider/overall Performance Indicators. However, the following specific environmental parameters can be quantitatively/qualitatively measured and compared over a period of time and are, therefore, selected as Performance Indicators (PIs) for monitoring because these parameters are critical in assessment of the performance of mitigation measures proposed and evaluation of adequacy / efficacy of the IEE. These are ambient air quality, water quality, noise levels, soil erosion, drainage – cross and lateral, borrow areas, haul roads, construction & labour camps, dumping sites, tree plantation, road accident and worker accidents, animal kill and poaching of avifauna.

24. The Environmental Monitoring Program has been devised for monitoring of vital environmental parameters during construction and operation phases of the project and it includes Performance Indicators, parameters, locations of monitoring, protocols used for monitoring, frequency and duration, standards, cost and implementation and supervision agency. Monitoring of parameters shall help in checking of adequacy of IEE and EMP.

25. *Environment Enhancement* of fresh water ponds and hand pumps has been proposed which will also help in recharging the water. Hand pumps which shall be relocated shall be enhanced with provision of soak pit to avoid loss of surplus water withdrawn from the hand pumps. 9 ponds have been identified to be enhanced with various measures like earthen embankment with stone pitching and turfing, Seating arrangement like benches, Solar lighting and provision of multiple rows of Plantation to be provided as per site conditions and decision of Engineer.

26. Institutional *Arrangement*: For effective implementation of Environmental Management Plan, Environment and Social Management Cell shall be established at PIU Headquarter level at Lucknow, which shall be assisted by the Environment Expert of Construction Supervision Consultant and shall oversee the compliance of Environment safeguards at the project level. At PIU Field Level Environment and Social Management Cell shall be established which will be headed by Executive Engineer and assisted by Assistant Engineer designated as Incharge Environment who along with Environment Expert of Construction Supervision Consultant shall supervise the implementation of EMP and report to the Environment and Social Management Cell at headquarter. Contractor shall also appoint Environment Health Safety Expert, who will be primarily responsible for implementation of EMP.

27. *Capacity Building*: The existing limited implementation capacity can affect environmental outcomes despite safeguard provisions. The dearth in capacity will be addressed through enhanced technical assistance and training. Orientation and Training programmes in Environmental Safeguards have been suggested at Headquarter level for Engineers of PWD, Construction Supervision Consultant & Contractors and on-site training for workers directly involved in construction to improve environmental awareness, construction practices, legislative compliance requirements, EMP & EMoP implementation requirements and roles and responsibilities. Roles and responsibilities of UPPWD Construction Supervision Construction for supervision and implementation of Environment Safeguards of the project have been defined.

28. *Grievance Redressal Mechanism:* Grievance Redressal Mechanism shall be established as suggested for the project for addressing the Environment Safeguard issues effectively in transparent and timely manner. Two tier Grievance Redressal Mechanism shall be established, one at Project HQ Level and other at Division Level of the project

29. *Environment Budget:* Budget has been provided for Environment Protection, Monitoring and Enhancement Measures for items, cost of which are neither included in the engineering cost nor incidental to work. The road wise Environment Management and Monitoring Budgets in

INR Millions are given below:

Road	ND	BA	MB	HK	HA	KN	KB	MM	AS
Env. Cost (Rs. In Millions)	66.94	20.74	62.30	73.56	48.52	29.63	47.40	43.52	37.76

ND – Nanao Dadao (MDR 82W), BA - Bulandshar – Anoopshar (MDR 58W), MB - Muzaffarnagar – Baraut (MDR 135W), HK - Haliyapur – Kurebhar – Bilwai (MDR 66E), HA - Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C), KN - Kaptanganj-Naurangiya (ODR 24), KB - Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg (MDR 25E), MM - Mohanlalganj to Maurawan Unnao Marg (MDR 52C), AS - Aliganj-Soron Marg (MDR 45W)

M. Cost and Implementation Schedule

30. The total cost of Project including Civil Cost, Environment Cost and R&R Cost of different project roads in INR Millions are given below in **Table Es 6**. Time for completion of construction is two years.

Table Es 6: Total Project Cost of different project roads

Cost (Rs. In Millions)	ND	BA	MB	HK	HA	KN	KB	MM	AS
Civil	1183.3		1946.96		1096.81			1583.64	
Env.	66.94	20.74	62.30	73.56	48.52	29.63	47.40	43.52	37.76
R&R	28.9	3.4	12.4	20.1	19.1	9.8*		6.0	57.2
Total									

**R&R Cost for both roads*

N. Conclusion

31. All sub-projects have been categorized as Category B in accordance with ADB's Safeguard Policy 2009 and do not fall in Category A or B in terms of EIA Notification 2006 and subsequent amendments thereof. Moreover, the scope of work is also limited, implying that negative impacts are moderate to low with as many positive impacts. IEE Study has further confirmed that most of the negative impacts are short term, insignificant, localized and reversible. Environment Management Plan (EMP) has been developed as outcome of IEE for offsetting / mitigating the negative impacts to acceptable level. Further, Environment Monitoring Programme (EMoP) has been developed to check adequacy of IEE and effectiveness of implementation of EMP. It is concluded that if sub-projects are implemented complying the ADB's Safeguard Policy 2009 and EMP & EMoP are implemented in true spirit effectively, then project shall have vast more positive impacts which will be long term with enhanced road safety, increased tree cover and overall improvement of environment quality and can act as catalyst for economic and social development of backward areas of State of Uttar Pradesh.

I. INTRODUCTION

1. Uttar Pradesh (UP), is a State located in northern India. It was created on 1 April 1937 as the United Provinces, and was renamed *Uttar Pradesh* in 1950. Lucknow is the administrative capital of Uttar Pradesh. On 9 November 2000, a new state, Uttrakhand was carved out from the Himalayan hill region of Uttar Pradesh. The state is bordered by Rajasthan to the west, Haryana and Delhi to the northwest, Uttrakhand and the Nepal to the north, Bihar to the east, Jharkhand to the southeast, Chhattisgarh to the south and Madhya Pradesh to the southwest. It covers 93,933 square miles (243,290 km^2), equal to 6.88% of the total area of India, and is the fourth largest state with over 200 million inhabitants in 2011, it is the most populous statein the country as well as the most populous country sub division in the world. Hindi is the official and most widely spoken language in its 75 districts. Uttar Pradesh is the Fourth largest Indian State by economy, with a GDP of 7080 billion (US$110 billion). Agriculture and service industries are the largest parts of the state's economy.

2. Demand for road transport has been continuously increasing in the state. The number ofannually registered vehicles in the state has increased at an average annual rate of about 10% since2001. As of 2012, there were about 1.7 million vehicles registered in the state. The state has a road network of 299604 Km, out of which 174451 Km is under Uttar Pradesh Public Works Department (PWD). The roads under PWD comprise 7550 Km of National Highways (NHs), 7530 Km of State Highways (SHs), 5761 Km of Major District Roads (MDRs), 3254 Km of Other District Roads (ODRs) and 138702 Km of Village Roads (VRs). Only about 60% of SHs are two-lane (7m). In the entire state 62% of MDRs and 83% of ODRs have widths less than 7m.About 40% of this network is in poorto very poor condition and congested.

3. India has the dubious distinction of leading the world in road accident fatalities. In 2012, there were more than 138,000 people killed on the roads, implying that about 378 lives are being lost every day in India due to road accidents. Uttar Pradesh together with Tamil Nadu has been the largest contributor to the total number of road crash deaths in the country (11.7 percent each), followed by Andhra Pradesh (10.8), Maharashtra (9.6) and Rajasthan (6.9). A total of 22,155 peoplewere injured and 16,149 killed on UP roads in 2012, of which 73 percent died on national and statehighways (less than 9 percent of the road network). Almost 50 percent of the people killed on UPRoad Network of UP.

A. Project Background

4. The Uttar Pradesh Major District Roads Investment Programme aims at improving the transport connectivity in the State by Rehabilitating and Upgrading Major District Roads (MDRs) of lengthkmand Other District Roads (ODRs) of length24km approx. from Single / Intermediate lane to Two lane with paved shoulders / Earthen Shoulder configuration in accordance with IRC Guidelines to the extent possible. UPPWD has specifically targeted MDRs and ODRs to form linkages between rural, semi urban and urban areas and complete the state roads connectivity.

5. Recognizing the importance and need of road improvement in providing momentum for accelerating economic development, Government of Uttar Pradesh has initiated several road improvement projects including externally aided projects. In line with this Govt. of Uttar Pradesh through Department of Economic affairs has requested for loan from Asian Development Bank to the tune of 300 million US Dollar for implementing the Uttar Pradesh Major District Roads investment Programme to upgrade and rehabilitate MDR’s thereby improving connectivity and fostering inclusive growth.

B. Objective of Project

6. Project aims to improve transport efficiency of the state road network, which will contribute to expansion of economic opportunities and poverty reduction. This will be realized by

(i) Improving the state road network,
(ii) Enhanced Safety and level of Service for the road user
(iii) Superior Operation and Maintenance enabling enhanced operational efficiency of Project Roads
(iv) Facilitating safe and appropriate road usage,
(v) Increasing efficiency of transport services including saving in travel time & cost,
(vi) Enhancing UPPWD'S capacity for road asset development and management.

7. Project immediate outcome will be improved accessibility to social services and markets, increased fuel efficiency, reduced travel time, accidents, vehicle emissions and better employment opportunities apart from agriculture, both through improved access to economic centers and increased industrial activities in the project area.

C. Project Roads

8. 08 Roads has been shortlisted by UPPWD after carrying out Prioritization Study of Core Road Network for Rehabilitation and Up-gradation under this project, details of which are given in **Table I-1** and **Fig. 1** at the end of this Chapter.

Table I-2: Project Roads

Sl. No.	Road No	Project Road Name	District Name	Length (Km)	Category (ADB guidelines)
1.	MDR 82W	Nanau- Dadon (ND)	Aligarh	30.00	B
2.	MDR 58W	Bulandshar – Anoopshar (BA)	Bulandshar	36.137	B
3.	MDR 135W	Muzaffarnagar – Baraut (MB)	Muzaffarnagar -Baraut	59.174	B
4	MDR 66E	Haliyapur–Kurebhar – Bilwai (HK)	Sulltanpur	95.628	B
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur (HA)	Fatehpur	36.00	B
6A	ODR24	Kaptanganj-Naurangiya (KN)	Kushinagar	24.041	B
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar-Barhaaj Marg (KB)	Kushinagar and Deoria	61.350	B
7	MDR 52C	Mohanlalganj to Maurawan Unnao Marg (MM)	Unnao	54.100	B
8	MDR 45W	Aliganj-SoronMarg (AS)	Etah and Kanshiram Nagar	35.603	B

Source: DPR consultant

D. ADB Safeguard Policy Statement, 2009 and Environmental Categorization

9. The ADB has defined its safeguard requirements under its SPS, 2009. The prime objectives of these safeguard policies are to: (i) avoid adverse impacts of projects on the environment and affected people, where possible; and (ii) minimize, mitigate, and/or

compensate for adverse project impacts on the environment and affected people when avoidance is not possible.

10. The environmental screening has been carried out for the proposed project as per ADB Safeguard Policy Statement (SPS) 2009. Road specific Rapid Environmental Assessment (REA) checklists were prepared to screen significant potential environmental impacts considering the aspects of project siting and alignment, project design, and climate change and disaster risks. Although, the proposed project will bring in many benefits to the influence areas, there are potential adverse environmental impacts particularly during theconstruction period like lost of avenue trees, air quality deterioration from dust and noise, temporary blockage of access, and utility shifting among others. However, none of the adverse impacts are significant, all road construction activities are limited to the available right of way, road alignments are not inside or near environmentally protected areas, and all anticipated environmental impacts can be easily managed through proper road design, good engineering and housekeeping practices, the entire project is classified as environment category B. The conduct of an initial environmental examination (IEE) and the preparation of this report is in compliance to this environmental categroizarion.

E. Initial Environment Examination

11. Initial Environment Examination (IEE) is a process of evaluating the likely environmental impacts of a proposed project or development to lesser extent, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

12. IEE can also be defined as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers. By using IEE both environmental and economic benefits can be achieved, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations.

1. Objective of IEE

13. The IEE study has been carried out with following objective

- Ensuring environmental factors are considered in the decision-making process
- Ensuring that possible adverse environmental impacts are either avoided or minimised and brought to acceptable level.
- More informed decision making by involving public since the beginning of project, informing the public about the proposal, allowing people to examine the underlying need for a project and giving them opportunity to identify problem and suggesting environment friendly locally available solutions to the identified problem.
- improved integration of projects into their environmental and social setting
- a positive contribution toward achieving sustainability
- Facilitates the design of a monitoring programme to check the adequacy of IEE and Implementation of mitigative measures suggested in EMP.

2. Extent of IEE

14. IEE extent has been decided considering all likely Impacts and risks analyzed in the context of the project's area of influence. It encompasses (i) the primary project site(s) and related facilities (ii) associated facilities whose viability and existence depend exclusively on the project (iii) areas and communities potentially affected and other project-related developments that are realistically defined at the time of assessment. The direct area of impact is taken as proposed right of way and indirect area of impact is taken as 500 meters on either side from proposed right of way. The assessment also considers the areas and activities related to associate facilities viz. quarry operation, borrow areas, construction camp, transportation/haulage routes etc. The study area is considered up to 15 km on either side of road alignment for larger analysis of sensitive environmental features. Assessment is carried out for all components of environment covering terrestrial and aquatic ecology, soil, water, noise and socio economic aspects.

F. Approach and Methodology

15. The IEE Report has been prepared meeting the requirements of ADB's Environment Assessment Guidelines, Safeguard Policy Statement 2009, Requirement of National laws, Guidelines for Carrying out EIA of Highways etc. TheApproach and Methodology followed during the IEE Study is given below

1. Reconnaissance Site visit

16. The Reconnaissance Site visit was carried out by Consultants to have a feel of area and identify the key environment issues associated with Projects.

2. Desk Review

17. The Consultants reviewed the project documents, Prototype Studies, available literature, National Environmental Guidelines, National Environment Policy, ADB's Environmental Assessment Guidelines 2003, ADB's Safeguard Policy 2009 etc., DPR and Environmental Screening submitted by Consultant

3. Establishment of Baseline

18. Environment Baseline has been established for Valued Components of Eco System as precursor to Prediction of Impact and to have a fair assessment of environment scenario / setting of the study area.

a. Collection of Secondary Data

19. The Secondary data of valued components of Eco-system like climate, rain fall geology, soil, drainage etc. has been collected from Environment Assessment Reports prepared by DPR Consultant, Detailed Project Report, Indian Metrological Department and otherWebsites, Published data of various Govt. Departments, Research papers etc, Google Imagery was used to verify the data collected in field and various other sources.

b. Generation of Primary Data

20. The Primary Data was generated to fill the gaps where secondary data was not available and also to verify the Secondary data of any discrepancy. The primary data was collected using the following tools

- Inventorization of Sensitive features along the Road like Ponds, Hand Pumps, Religious and Educational Institutions, orchards, polluting sources, sensitive features etc along the road.
- Questionnaire was developed after carrying out Field Visits, which was pre tested and detailed questionnaire survey for collecting the information was carried out along the road.
- Field Visits were carried out by PPTA Consultants to catch the environment issues associated with the project. etc.
- Land use maps have been prepared within 500m on either side from the center line using Google earth imageries. All the collected paper maps and drawings were scanned and geo-referenced on common geographic coordinates in GIS platform using Arc GIS software. Different land use types were digitized in separate layers for ease of analysis. The satellite imageries were visually interpreted and integrated with ground verified data and other secondary data. Finally, a classified land use/ land cover map was prepared based on classification system as per EIA Guidance Manual for highways sector.

4. Anticipated Impacts

21. Prediction ofAnticipating Impacts on Components of Valued Eco System has been done qualitatively and quantitatively to the extent possible. The impacts have been predicted based on past experiences, prototype studies, trend analysis etc. and also by use of mathematical models viz.; TEEMP, Caline 4, Cortan. The assessment of the type, nature, direct, indirect, cumulative or induced impacts and their significance to the physical, biological, and socio-economic components of the environment has been done to ascertain whether the project is environmentally sustainable or not. Nature of impacts has further been classified aspositive or negative, significant, insignificant, short-term, long-term, reversible, irreversible, temporary or continuous etc.

5. Mitigative Measures

22. Cost effective, technically viable, Environment Friendly Mitigative Measures have been suggested to offset the adverse impact or to minimize the adverse impact and to bring the adverse impact to an acceptable level on components of Valued Eco System.

6. Development of Environment Management and Monitoring Plan which shall include Implementation Measures and Responsibility

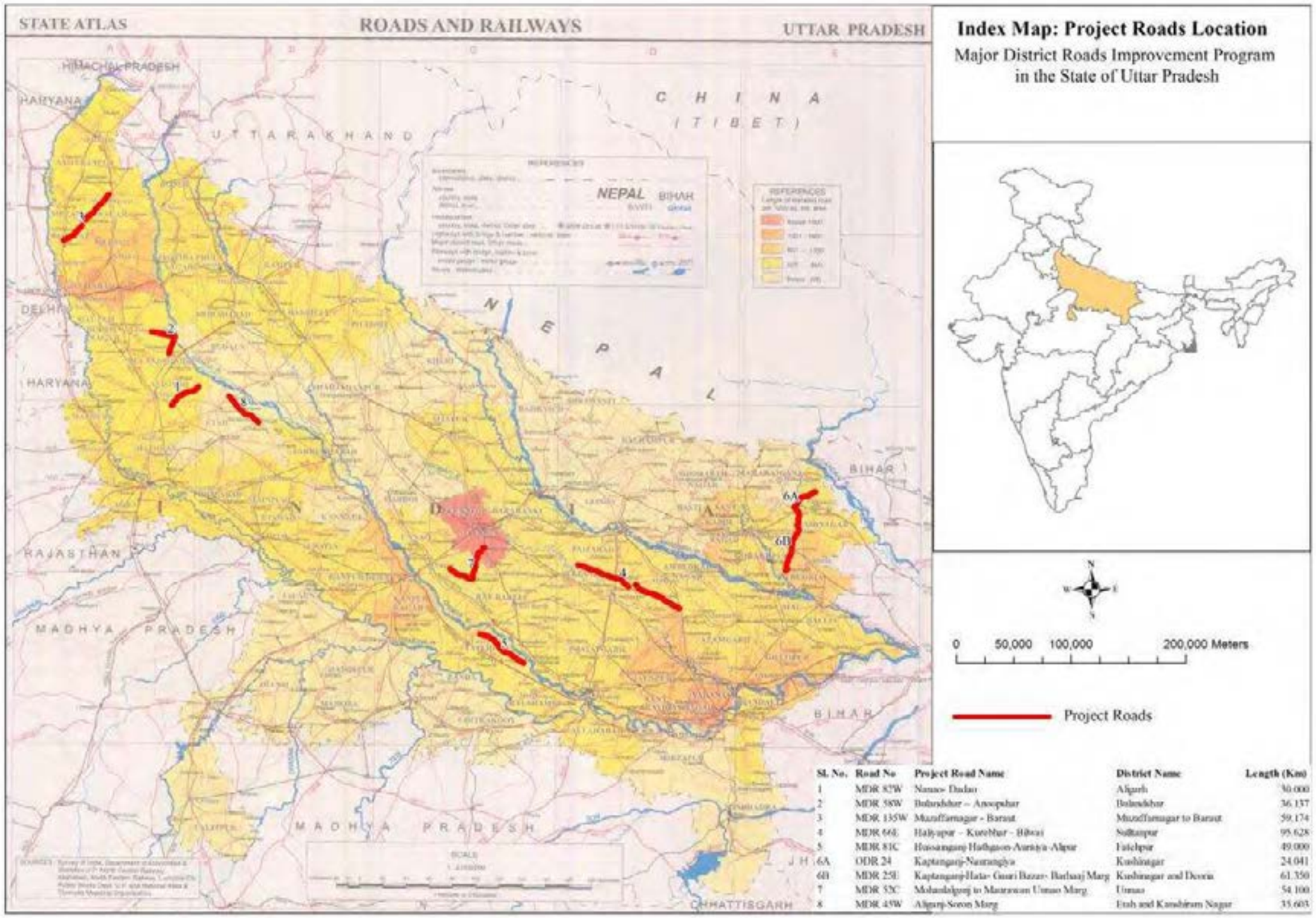
23. Site Specific Environment Management and Monitoring Plan has been developed outlining measures for implementing suggestive mitigative measures along with the responsibility of implementation and supervising the implementation measures to avoid, reduce, mitigate, or compensate adverse environmental impacts/risks. Performance indicators have been identified to check the adequacy of IEE study and effectiveness of implementation of Environment Management Plan. Institutional arrangement and Capacity building for strengthening the Executing agency for effective Implementation of EMP has been suggested. Environment Enhancement Measures has also been suggested along with Cost Estimates. Budget for implementation of Environment Management and Monitoring Plan has been developed.

G. Structure of IEE

24. The structure of IEE is as follows

Executive Summary
I. Introduction
II. Project Description
III. Description of Environment
IV. Environmental Impacts and Mitigation Measures
V. Public Consultation and Information Disclosure
VI. Environment Management Plan and Grievance Redressal Mechanism
VII. Conclusion

Fig. 1: Index Map



Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanao- Dadao	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Baraut	Muzaffarnagar to Baraut	59.174
4	MDR 66E	Hallyapur – Kurebhar - Bilwai	Sultanpur	95.628
5	MDR 81C	Haiasangang Hathgaon-Auraiya-Aligur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Nautanglya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohandalganj to Mauranwam Unnao Marg	Unnao	54.100
8	MDR 45W	Aligarj-Soron Marg	Etah and Kanshiram Nagar	35.603

II. PROJECT DESCRIPTION

A. General

26. Uttar Pradesh is India's fourth largest and most populous state, located in the north-central part of the country. It spreads over a large area, and the plains of the state are quite distinctly different from the high mountains in the north.Uttar Pradesh is the rainbow land where the multi-hued Indian Culture has blossomed from times immemorial. Blessed with a varaity of geographical land and many cultural diversities, Uttar Pradesh, has been the area of activity of historical heroes like - Rama, Krishna, Buddha, Mahavira, Ashoka, Harsha, Akbar and Mahatma Gandhi. Rich and tranquil expanses of meadows, perennial rivers, dense forestsand fertile soil of Uttar Pradesh have contributed numerous golden chapters to the annals of Indian History. Dotted with various holy shrines and piligrim places,full of joyous festivals, it plays an important role in the politics, education, culture, industry, agriculture and tourism of India.Garlanded by the Ganga and Yamuna. The two pious rivers of Indian mythology,Its area of 2,36,286 sq kms. lies between latitude 24 deg to 31 deg and longitude 77 deg to 84 deg East. Area wise it is the fourth largest State of India.

27. Uttar Pradesh is situated on a major historical east west trade route dating back to Hellenic and Mauryan empires. The existing overland route was enhanced by Sher Shah Suri and Akbar in the 16th and 17th Centuries before becoming Grand Trunk Road under British rule. With India's growing prosperity in recent decades National Highways has improved remarkably but Major District Roads (MDR's) and Other District Roads (ODR's) has not improved with the pace of National Highways. The economy of Uttar Pradesh is majorly agriculture and agro produce are transported by farmers primarily through Village Roads, MDR's, ODR's and State Highways from Villages to Market places. Realizing this UPPWD carried out studies in conjunction with World Bank and ADB for development of Core Road Network.

B. Project Roads

28. UPPWD carried out prioritization study of Core Road Network and selected eight roads for Rehabilitation and Improvement under Major District Road Improvement Programme proposed to be financed by ADB .The details of Project road along with Spatial and Extent is given below,

1. Nanau – Dadon (ND MDR 82 W)

29. The Project Road is located in District Aligarh,which is situated in the western part of Uttar Pradesh and is a very important education and commercial hub of India. The Project Road Starts near Nanau forming T intersection with NH 34 (Earlier Known as NH 91) and ends at km 30+000 near Dadon. The existing length of Project Road is 30 km and is in eastern part of the District and important settlements enroute are Nanau, Pilakhna, Sikandarpur, Chitta, Siyawati, Charra Market, Dadon, Nagla Bhore etc.

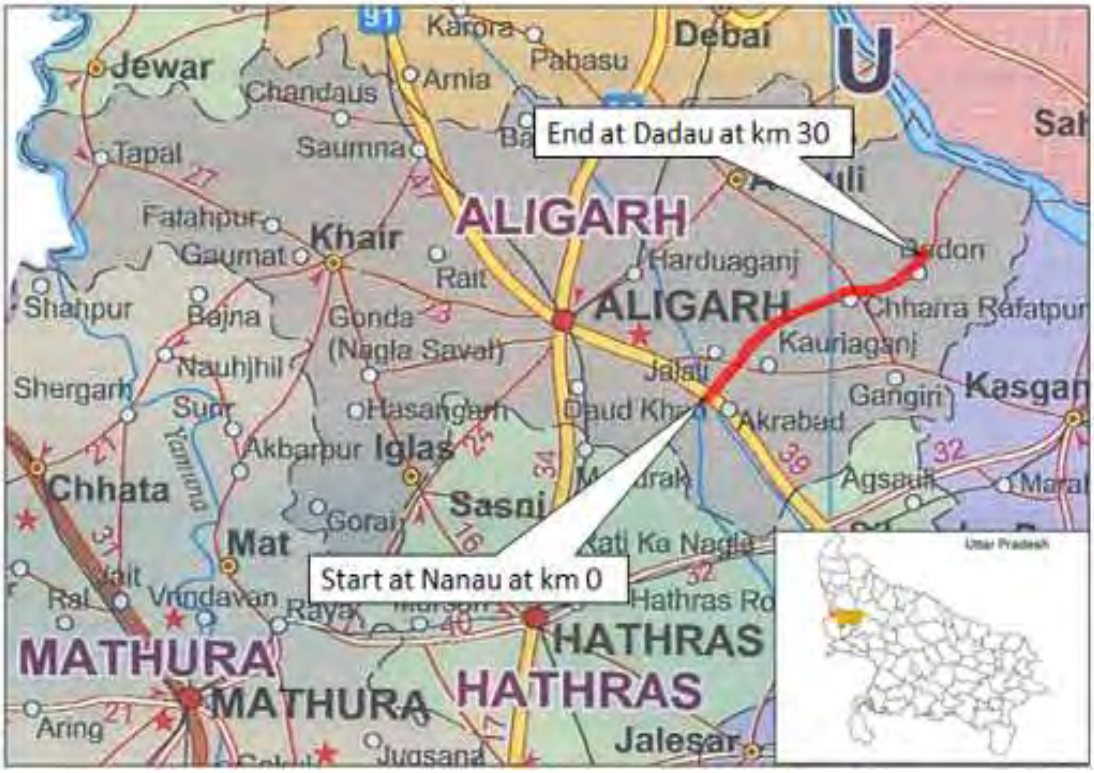


Fig. 2A: Nanau-Dadon Road stretch marked on District Map

Fig. 2B: Road passing through Charra TownUrban Settlement

Fig. 2C: Road passing through Open Areas

2. Bulandshar to Anoopshar (BA MDR 58W)

30. The Project Road is located in District Bulandshar, which is situated in the western part of Uttar Pradesh. The Project Road starts at km20.00 of MDR 58W and ends at km 57.00, Bheem Chowk at NH 93. The length of Project Road proposed for improvement is 37.000 km and is in south-east part of the District. The important settlement enroute areJatvai, Ghana, Balpur Doraha, Karanpur, Anoopshar, Veerpur, Jirauli, Amarpur, Inderkhera, Bhempur etc.

Fig. 3A: District Map showing Bulandshahar-Anoopshahar Road

Fig. 3B: Road passing through Dibai Chowk urban Settlement

Fig. 3C: Road passing through Open Areas

3. Muzaffarnagar to Baraut (MB MDR 135W)

31. The Project Road is located in District Muzaffarnagar and Baghpat, which are situated in Northern part of Uttar Pradesh. The area is DOAB of River Ganges and River Yamuna. The districts are known as Sugar Bowl. The project road starts near Muzaffarnagar at km 3+000 and ends at km 62+000 in Baraut. The length of Project Road is 59.174 km. The important settlements enroute are Budhana Mor, Sanjhak, Tabli, Kakda, Shahpur, Sarabar, Madimpur, Basana, Budhana, Bhadal, Daha, Kanhar, Pussari Adda, Bamdoli, Bijraul, Baraut etc.

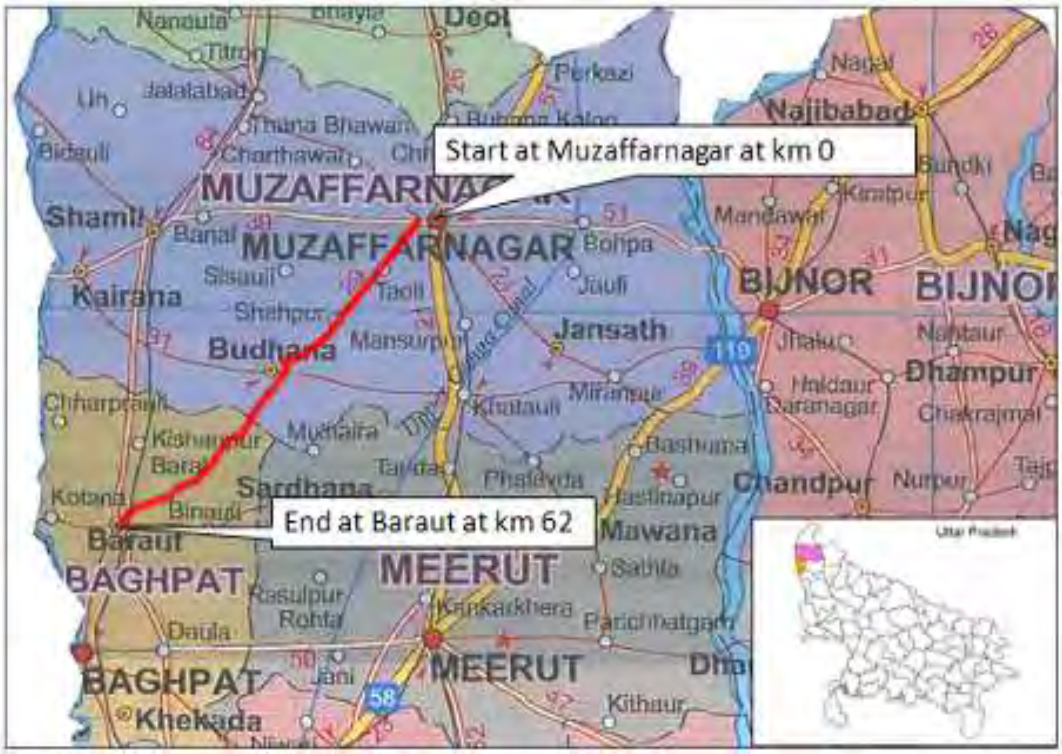


Fig. 4A: District Map showing Muzaffarnagar-Baraut Road

Fig. 4B: Road passing through Shahpur Urban Settlement

Fig. 4C: Road passing through Rural areas

4. Haliyapur to Kurebhar to Bilwai (HK MDR 66E)

32. The Project Road is located in District Sultanpur, eastern part of Uttar Pradesh, primarily agriculture district. The Project Road is in two stretches; Stretch One takes off from National Highway, 0.00km of MDR and terminates at National Highway 232. The length of Stretch one is 49 km and settlement enroutes are Kurebhar Mor Haliyapur, Kanhai ka pura, Dubhara mor, Narainpur Hosain, Bhawani Garh, Girza more , Raichamauja Village, Govindpur, Makhdom Mir, Signi, Bourhawan Bazar, Delhi Bazar, Piro Sarainya, Ho Dugaon, Harora Bazar, Kutta Dharamganj, Phanpat Ganj, Atasma, Chandeypur, Rainpur,Kurebhar,Birampur, Barwla,Fulawna, Akori . The Second stretch of the road takes off from National Highway 232 and ends at Bilwai. The length of the second stretch is 46 km and settlement enroute are Simri

Bazar, Chuma, Durga Nagar,Birsinghpur, Sriram Bazar, Gosning Singh,Dostpur, Badhwali, Rahul Nagar, Akhand Nagar, Rupai Pur, Deaw Nagar, Bilwai etc

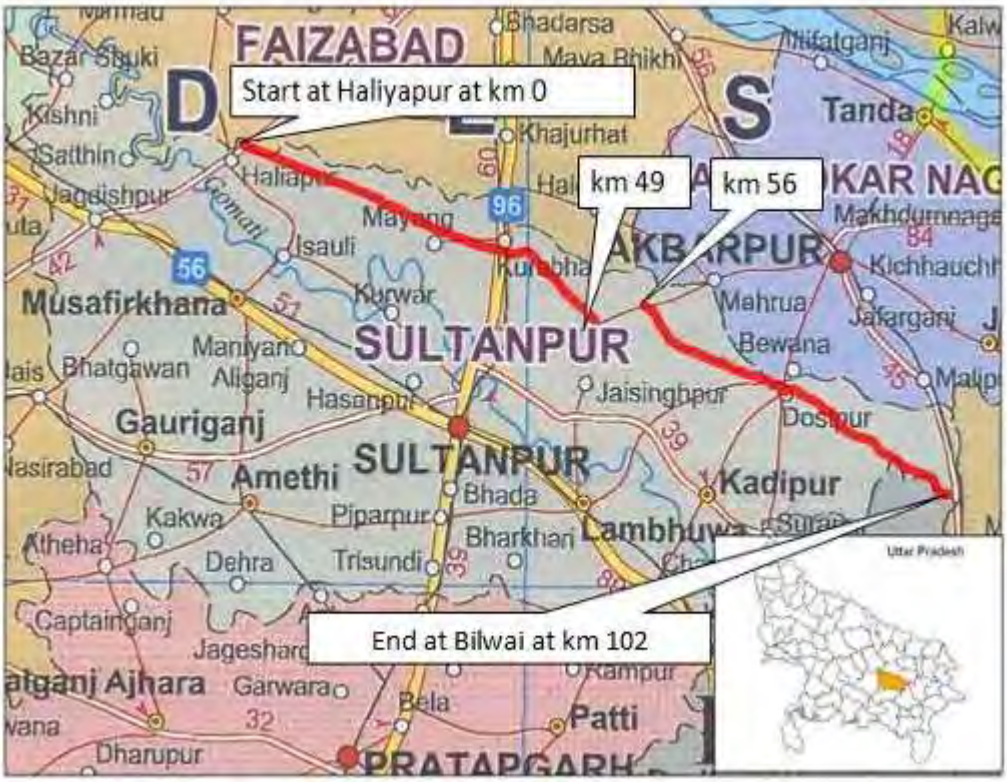


Fig. 5A: District Map showing Haliyapur-Kurebhar-Bilwai Road

Fig. 5B: Road passing through Bibiganj Urban Settlement

Fig. 5C: Road passing through Rural Areas

5. Hussainganj to Alipur Marg (HA MDR 81 C)

33. The Project Road is located in District Fatehpur, which is situated in Central Part of Uttar Pradesh.The city is between two holy rivers Ganga and Yamuna and is also known as 'Doaba' between Ganges and Yamuna. The Project Road starts from km 13+00 and ends at km 49.00 (Alipur Marg). The length of the Project Road is 36 km. The important settlements enroute are Husainganj, Bajrangpur, Lakadi, Kanaih ke Purva, Mabai, Bela, Gosai ke Sarai, Ahinda,

Chhiwlaha, Baliya, Hathgaon, Hardaish ki purva, Bahera Chowki, Sultanpur Gosh, Kushraha purva, Nawapurva, Aphoe etc.

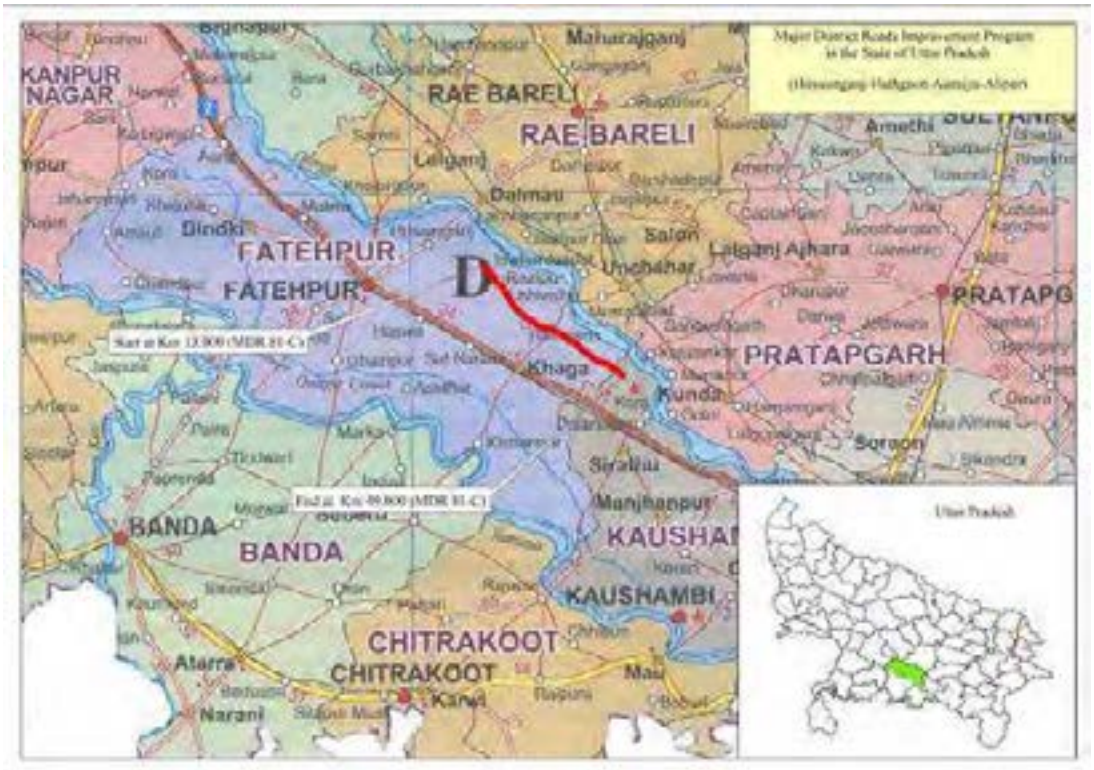


Fig. 6A: District Map showing Hussainganj-Alipur Road

Fig. 6B: Road passing through Prem NagarUrban settlement

Fig. 6C: Road passing through Rural Areas

6. Naurangia-Kaptanganj-Barhaaj Marg (KN ODR 24, KB MDR 25E)

The Project road has two sections viz

34. **ODR 24** starts at Kaptanganj (0.00 km) and ends at Naurangiya at intersection of NH 28. The total length of this road is approx. 24 km and traverses in Kushinagar District and important settlement enroute are Kaptanganj, Bicholi, Naurangia etc.

35. **MDR 25E,** starts at Kaptanganj and ends at Rudrapur. The road traverses in two districts namely Kushinagar for a length of 31.5 km and Deoria for a length of 28.5 km and total length is approx. 60 km and important settlements en route are Kaptanganj, Hata, Vakeelganj, Gauribazar , Rudrapur etc.

Fig. 7A: District Map showing Naurangia-Kaptanganj (ODR 24) and Kaptanganj-Rudrapur (MDR 25E)

Fig. 7B1: ODR 24 passing through Naurangia Urban Settlement

Fig. 7B2: ODR 24 passing through Open Areas

Fig. 7C1: MDR 25E passing through Gauri Bazar Urban Settlemen

Fig. 7C2: MDR 25E passing through Open Areas

7. Mohanlalganj to Maurawan Unnao Marg section of MDR-52C(MM MDR52C)

36. The Project Road Starts from NH 24-B at Mohanlalganj, The First Section comprises of NH 24-A of length 1.3 km, thereafter follows Mohanlalganj Maurawan Marg MDR 52C till km 54.100 beyond which road has already widened to 2 lane with Earthern Shoulder. The Project road is located in Lucknow District for a length of 12.750 km and Unnao District for length of 41.350 km. The important settlement en route are Sisandi , Jabrella, Beru, Gonamau, Kalu Khera, Rasulpur, Maurawan & Purwa etc.

Fig 8A:Mohanlalganj to Maurawan Unnao Marg section of MDR-52C (MM MDR52C)

Fig.8B: MDR 52C passing through Mohanlalganj Urban Settlement

Fig. 8C: MDR 52C passing through Open Areas

8. Aliganj – Soron Marg MDR 45W (AS MDR 45W)

37. The Project Road is section of MDR 45W, Aliganj to Soron. Project Road Starts at km 26.087, near Patiyali and ends at km 61+592 near Soron on SH-33 .The length of road is 35.505 km and is located in District Kanshiram Nagar of Uttar Pradesh. Important settlements enroute are Patiyali, Sahavar, Ganj Dundwara , Soron etc.

Fig 9A:Aliganj – Soron Marg MDR 45W (AS MDR 45W)

Fig.9B1: MDR 45W passing through Ganj Dundwara Urban Settlement

Fig. 9B2: MDR 45W passing through Open Areas

C. Features of Road

38. The existing road stretches are Single / Intermediate / two lane with earthen shoulders of width varying between 1 to 2m and Failures like Shoulder drop, rain cuts and corrugations are common features . The Project Stretches are deficient in Horizontal alignment at few locations, Pavement Condition of stretches varies from v.poor to Good, Embankment height varies from 0.00m to 1.6m. Damaged/chocked cross drainage structures, absence of side drains in open areas and partially choked drains in settlements, absence of Safety installations, Road Furniture's and Protection works are common features of Project Roads. Details of Existing Condition of Project Roads are given in **Table II-1.**

Table II-1: Salient Features of Project Roads

S. No.	Parameter	Nanau to Dadon (MDR 82 W)	Bulandshar to Anoopshar MDR 58W	Muzaffar Nagar to Baraut MDR 135W	Haliyapur – Kurebhar-Bilwai MDR 66E	Hussain Ganj Hathgaon Alipur Marg MDR 81 C	Naurangia – Kaptanganj ODR 24	Kaptanganj – Rudrapur MDR 25E	Mohanlalganj-Morwan MDR	Aliganj – Soron Marg MDR
1.	Length (Km)	30.00 Km	36.137 Km	59.174 Km	95.628 Km	36.00 Km	24.041 Km	61.350 Km	54.100 Km	35.603 Km
2.	Configuration									
A.	Carriageway	Single lane with width varying between 3.50m to 3.75m, 3.50m = 6.0 km 3.70m =15.0 km 3.75m = 8.0k m	Two lane carriageway width varying between 5.6m to 7.3m 5.6 m = 0.6 km 6.8 m= 3.0 km 7.0 to 7.3 km = 33.40 km	Two lane Carriageway Width varying between 5.5m to 6.5m. 5.5 to 6.0m = 22 km, 6.0 to 7.0m = 8.2 km, 7.0 to 7.5m = 26 km, 15.0m= .80km	Majorly single lane and also two lane carriageway varying between 3.2 to 7.0m, 3.2m to 3.8m= 49.00 km, 3.3m to 6.0m=36 km, 6.8m to 7.0m=10 km.	Single lane with width varying between 3.5m to 4.5m. 3.5 to 4.0m= 34 km. 4.0 to 4.5m= 2.00km	Single lane width varying between 3.5m to 3.8m	Single / Double lane width varying between 3.5m to 7.2 m	Single / Intermediate /Double lane 4.9 to7.1m= 25km, 4.3 to 5.6 m =29 km	Single / Intermediate/ Double lane 3.5 to 4.0m=30.400 6.5 to 7.5m= 5.200 km
B.	Shoulder	Earthen Shoulder with width varying between 1 to 2 m. Failures like Shoulder drop, rain cuts and corrugations are present.	Earthen Shoulder with width varying between 1 to 2 m. Failures like Shoulder drop, rain cuts and corrugations are present.	Earthen Shoulder with width varying between 1 to 2 m. Failures like Shoulder drop, rain cuts and corrugations are present.	Earthen Shoulder with width varying between 1.0 to 1.9 m. Failures like Shoulder drop, rain cuts and corrugations are present.	Earthen Shoulder with width varying between 0.8 to 2 m. Failures like Shoulder drop, rain cuts and corrugations are present.	Earthen Shoulder with width varying between 0.5 to 2 m. Failures like Shoulder drop, rain cuts and corrugations are present.	Earthen Shoulder with width varying between 1.0 to 2 m. Failures like Shoulder drop, rain cuts and corrugations are present.	Earthen Shoulder with width varying between 0.7 to 2.5 m. Failures like Shoulder drop, rain cuts and corrugations are present	Earthen and Gravel Shoulder with width varying between 1.0 to 2.0 m. Failures like Shoulder drop, rain cuts and corrugations are present

S. No.	Parameter	Nanau to Dadon (MDR 82 W)	Bulandshar to Anoopshar MDR 58W	Muzaffar Nagar to Baraut MDR 135W	Haliyapur – Kurebhar-Bilwai MDR 66E	Hussain Ganj Hathgaon Alipur Marg MDR 81 C	Naurangia – Kaptanganj ODR 24	Kaptanganj – Rudrapur MDR 25E	Mohanlalganj-Morwan MDR	Aliganj – Soron Marg MDR
2.	Pavement	Poor to V.Poor and deficient existing layer/ composition.	Good to fair	Good to Fair, Poor to V poor at few locations.	Good to v.poor	Good to Poor	Fair49% Poor to 51% V.Poor	Good 83% Fair 12% Poor 05%	Good 52% Fair 11% Poor 15%	Good 54% Fair 38% Poor 6%
3.	Terrain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain	Plain
4.	Land Use	Pre Dominantly Agriculture followed by built up Section								
5.	Available ROW	20 to 30m Less in Built Up Section	35 to 40m. Less in Built Up Section	16 to 35.2 m Less in Built Up Section	5 to 30.0 m Less in Built Up Section	15m to 32.5m Less in Built Up Section	7.0m to 10m less in Built up Section	10m to 29.6m less in Built up Section	12 to30m less in Built up Section	10 to 25m less in Built up Section
6.	Pavement	Flexible						Majorly Flexible and CC Roads at few locations	Flexible	Majorly Flexible and Gravel
7.	Embankment									
A.	Height	0 to 1.5m both sides, At some location existing road level is almost at ground level	0.1 to 0.8m LHS, 0.1 to 1.1m RHS, At some location existing road level is almost at ground level	0.1 to 1.2m LHS, 0.1 to 1.8m RHS, At some location existing road level is almost at ground level	0.3 to 1.6m LHS, 0.2 to 1.6m RHS, At some location existing road level is almost at ground level	0.1 to 1.5m LHS, 0.2 to 1.2m RHS, At some location existing road level is almost at ground level	0.4 to 1.m both sides, At some location existing road level is almost at ground level	0.2 to 1.5.m both sides, At some location existing road level is almost at ground level	0.2 to 4.2m LHS, 0.2 to 4.0m RHS, At some location existing road level is almost at ground level	0.2 to 0.6.m both sides, At some location existing road level is almost at ground level
B.	Condition	Fair to Poor	Fair to Poor	Fair to Poor	Fair to Poor	Fair to Poor	Fair to Poor	Fair to Poor	Fair to Poor	Fair to Poor
8.	Junctions									
A	Major	4	4	6	2	0	2	5	3	1
B	Minor	29	41	40	102	36	21	26	34	18
10.	Side drains	Observed in Built up Areas , Partially damaged and Choked								
11	Cross Drainage Structures									

S. No.	Parameter	Nanau to Dadon (MDR 82 W)	Bulandshar to Anoopshar MDR 58W	Muzaffar Nagar to Baraut MDR 135W	Haliyapur – Kurebhar-Bilwai MDR 66E	Hussain Ganj Hathgaon Alipur Marg MDR 81 C	Naurangia – Kaptanganj ODR 24	Kaptanganj – Rudrapur MDR 25E	Mohanlalganj-Morwan MDR	Aliganj – Soron Marg MDR
A	Major Bridges	1 No	Nil	Nil	Nil	Nil	1No	1 No	Nil	Nil
B	Minor Bridges	6 Nos	8 Nos	4 Nos	12 Nos	Nil	4Nos	6 No	9	Nil
C	Culverts	56 Nos Pipe 32 Slab/Box 14 Arch 10	44 Nos, Pipe 14 Slab/Box 09 Arch 21	89 Nos, Pipe 51 Slab/Box 34 Arch 04	196 Nos, Pipe 92 Slab/Box 100 Arch 04	72 Nos, 44 pipe culverts, 25 slab culverts & 3 Arch culverts	36 Nos, Pipe 17 Slab/Box 18 Arch 01	80 Nos Pipe 27 Slab/Box 33 Arch 20	109 Nos Pipe 48 Slab/Box 30 Arch 31	84 Nos Pipe 64 Slab/Box 17 Arch 03

Source : DPR Consultant

D. Traffic

39. The majority of traffic on project road comprises of two wheelers, slow moving traffic like animal drawn vehicles, pedal cycle etc. This caters to Short haul traffic, meeting localized demand for transportation of individual passenger and goods to market and Urban Centres. Passenger's vehicles and individual slow moving vehicles constitute more than 70% of traffic, resulting in drop in night traffic. Mode wise total corridor traffic is summation of normal and generated / induced traffic. The regression analysis has been carried out by creating econometric models, using past vehicle registration data, and economic indicators such as population and PCI for passenger vehicles and NSDP for freight vehicles. The projected PCU's for project road with 2014 as base year are given in **Table II-2** below and **Fig. 10** shows photographs of traffic on roads along with congested locations.

Table II-2: Projected Traffic

S. No.	Name of Road	2014 PCU	2019 PCU	2024 PCU	2029 PCU	2034 PCU	2039 PCU	2044 PCU
1.	ND MDR 82 W	3012	3586	4260	5042	5946	7069	8465
2.	BA MDR 58W	13238	16439	20132	24297	28931	34640	41681
3.	MB MDR 135W	11087	14190	17646	21413	25515	30546	36722
4.	HK MDR 66E	3168	3889	4729	8733	6821	8199	9896
5.	HA MDR 81 C	2478	3056	3741	4544	5482	6643	8084
6A.	KN ODR 24	3759	4695	5783	7027	8452	10198	12344
6B.	KB MDR 25E	4411	5453	6659	8031	9593	11496	13823
7.	MM MDR52C	4695	6643	8382	10339	12519	15201	18507
8.	AS MDR 45W	4560*	5538	7005	8766	10873	13488	16769

**2015, (Source- DPR Consultant)*

Fig. 10: Mixed Traffic and Congestion in Project Roads

E. Capacity and Level of Service

40. Capacity and design service volumes for various lane configurations are specified in IRC:SP: 73 – 2007, 'Manual for Standards and Specifications for Two-laning of State Highways through Public Private Partnership'. The project stretch passes through plain terrain predominantly. The capacity standards for LoS B and LoS C considered is as given in **Table II-3** below.

Table II-3: Capacity and Level of Service

S. No	Road	Terrain	Design Service Volume in PCUs per day	
			LOS B	LOS C
1.	2 lane	Plain and Rolling	15000	21000

Source: DPR Consultant, 2015

41. The capacity of two lane road is 15000 PCU/day as per the Table 4 of the IRC: 64-1990 design traffic and it will further increase by 15% by providing 1.5 m paved shoulder on either side as per the Para 10.3 of the IRC: 64-1990.

42. All roads except Bulandshar – Anoopshar (BA MDR 58W) qualify to be two lane with earthen shoulder as Projected PCU are less than 15000 at the opening year 2018. Bulandshar – Anoopshar (BA MDR 58W) is proposed to be upgraded to Two lane with Paved Shoulder configuration as traffic plying on the road at the opening year ie. 2015 will be more than 15000 pcu.

F. Design Parameters

43. The geometric design standards are proposed for this project based on IRC stipulations for Horizontal and vertical alignments. The summary of proposed geometric design standards are given in **Table II-4.**

Table II-4: Design Standards

Sl. No	Description	Proposed Parameters	
1	Design speed		
	Plain (MDR)	Max – Min	80 - 65 km/hr
	Plain (ODR)	Max – Min	65 - 50 km/hr
2	Lane width		3.75m (Single Lane)
			3.50m (Each Lane for Multilane Road
			5.50m (Intermediate Lane)
3	Paved shoulder width		1.5 m
	Earthen Shoulder Width		1.0 m
4	Shy away on median edge		0.25m
5	Shy away on outer/other edges		0.25m
6	Cross-slopes	Carriageway	2.50%
		Paved shoulder	2.50%
		Unpaved shoulder	3.00%
7	Maximum super elevation	5.00%	
8	Minimum horizontal curve radius	For 80 Km/hr	230 m
		For 65 km/hr	155 m
		For 50 km/hr	90 m
9	Radii beyond which super elevation not required	For 80 Km/hr	1100 m
		For 65 km/hr	750 m
		For 50 km/hr	450 m
10	Super elevation runoff rate	For Plain and rolling	<1 in 150
		For mountainous & steep	<1 in 60
11	**Transition curves to be used with length of spiral equal to length of super elevation runoff**		
12	Extra widening of carriageway on curves	For curve radius	
		>300m	Nil
		101 to 300m	0.6m
13	**Gradient**	Ruling, Limiting,	

Sl. No	Description	Proposed Parameters		
	Plain and Rolling	Exceptional	3.3 %, 5%, 6.7%	
	Mountainous		5%, 6%, 7%	
	Steep		6%, 7%, 8%	
14	Minimum Length of Vertical Curves / Grade change not requiring vertical curve	Design Speed	Min. curve length	Max. grade change
		80 km/hr	50m	0.60%
		65 km/hr	40m	0.80%
		50 km/hr	30 m	1.00%
15	Vertical curve 'K' values	For design Speed	Crest Sag	
	Crest vertical curve/Sag vertical curve	100 km/hr	74 42	
		80 km/hr	33 26	
		65 km/hr	19 18	
16	Vertical clearance	Road over road	5.5 m	
		Road over railway	7.3m	
		Electrical lines	6.0m (Up to 650 V)	
		H.T. Electrical lines	6.5m (More than 650 V)	
		Telecommunication Lines	5.5m (Up to 110 V)	

Source: DPR Consultant

G. Proposed Interventions

44. The Existing Project Roads are Proposed to be widened/ Improved from Single lane / Intermediate / two lane to Two Lane Configuration with Paved / Earthen Shoulders, drains, Road signages etc. Except in Muzaffarnagar to Baraut Section where in two stretches from km 19.280 to km 20.280 and km 30.690 to 32.690, 4 lanes Overlay in urban areas with lined drain is proposed. The formation width in general is 12m in open areas and between building lines in built up area. With the intention of segregating the pedestrian from the traffic in urban areas Footpath cum drain has been proposed. The generic configuration proposed is given in **Table II-5** and typical proposed cross sections are given in **Fig. 11 to Fig. 13** and different typical sections and their applicability are given in **Table II-6.**

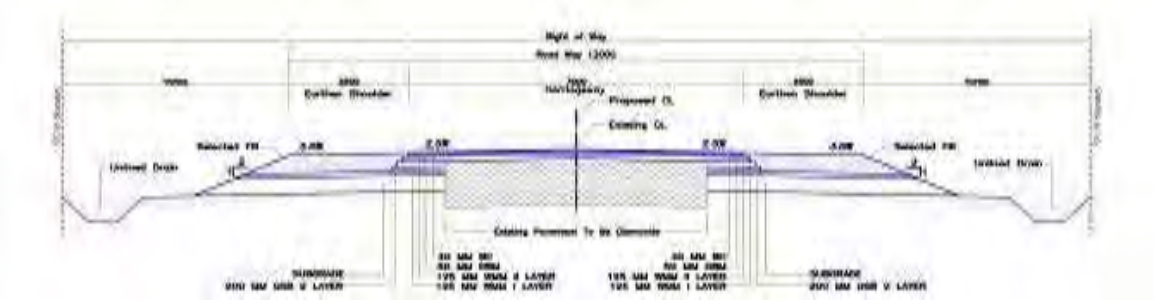


Fig. 11: TCS of Two Lane with Earthen Shoulder

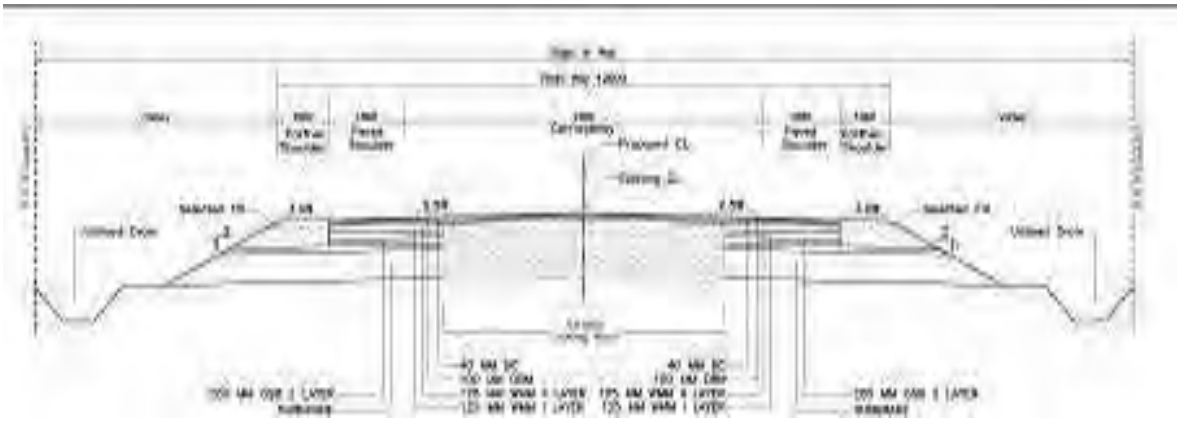


Fig. 12: TCS of Two Lane with Paved Shoulder

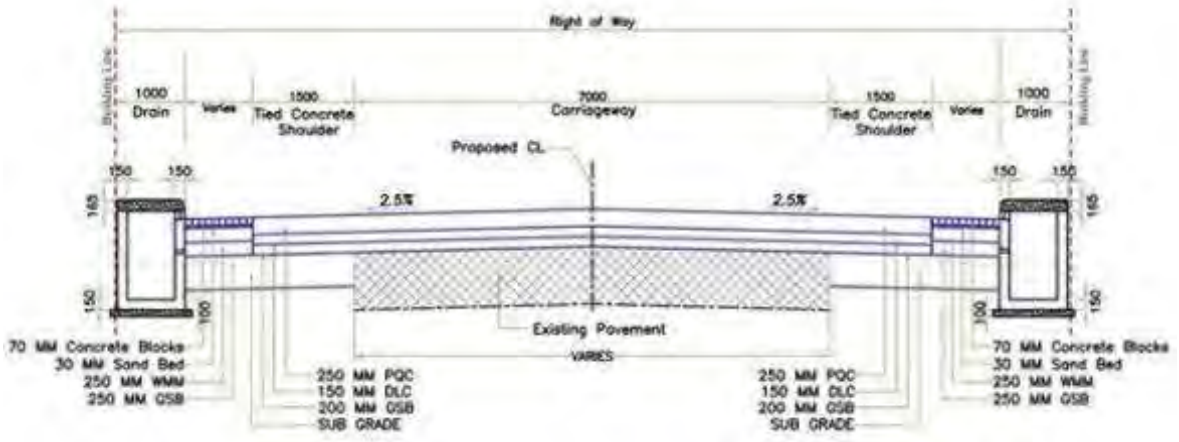


Fig. 13: TCS of Reconstruction with Footpath with line drain in Urban Areas.

45. Safety features such as elaborate system of signs and markings, cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, protection works viz. retaining walls, turfing of high embankment slopes, km stones, ROW stones, other safety measures, informatory boards, mandatory road signs, and edge line marking etc are proposed in line with IRC's Codal provision , MoRTH guidelines / Standards and International best practices .

Table II-5: Generic Configuration
(Configuration of Urban, rural section with earthen shoulder, Paved Shoulder)

Sl. No.	PARAMETERS	URBAN	RURAL
1.	Carriageway	2 lane, 2 x 3.50m	2 lane, 2 x 3.50m
2.	Paved Shoulders	1.5 m	NA
3.	Earthen Shoulders	NA	2.5m
4.	Concrete Pavers	Variable between Paved Shoulders and Footpaths.	NA
4.	Drains	2 x 1m wide Footpath cum Rectangular Drain	2x 1.8m wide Unlined Drain

Source: DPR Consultant

1. Junctions

46. Intersections are an important part of the highway because to a great extent the efficiency, the safety and the capacity depend on their design. All major intersections falling on the Project corridors have been studied for the improvement to allow a safe connection to the Corridor and minimum interference to the through traffic. The Junctions have been designed in accordance with provisions of IRC: SP 41-1994 and “MOST Type Design for Intersection on NH” have been considered. The details of Minor and Major Junctions in different Project Corridors have been given in **Table II-6.**

Table II-6: Proposed Interventions along the Project Road

Sl. No.	Parameter	Nanau to Dadon (MDR 82 W)	Bulandshar to Anoopshar MDR 58W	MuzaffarNagar to Baraut MDR 135W	Haliyapur – Kurebhar-Bilwai MDR 66E	Hussain Ganj Hathgaon Alipur Marg MDR 81 C	Kaptanganj - Naurangiya MargODR 24	Kaptanganj - Barhaaj Marg MDR 25E	Mohanlalganj to Maurawan Unnao Marg MDR 52C	Aliganj-Souraon Marg MDR 45W
1.	Design Length (Km)	30.00	36.137	59.174	95.628	35.675	24.041	61.350	54.114	35.505
2.	Configuration									
A	2 Lane Concentric Widening with Earthern Shoulder in Rural area **km**	22.466	21.920	27.410	47.558	26.785	3.680	27.200	33.914	24.353
B	2 Lane Eccentric Widening RHS with Earthern Shoulder and Unlined drain in rural area **Km**	0.10	N A	NA	NA	0.770	0.110	NA	NA	NA
C	2 Lane Eccentric Widening **L**HS with Earthern Shoulder and Unlined drain in rural area **km**	NA	0.28	NA	NA	1.470	0.110	NA	NA	NA
D	2 Lane Realignment in Rural areas with unlined drain **km**	0.22	NA	NA	NA	NA	NA	NA	NA	NA

Sl. No.	Parameter	Nanau to Dadon (MDR 82 W)	Bulandshar to Anoopshar MDR 58W	MuzaffarNagar to Baraut MDR 135W	Haliyapur – Kurebhar-Bilwai MDR 66E	Hussain Ganj Hathgaon Alipur Marg MDR 81 C	Kaptanganj - Naurangiya MargODR 24	Kaptanganj - Barhaaj Marg MDR 25E	Mohanlalganj to Maurawan Unnao Marg MDR 52C	Aliganj-Souraon Marg MDR 45W
E	2 Lane Re Construction in Rural Area with unlined drain **km**	NA	7.050	19.320	18.200	NA	11.780	10.120	9.400	NA
F	2 Lane Eccentric widening LHS Re Construction in Rural Area with unlined drain **km**	NA	NA	NA	NA	NA	0.500	NA	NA	0.300
G	2 Lane Eccentric widening RHS Re Construction in Rural Area with unlined drain	NA	NA	NA	NA	NA	0.160	NA		0.800
H	2 Lane Re Construction with Footpath cum drain in Urban Areas. km	7.150	6.870	9.444	29.870	6.650	7.040	24.030	10.200	10.052
I	4 lane Urban Section with lined drain	N A	N A	3.000	NA	NA	NA	NA	NA	NA
J	New LHS Bridge Approach	N A	N A	N A	N A	N A	0.440	NA	NA	NA

Sl. No.	Parameter	Nanau to Dadon (MDR 82 W)	Bulandshar to Anoopshar MDR 58W	MuzaffarNagar to Baraut MDR 135W	Haliyapur – Kurebhar-Bilwai MDR 66E	Hussain Ganj Hathgaon Alipur Marg MDR 81 C	Kaptanganj - Naurangiya MargODR 24	Kaptanganj - Barhaaj Marg MDR 25E	Mohanlalganj to Maurawan Unnao Marg MDR 52C	Aliganj-Souraon Marg MDR 45W
K	New RHS Bridge Approach	N A	N A	N A	N A	N A	0.220	NA	0.600	NA
3.	Pavement	Flexible in rural areas , **22.850 km** Rigid in Urban areas, **7.150** km	Flexible in rural areas **29.267 km** Rigid in Urban areas, **6.870** km	Flexible in rural areas , **46.730 km** Rigid in Urban areas, **12.444** km	Flexible in rural areas , **65.758 km** Rigid in Urban areas,**29.870** km	Flexible in rural areas , **29.025 km** Rigid in Urban areas, **6.650 km**	Flexible in rural areas **17.000 km** Rigid in Urban areas**, 7.040 km**	Flexible in rural areas **37.320 km** Rigid in Urban areas, **24.030 km**	Flexible in rural areas **43.915km** Rigid in Urban areas,**10.200 km**	Flexible in rural areas **25.453 km** Rigid in Urban areas,**10.05 2km**
A	Flexible	DMSA 5 DLife 15 DCBR(%) 08 BC(mm) 40 DBM (mm) 50 WMMmm 250 GSBmm 200 **THmm 540**	*Widening / Reconstruction Sections* DMSA 20 DLife(Yrs) 15 DCBR(%) 0 8 BC(mm) 40 DBM(mm) 100 WMM (mm) 250 GSB (mm) 200 **TH(mm) 590** In New Construction DBM and THwill be 85mm and 575mm respectively and rest will remain same.	DMSA 30 DLife 15 DCBR(%) 8 BC (mm) 40 DBM (mm) 100 WMM (mm) 250 GSB (mm) 200 **TH (mm) 590**	DMSA 05 DLife 15 DCBR(%) 10 BC (mm) 40 DBM (mm) 50 WMM(mm) 250 GSB (mm) 350 **TH(mm) 540**	DMSA 05 DLife 15 DCBR(%) 04 BC(mm) 40 DBM(mm) 50 WMM(mm) 250 GSB(mm) 300 **TH(mm) 640**	DMSA 05 DLife 15 DCBR(%) 10 BC(mm) 40 DBM(mm) 50 WMM(mm) 250 GSB(mm) 200 **TH(mm) 540**	DMSA 05 Dlife 15 DCBR(%) 10 BC(mm) 40 DBM(mm) 50 WMM(mm)250 GSB(mm) 200 **TH(mm) 540**	DMSA 05 Dlife 15 DCBR(%) 10 BC(mm) 40 DBM(mm) 50 WMM(mm)250 GSB(mm) 200 **TH(mm) 540**	DMSA 05 Dlife 15 DCBR(%) 10 BC(mm) 40 DBM(mm) 50 WMM(mm)2 50 GSB(mm) 200 **TH(mm) 540**
B	Rigid	Pavement Quality Concrete (PQC) 250 mm Dry Lean Cement Concrete (DLC) 150 mm Granular Sub base 200 mm Sub-grade with material having effective CBR 8% 500 mm Plain Dowel Bar Details 36 mm Dia. @ 200 mm c/c, 450 mm long Deformed Tie Bar Details 12 mm Dia. @ 700 mm c/c, 640 mm long								
4.	Major Bridges	1, Retained with minor repairing	NA	2 , Retained with minor repair	NA	NA	1, Retained with minor repair.	1, Retained with minor repair	NA	NA

Sl. No.	Parameter	Nanau to Dadon (MDR 82 W)	Bulandshar to Anoopshar MDR 58W	MuzaffarNagar to Baraut MDR 135W	Haliyapur – Kurebhar-Bilwai MDR 66E	Hussain Ganj Hathgaon Alipur Marg MDR 81 C	Kaptanganj - Naurangiya MargODR 24	Kaptanganj - Barhaaj Marg MDR 25E	Mohanlalganj to Maurawan Unnao Marg MDR 52C	Aliganj-Souraon Marg MDR 45W
5.	Minor Bridges	**6,** Widening 05 Reconstruction 00 Retained with minor Repair 01	**4,** Widening 06 Reconstruction 02 Retained with minor Repair	**4,** Widening 00 Reconstruction 02 Retained with minor Repair 02	**13,** Widening 09 Reconstruction 00 Retained with minor Repair 04	NA	**4,** Widening 00 Reconstruction 01 Retained with minor Repair 01 New Bridge 02	**4,** Widening 02 Reconstruction 00 Retained with minor Repair 02	**9,** Widening 02 Reconstruction 01 Retained with minor Repair 04 New Bridge 02	NA
6.	Culvert	**56** Widening 15 Reconstruction 28 Abandoned 08 Retained with minor Repair 05	**56** Widening 15 Reconstruction 28 Abandoned 08 Retained with minor Repair 05	**110** Widening 08 Reconstruction 84 Abandoned 02 Retained with minor Repair 15	**196** Widening 9 Reconstruction 113 Abandoned 18 Retained with minor Repair 56	**72** Widening 31 Reconstruction 35 Abandoned 05 Retained with minor Repair 01	**36** Wdening 01 Reconstruction 13 Abandoned 04 Retained with minor Repair 18	**80** Widening 34 Reconstruction 36 Abandoned 03 Retained with minor Repair 07	109 Widening 03 Reconstruction 58 Abandoned 07 Retained with minor Repair 41	Widening 06 Reconstruction 56 Abandoned 08 Retained with minor Repair 14
7.	Side Drains (Km) Lined Drain 1m wide, Unlined Drain 1.8m wide	Lined Drain 2 x 7.150 =**14.300** Unlined Drain 2 x 22.786 =**45.572**	Lined Drain 2 x 6.870 = **13.740** Unlined Drain 2 x 29.250 = **58.500**	Lined Drain 2 x 12.5335 = **25.067** Unlined Drain 2 x46.570,**93.140**	lined Drain 2 x 29.870=**59.740 km,** Unlined Drain,2 x 65.88=**131.516**	lined Drain 2 x 6.65=**13.300k m** Unlined Drain,2 x 29.025= 58.05 **km**	lined Drain 2 x 14.040=**14.080** km, Unlined Drain.2 x 17.200=**34.400**	lined Drain 2 x 24.030=**48.060** km, Unlined Drain 2 x 37.320=**74.640**	lined Drain 2 x 10.20=**20.40 km,** Unlined Drain 2 x 43.915= **87.83 km**	lined Drain 2 x10.052=**20. 104** km, Unlined Drain 2 x 25.453=**50.9 06 km**
8.	ROB	Not Applicable	Not Applicable	Not Applicable	Not Provided	Not Applicable	Not Required	Not Required	Not Applicable	Not Applicable
9.	Bus Stop	LHS 08, RHS 08	LHS 09, RHS 09	LHS 24, RHS 24	LHS 31, RHS 31	LHS 21, RHS 21	LHS 12, RHS 12	LHS 26, RHS 26	LHS,25 RHS 25	LHS, 16 RHS 16
10.	Truck lay bye	No	No	No	No	No	No	No	No	N0
11.	Crash Barrier(m)	Nil	148.55	60.531	1967	871.694	Nil	Nil	Nil	Nil

Source: DPR Consultant

2. Pavement

47. The Flexible pavement has been proposed in rural areas, length of Overlay and Reconstruction and length of rigid pavement for different project roads and composition of pavement is given in **Table II-7.**

Table II-7: Details of Pavement type along the Project Roads

S.No	Name of Road	Flexible Pavement		Rigid (km)
		Re Construction (km)	Overlay (km)	
1.	NANAU – DADON (MDR 82 W)	22.786	0.000	7.150
2.	BULANDSHAR ANOOPSHAR (MDR 58W)	7.050	22.200	6.870
3.	MUZAFFARNAGAR BARAUT (MDR 135W)	19.32	30.41	9.444
4.	HALIYAPUR -KUREBHAR – BILWAI (MDR 66E)	18.200	47.558	29.870
5.	HUSSAINGANJ TO ALIPUR MARG (MDR 81 C)	0.000	29.026	6.650
6.	NAURANGIA-KAPTANGANJ-BARHAAJ MARG (ODR 24 and MDR 25E)	ODR 12.64 MDR 11.6	ODR 4.1 MDR 28.7	ODR 7.5 MDR 20.85
7.	ALIGANJ TO SORON MARG(MDR 45W)	25.453	-	10.052
8.	MOHANLALGANJ TO MORAVA UNNAO ROAD(MDR 52C)	10.0	33.913	10.2

Source: DPR Consultant

3. Drainage

48. The details of improvement proposals for Major, Minor bridges and Culverts are given in **Table II-6**. All pipe Culverts are being reconstructed with pipe of 1.2 dia.

49. 1m wide lined Rectangular covered Drains are proposed in Built up area and 1.8 m wide unlined Trapezoidal drains are proposed in open areas. Details are given in **Table II-6.**

4. Traffic Safety and Control

50. Roadway indicators are intended to mark the edges of the roadway so as to guide drivers on the alignment ahead. Hazard markers used to define obstructions like guardrails and abutment adjacent to carriageway and bridges which are narrower than the normal width. Object markers are used to indicate hazards and obstructions within the vehicle flow path, for example, channelling islands close to the intersections. Delineators and object markers are provided as per provisions of IRC: 79-1989. They are basically driving aids and not substitutes for warning signs, road markings or barriers.

51. Road markings perform the important function of guiding and controlling traffic on a highway. The location and type of marking lines, material and color has been proposed in accordance with IRC: 35-1997,“Code of Practice for Road Markings”

52. Cautionary, mandatory and informatory signs have been provided depending on the situation and function they perform in accordance with the IRC: 67-2012 guidelines for Road Signs.

53. Kilometre stones are proposed in accordance with IRC: 8-1980 guidelines. Kilometre stones are located on the left-hand side of the road as one proceeds from the station from which the Kilometre count starts. Kilometre stones shall be fixed at right angles to the centre line of the carriageway. 200m stones and boundary stones conform to IRC: 26-1967 and IRC: 25-1967. 200m stones are located on the same side of the road as the kilometre stones

5. Crash Barrier

54. Crash barrier system absorbs impact of vehicle and laterally restrains a vehicle from veering off. This ensures minimum damage to the vehicle and passengers, Metal Beam Crash Barrier is proposed at locations where the embankment height is more than 3.0m, Sharp curves and also at major bridge approaches. Metal beam rail shall be W profile corrugated sheet steel beams. The length of crash barriers provided in different project roads is given in **Table II-6.**

6. Way Side Amneties

55. Bus Stops have been proposed on all Project Roads and no. of proposed bus stops are given in **Table II-6.**

H. Construction Material

56. Quantity and sources of key construction materials have been summarized in **Table II-8**.

57. **Fly Ash**. In order to restrict the excavation of top soil in various construction activities, Ministry of Environment and Forests (MoEF) issued a Notification (S.O. 2804 E) dated 3rd November, 2009 promoting the utilization of fly ash in any construction activity if located within a radius of 100km from a coal or lignite based thermal power plants. The location of thermal power plants within 100 km radius from the project roads is given in **Table II-8**.

58. The reconstruction of embankment along the project roads is very marginal, therefore, use of fly ash is not proposed in the project.

Table II-8: Details of Construction material and location of thermal power plants

S. No	Name of Road	EARTH (Cum)	Sand (Cum)	Aggregates (Cum)	Cement (MT)	Bitumen (MT)	Thermal Power Plants within 100km radius
1.	Nanau – Dadon (MDR 82 W)	Filling 108896 Cutting 39466 Earth Reqd 81270 Borrow Area < 1km	22787 Kachla LHS 120 km.	238528 Ghatri LHS 201 km, Haldwani RHS 229 km	16532 Local Market Aligarh	60/70 2681 Emulsion 229 Mathura Refinery , 75 km from Aligarh	Harduaganj Thermal Power Station is about 25 km from the proposed improvement road.
2.	Bulandshar Anoopshar (MDR 58W)	Filling 39064 Cutting 70885 Earth Reqd 3622 Borrow Area < 1km	24338 Kachla LHS 120 km. Ganga River , Narora RHS 15 km	254942 Jhagirabad RHS 30 km, Kotputli LHS 250 km	16722 Local Market Aligarh	60/70 6321 Emulsion 321 Mathura Refinery , 75 km from Aligarh	Dadri Thermal Power Station is located 55 km (crow fly) from the proposed project road.
3.	Muzaffar nagar Baraut (MDR 135W)	Filling 77136 Cutting 373804 Earth Reqd 2375 Borrow Area < 1km	34726 Yamuna River , LHS, Jharkheri Village 55 km	375476 Jhagirabad RHS 160 km, Kotputli LHS 330 km	24620 Local Market MuzaffarNagar, Meerut	60/70 7790 Emulsion 372 Mathura Refinery , 260 km from Muzaffarnagar	No coal based operational Thermal Power Station is located within 100 Km radius of road
4.	Haliyapur-Kurebhar-Bilwai (MDR 66E)	Filling 137780 Cutting 297870 Earth Reqd 40486 Borrow Area < 1km	68601 Bandacane LHS 79 km	92421 Sankargarh LHS 214, Dala LHS 79 km	712983 Local Markets Sultanpur,Lucknow	60/70 8499 Emulsion 608 Mathura Refinery , 500 km from Haliyapur	Tanda (440 MW) Thermal Power Station is within 100 km from the project road.
5.	Hussainganj-Alipur Marg (MDR 81 C)	Filling 67268 Cutting 46755 Earth Reqd 34539 Borrow Area < 1km	21099 Bandacane LHS 114 km	29322 Sankargarh LHS 214, Karbai LHS 155 km	304607 Local Markets Fatehabad, Kanpur	60/70 4339 Emulsion 298 Mathura Refinery , 500 km from Haliyapur	Unchahar Thermal Power Station is about 15 km from the proposed project road.

S. No	Name of Road	EARTH (Cum)	Sand (Cum)	Aggregates (Cum)	Cement (MT)	Bitumen (MT)	Thermal Power Plants within 100km radius
6.	Naurangia-Kaptanganj-Barhaaj Marg (ODR 24 and MDR 25E)	Filling 120943 Cutting 143646 Earth Required 55555 Borrow Area < 2km	54307 Sukrut LHS 337 km	73767 Sukrut LHS 337 km Dalla LHS 385 km.	550867 Local Markets	60/70 7022 Emulsion 335 Indian Oil Refinery, Mathura. 1000km from Kaptanganj.	No Thermal Power Station in 100km from the Road
7.	MOHANLALGANJ MORAVA UNNAO ROAD(MDR 52C)	Filling 50069 Cutting 328628 Earth Required 775 Borrow Area < 2.5km	35585 Hameerpur RHS 26.00 km	315436 Kabrai RHS 191 km	24806 Local Markets	60/70 5316 Emulsion 285 Indian Oil Refinery, Mathura. 400km from Mohanlalganj	Panki Thermal Power STtaion (220 MW) at 80 km and Unchar Thermal Power Station (1050 MW) at 90 km from the project road.
8.	ALIGANJ TO SORON MARG(MDR 45W)	Filling 28188 Cutting 159731 Earth Required 4228 Borrow Area < 3.0km	28896 Kachla LHS 75.0 km	264671 Haldwani LHS 215km Ghatri LHS 249 km	21501 Local Markets	60/70 2899 Emulsion 234 Indian Oil Refinery,. 156 km from Aliganj	Harduaganj Thermal Power Station is about 60 km from the road.

Source: DPR Consultant

I. Construction Methodology

The typical construction activities involved in the upgrading of the MDRs is classified into 6 stages, namely: i) preparation of the existing base course layer, ii) application of tuck coat, iii) preparation and placing of premix, iv) rolling, v) quality control of bituminous concrete construction, and vi) finished surface. All existing potholes and ruts on the existing road surface will be removed and filled with pre-mix chippings at least 1 week before the laying of the surface course, and depending on the existing condition a bituminous leveling course may be provided. After the base course is prepared a tuck coat of bitumen is applied at a rate of 6.0-10 kg/10 square meter on bituminous base and as much as 10kg for non-butuminous base. This is followed by the preparation of pre-mix in a hot mix plant, collected by trucks and carried to the construction front where it is spread by a mechanical paver at temperature of about 150^{o}C. Quality control of the bituminous construction is strictly observed by monitoring aggregate and bitumen grades, temperatures, and compaction. Finally, the finished surface is checked for undulations.

J. Cost and Implementation Schedule

59. The cost of civil, environment & RNR is given in **Table II-9.** Period of implementation is 2 years.

Table II-9: Cost of Civil, Environment and R&R

Sl. No.	Name of Road	Civil Cost	Environment Cost (INR in Millions)	R&R Cost (INR in Millions)	Total Cost
1	Nanao to Dadao (MDR 82W)		66.94	28.9	
2	Bulandansharar to Anupshahar (MDR 58W)		20.74	3.4	
3	Muzzaffarnagar to Baraut (MDR 135W)		62.30	12.4	
4	Hussainganj to Alipur Marg (MDR 81C)		48.52	19.1	
5	Haliyapur to Kurebhar to Bilwai (MDR 66E)-Pkg I		28.59	20.1	
6	Haliyapur to Kurebhar to Bilwai (MDR 66E)-Pkg II		44.97		
7	Kaptanganj to Naurangiya (ODR 24)		29.63	9.8	
8	Kaptanganj to Rudrapur (MDR 25E)		47.40		
9	Mohanlaganj to Maurawan Unnao Marg (MDR 52C)		43.52	6.0	
10	Aliganj-Soron Marg (MDR 45W)		37.76	57.2	

Source: PPTA Consultant

K. Cold Mix and Hot Mix Alternatives

60. Cold Mix Technology involves cold asphalt which is a high-quality, polymer-modified cold mix asphalt available in batch orders. Hot Mix Technology involves Hot Mix Asphalt (HMA) which is a combination of approximately 95% stone, sand or gravel bound together by asphalt cement, a product of crude oil. Asphalt cement is heated aggregate, combined, and mixed with the aggregate at an HMA facility. The comparison between the two is given in **Table II-10**.

Table II-10: Comparison of Cold & Hot Mix Plant

S. No.	Parameter	Cold Mix	Hot Mix
1	Description	• Street Cold Asphalt is a relatively new product developed in 1995 through the introduction of new polymer technology and research into the manipulation of viscosity and material design, of the various components of an asphalt mix - Street Cold Asphalt is soft and sticky out of the bag, but it quickly hardens after application and the end result is a pavement patch with better strength but	• Hot mix asphalt is used primarily as paving material and consists of a mixture of aggregate and liquid asphalt cement, which are heated and mixed in measured quantities. • Hot mix asphalt facilities can be broadly classified as either drum mix plants or batch mix plants, according to the process by which the raw materials are mixed. • In a batch mix plant, the aggregate is dried first, then transferred to a mixer where it is mixed with the liquid asphalt. • In a drum mix plant, a rotary dryer serves to dry the aggregate and mix it with the

S. No.	Parameter	Cold Mix	Hot Mix
		similar properties to hot asphalt.	liquid asphalt cement.
2	Requirements	• Cold patch, also known as cold mix or cold asphalt, was first recognized as a way to make road repairs quickly because it can be applied right from the container without heating. • Cold asphalt also doesn't require any special heavy rolling machines or special applicators as it can be shovelled or poured into a pothole or utility cut and tamped down with a hand tool.	• Hot mix asphalt concrete (commonly abbreviated as HMAC or HMA) is produced by heating the asphalt binder to decrease its viscosity, and drying the aggregate to remove moisture from it prior to mixing. • Mixing is generally performed with the aggregate at about 300° F (roughly 150° C) for virgin asphalt and 330° F (166° C) for polymer modified asphalt, and the asphalt cement at 302° F (150° C). • Paving and compaction must be performed while the asphalt is sufficiently hot
3	Use	• Cold mix asphalt concrete is produced by emulsifying the asphalt in water with (essentially) soap prior to mixing with the aggregate. While in its emulsified state the asphalt is less viscous and the mixture is easy to work and compact • The emulsion will break after enough water evaporates and the cold mix will, ideally, take on the properties of cold HMAC • Cold mix is commonly used as a patching material and on lesser trafficked service roads	• HMAC is the form of asphalt concrete most commonly used on high traffic pavements such as those on major highways, racetracks and airfields • Asphalt concrete has different performance characteristics in terms of surface durability, tire wear, braking efficiency and roadway noise.
4	Merits	• Actually less expensive to use over the life of a road repair • Completely seals and patches potholes, utility cuts, edge repairs, and even overlays.	• Less expensive for new road construction
5	Demerits	• Less resilient and more vulnerable to cracking	• Expensive

Source: DPR Consultant

61. Cold Mix technology is more suitable for repair of potholes and cracks on roads, bridges, overlays, parking lots and other asphalt and concrete surfaces. Cold Mix is fast, permanent, easy to use and environmentally preferable cold asphalt product. However, for constructing of new roads hot mix technology is better suited so the contractor shall utilise the same where ever suitable.

L. Country's Legal Framework and Regulatory Requirements

62. The Government of India has laid out various policy guidelines, acts and regulations for the safeguard and conservation environment. The Environment (Protection) Act, 1986 provides umbrella legislation for the protection of environment. As per this Act, the responsibility to

administer the legislation has been jointly entrusted to the Ministry of Environment and Forests and Climate Change (MoEF&CC) and the Central Pollution Control Board (CPCB)/Uttar Pradesh Pollution Control Board (UPPCB) in the present context. **Table II-11** presents all relevant policies/acts/rules and regulations and its applicability to the project.

Table II-11: Applicable National Laws and Regulations for the Investment Project

S. No	Act / Rules	Purpose	Applicable	Reason for Applicability	Authority
1	Environment Protection Act-1986	To protect and improve overall environment	Yes	It is umbrella legislation and notifications, rules and schedules are promulgated under this act.	MoEF&CC. UPPCB
2	Environmental Impact Assessment Notification,14th Sep-2006[4]	To accord environmental clearance to new development activities listed in schedule of EIA notification.	No	MDR and ODR are not covered under the notification.	MoEF&CC. SEIAA, UP
3	Fly Ash Notification, 1999 as amended upto 17th August 2003:	Reuse large quantity of fly ash discharged from thermal power plant to minimize land use for disposal	Yes	Projects are located within 100 km from Thermal Power Plants. However, since work of construction of embankment is very marginal ,therefore Fly ash utilization has not been proposed	MoEF&CC
4	Office memorandum dated 18.05.12,by MoEF in view of Apex Court order dated 27.2.2012	Conserve top soil, aquatic biodiversity, hydrological regime etc. by haphazard and unscientific mining of minor minerals	Yes	Opening of new borrow areas. In case of opening of new quarry	SEIAA,UP
5	National Environment Appellate Authority Act (NEAA) 1997	Address Grievances regarding the process of environmental clearance.	Yes	Grievances if any will be dealt with, within this act.	NEAA
6	Forest Conservation	To check deforestation by restricting conversion	Yes	Vacant Spaces on both sides of road has been notified as Protected Forest	MoEF&CC/ Dept. Of Forest ,

[4] ***Category A -i)*** *New National High ways; and ii) Expansion of National High ways greater than 100 KM, involving additional right of way greater than 40m in existing alignment and 60 m in bypass and realignment section.*

Category B-*i) All new state High ways; and ii) Expansion projects in hilly terrain (above 1000 m above mean sea level and/or ecologically sensitive areas.*

Note:*"Any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries".*

S. No	Act / Rules	Purpose	Applicable	Reason for Applicability	Authority
	Act (1980)	of forested areas into non- forested areas		in following cases Nanau – Dadon (MDR 82 W), Muzaffar Nagar- Baraut (MDR 135W), Hussainganj - Alipur Marg (MDR 81 C),Mohanlalganj Morava Unnao Marg (MDR 52C) Diversion of forest land is required in above cases	Govt.of UP.
7.	Indian Tree Act 1927	Permission for Felling of Road Side trees	Yes	Road Side Trees shall be Felled after taking Permission from Forest Department BA (MDR 58W),MB (MDR 135W),HK (MDR 66E) HA (MDR 81 C),NK, KB (ODR 24 and MDR 25E), MM (MDR 52C),AS	Department of Forest GoUP
8	National Forest Policy1952 National Forest Policy (Revised) 1988	To maintain ecological stability through consservation and restoration of biological diversity.	Yes	This policy will be applicable as project intervention requires forest land to be acquired.	Forest Department, GoI and GoUP
9	Air (Prevention and Control of Pollution) Act, 1981	To control air pollution by & Transport controlling emission of air Department. Pollutants as per the prescribed standards.	Yes	For construction; for obtaining NOC for establishment of hot mix plant, workers' camp, construction camp, etc.	UPPCB
10	Water Prevention and Control of Pollution) Act1974	To control water pollution by controlling discharge of pollutants as per the prescribed standards	Yes	This act will be applicable during construction for (establishments of hot mix plant, construction camp, workers' camp, etc.	UPPCB
11	Noise Pollution (Regulation and Control Act) 2000	The standards for noise for day and night have been promulgated by the MoEF for various land uses.	Yes	This act will be applicable as vehicular noise on project routes required to assess for future years and necessary protection measure need to be considered in design.	District Magistrates / Officer Authorized under Noise Rules
12.	Ancient Monuments and Archaelogical Sites and	Protection of Archaeological Monuments	No	No Archaeological Monuments notified under this Act is within 300m of the boundary of Project.	Archaelogical Survey of India

S. No	Act / Rules	Purpose	Applicable	Reason for Applicability	Authority
	Remains Act 1958				
13	Antiquities and Art Treasures Act , 1972 along with Rules 1973	An Act to regulate the export trade in antiquities and art treasures, to provide for the prevention of smuggling of, and fraudulent dealings in, antiquities, to provide for the compulsory acquisition of antiquities and art treasures for preservation in public places and to provide for certain other matters connected therewith or incidental or ancillary thereto.	Yes	If during digging any Antique Articles and Art Treasures is found than it needs to be handed over to District Authorities	District Magistrate
14	Central Motor Vehicle Act 1988 and Central Motor Vehicle Rules1989	The Act provides in detail the legislative provisions regarding licensing ofdrivers/ conductors, registration of motor vehicles, control of motor vehicles through permits, special provisions relating to state transport undertakings, traffic regulation, insurance, liability, offences and penalties,	Yes	These rules will be applicable to road users	Motor Vehicle Department
15	Mines and Minerals (Development and Regulatio) AmendmenT ACT, 2015	The mining act has been notified for safe and sound mining activity.	Yes	The construction of project road will require aggregate through mining from riverbeds and quarries	Department of mining. State Gov.
16	Minor Mineral and concession Rules, 2015	For opening new borrow /quarry.	Yes	Regulate use of minor minerals like stone, soil, river sand etc.	District Collector
17	Public Liability and Insurance Act 1991	Protection form hazardous materials and accidents.	Yes	Contractor need to stock hazardous material like diesel, Bitumen, Emulsions	----

S. No	Act / Rules	Purpose	Applicable	Reason for Applicability	Authority
				etc.	
18	Explosive Act 1984	An Act to regulate the manufacture, possession, use, sale, [transport, import and export] of Explosives	No	Blasting is not involved in Projects.	Chief Controller of Explosives
19	Minor Mineral and concession Rules, 2015	For opening new borrow /quarry.	Yes	Regulate use of minor minerals like stone, soil, river sand etc.	District Collector
20.	The Building and Other Construction Workers (regulation of employment and conditions of service) Act, 1996	To regulate the employment and conditions of construction workers and to provide for their safety, health and welfare measure and for other matter incidental thereto	Yes	A large number of construction workers skilled, semiskilled or unskilled will be employed temporarily during Construction Phase of the project	Ministry of Labor and Employment
21	Bonded Labour System (Abolition) Act, 1976 along with Rules, 1976	An Act to provide for the abolition of bonded labour system with a view to preventing the economic and physical exploitation of the weaker sections of the people and for matters connected therewith or incidental thereto	Yes	Contractors shall employ a large number of Labor during Construction Phase.	Ministry of Labor and Employment
22	Contract Labour (Regulation and Abolition) Act 1970 along with rules, 1971	The Object of the Contract Labour Regulation and Abolition) Act, 1970 is to prevent exploitation of contract labour and also to introduce better conditions of work	Yes	Contractors shall employ a large number of Labor during Construction Phase. The Act applies to the Principal Employer of an Establishment and the Contractor where in 20 or more workmen are employed or were employed even for one day during preceding 12 months as Contract Labour	Ministry of Labor and Employment
23	Employees Provident Funds and Miscellaneous Provisions Acts 1952 along with	It is a beneficent piece of social welfare legislation aimed at promoting and securing the well-being of the	Yes	Contractors shall be employing Workman more than 20 persons during Construction Phase	

S. No	Act / Rules	Purpose	Applicable	Reason for Applicability	Authority
	EPF Scheme Rules and Forms	employees			
24	Employees State Insurance Act 1948 along with Rules and Regulations	Protect the interest of workers in contingencies such as sickness, maternity, temporary or permanent physical disablement, death due to employment injury resulting in loss of wages or earning capacity. the Act also guarantees reasonably good medical care to workers and their immediate dependants.	Yes	Contractor shall be applying large number of labours during construction which will include both Men and Women	Ministry of Labor and Employment
25	Equal Remuneration Act, 1976 along with allied Rules	An Act to provide for the payment of equal remuneration to men and women workers and for the prevention of discrimination, on the ground of sex, against women in the matter of employment and for matters, connected therewith or incidental thereto.	Yes	Contractor shall be applying large number of labours during construction which will include both Men and Women.	Ministry of Labor and Employment
26	Inter State Migrant Workmen (Regulation of Employment and Conditions Service Act	Act of the Parliament of India enacted to regulate the condition of service of inter-state labourers in Indian labour law. The Act's purpose is to protect workers whose services are requisitioned outside their native states in India. Whenever an employer faces shortage of skills among the locally available workers, the act creates provision to employ better	Yes	Contractor Shall be employing large number of workers during Construction from other States also.	Ministry of Labor and Employment

S. No	Act / Rules	Purpose	Applicable	Reason for Applicability	Authority
		skilled workers available outside the state			
27	Minimum Wages Act 1948 along with Central Rules 1950	To ensure that workman gets at least minimum wages as fixed by Govt. Minimum wages sets the lowest limit below which wages cannot be allowed to sink.	Yes	Contractor Shall be employing large number of workers during Construction	Ministry of Labor and Employment
28	Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participations) Act , 1995 along with Rules, 1996 and National Trust for Welfare of Persons with Disabilities Act,1999 with rules2000.	It gives effect to the proclamation on the full participation and equality of the persons with disabilities in the Asian & Pacific Region and provides for their education, employment, creation of barrier free environment, social security, etc.	Yes	Contractor Shall be employing large number of workers during Construction.	Ministry of Labor and Employment

Source: PPTA Consultant

M. International Agreements and Commitments

63. India is party to various international agreements/conventions/treaties for conservation of environment at global level. Important among them have briefly described and analysed vis- a-vis the project development.

64. **Ramsar Convention on Wetlands, 1971:** The Ramsar Convention on Wetlands (formally, the Convention on Wetlands of International Importance, especially as Waterfowl Habitat), signed in Ramsar, Iran, in 1971, is an international treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. *Out of 26 designated wetlands of International Importance in India, one of them, the Upper Ganga River (Brijghat to Narora Stretch) is located in Uttar Pradesh.The Bulandshahar- Anoopshahar- (MDR 58W) road is outside the wetland boundary of Ramsar site and the nearest point is junction of Anoopshahar at km 39.700 which is 900m away from the wetland boundary.*

65. **Convention on Protection of the World Cultural and Natural Heritage, 1972:** The United Nations Educational, Scientific and Cultural Organization (UNESCO), which seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity has embodied these objectives in an international treaty called the Convention concerning the Protection of the World Cultural and

Natural Heritage in 1972. *There are 32 World Heritage Sites in India out of which, two, Agra Fort & Fatehpur Sikri are located in Uttar Pradesh and are at a distance of 74 km and 99 km respectively from project road.*

66. **Vienna Convention for Protection of the Ozone layer, 1985 and Montreal Protocol on Substances Depleting the Ozone layer, 1987:** The Vienna Convention outlines states responsibilities for protecting human health and the environment against the adverse effects of ozone depletion, and established the framework under which the Montreal Protocol was negotiated. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform) are to be phased out by 2010. The project does not envisage production and consumption of ODS.

67. **United Nations Framework Convention on Climate Change (UNFCC), 1994:** As per the convention the reduction/limitation requirements of Green House Gases (GHG) apply only to developed countries. The only reporting obligation for developing countries relates to the construction of a GHG inventory (GHG sources and sinks, potential vulnerability to climate change, adaptation measures and other steps being taken to address climate change). India acceded to the Kyoto Protocol but has not ratified it and hence the carbon emission limits are not binding upon India.

68. **Convention on Biological Diversity (CBD) 1992:** The Convention on Biological Diversity (CBD) is dedicated to promoting sustainable development and came into force in 1992 Rio Earth Summit. India signed the CBD in 1994. Member Parties have committed themselves to achieve by 2010, a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth.

N. World Bank Environment, Health, and Safety Guidelines (EHS Guideline)

69. In cases where national regulations and guidelines are lacking or not-responsive, the guide values, pollution prevention and control technologies and practices provided the EHS Guideline[5] will be adopted to address impacts and risks consistent with international good practice. The EHS Guidelines contain discharge effluent, air emissions, and other numerical guidelines and performance indicators as well as prevention and control approaches acceptable to ADB.

[5] http://www.ifc.org/ehsguidelines

III. DESCRIPTION OF THE ENVIRONMENT

A. Introduction

69. Initial Environmental Examination (IEE) study of the project area can be best done on the basis of its physical, biological and socio-economic aspects. The description of environmental settings includes the environmental characteristic of the project area.The secondary data has been collected and primary data has been generated to establish a baseline profile related to topography, hydrology, geology, air quality, water quality, noise, soil, biodiversity, socio- economic aspects etc. Efforts have been made to collect the latest information both at regional as well as local level especially along the project road alignment.

70. This will help to predict likely changes in the environment due to the proposed project activities. The existing baseline data and analysis for Project Roads are presented in the following sections.

71. ***Study Area-***Secondary data has been collected both on macro level (district level) and micro level (project corridor).The Corridor of Impact (COI) is being divided into Direct Corridor of Impact and Indirect Corridor of Impact.

72. ***Direct Corridor of Impact:***The area within 10m on either side of centerline (CL) of the project roadin rural areas and within building line in urban areas has been taken as Direct Corridor of Impact.

73. ***Indirect Corridor of Impact:*** The area between10m to 25m on either side of CL has been considered as Indirect Corridor of Impact.The study of land use pattern along project roads has been done within 500 m on either side of CL. However, site sensitivity analysis w.r.t Protected Areas like Wildlife Sanctuary/ National Park and Ramsar Convention Site has been conductedwithin 15km aerial distance from the project road.

B. Physical Environment

1. Physiography and Topography

74. The state of UP has 3 major physiographic divisions viz. Himalayas, Gangetic Plain and Southern Highlands. Greater Himalayas, Lesser Himalayas and Shiwaliks are subcategories of Himalayas. There are four sub categories under Gangetic Plain viz. Piedmont plain, Tarai plain, Alluvial plain and Aravalli plain. The southern highlands also have four sub categories like Eastern Rajasthan Upland, Bundelkhand Uplands, Vindhyan Scraplands and Eastern Plateau.

75. Elevation of the state varies from 150 mamsl to 900 mamsl. Slope varies from 600 m per km to <10 m per km.**Fig.14** shows the Physiographic divisions of the state and **Fig.15** shows slope map of the state with project roads superimposed on them placed at the end of this chapter.

76. All the project roads fall under Gangetic Plain in Alluvial plain terrain with slope being less than 10 m per km. The project area along the roads generally slopes from north to south and north-west to East or south east as is evident from the drainage pattern of the region. The Average elevation of the study area along the projects roads are mentioned below.

Nanau – Dadon	-	182 mamsl
Bulandshahar to Anoopshahar	-	195 mamsl
Muzaffarnagar to Baraut Marg	-	240 mamsl

Hussainganj to Alipur Marg	-	110 mamsl
Haliyapur to Kurebhar to Bilwai	-	95 mamsl
Kaptanganj to Naurangia and Kaptanganj to Rudrapur	-	80 mamsl
Mohanlalganj to Maurawan Unnao Marg	-	98 m amsl
Aliganj-Soron Marg	-	178 m amsl

2. Geology and Soil

77. The state of U.P is predominantly covered with younger alluvial deposits of Pleistocene age. Recent river deposits of Holocene age are found along the rivers of Ganga, Ghagra and Yamuna[6]. Bundelkhand region in the south has rock formation of Archean age. Map of Geology along with project road is given in **Fig.16** placed at the end of this Chapter**.**

78. Most of the project roads lie in the inter-fluvial tract of Ganga and Yamuna.The area along the project roads is underlain by Quaternary alluvium of Pliestocene and Holocene age consisting of clays, occasional kankar, sand of various grades and gravels in different proportions.

79. **Soil Type and Soil Quality**. As per United States Department of Agriculture (USDA) soil taxonomy that is followed by the NationalBureau of Soil Sciences and Land Use mapping (NBSS & LU), major part of the state is covered with Alfisols followed by Inceptisols & Entisols along the rivers; aridisols and vertisols in the Bundelkhand region. Soil map of U.P is given in **Fig.17**at the end of this Chapter.

80. The environment monitoring locations of all project roads with respect to soil, surface water, ground water, air and noise is shown in SOI Toposheet placed at **Appendix 2**.

a. Nanau- Dadau (MDR 82W)

81. Two types of soil are found along the project road. Coarse loamy well drained older alluvium categorized as Alfisols and imperfectly drained fine loamy moderately saline calcareous alluvial soil categorized broadly as Inceptisols. Soil here is deep i.e. <100 cm. Deep soil refers to availability of high volume of soil that the plants can make use of for obtaining their nutrients, water. The region is not prone to soil erosion.[7]

82. To assess the soil characteristics along the corridor one sample from Tikta village has been collected and analyzed for Physical and Chemical properties. The result of soil quality as analyzed is presented in **Appendix3.**The soil along the project road is yellowish brown in colour. The Bulk density of soil in the area is 1.43 gm/cm3. The soils were moderately alkaline in nature with pH 8.1. Organic carbon and NPK content of the soil sample shows medium soil fertility.

b. Bulandshahar to Anoopshahar (MDR 58W)

83. Soil type found here is coarse loamy well drained older alluvium categorized as Alfisols. Soil here is deep i.e. <100 cm and is slightly prone to erosion.

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[6] *Directorate of Geology and Mining, U.P; National Atlas and Thematic Mapping Organization, 2008 (NATMO)*

[7] *National Bureau of Soil Sciences and Land Use planning*

84. Two sampling locations were selected, one each at Bichada village and Anoopshahar Bypass to assess the existing soil quality in and around the project area. The soil characteristic is given in **Appendix3**.The soil was predominantly dark brown to brownish grey in colour. Bulk density of soils in the area was found to be in the range of 1.48 gm/cm3 to 1.52 gm/cm3. The soils were slightly alkaline in nature with pH 7.7 to 7.9. The percentage of Organic carbon of the soil samples was found to be between 0.72 and 0.75 which depicts medium fertility of the soil in the area.

c. Muzaffarnagar to Baraut Marg (MDR 135W)

85. Soil type found here is coarse loamy well drained older alluvium categorized as Alfisols. Soil here is deep i.e. <100 cm and is slightly prone to erosion.

86. The physical and chemical characteristics of the soil in the study area have been assessed by analyzing two samples collected in the study area, one at Tawli village at km 10.200 and the other at Budhana village at km 32.400. The result of soil characteristic as analyzed is presented in **Appendix3**. The soil was found brownish in color. Bulk density of soils in the area ranged from 1.47 gm/cm^3 to 1.50 gm/cm^3. The soil is moderately alkaline in nature with pH ranging from 8.1 to 8.3. Organic carbon of the soil samples was found sufficient i.e 0.79% to 0.85%, which presents high fertility potential of the area.

d. Hussainganj to Alipur Marg (MDR 81C)

87. The project road corridor has two types of soil. Major part has coarse loamy well drained older alluvium categorized as Alfisols. And the other is excessively drained sandy younger alluvial soil falling in the group of Entisols. Soil here is deep i.e. <100 cm and is slightly prone to erosion.

88. To assess the soil characteristics along the corridor two samples from Hussainganj & Alipur were collected and analyzed for Physical and Chemical properties. The result of soil quality as analyzed is presented in**Appendix3.**From the results it can be concluded that the pH of soil is ranging from 6.25 to 6.45, average nitrogen values were in the range of 182.00 to 190 mg/kg, average potassium values in the range of 158.00 to 164.00 mg/kg whereas the average phosphorus values were found in the range of 70.00 – 74.00 mg P2O5/kg.

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

89. The study area has well drained fine loamy older alluvial soil categorized as Alfisols. Soil here is deep i.e. <100 cm and is slightly prone to erosion.

90. A total of 3 samples were collected from Dhobhiyara, Gosaisinghpur and Akhand Nagar for analyzing the physio-chemical properties of the soil samples. The result of soil quality is given in **Appendix3**. The soils were very slightly acidic in nature with pH 6.2 to 6.6. The bulk density of the soil was found in the range of 1.65 -1.8 gm/cc. The percentage of organic matter in the soil samples varies from 14.5 to 16.5 which present good fertility potential of the soil in the area.

f. Kaptanganj to Naurangia (ODR 24) and Kaptanganj to Rudrapur (MDR 25E)

91. The project area has silty, fine, non-calcareous soil associated with loamy soils categorized as alfisols. Soil found here is deep i.e. <100 cm and is slightly prone to erosion.

92. Two soil samples were collected each from Nirvaya village and Rudrapur to assess the soil quality along the project corridor. The physical and chemical properties as analyzed are presented in **Appendix3.** It can be inferred from the result that the pH of the soil varies from 6.5 to 6.9. The Bulk density varies from 1.78 – 1.8 gm/cc. The organic content of the soil ranges from 12.5% to 14% which states good fertility potential of the soil.

g. Mohanlalganj to Maurawan Unnao Marg (MDR 52C)

93. The project area is occupied by soils locally known as "Bhur" or Silty Sand "Matiyar" or Clay Soils and "Dumat" or Loamy soils. The predominant soil type along the road stretch is well drained fine loamy.

94. **Soil Quality.** To assess the soil characteristics along the corridor,threesoil samples from Dhobhiyara, Gosaisinghpur and Akhand Nagar have been collected and analyzed for Physical and Chemical properties. The result of soil quality as analyzed is presented in **Appendix3.** The soil along the project road is sandy clay in texture. The Bulk density of soil in the area varies from 1.27-1.32 gm/cm^3. The soils were neutral in nature with pH in the range of7.21 to 7.45. Organic carbon and NPK content of the soil samplesdrawn are fertile in terms of productivity.

h. Aliganj-Soron Marg (MDR 45W)

95. Soil type of the area is well drained rich alluvium soil falling under the category of Alfisols and Inceptisols whichmakes the land fertile for agriculture.

96. **Soil Quality.** To assess the soil characteristics along the corridor three soil samples were collected from Soron, Near Pond in Sahawar and Alipur Dadar. The physical and chemical properties as analyzed are presented in **Appendix 3.** It can be inferred from the result that the pH of the soil varies from 7.12 to 7.41 which states neutral nature of soil. The Bulk density varies from 1.26 – 1.32 gm/cc. The organic content of the soil ranges from 0.88% to 1.09% which states good fertility potential of the soil.

3. Land Use

97. The state of UP generally has deep fertile alluvial soil that predominantly supports agriculture (69% of the total state area). Most of the gross cropped area (around 72%) is sown more than once i.e. double cropped or multiple cropped. Around 11 % constitutes of forest and rest under built up, barren and uncultivated landwhich has been depicted in **Fig. 18** given at the end of this Chapter.Photographs of agricultural land found along the project roads are given in **Fig. 19**.

Fig. 19: Agricultural land along the Project Roads

98. Waste dumping on the shoulders of the project roads by nearby habitants is a very common observation found during site survey of the project roads. Few photos of the same are shown in **Fig. 20**.

At km 21.00 in Shahpur along Muzaffarnagar-Baraut Road

At km 77.900 in Dostpur along Haliyapur-Kurebhar-Bilwai Road

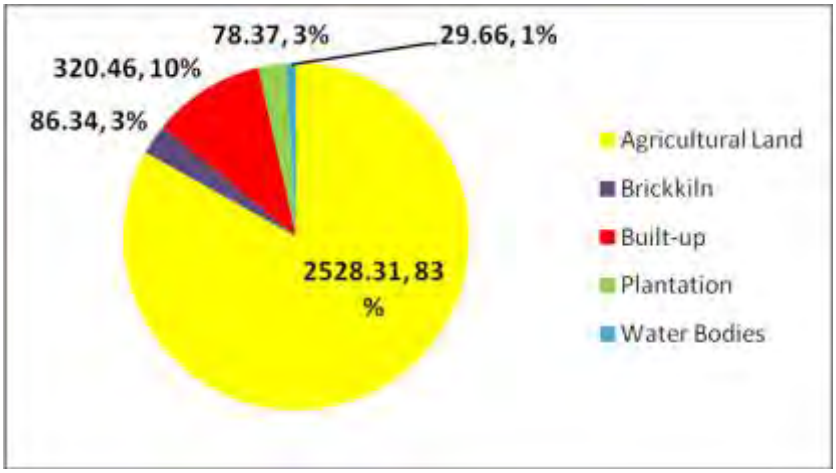
At km 21.800 in Hata along Kaptanganj-Barhaaj Road

At km 8.100 in Sesandi along Mohanlalganj-Maurawan Road

Fig. 20: Waste Dumping along the Project Roads

a. Nanao- Dadao (MDR 82W)

99. The rich quality of alluvial soil supports agriculture widely and thus the land use pattern studied within 500 m on either side from the boundary of the project road shows 83 % of agricultural (mono and double cropped) land followed by 10% of built- up area, 3 % vegetation cover, 3 % of industrial area (brick kiln) and 1 % of water bodies. Land use maps are given in **Fig.20A** towards end of this Chapterand chart in **Fig.21** below**.**

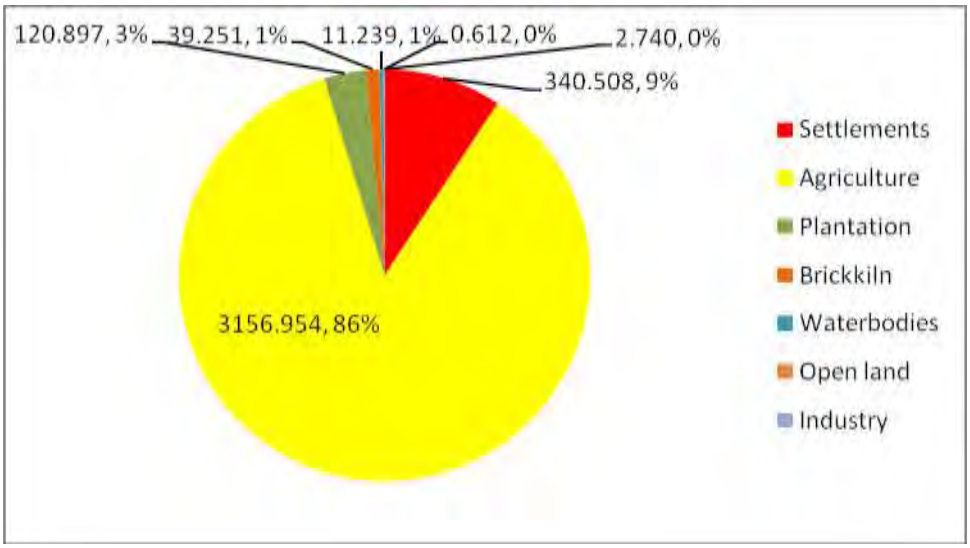


Source: PPTA Consultant

Fig 21: Land use pattern within 500 m buffer- Nanao to Dadao

b. Bulandshahar to Anoopshahar (MDR 58W)

100. Agricultural activity predominates the region with 86% coverage followed by 9% of built up area, 4 % of vegetation cover, and rest falling under water bodies (1%), open land and industries (**Fig 22**). Multiple cropping is practiced in this region. Double cropping is done for sugarcane. Land use map is given in **Fig. 23** at the end of this Chapter**.**

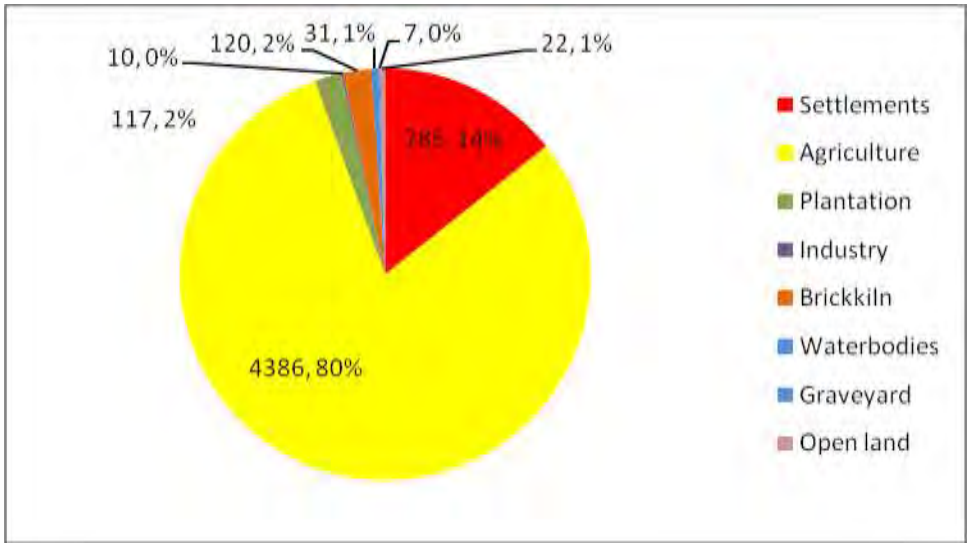


Source: PPTA Consultant

Fig 22: Land use pattern within 500 m buffer- Bulandshahar to Anoopshahar

c. Muzaffarnagar to Baraut Marg (MDR 135W)

101. Land use pattern along Muzaffarnagar to Baraut Marg is predominated by agriculture (80%) followed by 14% of built up area, 2% of plantation and 2 % of brickkiln and 1% of water bodies (**Fig.24**). Double cropping is practiced in this region. Land use map prepared within 500m buffer along the project road is given in **Fig.25** placed at the end of this Chapter.

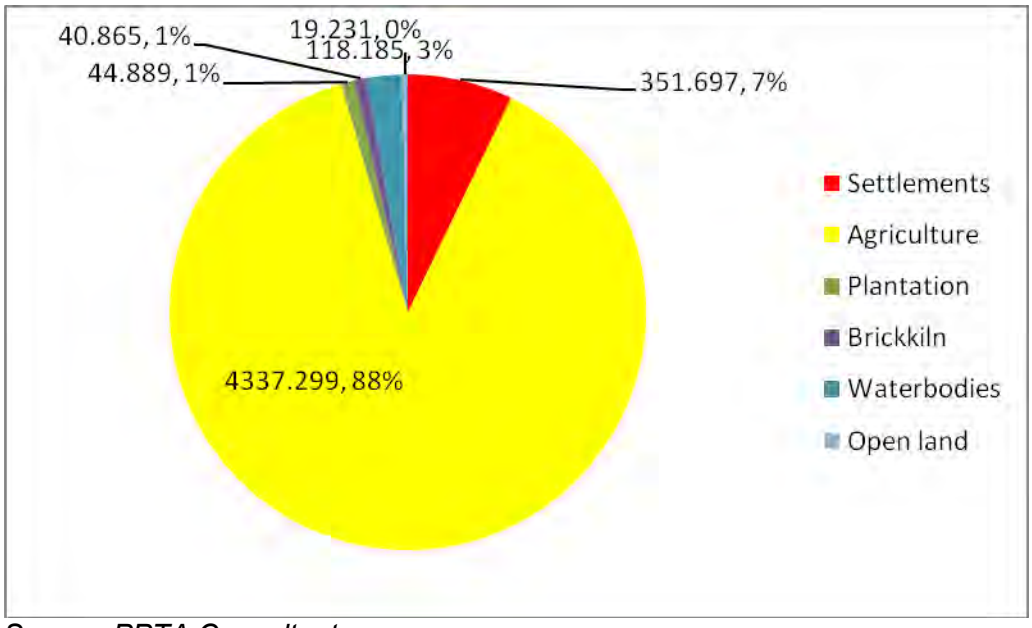


Source: PPTA Consultant

Fig 24: Land use pattern within 500 m buffer- Muzaffarnagar to Baraut Marg

d. Hussainganj to Alipur Marg (MDR 81C)

102. Land use pattern is dominated by 88% multiple/ double cropped agricultural land followed by 7%of settlement, 3% water bodies and rest of the area comprises of open land, brick kiln and vegetation (**Fig 26**). Land use maps are given in **Fig.27** towards end of the Chapter**.**

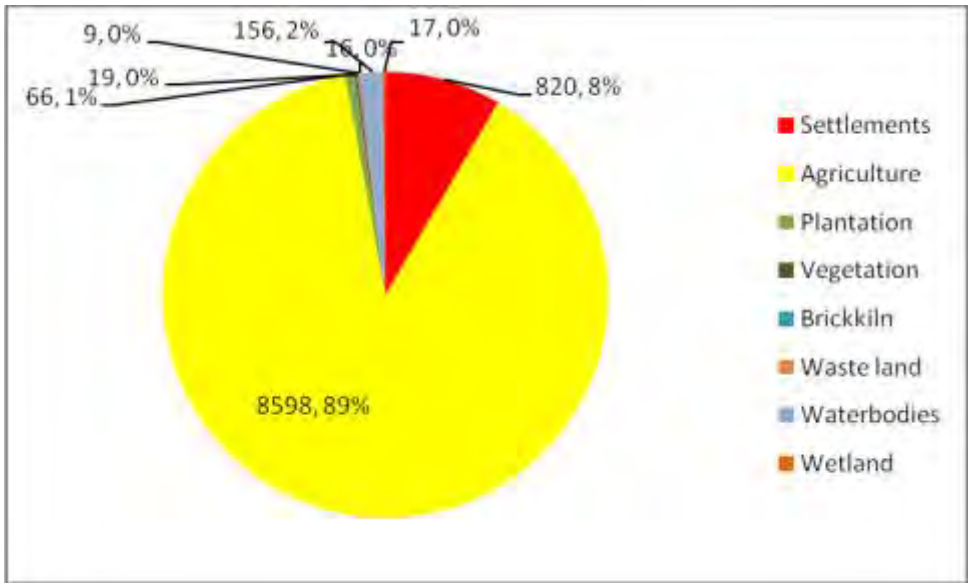


Source: PPTA Consultant

Fig 26: Land use pattern within 500 m buffer- Hussainganj to Alipur Marg

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

103. The study area of 500 m radius predominantly has agricultural land use on 89% of the land. Double cropping is practiced in this region. 8% of the area has built up, 2% under water bodies and rest of the area comprises of vegetation and brick kilns etc (**Fig 28**). Land use maps are given in **Fig29** placed at the end of this Chapter.



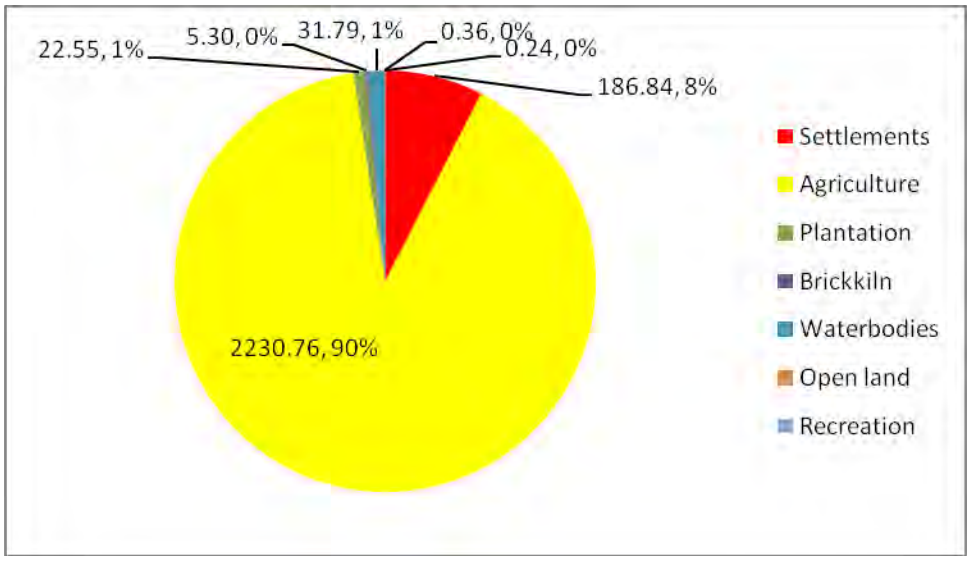
Source: PPTA Consultant

Fig 28: Land use pattern within 500 m buffer- Haliyapur to Kurebhar

f. Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E)

- **Kaptanganj to Naurangiya (ODR 24)**

104. The predominant landuse within 500m buffer on either side from the center line of the project road is agicultural land (90%) followed by Built-up areas (8%), Plantation (1%) and water bodies (1%). The break-up of land under different landuse is shown in **Fig. 30**. Land use maps are given in **Fig 31** placed at the end of this Chapter.

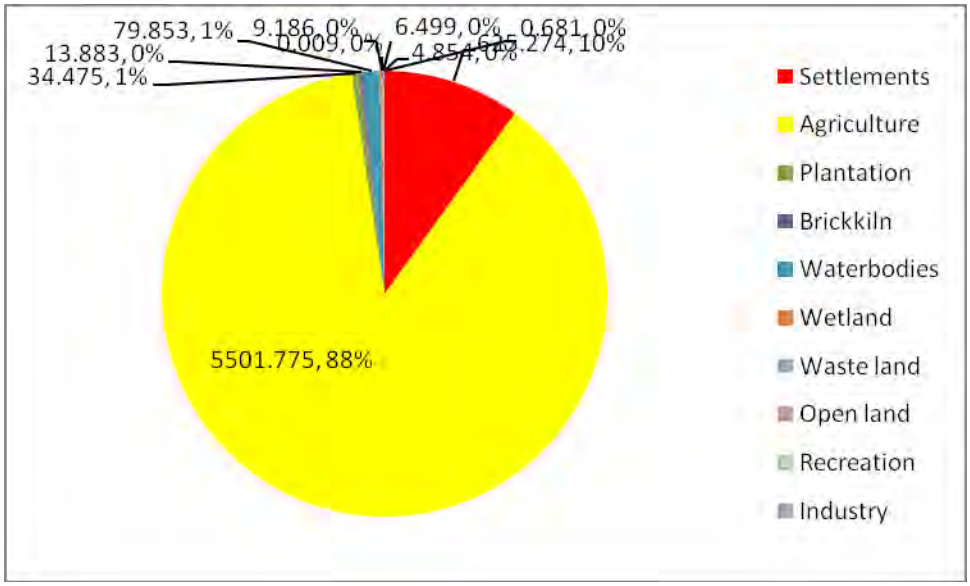


Source: PPTA Consultant

Fig 30: Land use pattern within 500 m buffer- Kaptanganj to Naurangia

- **Kaptanganj to Rudrapur (MDR 25E)**

105. The predominant landuse by 88% agricultural land followed by 10% of settlement, 1% waterbodies, 1% Plantation and rest of the area comprises of brick kiln, waste land, open land, recreation and industry (**Fig 32**). Land use maps are given in **Fig. 33** placedtowards end of the Chapter**.**

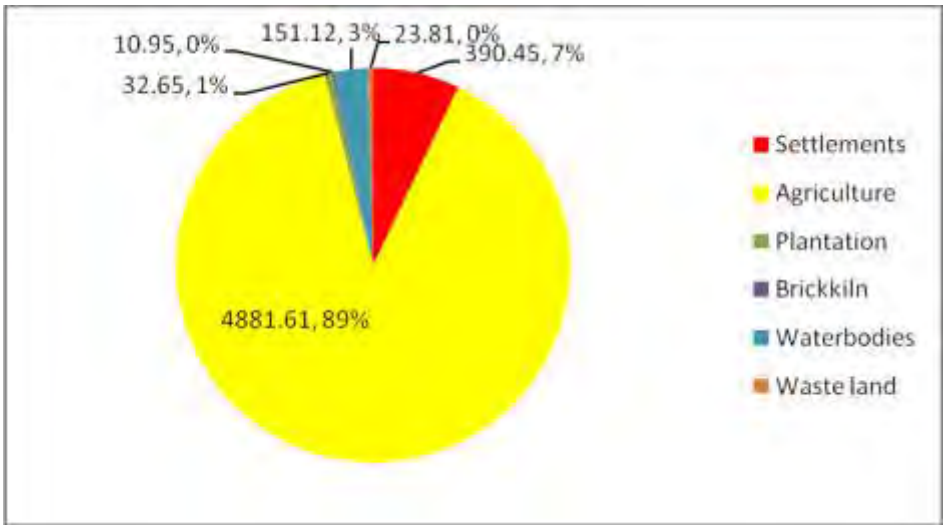


Source: PPTA Consultant

Fig 32: Land use pattern within 500 m buffer- Kaptanganj to Rudrapur

g. Mohanlaganj to Maurawan Unnao Marg (MDR 52C)

106. The predominant landuse within 500m on either side of centerline of the project road is 89% agricultural land followed by 7% of settlement, 3% waterbodies, 1% Plantation and rest of the area comprises of brick kiln and waste land (**Fig 34**). Land use maps are given in **Fig. 35** placedtowards end of the Chapter**.**

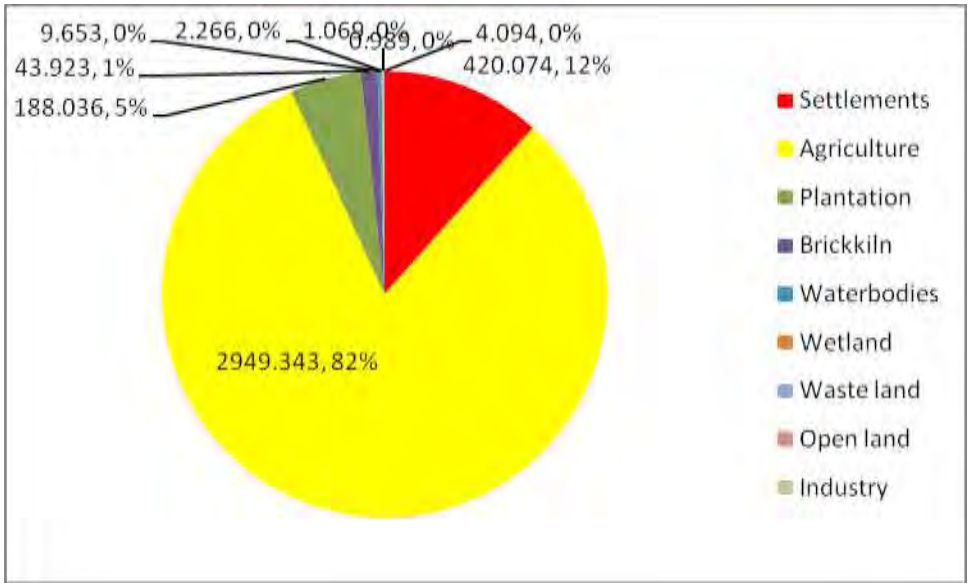


Source: PPTA Consultant

Fig 34: Land use pattern within 500 m buffer- Mohanlalganj to Maurawan

h. Aliganj-Soron Marg (MDR 45W)

107. Land use pattern is dominated by agricultural land (82%) followed by 12% of settlements, 5% Plantation and rest of the area comprises of brick kiln, waterbodies, wetland, waste land, open land and industry (**Fig 36**). Land use maps are given in **Fig. 37** placedtowards end of the Chapter**.**



Source: PPTA Consultant

Fig 36: Land use pattern within 500 m buffer- Aliganj to Soron Marg

4. Drainage

108. Uttar Pradesh is a riverine state. The dendritic pattern follows the general slope of landform i.e. from the North West to South East. The entire state lies in the catchment area of river Ganga and its principle tributaries like Yamuna, Ramganga, Sarda, Gomti, Saryu and Ghaghra. All these rivers are of Himalayan origin. Other rivers like Son, Betwa, Ken, etc. have their origin in the hills of Central India.

109. The eastern Yamuna canal, upper and lower Ganga canal, sarda canal are the major irrigation canals of the state. These are bifurcated in to various branches to supply water to agricultural land. **Fig.38** shows drainage map of U.P placed at the end of this Chapter with road stretches superimposed on it.

110. The side drains were present in the built-up areas along the project roads which were partially choked and water was observed spilling on the road which can be seen in **Fig. 39.**

Fig 39: Water logged sections along the Project Roads

a. Nanao- Dadao (MDR 82W)

111. The road stretch of Nanao to Dadao falls within Yamuna and Ganga sub Basin. River Ganga Originates from Gomukh in Gangotri glacier, enters the plain near Haridwar and flows towards South and South east upto Allahabad and then continues East towards West Bengal. The Ganga Basin is 8.6 lakh sq km of which nearly 32% falls in Uttar Pradesh.River Yamuna has its source in Uttarkashi and meets Ganga at Allahabad. Yamuna Basin has an area of 3.2 sq km. Major part of the basin falls in U.P.

112. The project area falls in interfluvial zone of Ganga and Yamuna. River Ganga is at a distance of 12 km from the project road towards east and Yamuna river is at a distance of 65 km towards west. The region has dendritic drainage pattern that is common to the alluvial plain. The region is drained by tributaries of Yamuna (river Karwan Sirsa and Sengar) and Ganga river (Rind, Isan, Nin and Kali Nadi). The project road crosses Kali River at km 6.910. The KaliRiver originates in the Doon Valley and passes through Aligarh ,Saharanpur, Muzaffarnagar and Bagpat districts, before merging with Hindon River (at Barnava, Bagpat), which goes on to merge with the Yamuna River.

113. The cross drainage structures present along the road are 1 Major bridge, 6 Minor bridges and 56 Culverts.

b. Bulandshahar to Anoopshahar (MDR 58W)

114. This road stretch in Bulandshahar district falls in Ganga sub basin. This area is drained by small rivulets emerging from kali nadi. River Ganga flows at a distance of 800 m from the project road at km 40 near Anoopshahar.

115. 8 Minor bridges and 44 culverts including 14 pipe culverts, 21 arches and 9 slab culverts are present for maintaining the natural drainage of the road.

c. Muzaffarnagar to Baraut Marg (MDR 135W)

116. This road stretch in the districts of Muzaffarnagar and Baghpat falls in Yamuna sub basin. It is around 10 km from river Yamuna and 33km from river Ganga. Major rivers are Hindon and Krishna that crosses the project road at km 30.100 and km 51.700 respectively.

117. The cross drainage stuctures viz.; 4 Minor bridges and 89 culverts including 51 pipe culverts, 34 slab culverts, and 4 Arch culverts are observed for maintaining the natural drainage.

d. Hussainganj to Alipur Marg (MDR 81C)

118. This road stretch in Fatehpur district falls at the border of Yamuna and Ganga sub basin. The road flows almost parallel to Ganga river at a distance ranging from 4 to 12 km.

119. To maintain the natural drainage 2 Minor bridges and 110 culverts including77 pipe culverts, 29 slab culverts and 5 Arch culverts exist along the project road.

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

120. This road stretch in Sultanpur district falls both in Gomti and Ganga sub basin. River Gomti has its source in Terai region of Pilibhit district and joins Ganga beyond Varanasi. Main tributary of Gomti is Sai river that shares major part of the basin. The road is around 16 km from Gomti river and 40 km from Ghaghra river. The river Gomti divides the district into two unequal tracts, the larger lying in south & smaller in the north. Gomti River flows through the district from north-west to south-east. Kadhi Nala, a tributary of Gomti River and Chamraura Nala a tributary of Sai River drain the south-western part of the district. The north-eastern part of the district is drained by Majauli River, which is a tributary of Tons river form the north-eastern boundary of the district.

121. To maintain the natural drainage 12 Minor bridges and 196 culverts including92 pipe culverts, 100 slab culverts and 4 arch culverts exist along the project road.

f. Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E)

122. The road stretch lies between Gandak and Rapti rivers, tributaries to Ghaghra river in the Ghaghra- Gandak basin. Gharghra river is snow fed and has its origin near lake Mansorovar. It flows in southern direction parallel to river Ganga up to Chappra before joining it. Gandak flows in north-eastern part of the Kushinagar district and is prone to flood. Little Gandak flows from north to south in the western part of Kushinagar district and Eastern part of Deoria district with their tributaries Khanua, Mawan, Dhurachi submerged in it.

123. Along Kaptanganj to Naurangia road, Choti Gandak river crosses the project road at km 0.200 in Kaptanganj.

124. In ODR 24, 1 Major bridge, 4 Minor bridges and 36 culverts including 17 pipe culverts, 18 culvertsand 1 arch culvert whereas in MDR 25E, 1 Major bridge, 6 Minor bridges and 80 culverts including 27 pipe culvert, 33 slab culvert and 20 arch culvert exist along the project roads.

g. Mohanlalganj to Maurawan Unnao Marg (MDR 52C)

125. The project area is bounded by river Ganga in the west and the river Sai in the east.The districts fall in Sai Sub-basin of Ganga basin.The drainage of the area is controlled by river Ganga, Gomti and Sai its tributaries.The chief river of the district is Ganga which first touches the district near the village of Purwa Gahir, in Pargana Bangarmau and flows south-eastward, separating the region from districts of Kanpur and Fatehpur. Generally it flows from north-west to the south-east, but it makes several sharp bends such as those near Umriya Bhagwantpur, and Rustampur in tehsil Safipur, Rautapur in tehsil Unnao and Ratua Khera and Duli Khera in tehsil Purwa. The Ganga receives the Morahi near Baksar where it flows close to its old high bank. It leaves the district at a short distance from Baksar.

126. The Sai river crosses the project road at km 13.100 which marks the district boundary of Lucknow and Unnao.

127. To maintain the natural drainage 9 Minor bridges and 109 culverts including48 pipe culverts, 30 slab culverts and 31 arch culverts exist along the project road.

h. Aliganj-Soron Marg (MDR 45W)

128. The drainage system of the study area is controlled by the river Ganga and its tributaries namely Kali, Isan, Burhi Ganga Arind and Bargash. The project area falls in Kali sub-basin of Ganga basin.

129. The cross drainage structures viz.; 84 culverts including 64 pipe culverts, 17 slab culverts, and 3 Arch culverts exist along the road for maintaining the natural drainage.

5. Water Environment- Surface water resources& quality

a. Nanao- Dadao (MDR 82W)

130. Surface water includes both flowing water resources like rivers and canals and stagnant water bodies like ponds. There are 5 ponds along the road,details with distance from centerline given in **Table III-1**. Out of which 3 (at km 0.730 & km 0.80 in Nanao, at km 11.1 in Datawali) are waste water ponds i.e. domestic liquid and solid wastes have been dumped on them by the surrounding dwellers. Rest two ponds are in the midst of farms and are used mainly for irrigation purpose.

131. Ninecanals, one nallah, 53 minor streams and a major river i.e. Kali river at km 6.910 crosses the project road. Details are given in **Appendix4** and photos provided in **Fig.40 to 41.**

Fig.40:Pond at km 15.180in Tikta

Fig. 41:Canal at km 2.650in Pilakna

132. It is observed that surface water quality of the canals is better than the ponds probably because they have flowing water. Also the ponds as mentioned above are being used for disposing waste. Aquatic plants and water hyacinth has been observed choking the ponds.

133. **Surface water quality.** One sample from pond located in Tikta village was collected and analyzed for the parameters as desired for assessment of surface water quality and results are presented in **Appendix5.**The water quality of the pond monitored is conforming to water quality criteria for use after conventional treatment (Class C) with respect to pH, Dissolved Oxygen, BOD and Total coliform which indicate that there is insignificant organic and bacterial contamination in the sampled water body and can be used as a drinking water source after conventional treatment and disinfection.

b. Bulandshahar to Anoopshahar (MDR 58W)

134. There are 2 ponds along the road, distance of the ponds from road centerline given in **Table III-1**. 15 canal & 2 nallahs crosses the project road. Details are given in **Appendix6** and photos in **Fig.42 to 43.**

Fig.42: Pond at km 20.850 in Jatvai

Fig.43: Canal at km 54.1 in Devi ka nagla

135. **Surface water quality.** One surface water sample was drawn from Canal at Bichda village (Ch. 37.800) and analyzed for the parameters as desired for assessment of surface water quality and results are presented in **Appendix5.** The water quality of the canal conforms to the Class B Standards of CPCB water quality criteria with respect to pH, DO and Total Coliforms. BOD value is 7.2 which are not complying with the permissible limit of water quality criteria for bathing but conforms to Class C for drinking water source after conventional treatment and disinfection.

c. Muzaffarnagar to Baraut Marg (MDR 135W)

136. There are 6 ponds along the road, details of ponds from the road center line is given in **Table III-1**. All of them are being used as waste disposal grounds. However the degree of disposal is different and can be represented by the parameter showing coverage of pond area by water hyacinth or other aquatic plants that grow due to presence of excess amount of nutrients. The nutrient amount gets higher because of decomposition of organic matter/ waste that is thrown into it. Two ponds have approximately 100% coverage, 1 has 25% and rests have less than 10%.

137. The rivers of Hindon and Krishna cross the road at km 30.110 and km 51.650. Apart from this 12 canals and 82 small water channels also crosses the road. Details are as given in **Appendix7**and photos in **Fig.44 to Fig. 46.**

Fig.44:Canal at km 11.15 in Tawli

Fig.45:River Krishna at km 51.650 inPusar

Fig.46:Pond at km 61.550 in Baraut

138. **Surface water quality.** Two surface water samples were collected from village ponds at Tawli (Km 10.000) and Kanhar (Km 45.400). The collected samples were analysed for the parameters as desired for assessment of surface water quality and results are presented in **Appendix5.**The water quality of the village ponds is meeting with the water quality criteria at both the locations with respect to pH, DO and Conductivity. The DO varies from 4.5 to 5.2 mg/l and the BOD ranges from 15.7-23.1 mg/l.The maximum value 23.1 mg/l of BOD is observed at village pond at Tawli.Total Coliform value ranges from 2600 to 5300 MPN/100ml.Total coliform countat Tawli village and BOD value at both the locations is not complying with the permissible limit of water quality criteria for drinking water source after conventional treatment and disinfection (Class C) but can be used for fisheries and wildlife propagation and irrigation (Limit of DO-4 mg/l or more).

d. Hussainganj to Alipur Marg (MDR 81C)

139. There are 3 nallahs, 1 Ganga canal at Km 14.950 and 105 small water channels cutting across the road. There are 18 ponds falling along the road within 20 m center line, details of distance from road center line is given in **Table III-1.**Out of which the one at km 24.100 has domestic use of bathing and washing, rest are mostly used for irrigation along with bathing and washing **(Appendix8).**Photos of pond and canal are provided at **Fig.47& Fig.48.**

Fig.47: Pond at km 13.500 in Gosain ki Sarai

Fig.48: Canal at km 14.950 across the road in Luxmanpur

140. **Surface water quality.** One surface water sample was drawn from Ganga canal at Hussainganj and analyzed for the parameters as desired for assessment of surface water quality and results are presented in **Appendix5.**From the results it may be concluded that the water quality of the Canal is significantly less contaminated and is meeting with water quality criteria (Class B-bathing) with respect to pH, DO, BOD and Total Coliforms. The DO value is 13.1 mg/l which is relatively high indicating good water quality withnegligible organic contamination. The water of the canal may be used for drinking water source after conventional treatment and disinfection.

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

141. There are 22 canals crossing the road out of which 5 are dry canals, 6 nallahs are also crossing the road alignment.

142. There are 18 ponds along the road within 15 to 20m from CL; details of distance of ponds from CL are given in **Table III-1**. Out of these 9 ponds are used for domestic liquid and solid waste dumping and 9 are used for domestic use or fishing. Details of the surface water bodies are given in **Appendix9** and photos are shown in **Fig.49 to 50.**

Fig.49: Pond at km 90.050in Bacharia

Fig.50: Canal at km 16.900 across the road in Delhi Bazaar

143. **Surface water quality.** The surface water quality monitoring was done at two locations, one sample collected from pond at Govindpur and the other sample collected from pond at Loknathpur. The samples were analysed with respect to parameters as mentioned in the CPCB surface water criteria and the results of the assessment are mentioned in **Appendix 5**. On analysis of the results, it is clear that the water quality of the ponds conform to the water quality

criteria of Class C CPCB standards with respect to all the parameters. The water quality of pond at Govindpur seems better than that of at Loknathpur because the DO level is higher (13.9 mg/l) indicating less contamination. The water from both the ponds may be used as a drinking water source after conventional treatment and disinfection.

f. Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E)

- **Kaptanganj to Naurangiya (ODR 24)**

144. There are 6 canal crossings, 1 water channelat km 17.400 and Choti Gandak river crosses the project road at km 0.200 in Kaptanganj.

145. There are 5 ponds along the road within 25 from CL; details of distance of ponds from CL are given in **Table III-1**. The ponds are seasonal and serve as ground water recharging points. Details of the surface water bodies are given in **Appendix10A** and photos are shown in **Fig.51 to Fig. 53.**

Fig. 51: River Choti Gandak crosses at km 0.200 in Kaptanganj

Fig. 52: Pond at km 17.400 in Village Chargharwa

Fig. 53: Canal crosses at km 18.000 in Khairatia Colony

- **Kaptanganj to Rudrapur (MDR 25E)**

146. 12 canals cross the project road at various locations which are mainly used for irrigation in the area. Choti Gandak tributary also crosses the project road at km 3.200 in Samara village and Mawan nallah at km.15.500 in Harpur Barawan.

147. There are 8 ponds along the project road within 25 m from CL of the project road which are used as ground water recharging points and two water logged areas along the road in Indupur and Chappauli. Details of distance of ponds from CL are given in **Table III-1.** Details of the surface water bodies are given in **Appendix 10B** and photos are shown in **Fig.54 to 55.**

Fig.54: Pond at km 34.900 in Bakhara

Fig.55: Canal at km 24.300 across the road in Hata

148. **Surface water quality.** Two surface water samples, one from Gandhak River and the other from Pond at Rudrapur were collected and analysed for the parameters as desired for assessment of surface water quality and results are presented in **Appendix 5**. The water quality of both the samples is conforming to the water quality criteria (Class C) with respect to all the parameters including pH, DO, BOD and Total Coliforms. The DO varies from 6.2 mg/l – 9.4 mg/l (Class C limit-4 mg/l or more) which shows that the water quality of the river and pond is generally good with negligible organic load and can be used as a drinking water source after conventional treatment and disinfection.

g. Mohanlaganj to Maurawan Unnao Marg (MDR 52C)

149. 14 canals, 2 nallahs and Sai river at km 13.100 in Jabrella village crosses the project road.

150. There are 26 ponds within 25 m from CL of the project road. Details of distance of ponds from CL are given in **Table III-1.** Out of these, 14 ponds are used as ground recharging points, for irrigation and fishing (2 Adarsh Jalasaya).Baknai Badaila Jheel exists along the road from km 46.900 to km 47.500 in Unchgaon Kila which is mainly used for fishing and irrigation but few birds from Nawabganj Bird Sanctuary were also spotted here. It has also been observed that 11 ponds are used as dumping of waste and discharge of domestic effluent. Details of these surface water bodies are given in **Appendix 11** and photographs of few are shown in **Fig. 56 to 58**.

Fig. 56: Sai River at km 13.100 in Village Jabrella

Fig. 57: Canal at km 1.100 in Mohanlalganj

Fig. 58: Pond at 8.300 in Village Sesandi

151. **Surface water quality.** Two surface water samples from ponds located in Unchhagaon and Uttargaon were collected and analysed for the parameters as desired for assessment of surface water quality and results are presented in**Appendix 5.** The water quality of the village

ponds is meeting with the Class C water quality criteria at both the locations with respect to pH, DO and Total Coliform. The DO varies from 5.8 to 5.9 mg/l and the pH ranges from 8.15-8.53 mg/l.Total Coliform value ranges from 1500 to 1700 MPN/100ml.BOD count at both the locations is not complying with the permissible limit of water quality criteria for drinking water source after conventional treatment and disinfection (Class C).

h. Aliganj-Soron Marg (MDR 45 W)

152. There are only 3 canals crossing the road alignment which are used for irrigation purposes in the area. Photographs of these are shown **in Fig 59 to Fig61.**

Fig.59: Canal at km 39.550 in Village Gadka

Fig.60: Canal at km 47.450 in Village Sahavar

Fig.61: Canal at km 50.450 in Village Bhiloli

153. **Surface water quality.** Two surface water samples, one from pond in Kunwarpur and the other from Pond at Sahawar were collected and analysed for the parameters as desired for assessment of surface water quality and results are presented in **Appendix 5**. The water quality of both the samples is conforming to the water quality criteria (Class C) with respect to all the parameters except BOD. The DO varies from 5.2 mg/l – 5.5 mg/l, pH varies from 8.32-8.38 and Total Coliform varies from 2800-3400 MPN/100ml. BOD is in the range of 3.8-5.4 mg/l which indicates organic load in the ponds.

Table III-1: Distance of Ponds from the centerline along the Project Roads

Sl. No	Road stretches	Ponds within 10m		Pond within 10 to 12m		Ponds within 12-15m		Ponds beyond 15m		Total ponds		
		F	W	F	W	F	W	F	W	F	W	Total
1.	Nanao to Dadao (MDR 82W)	1	3	0	0	0	0	1	0	**2**	**3**	**5**
2.	Bulandansharar to Anupshahar (MDR 58W)	1	0	0	0	0	0	1	0	**2**	**0**	**2**
3.	Muzzaffarnagar to Baraut (MDR 135W)	4	1	0	1	0	0	0	0	**4**	**2**	**6**
4.	Hussainganj to Alipur Marg (MDR 81C)	5	5	2	0	3	0	3	0	**13**	**5**	**18**
5.	Haliyapur to Kurebhar to Bilwai (MDR 66E)	4	8	0	0	1	1	4	0	**9**	**9**	**18**
6A.	Kaptanganj to Naurangiya (ODR 24)	3	0	0	0	2	0	0	0	**5**	**0**	**5**
6B.	Kaptanganj to	2	0	0	0	3	0	3	0	**8**	**0**	**8**

Sl. No	Road stretches	Ponds within 10m		Pond within 10 to 12m		Ponds within 12-15m		Ponds beyond 15m		Total ponds		
		F	W	F	W	F	W	F	W	F	W	Total
	Rudrapur (MDR 25E)											
7.	Mohanlaganj to Maurawan Unnao Marg (MDR 52C)	9	3	1	2	7	1	3	1	**20**	**7**	**27**
8.	Aliganj-Soron Marg (MDR 45W)	0	0	0	0	0	0	0	0	**0**	**0**	**0**
	Total	**29**	**20**	**3**	**3**	**16**	**2**	**15**	**1**	**63**	**26**	**89**

Source: PrimarySurvey of PPTA Consultant

**F-Fresh water ponds, W-Waste water ponds/Ponds used as waste dump*

6. Water Environment- Ground water resources& quality

154. Total annual recharge of rainfall is 76.35 bcm. Out of which recharge from rainfall in U.P is that of 44.27 bcm (58%). This is evident to the fact that UP receives moderate to high rainfall.Net annual ground water availability is around 70.18 bcm and annual ground water draft is that of 48.78 bcm. Stage of ground water development is around 74% that means over all the state falls in safe category but 111 blocks are categorized as over exploited, 68 as critical and 82 as semi critical[8].

155. Few districts face the problem of excess fluoride, salinity, nitrate, iron etc in ground water. Map of ground water sourced from NATMO is given in **Fig.62** at the end of this Chapter**.**

a. Nanao- Dadao (MDR 82W)

156. The aquifer here has primary interangular porosity and average depth to ground water table is 170 mamsl. Stage of ground water development is 82.2% i.e. safe. The pre-monsoon water level is 2 to 21 mbgl and that of post monsoon is 1.9 to 17 mbgl. Long term trend of water level in 10 years shows pre monsoon rise by 0.014 to 0.375 m/yr; pre monsoon decline by 0.010 to 0.319 m/yr; Post monsoon rise by 0.010 to 0.319m/yr; and post monsoon decline by 0.0024 to 0.277 m/yr.

157. The study area is within Aligarh district that has brackish / saline water overlain and under lain by fresh ground water for 70 % of the length of road starting from Dadao. Rest of the stretch has fresh water underlain by saline ground water.

158. There are two abandoned wells mainly used for irrigation and 102 hand pumps within 25 m from the center line. Out of 102 hand pumps, 13 are abandoned, 85 are used for drinking water and rest are used for both drinking and washing (**Appendix12**)

159. **Ground water quality along Nanao to Dadao Road.** Three samples of ground water located in Sikandarpur village, Tikta village and Dadon were collected and analyzed for the parameters as desired for assessment of ground water quality and results are presented in **Appendix13.** pH of groundwater samples is observed in the range of 7.2-7.5 and meets the water quality criteria. Conductivity varies from 645.3-821.5 µmhos/cm andmeeting the desired

[8] *State Profile, Ground water scenario of Uttar Pradesh, CGWB*

criteria. Other parameters like Chloride, Sulphate, Nitrate, Flouride and Arsenic also conform to the drinking water standards and are not in excess of limits.

b. Bulandshahar to Anoopshahar (MDR 58W)

160. The aquifer here has primary inter-angular porosity and average depth to ground water table is 190 mamsl. Pre-monsoon Depth to water level during May is 3.35 to 14.40 mbgl and post-monsoon Depth to water level during November is 2.00 to 13.35 mbgl. Stage of Ground water development is 71.81% i.e Semi- critical area. Long term trend (10 years) of water level shows pre-monsoon fall by 0.12-0.35m/yr; post-monsoon fall by 0.07-0.51m/yr.

161. The study area has brackish / saline water overlain and underlain by fresh ground water.

162. 122 hand pumps are present along the road, out of which 117 are within 15 m from center line and 6 are at 16 m from center line. 103 hand pumps out of all have cemented/ brick platform and 14 out of them are broken. Water sources from hand pumps are used for drinking and domestic purpose.

163. Details of ground water tapping resources along the road are given in **Appendix 14.**

164. **Ground water quality** Two ground water samples were collected to assess the ground water quality along the project corridor. The samples were collected from handpumps located at Anoopshahar Bypass at km 40.000 and Amarpur at km 50.500. The results of ground water samples as analysed are presented in **Appendix 13**.All ground water samples are complying with the limits of IS 10500:2012.

c. Muzaffarnagar to Baraut Marg (MDR 135W)

165. The aquifer here has primary interangular porosity and average depth to ground water table is 230 mamsl. Pre-monsoon depth to water level is 3.20 to 9.95 mbgl and that of post monsoon is 2.5 to 7.95 mbgl.Stage of ground water development in Muzaffarnagar is 82% i.e Semi- critical area. Shahpura block is categorized as over exploited i.e. 137% of development stage. Long term trend of water level in 10 years shows Pre monsoon Rise by 0.08 m/yr; pre monsoon Fall by 0.07 – 0.47 m/yr; no Post monsoon rise; and post monsoon fall by 0.02 – 0.64 m/yr.

166. The study area has brackish / saline water overlain and underlain by fresh ground water.Muzaffarnagar faces the problem of excess lead and Baghpat that of excess nitrate in groundwater.

167. There are 128 hand pumps within 15 m from center line that are likely to be affected. Depth of these varies from 20 to 75 mbgl. Out of 128 hand pumps 23 are abandoned, 104 are used only for drinking and rest for both washing and drinking. Details are given in **Appendix15.**

168. **Ground water quality** Three ground water samples were collected from handpumps located at Shahpur at km 21.400, Daha at km 42.900 and Baraut at km 61.000 to assess the ground water quality along the project corridor. The results of ground water samples are presented in **Appendix13.** The water quality of all the ground water samples are complying to the drinking water criteria with respect to Hardness, Alkalinity, calcium, Sodium, Potassium and heavy metals etc**.** pH of groundwater samples is observed in the range of 7.1-7.6 and meets the water quality criteria. Conductivity varies from 548.4-629.4 µmhos/cm. From the result it can be concluded that the overall quality of ground water in the area is good and can be used for drinking.

d. Hussainganj to Alipur Marg (MDR 81C)

169. The aquifer here has primary inter-angular porosity and average depth to ground water table is 100 mamsl. The study area has brackish / saline water overlain and underlain by fresh ground water. Pre monsoon depth to water level during May is around 2.20 to 27.13 mbgl and post monsoon depth is between 2.08 to 27.13 as recorded during November.Stage of ground water development is 67.33%.

170. Long term water level trend in 10 years shows pre-monsoon rise by 0.07 to 0.43 m/yr; pre-monsoon fall by 0.04 to 0.63 m/yr; post-monsoon rise by 0.08 and post monsoon fall by 0.04 to 0.84 m/yr.

171. There are 15 bore wells, 181 hand pumps and 19 wells within 25 m from CL as given in **Appendix 16.**

172. **Ground water quality** Two ground water samples from hanpumps located at Mawai at km 8.500 and Chhiblaha at km 17.100 were collected to assess the ground water quality along the project corridor. The result of ground water samples are presented in **Appendix 13.**The water quality of the ground water samples for all parameters is conforming to the permissible limit of drinking water quality criteria. The water quality of handpump located at Chhiblaha exceeds the desirable water criteria with respect to Alkalinity (326.0 mg/l, Limit-200 mg/l) and Total Hardness (344.0 mg/l, Limit-200 mg/l) but is well within the permissible limits.

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

173. The aquifer here has primary interangular porosity and average depth to ground water table is 85 mamsl. Pre monsoon depth to water level is 2.97-14.58 mbgl and that of post monsoon is 0.98 -12.12 mbgl. Stage of ground water development is 72 % i.e. safe category. Long term of water level trend shows annual rise by 0.0052 to 0.3230 m/yr and fall by 0.0332 to 0.4866 m/yr.The study area has brackish / saline water overlain and underlain by fresh ground water.There are 450 hand pumps and 15 wells within 15 m of CL and 2 hand pumps between 15 to 20 m from CL. Details are given in **Appendix 17.**

174. **Ground water quality** Three ground water samples from handpumps located at Kurebhar at km 34.500, Dostpur at km 77.200 and Belwai at km 102.000 were collected to assess the ground water quality along the project corridor. The result of analysis of ground water quality is presented in **Appendix13.**The ground water quality at all the locations is meeting with the permissible limit of the drinking water standards of IS:10500(2012). Few of the parameters like Alkalinity, Total hardness, Calcium, Magnesium, TDS and Iron exceeds the desirable limit at the sampled locations but are well within the permissible limit as already mentioned.

f. Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E)

175. The major water bearing formation is of alluvium, sand and silt.Precipitation is the principal source of replenishment of ground water. Ground water in kushinagar district occurs in the unconsolidated alluvial sediment. The shallow ground water is being tapped by open well and hand pumps. Deeper aquifers are under confined /semi confined conditions. The road passes through Sukrauli block which is categorized as semi critical and rest of the blocks are categorized as safe. Stage of ground water development is 44%. Pre monsoon depth to water level is 2.8-4.5 mbgl and that of post monsoon is 1.15 to 3.27mbgl.

- **Kaptanganj to Naurangiya (ODR 24)**

176. There are 205 hand pumps, 1 well and 1 Pumping setpresent within 25 m of CL along the road alignment. Details of these are provided in **Appendix 18A.**

- **Kaptanganj to Rudrapur (MDR 25E)**

177. There are 297 hand pumps and 5 taps within 25 m of CL along the road alignment. Details of these are provided in **Appendix18B.**

178. **Ground water quality** Two ground water samples were collected from handpumps located at Kaptanganj and Rudrapur to assess the ground water quality along the project corridor. Details of results of ground water samples are presented in **Appendix13**. The water quality of both the samples is meeting with the criteria of drinking water standards with respect to all the parameters except Iron (3.82 mg/l) which exceeds the limit only at Rudrapur sample. The value of Alkalinity (332 mg/l; Limit-200 mg/l) and Total hardness (336 mg/l; Limit-200 mg/l) at Rudrapur sample exceeds the desirable limit but is well within the permissible limit. The ground water quality at Kaptanganj is comparatively better than Rudrapur sample which is hard water and also has an unpalatable taste due to high iron content.

g. Mohanlaganj to Maurawan Unnao Marg (MDR 52C)

179. The ground water occurs under unconfined to confined conditions. The pre -monsoon depth to water level ranges from 1.10 to 15.65 m.bgl while post-monsoon depth to water level varies from 0.70 to 14.80 mbgl. Stage of ground water development is 81.21% i.e. Semi-critical.The long term water level trend of 10 years shows pre-monsoon rise of 22% and fall of 78% whereas post- monsoon rise of 28% and fall of 72% .The areaexperiencing water logging/ prone to water logging lies mainly along theSharda canal command area. The region also experiences ground water quality problems w.r.t to various contaminants viz; salinity, fluoride, iron, nitrate, arsenic and cadmium.

180. The study area is within Lucknow and Unnao districts that have brackish / saline water overlain and underlain by fresh ground water for entire length of road starting from Mohanlalganj falling In Lucknow district.

181. There are 147 hand pumps and 6 wells within 11.5 m of CL on either side of the road alignment. Details of these are provided in **Appendix 19.**

182. **Ground water quality.** Four ground water samples were collected from handpumps located at Dehwa at km 0.300, Jabrella at km 13.400, Maurawan at km 30+800 and Mangat Khera at km 51.200 to assess the ground water quality along the project corridor. The results of ground water samples are presented in **Appendix 13.** The water quality of all the ground water samples is complying to the drinking water criteria with respect to all the parameters except Iron in Mangat Khera which is 0.34 mg/l against 0.30 mg/l.From the result it can be concluded that the overall quality of ground water in the area is good and can be used for drinkingwith the pond sample in Mangat Khera which has an unpalatable taste due to high iron content.

h. Aliganj-Soron Marg (MDR 45W)

183. The ground water occurs under unconfined to confined conditions in aquifers with primary intergranular porosity in the area. The pre-monsoon depth to water level ranges from 8.00 to 12.00 m.bgl while post-monsoon depth to water level varies from 3.00 to 9.00 m.bgl.The regional flow of direction of ground water is from north west to south east which is in conformity with the regional topography. Seasonal water level fluctuation is between 2.0 m and 6.0m.The ground water quality in the major parts of the district is fresh and suitable both for domestic and

irrigation purposes.The total ground water available for district is 132761.82 ham and Ground Water draft is 101344.52 ham with Stage of Ground water development 76.34% which falls under Semi-critical area.The long term water level trend of 10 years shows pre-monsoon rise of 33% and pre-monsoon fall of 67% whereas post-monsoon rise of 27% and post-monsoon fall of 73%.The entire length of road has brackish / saline water overlain and under lain by fresh ground water

184. There are 143 hand pumps within 25 m of CL along the road alignment. Details of these are provided in **Appendix20.**

185. **Ground water quality**. Three ground water samples were collected from handpumps located at Patiyali at km 27.200, Garkha at km 41.400 and Timberpur at km 56.800 to assess the ground water quality along the project corridor. Details of results of ground water samples are presented in **Appendix 13**. The water quality of all the samples is meeting with the criteria of drinking water standards with respect to all the parameters. The value of Alkalinity at Garkha sample (265.3 mg/l) and Timberpur sample (295.35 mg/l) exceeds the desirable limit (200 mg/l) but is well within the permissible limit (600 mg/l). From the result it can be concluded that the overall quality of ground water in the area is good and can be used for drinking

7. Climate

186. Uttar Pradesh experiences humid subtropical with dry winter (CWa) type with parts of Eastern U.P. as semi-arid (BS) type as per Koppens' classification. In other words it has tropical monsoon type climate.Variations do exist in different parts of the large state, however the uniformity of the vast Indo-Gangetic Plain forming bulk of the state gives a predominantly single climatic pattern to the state with minor regional variations. U.P. has a climate of extremes. With temperatures fluctuating anywhere from 0 °C to 50 °C in several parts of the state and cyclical droughts and floods due to unpredictable rains, the summers are extremely hot, winters cold and rainy season can be either very wet or very dry. The meteorological data of the nearest IMD station of 30 years (1971-2000) has been considered for analyzing the climatology of the project roads. For the project roads falling in the districts of Aligarh,Muzaffarnagar, Baghpat, Bulandshahar, Etah and Kanshiram Nagar districts, data from New Delhi station has been used.For Sultanpur, Fatehpur, Lucknow and Unnao districts, data from Lucknow has been usedwhereas for Deoria and Kushinagar districts, data from Gorakhpur has been used. This selection has been done based on proximity of study area to the IMD station. The meteorological data w.r.t to temperature, relative humidity and wind speed recorded at the three IMD stations viz.; New Delhi, Lucknow and Gorakhpur has been detailed below.

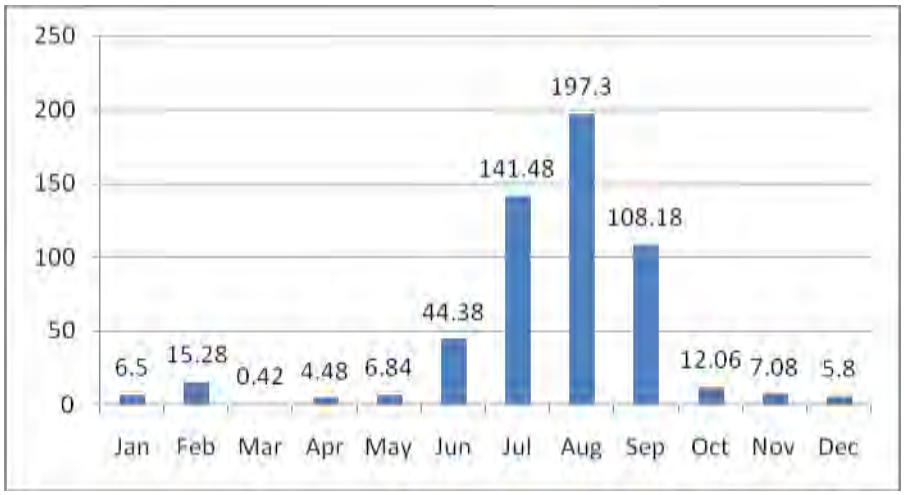
187. New Delhi IMD Station - Annual mean range of temperature varies from 18.9^0C to 31.2^0C as recorded in the IMD station. Mean Maximum temperature is recorded in the month of May and lowest in the month of December and January. January is the coldest month with mean daily maximum temperature at about 20.8°C and mean daily minimum at 7.6°C.Annual mean relative humidity in the morning is 63% and 42% in the evening. Mean monthly relative humidity in the morning varies from 80% to 37 % whereas in the evening from 20% to 68%. Annual mean wind speed is 9.5 km/hr. Mean monthly maximum and minimum wind speed is 13.7 km/hr and 6.1 km/hr respectively.

188. Lucknow IMD Station - Annual average minimum and maximum temperature recorded in Lucknow are 18.3°C and 32°C. The annual mean relative humidity in the morning reaches 68% and 50% in the evening. The mean monthly relative humidity in the morning varies from 86% to 36% whereas in the evening from 20% to 77%. Annual mean wind speed is 8 km/hr whereas mean monthly maximum and minimum wind speed is 11.7 km/hr and 4 km/hr respectively.

189. Gorakhpur IMD Station - The annual mean temperature varies from 19.2^{0}C to 32.0^{0}C as observed at Gorakhpur IMD station. The mean daily maximum temperature was 38.8^{0}C in May whereas mean daily minimum temperature was 8.9^{0}C in January. The annual mean relative humidity in the morning reaches 69% and 53% in the evening. Mean monthly relative humidity in the morning varies from 84% to 43% whereas in the evening from 25% to 77%. Annual mean wind speed is 4.1 km/hr. Mean monthly maximum and minimum wind speed is 6.7 km/hr and 1.7 km/hr respectively The mean wind velocity is 4.1 km/hr.

a. Nanao- Dadao (MDR 82W)

190. Aligarh experiences tropical monsoon type of climate. Annual average rainfall as derived from 5-years (2009 to 2013) rainfall data of Indian Meteorological Department is 549.8 mm. Aligarh receives highest rainfall in the month of August i.e. 197 mmduring monsoon and lowest in the month of March i.e. 0.42 mm **(Fig 63).**

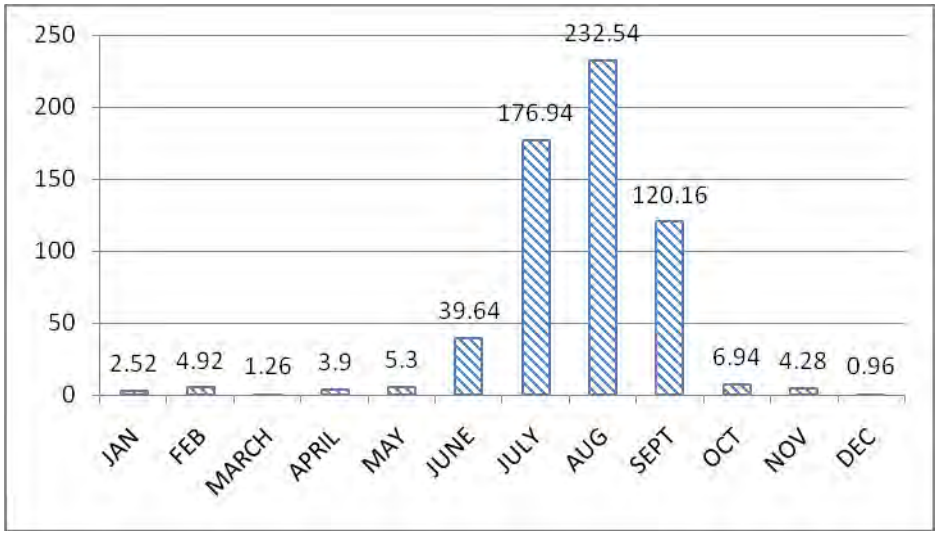


Source: IMD

Fig 63: Average monthly rainfall (mm) in Aligarh district (2009-2013)

b. Bulandshahar to Anoopshahar (MDR 58W)

191. The district of Bulandshahar receives an annual average rainfall of 600 mm derived from rainfall data of 5 years from 2009 to 2013 (IMD) as given in **Fig. 64.** Highest rainfall is recorded in the month of August and lowest in the month of December**.**

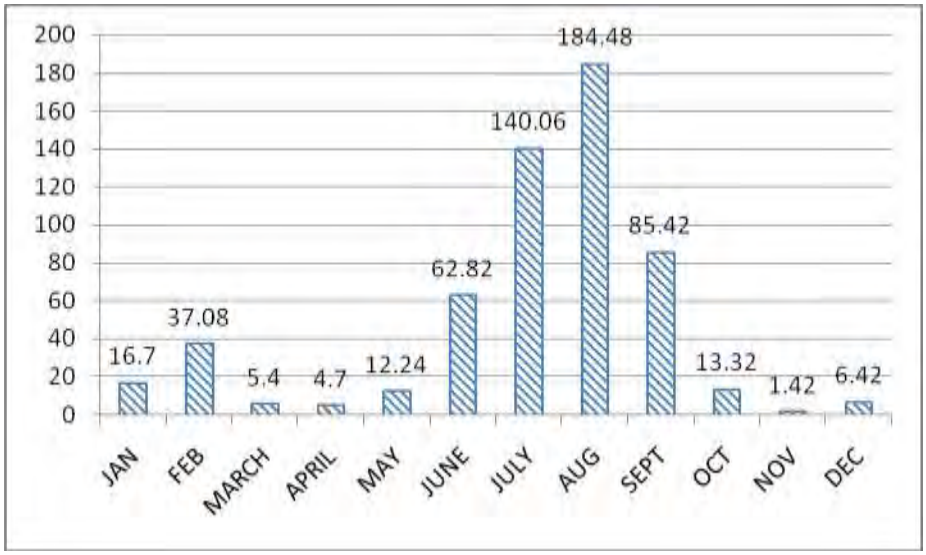


Source: IMD

Fig 64: Average monthly rainfall (mm) in Bulandshahar district (2009-2013)

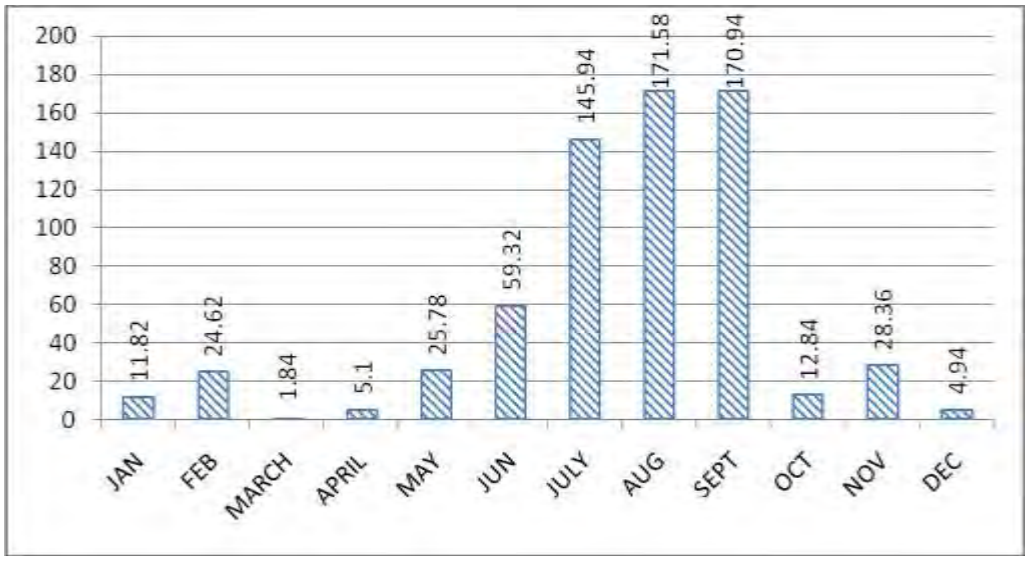
c. Muzaffarnagar to Baraut Marg (MDR 135W)

192. The districts of Muzaffarnagar and Baghpat experience tropical sub humid climate.About 80% of rainfall takes places from June to September. Muzaffarnagar receives annual average rainfall of 557 mm and Baghpat receives 663 mm as derived from 5 years rainfall data sourced from IMD (**Fig 65 & Fig 56**).With the onset of southern monsoon by the end of June, there is appreciable drop in temperature.



Source: IMD

Fig 65: Average monthly rainfall (mm) in Muzaffarnagar district (2009-2013)

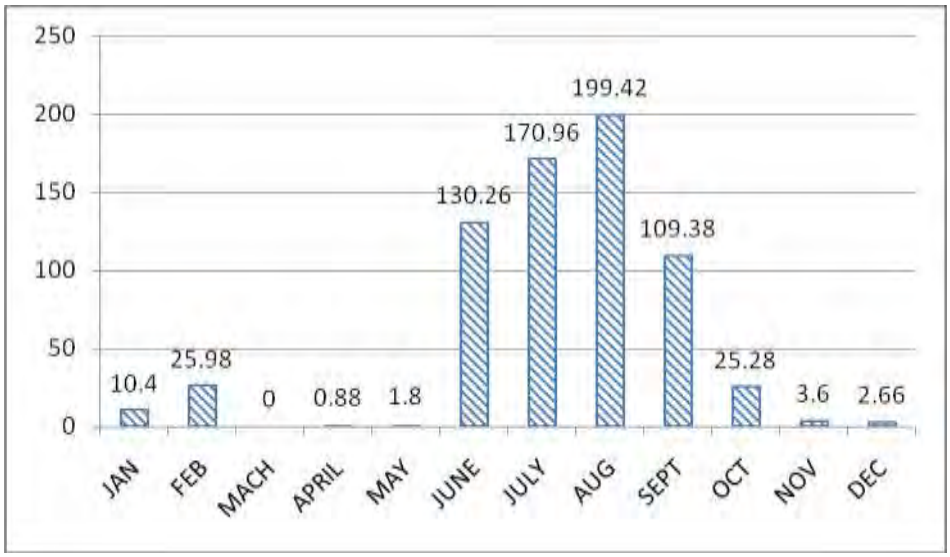


Source: IMD

Fig 66: Average monthly rainfall (mm) in Baghpat district (2009-2013)

d. Hussainganj to Alipur Marg (MDR 81C)

193. 5- years (2009 to 2013) annual average rainfall received is 681 mm. Highest rainfall is recorded in the month of August i.e 199 mm and lowest in the month of March **(Fig 67).**

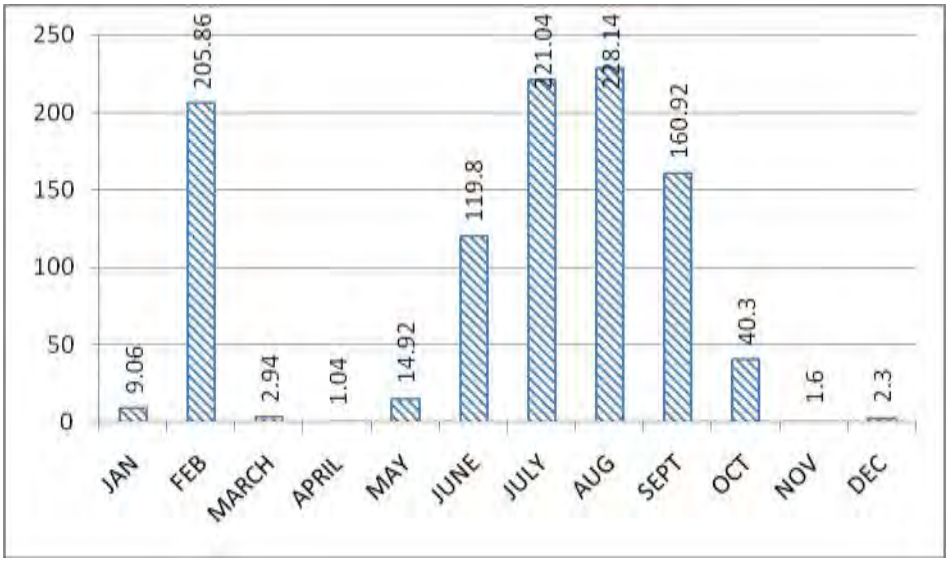


Source: IMD

Fig 67: Average monthly rainfall (mm) in Fatehpur district (2009-2013)

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

194. The district of Sultanpur receives annual average rainfall of 1007 mm (5-years average from 2009 to 2013).Highest rainfall is recorded in the month of August i.e 228 mm and lowest in the month of April i.e. 1.04 mm **(Fig 68).**

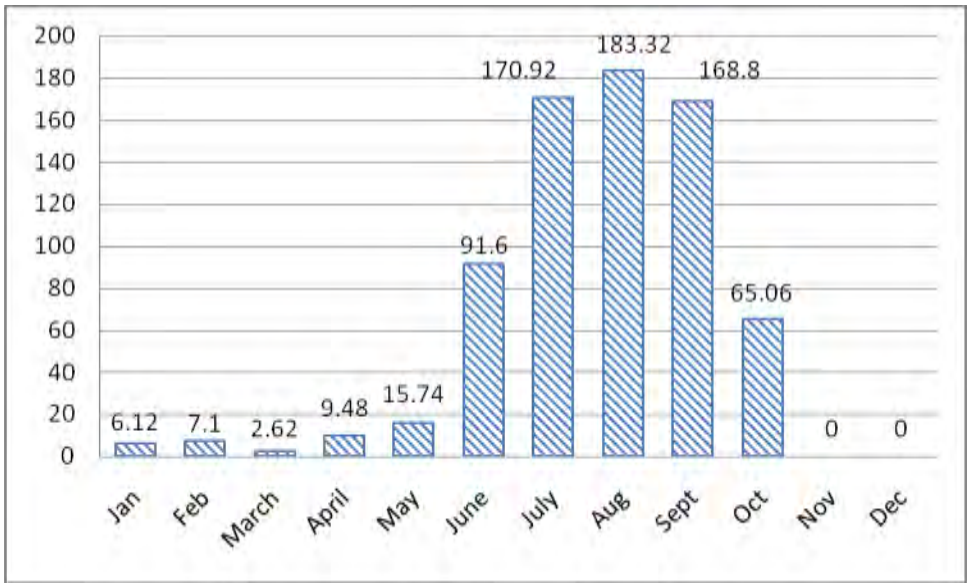


Source: IMD

Fig 68: Average monthly rainfall (mm) in Sultanpur district (2009-2013)

f. Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E)

195. The annual average rainfall for five years (2009 -2013) in Deoria district is 721 mm. Major portion of rainfall is experienced between the months of June to September. Maximum average monthly rainfall recorded is 183.32 mm in the month of August whereas no rainfall is recorded during the months of November and December **(Fig.69).**In Kushi Nagar district the average annual rainfall is 1202.8 mm. The climate is sub-humid.

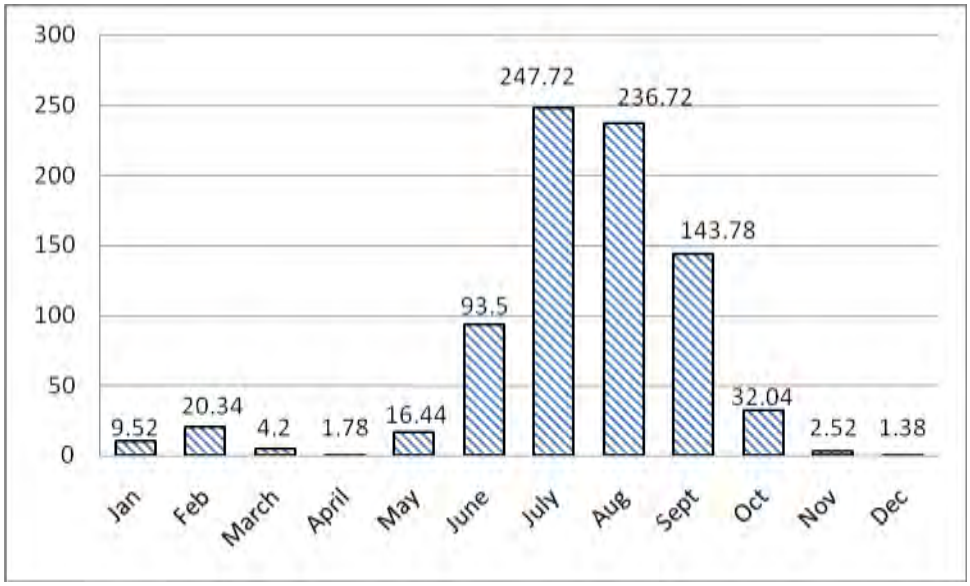


Source: IMD

Fig 69: Average monthly rainfall (mm) in Deoria district (2009-2013)

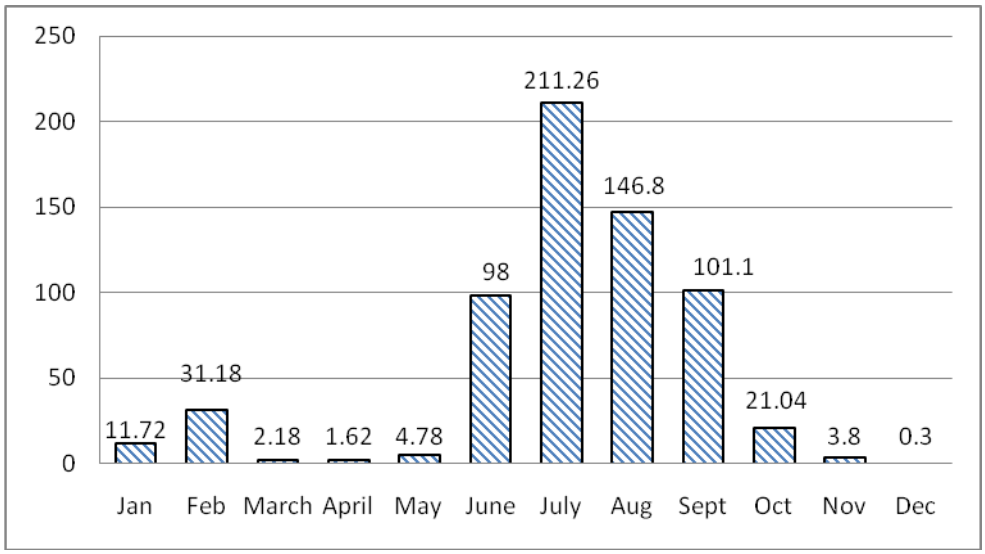
g. Mohanlalganj to Maurawan Unnao Marg (MDR 52C)

196. The districts of Lucknow and Unnao experience subtropical climate with three distinct seasons namely summer, monsoon and winter.The annual average rainfall for last 5 years (2009-2013) in Lucknow district is 810 mm and Unnao district is 633.78 mm as sourced from IMD. In both the districts, the highest rainfall is recorded in the month of Julywhereas lowest in the month of December which is given in **Fig 70** and **Fig.71**.



Source: IMD

Fig 70: Average monthly rainfall (mm) in Lucknow district (2009-2013)



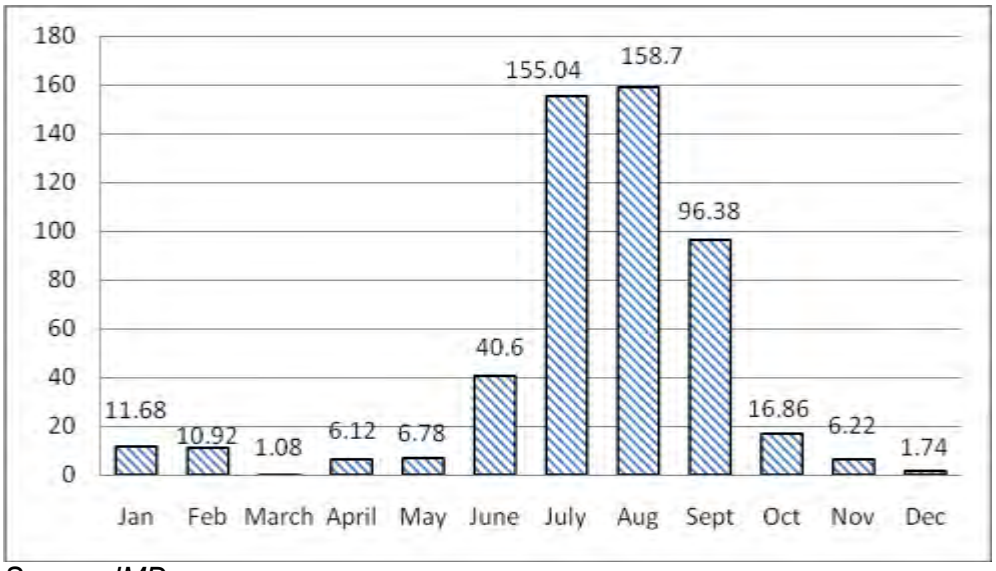
Source: IMD

Fig 71: Average monthly rainfall (mm) in Unnao district (2009-2013)

h. Aliganj -Soron Marg (MDR 45W)

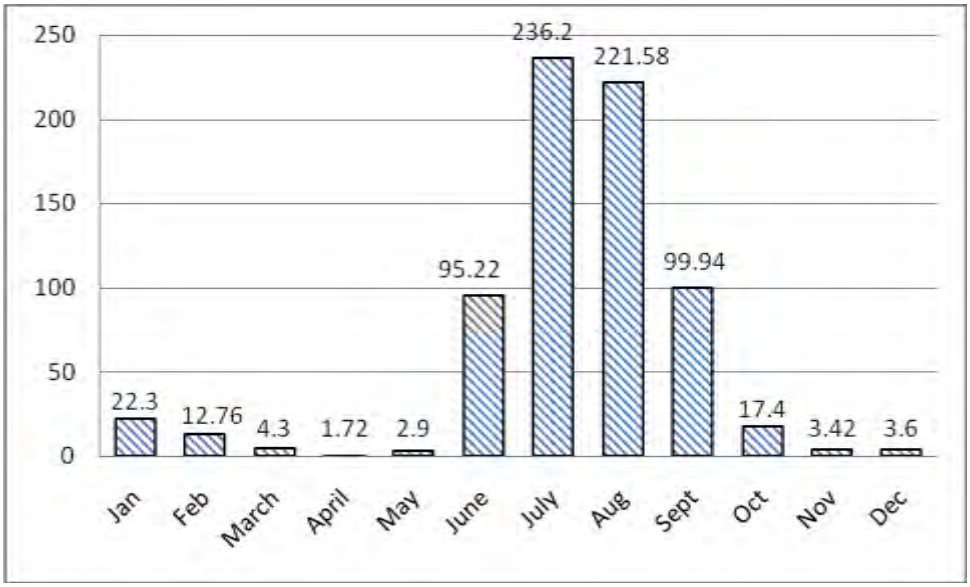
197. The districts of Etah and Kanshiram experiencesub-tropical climate. Around 88-90% of rainfall takes place from June to September in both the districts. Etah receives annual average

normal rainfall of 512 mm and Kanshiram Nagar receives 721 mm as recorded from 5 years rainfall data sourced from IMD (**Fig 72& Fig 73**).



Source: IMD

Fig 72: Average monthly rainfall (mm) in Etah district (2009-2013)



Source: IMD

Fig 73: Average monthly rainfall (mm) in Kanshiram Nagar district (2009-2013)

8. Climate change trend in Uttar Pradesh

198. Long-term changes in surface temperature and precipitation in all states were analyzed using observational records of IMD from 1951 to 2010 by IMD. This study is based on records of 16 stations for temperatureand 162 for rainfall. It was seen that Uttar Pradesh doesnot show any trend of increase or decrease in mean Maximum or Minimum temperature. However, trend

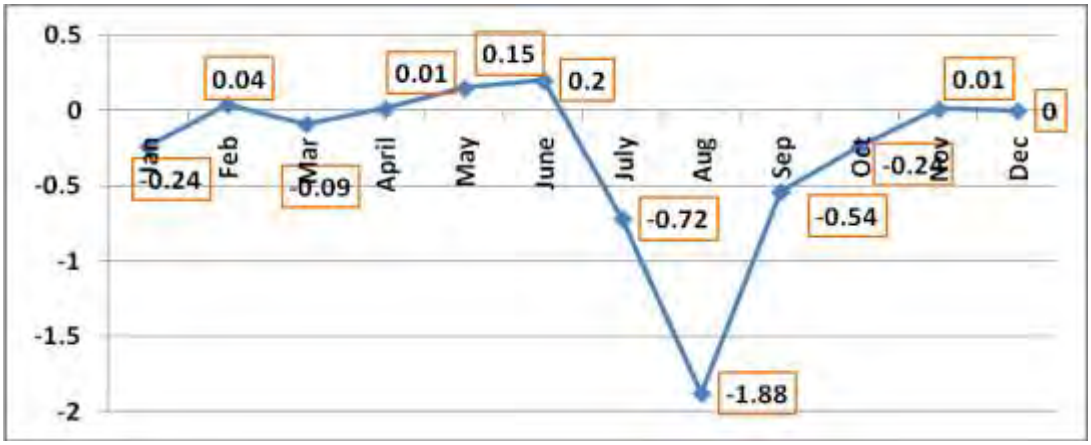
of Daily Temperature Range (DTR) has significantly decreased at 95%. Winter season'smaximum and minimum temperature is showing a decreasing trend.

199. Annual rainfall trends have been seen significantly decreasing over Uttar Pradesh (-4.42 mm/year) at 95%[9]. Season variation in rainfall trend is also noticed i.e. in summer, rainfall is showing an increasing trend while monsoon, post monsoon and winter shows decreasing trend.**Table III-2** is showing seasonal trends and **Fig. 74** and **77** are showing the monthly trend of rainfall and temperature in the state of UP.

Table III-2:Seasonal trend of temperature and rainfall

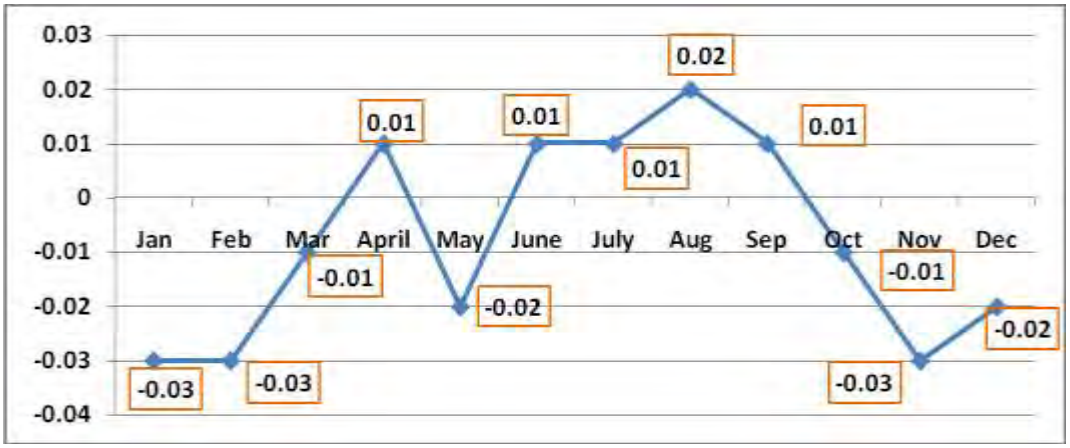
Uttar Pradesh	Annual	Winter	Summer	Monsoon	Post monsoon
DTR ^{0}C	-0.01*	-0.03*	-0.01	+0.01*	-0.02*
Rainfall (mm)	-4.42*	-0.22	+0.02	-3.52*	-0.33
(-)means decreasing; (+) means increasing trend; (*) means significant at 95% level of significance					

Source: IMD, 2013



Source: IMD, 2013

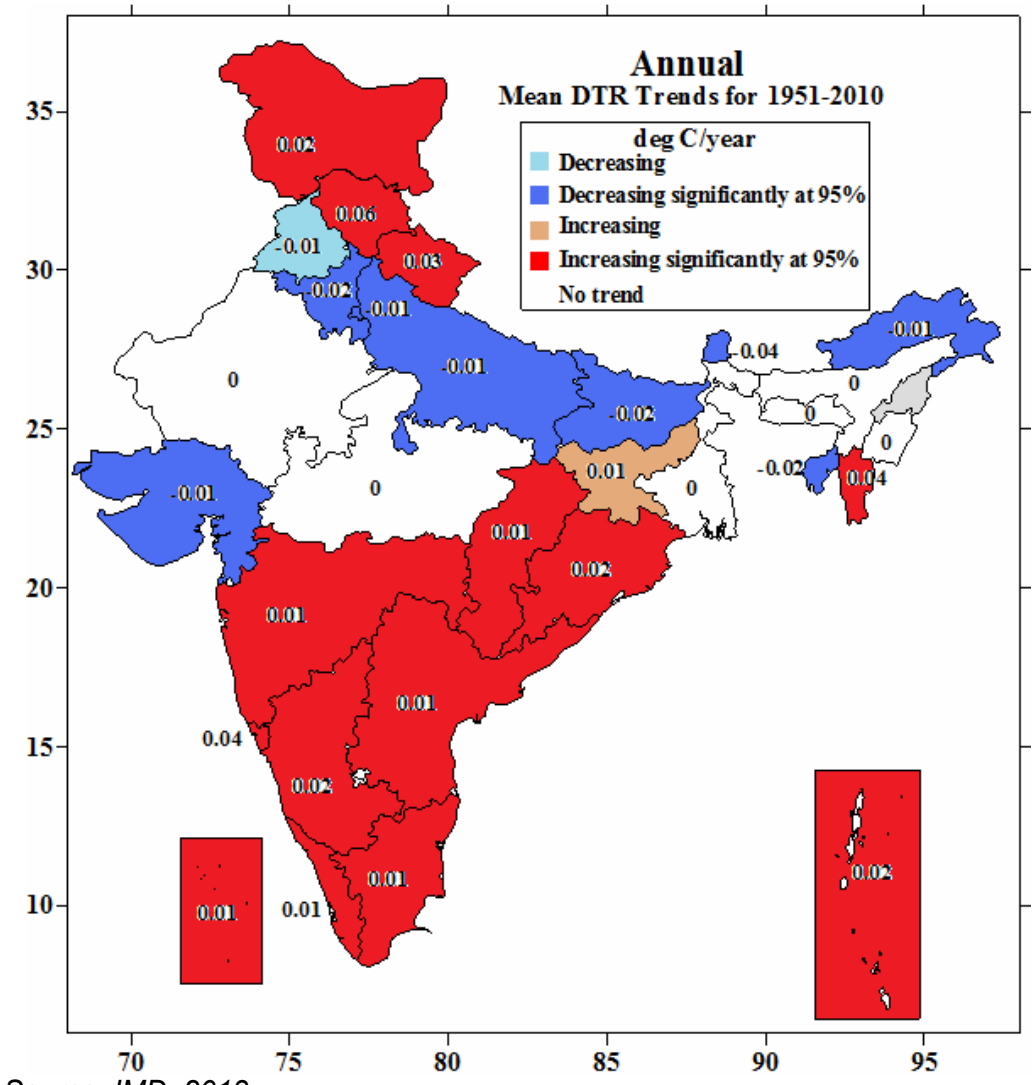
Fig. 74: Monthly rainfall (mm) trends over 50 years



Source: IMD, 2013

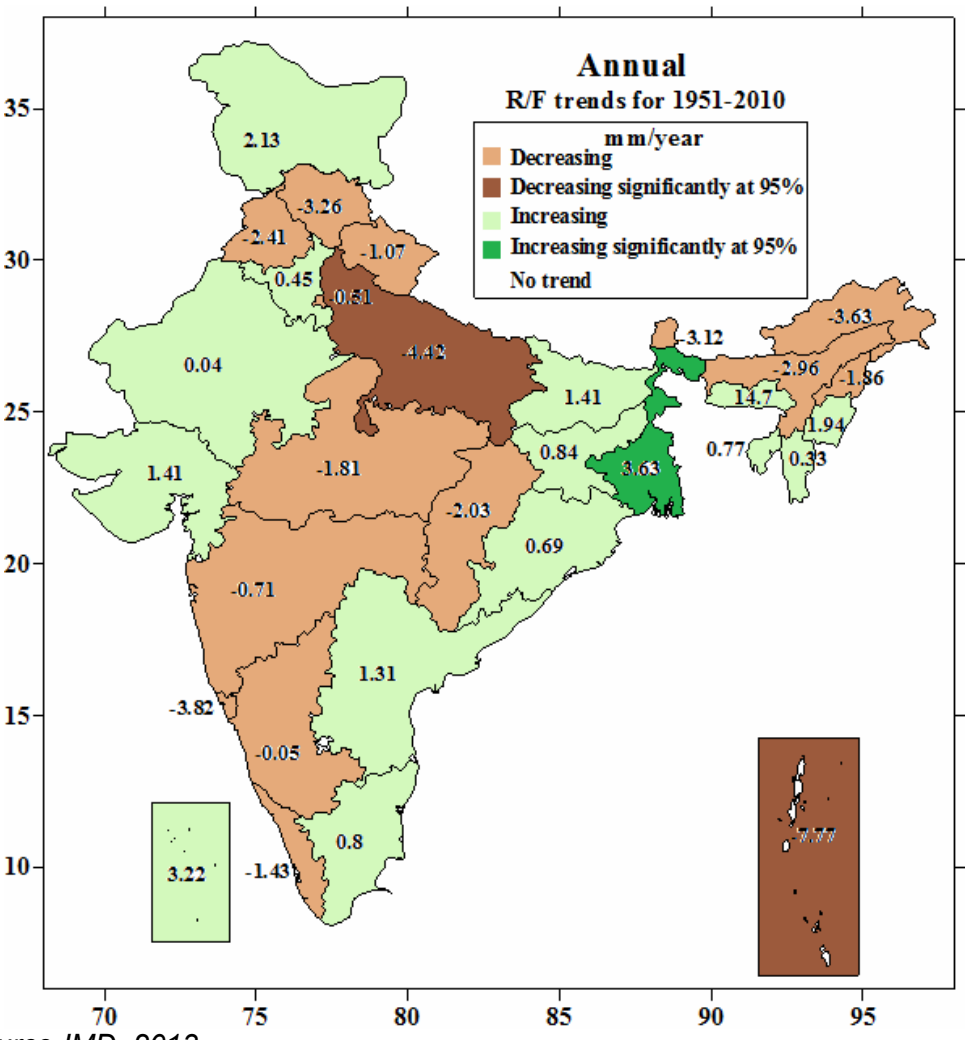
[9] *L S Rathore, S D Attri and A K Jaswal, 2013, "State Level Climate Change Trends" Ministry Of Earth Sciences, Earth System Science Organization, India Meteorological Department.*

Fig. 75: Monthly mean DTR trends in ^{0}C over 50 years



Source: IMD, 2013

Fig 76:State level annual mean diurnal temperature range (DTR) trends



Source-IMD, 2013

Fig 77: State level annual rainfall trends.

9. Natural Hazards

200. **Flood/Drought.** As per the hazard map of U.P sourced from NATMO none of the project districts are drought prone.

201. Almost part of all districts along the project roads except Etah and Kushinagar are flood prone but the project roads do not fall in flood zone. Hazard map is given in **Fig. 78** at the end of this Chapter**. Table III-3** gives a list of flood prone districts along the project roads.

202. **Seismicity**. The state of UP has earthquake high risk zone to low risk zone as per Building Material and Technology Promotion Council (BMTPC). Seismicity map is given in **Fig. 79** towards the end of this Chapter.

203. Out of 8 Project roads, 4 roads fall in moderate damage risk zone III (MSK VII), 3 road stretches fall in high damage risk zone IV (MSK VIII) whereas only one project road falls in low damage risk zone II (MSK VI) as per BMTPC. The project roads which fall under zone IV, the structural designs shall be earthquake resistant. The following types bridges need not be

checked for seismic effects as per Clause 219.1.1 of IRC 6-2014: a. Culverts & MNBR up to 10m span in all seismic zones; and b.Bridges in seismic zones II & III satisfying both limits of total length not exceeding 60m and spans not exceeding 15m. Bridges in Zone III above this span are checked for seismic forces. Since none of bridges in the proposed project satisfy the requirement, hence no seismic analysis is required,

204. The detail of seismic category of the project roads is given in **Table III-3**.

Table III-3: List of HazardProne districts and Project Roads

S. No.	Project Road Name	Whether District Flood Prone (Y/N)		Whether Project road falls in flood Zone (Y/N)	Seismic Zone/MSK Scale
1.	Nanao to Dadao (MDR 82W)	Part of Aligarh - Y		No	moderate damage risk zone III/MSK VII
2.	Bulandansharar to Anupshahar (MDR 58W)	Part of Bulandshahar - Y		No	high damage risk zone IV /MSK VIII
3.	Muzzaffarnagar to Baraut (MDR 135W)	Muzzaffarnagar	Baghpat	No	high damage risk zone IV /MSK VIII
		Part - Y	Part - Y		
4.	Hussainganj to Alipur Marg (MDR 81C)	Part of Fatehpur - Y		No	low damage risk zone II (MSK VI)
5.	Haliyapur to Kurebhar to Bilwai (MDR 66E)	Part of Sultanpur - Y		No	moderate damage risk zone III/MSK VII
6.	Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E)	Kushinagar	Deoria	No	high damage risk zone IV /MSK VIII
		No	Part - Y		
7.	Mohanlaganj to Maurawan Unnao Marg (MDR 52C)	Lucknow	Unnao	No	moderate damage risk zone III/MSK VII
		Part - Y	Part - Y		
8.	Aliganj-Soron Marg (MDR 45W)	Kanshiram Nagar	Etah	No	moderate damage risk zone III/MSK VII
		Part - Y	No		

Source: National Atlas & Thematic Mapping Organization (NATMO)

10. Air quality

205. Air quality of the roads has been assessed based on observation as well as monitoring. Observation includes identifying various pollution sources, presence of dust in the air etc.

206. In case of monitoring, for collection of samples, APM-460NL (Envirotech) Respirable Dust Samplers (RDS) with provision for gaseous sampling attachment APM-860 (Envirotech) were used for measuring the concentrations of PM10, NO2 and SO2 in the ambient air while Carbon Monoxide was measured using CO Analyzer. The APM-460 NL Respirable Dust Sampler has been provided with a cyclone. The cyclone has been designed to provide separation of PM10 particles. Atmospheric air was drawn for ~24 hours through the cyclone and

20 x 25 cm glass fiber filter (GF/A) sheet at a flow rate of 0.8 to 1.2 m^3/min and finally the average flow rate was calculated. As the air with suspended particulate enters the cyclone, coarse non-respirable dust is separated from the air stream by centrifugal forces. The suspended particulate matter falls through the cyclone's conical hopper and gets collected in the cyclonic-cup. The fine dust comprising the respirable fraction passes through the cyclone and gets collected on GFF. The amount of Respirable particulate per unit volume of air passed was calculated on the basis of the difference between initial and final weights of the filter paper, and the total volume of the air drawn during sampling. For gaseous (SO_2 and NO_2) sampling the impingers having absorbing reagents was exposed for ~24 hour at an impingement rate of 0.5 lpm. SO_2 was analyzed by the West-Gaeke method on Spectrophotometer at wavelength of 560 nm. NO_2 was analyzed employing the Jacob- Hochheiser modified method on spectrophotometer at wavelength of 540 nm. APM 550 Fine Particulate Sampler (Ecotech made) was used for measuring PM2.5. Fine particulates were collected on PTFE filter base, and then PM2.5 is estimated by gravimetric method.

a. Nanao- Dadao (MDR 82W)

207. The project road at certain stretches has the paved surface broken/ kuchha road and has agricultural land along major part of its length. This gives rise to dust when vehicles ply on them or due to wind. Thus particulate matter level is assumed to be high at some place. Another major source of pollution along the road side is emissions from brick kilns which are 13 in number within 200m of CL along the road. Photographs of pollution sources are given in **Fig 80.** Brick kilns are generally sources of particulate matters or P.M 2.5 in the form of black carbon, sulphur dioxide, nitrogen dioxide and carbon dioxide.

208. Black carbon (BC) is the most strongly light-absorbing component of particulate matter (PM), and is formed by the incomplete combustion of fossil fuels, biofuels, and biomass. BC is emitted directly into the atmosphere in the form of fine particles (PM2.5). BC is the most effective form of PM, by mass, at absorbing solar energy per unit of mass in the atmosphere; BC can absorb a million times more energy than carbon dioxide (CO2) but has less atmospheric life time (few days to week). It is a major component of "soot", a complex light-absorbing mixture that also contains some organic carbon (OC).

209. Short-term and long-term exposures to PM2.5 (in the form of BC) are associated with a broad range of human health impacts, including respiratory and cardiovascular effects. This is also reported to have effect on productivity of agriculture (Source-*United States Environment Protection Agency*).

Broken pavement and dust emission at km 22.000

Broken pavement and dust emission at km 25.700

Brick kiln at km 3.50

Brick kiln at km 4.00

Fig. 80: Polluting Sources along Nanau-Dadau (MDR 82W)

210. **Air quality monitoring.** Air quality monitoring has been done at two representative locations viz; Pilkhana Village at km 5.400 and Tikta Village at km 14.800 to establish baseline as per National Ambient Air Quality Standards (NAAQS), 2009. The equipment was placed at a height of 3.6 m above ground level at each monitoring station, for negating the effects of windblown ground dust. The equipment was placed at open space free from trees and vegetation, which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.98th percentile concentration of ambient air quality as monitored is presented in **Table III-4.**At both the locations, the value of PM_{10} varies from 62.5 to 75.4 $\mu g/m^3$, $PM_{2.5}$ from 28.3 to 39.2 $\mu g/m^3$, SO_2 from 11.7 to 13.2 $\mu g/m^3$, NO_x from 15.8 to 20.8 $\mu g/m^3$ and CO from 1.03 to 1.28 mg/m^3respectively. The ambient air quality parameters were found within prescribed standards.

b. Bulandshahar to Anoopshahar (MDR 58W)

211. Main sources of air pollution along the Bulandshahar to Anoopshahar road are also brick kilns and small scale sugarcane factoriesknown as *kolu*. There are 7 brick kilns and 1 kolu along the road. Photographs of pollution sources are given in **Fig 81.**

Sugar cane factories at km 49.000

Brick kiln at km 54.300

Brick kiln at km 37.600

Brick kiln at km 43.900

Fig. 81: Polluting Sources along Bulandshahar-Anoopshahar (MDR 58W)

212. **Air quality monitoring.** Air quality monitoring has been done in two locations viz; Anoopshahar Bypass at km 39.600 and Amarpur at km 52.800. The details of monitoring results are given in **Table III-4.** However, values for PM_{10} were observed in the range of 62.5 to 83.8 $\mu g/m^3$& $PM_{2.5}$within 30.3 to 46.4$\mu g/m^3$and other gaseous parameters like SO_2, NO_x and CO were found within 14.1 to 16.3 $\mu g/m^3$, 22.4 to 24.6 $\mu g/m^3$and 1.40 to 1.62 mg/m^3 respectively. From the above range, it is clear that all parameters were well within the stipulated limit as per NAAQS in both the locations.

c. Muzaffarnagar to Baraut Marg (MDR 135W)

213. Main sources of air pollution along the Muzaffarnagar –Baraut road are that of brick kilns and sugarcane factories producing jaggery. This is also a source of particulate matter, Sulphur dioxide, Nitrogen dioxide and CO_2.Photographs of pollution sources are given in **Fig 82.** There are 27 brick kilnswithin 200 m of center line and 15 koluwithin 60 m along the road. There is one plastic industry acting as air polluting source at km 3.250 at 30 m from the center line. List of air polluting sources are given in **Appendix21.**

Sugarcane factoriesat km 12.750

Sugarcane factories at km 12.900

Brick kiln at km 24.450

Brick kiln at km 15.050

Fig. 82: Polluting Sources along Muzaffarnagar to Baraut Marg (MDR 135W)

214. **Air quality monitoring.** The monitoring of the ambient air quality (AAQ) for the various land uses along the project corridor was carried out at a frequency of twice in a week at each station in post-monsoon season (November, 2014 to January, 2015). Air quality monitoring has been done in three locations at Shahpur, Tawli and Bijrol. The results of air quality are given in**Table III-4.**The concentration of PM10, PM2.5, SO_2, NO_x and CO varied between 51.6 to 65.2 μg/m^3, 20.1 to 32.4 μg/m^3,9.7 to 13.1 μg/m^3, 15.3 to 21.5 μg/m^3 and 1.08 to 1.31 mg/m^3respectively. From the results, it can be concluded that all the air quality parameters were found within prescribed NAAQ standards, 2009.

d. Hussainganj to Alipur Marg (MDR 81C)

215. Air pollution sources as observed along this road are brick kilns, vehicular traffic and dusty roads (**Fig 83**). There are around 4 brick kilns within 100 m of the center line.

Brick Kiln at km 48.678

Brick Kiln at km 6.1

Fig. 83: Brick Kilns along Hussainganj to Alipur Marg (MDR 81C)

216. **Air quality monitoring.** Air quality monitoring has been done in 3 locations at Hussainganj (at the junction and start point of the road) at km 0.175, Hathgaon (near junction of the road) at km 26.825, Premnagar at km 41.475 and the results are as given in**TableIII-4.**The values of PM_{10}, $PM_{2.5}$, SO_2, NO_x and CO varied in the rangeof80.6 to 120 μg/m^3, 52.0 to 90.0 μg/m^3, 11.6 to 12.3 μg/m^3, 33.0 to 40.2 μg/m^3 and 0.73 to 1.54 mg/m^3 respectively at all the locations.At Hussainganj and Hathgaon the concentration of PM $_{10}$& $PM_{2.5}$ are found above

permissible limit. This may be probably due to higher commercial activities, heavy traffic movement, dusty and broken pavements.Values for other parameters are found well within the stipulated limit of NAAQS.

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

217. Air pollution sources along Haliyapur to Kurebhar are mainly vehicular traffic, Kolu (Jaggery factory) and brick kilns (**Fig 84**).

Fig 84: Brick kilns and Kolu along Haliyapur to Kurebhar to Bilwai (MDR 66E)

218. **Air quality monitoring.** Five ambient air monitoring stations were set up at Akhand Nagar at km 92.100, Kurebhar at km 34.400, Birsinghpur at km 60.000, Dostpur at km 77.200 and Bhawanigarh at km 5.100 for assessing the air quality along the project corridor. The 98th percentile concentration of the parameters assessed is provided in **TableIII-4**. The concentration of air quality parameters were in the range of 98.0 to 131.0 $\mu g/m^3$ (PM10), 63.0 to 90.0 $\mu g/m^3$ (PM2.5), 12.3 to 14.0 $\mu g/m^3$ (SO_2), 37.0 to 39.4 $\mu g/m^3$ (NOx)and 1.0 to 1.5 mg/m^3 (CO). From the analysis results, it is observed that the concentration of gaseous pollutants like SOx, NOx and CO is well within the permissible limit of NAAQS, 2009 at all the monitoring stations. But PM2.5 value exceeds the limit at all the stations while value of PM10 also exceeds the prescribed norms at all locations except at Birsinghpur. Adequate measures have to be taken at these locations for limiting further generation of dust during construction activity.

f. Kaptanganj to Naurangiya (ODR 24) & Kaptanganj toRudrapur (MDR 25E)

219. Main sources of air pollution along the Kaptanganj to Naurangiya (ODR 24) road are that of vehicular traffic and poor condition of pavement which leads to enormous dust when vehicles ply on them. Photographs of pollution sources are given in **Fig 85A.**

220. The condition of Kaptanganj to Rudrapur road (MDR 25E) is fairly good in Kushinagar district but in Deoria district the road is observed with broken pavements. Air pollution sources along this stretch are mainly vehicular traffic and dusty roads. One Rice mill is also observed at km 37.200 in Kakwal village. Photographs of pollution sources are given in **Fig 85B.**


Fig 85A: Broken pavements along Kaptanganj-Naurangia (ODR 24)


Rice Mill at km 37.200 in Kakwal *Dusty road in Deoria district*

Fig 85B: Polluting Sources along Kaptanganj-Rudrapur (MDR 25E)

221. **Air quality monitoring.** Ambient air pollution monitoring has been carried out at four locations viz; Kaptanganj at km 0.000, Gauribazaar at km 42.000, Vakeelganj at km 31.500 and Mathaiya Tiwari at km. 7.500. All these locations vary between 8-10m from the edge of the road. The result of ambient air quality is as given in **TableIII-4**.The value of PM_{10}, $PM_{2.5}$, SO_2, NOx and CO varies from 94.3 to 120.0 $\mu g/m^3$, 58.2 to 65.6 $\mu g/m^3$, 12.0 to 13.0 $\mu g/m^3$, 34.9 to 40.2 $\mu g/m^3$ and 0.8 to 1.3 mg/m^3 respectively. The concentration of both $PM_{10}$and $PM_{2.5}$exceeds at Kaptanganj and Gauribazar whereas $PM_{2.5}$ alsoexceeds at Mathaiya Tiwari. However, the gaseous parameters are found well within the prescribed standards.

g. Mohanlaganj to Maurawan Unnao Marg (MDR 52C)

222. Air pollution sources along MDR 52C are brick kilns and vehicular traffic at congested locations in Mohanlalganj, Maurawan and Purwa.There are 6 brick kilns within 100 m from centerline of the project road. One Small Oil Extractor & Flour Mill and one Pipe Industry are observed along the road.Photographs of polluting sources are given in **Fig.86**.

Brick kiln at km 15.400 in Pitna Kheda

Pipe Industry at km 55.200 in Taura Bichia

Congested point in Mohanlalganj

Fig 86: Polluting Sources along Mohanlaganj-Unnao Marg (MDR 52C)

223. **Air quality monitoring.** Four ambient air monitoring stations were set up at Dehwa at km 0.200, Kalu Khera at km 16.400, Maurawan at km 30+800 and Mangat Khera at km 51.100 for assessing the air quality along the project corridor. The 98th percentile concentration of the parameters assessed is provided in **Table III-4**. The concentration of air quality parameters were in the range of 76.50 to 81.00μg/m^3 (PM10), 47.00 to 49.58μg/m^3 (PM2.5), 12.24 to 13.16μg/m^3 (SO_2), 18.14 to 19.61μg/m^3 (NOx) and 0.75 to 0.83 mg/m^3 (CO). From the analysis results, it is observed that the concentration of all parameters is well within the permissible limit of NAAQS, 2009 at all the monitoring stations.

h. Aliganj-Soron Marg (MDR 45W)

224. Major sources of pollution along the road are brick kilns, vehicular traffic and dusty roads. There are 16 brick kilns observed within 200 m of the centerline of the project road. List of polluting sources are given in **Appendix 22.** Photographs of brick kilns are given in **Fig 87.**

Fig 87: Dusty roads and Brick Kilns along Aliganj-Soron Marg (MDR 45W)

225. **Air quality monitoring.** Ambient air pollution monitoring has been carried out at three locations viz; Patiyali at km 27.200, Sahawar at km 47.800 and Timberpur at km 57.000. All these locations vary between 10-25m from the edge of the road. The result of ambient air quality is as given in **Table III-4**. The value of PM_{10}, $PM_{2.5}$, SO_2, NOx and CO varies from 79.14 to 81.09$\mu g/m^3$, 47.08 to 48.44$\mu g/m^3$, 12.06 to 13.08$\mu g/m^3$, 18.11 to 20.28$\mu g/m^3$ and 0.81 to 0.84 mg/m^3 respectively. The concentration of all parameters at all locationsis found well within the prescribed standards.

Table III-4: Ambient Air Monitoring results along the Project Roads

Sl. No.	Parameter	UNIT	MDR 82W		MDR 135W			MDR 58W		MDR 81C			MDR 66E					NAAQS2009
			AQ1*	AQ2*	AQ3*	AQ4*	AQ5*	AQ6*	AQ7*	AQ8*	AQ9*	AQ10*	AQ11*	AQ12*	AQ13*	AQ14*	AQ15*	
1	**PM10**	$\mu g/m^3$	75.4	62.5	65.2	64.0	51.6	83.8	62.5	120	112	80.6	105.5	131.0	98.0	110.0	105.0	100
2	**PM2.5**	$\mu g/m^3$	39.2	28.3	32.4	28.1	20.1	46.4	30.3	65.6	90	52	65.0	90.0	63.0	89.0	65.0	60
3	**SO_2**	$\mu g/m^3$	13.2	11.7	13.1	12.7	9.7	16.3	14.1	12	12.3	11.6	12.0	12.3	14.0	13.0	13.0	80
4	**NO_X**	$\mu g/m^3$	20.8	15.8	21.5	17.8	15.3	24.6	22.4	40.2	37	33	37.2	37.0	37.0	39.0	39.4	80
5	**CO**	mg/m^3	1.28	1.03	1.31	1.20	1.08	1.62	1.40	1.54	1.25	0.73	1.16	1.00	1.00	1.50	1.00	2

98^{th} Percentile Concentration; Source: DPR Consultant

Sl. No.	Parameter	UNIT	O24& MDR 25E				MDR 52C				MDR 45W			NAAQS 2009
			AQ16*	AQ17*	AQ18*	AQ19*	AQ20*	AQ21*	AQ22*	AQ23*	AQ24*	AQ25*	AQ26*	
1	**PM10**	$\mu g/m^3$	120.0	120.0	94.3	96.0	80.79	80.30	81.00	76.50	79.14	81.09	79.90	100
2	**PM2.5**	$\mu g/m^3$	65.6	65.0	58.2	65.0	49.58	49.10	47.12	47.00	47.08	48.18	48.44	60
3	**SO_2**	$\mu g/m^3$	13.0	13.0	12.0	13.0	12.54	12.71	12.24	13.16	13.08	12.06	12.06	80
4	**NO_X**	$\mu g/m^3$	40.2	38.0	34.9	39.4	18.14	18.32	18.38	19.61	18.11	20.28	20.28	80
5	**CO**	mg/m^3	1.3	1.3	0.8	1.1	0.75	0.78	0.83	0.79	0.81	0.83	0.83	2

98^{th} Percentile Concentration; Source: DPR Consultant

*Note: **Nanau-Dadau_AQ1**:Pilkhana Village at km 5.400,(Commercial Area); **AQ2**:Tikta Village at km 14.800,(Residential Area); **Muzaffarnagar-Baraut Road_AQ3**:Shahpur,(Residential/Commercial Area);**AQ4**:Tawli,(Residential/Commercial Area); **AQ5**:Bijrol,(Residential Area); **Bulandshahar-Anoopshahar Road_AQ6**:Anoopshahar Bypass at km 39.600, (Residential/Commercial Area); **AQ7**:Amarpur at 52.800,(Residential/Commercial Area); **Hussainganj to Alipur Road_AQ8**:Hussainganj (at the junction and start point of the road) at km 0.175, (Commercial Area); **AQ9**:Hathgaon (near junction of the road) at km 26.825,(Commercial Area); **AQ10**:Premnagar at km 41.475,(Commercial Area); **Haliyapur to Kurebhar_AQ11**:Akhand Nagar at km 92.100, (Residential Area); **AQ12**:Kurebhar at km 34.400,(Commercial Area); **AQ13**:Birsinghpur at km 60.000,(Residential Area); **AQ14**:Dostpur at km 77.200, (Residential Area);**AQ15**:Bhawanigarh at km 5.100,(Residential Area);**Naurangiya-Kaptanganj-Rudrapur_AQ16**:Kaptanganj at km 0.000, (Commercial Area); **AQ17**: Gauribazar at km 42.000,(Residential Area);**AQ18**:Vakeelganj at km 31.500,(Commercial Area);**AQ19**:Mathaiya Tiwari at km 7.500,(Residential Area); **Mohanlalganj-Maurawan-Unnao_AQ20**:Dehwa at km 0.200 (Silence Zone), **AQ21**:Kalu Khera at km 16.400 (Silence Zone), **AQ22:**Maurawan at km 30.800(Residential), **AQ23**:Mangat Khera at km 51.100(Residential); **Aliganj-Soron_AQ24**:Patiyali at km 27.200(Commercial), **AQ25**:Sahawar at km 47.800 (Residential), **AQ26**:Timberpur at km 57.000(Residential)*

11. Noise level

226. Noise pollution in an area has been assessed based on observation and monitoring both. Observation is done in terms of identification of congestion points and consultation with public (detailed in the chapter on Public consultation).

227. In case of noise monitoring sound pressure levels (SPL) have been measured by a sound level meter. The noise levels within the study area were recorded using Sound Level Meter (SLM-100) and integrating sound level meter (SL-1352) of HTC. Outdoor noise measurements were made at a height of 1.0 – 1.5m, above the ground and away from sound reflecting sources like walls, buildings etc. A-weighted equivalent continuous sound pressure level (Leq) values have been computed from the values of A-weighted sound pressure level measured with the help of noise meter. At each location, noise monitoring has been carried out once during the entire study period over a period of twenty-four hours to obtain L_{eq} values at uniform time intervals of 1 hour. For each location, day and night time L_{eq} values have then been computed from the hourly L_{eq} values such that comparison could be made with the national ambient noise standards. Day & night time L_{eq} has been computed from the hourly L_{eq} values as per standards.

a. Nanau- Dadau (MDR 82W)

228. Due to poor condition of road and traffic congestion along towns like Charra and Dadau noise levels at certain stretches were observed at higher side.

229. Threenoise monitoring stations were selected on the basis of land use and density of habitation in the area. The noise level was monitored at Barla More at km 12.300, Sihawali at km 17.100 and Charra Town at km 20.700 for the project and the result is shown in **Table III-5.**From the result it can be concluded that noise level in day time in the area was found slightly on the higher side of the permissible limit due to intervention of vehicular traffic along congestion points and noise generating activities during daytime.However, night time noise was well within prescribed standards due to absence of any major noise generating activities during night time.

b. Bulandshahar to Anoopshahar (MDR 58W)

230. 2 monitoring stations were selected on the basis of land use and density of habitation. The noise level as monitored for the project is shown in **Table III-5**. From the results it is clear that the ambient noise level during day and night time is found well within the stipulated CPCB standards at both the locations.

c. Muzaffarnagar to Baraut Marg (MDR 135W)

231. The noise level was monitored in 4 locations at Tawli Village at km 10.400, Shahpur Town at km 21.300, Bijrol at km 56.600 and Baraut Town at km 62.100. The noise level recorded for the project is shown in **Table III-5**. Based on the results, it can be inferred that the noise level during day time was found slightly beyond noise standards due to noise generating activities during daytime and congestion of vehicular traffic. However, the night time noise was found conforming to the permissible limit.

d. Hussainganj to Alipur Marg (MDR 81C)

232. Main source of noise is vehicular traffic due to congested areas and poor condition of pavement. Few points of congestion found along the road are at Chhiblaha from km 16.200 to

km 16.600, in Hathgaon from km 25.800 to km 26.800, in Prem Nagar from km 41.00 to km 41.500 (**Fig 88**).

Congestion Point in Chhiblaha

Congestion Point in Hathgaon

Congestion Point in Prem Nagar

Fig 88: Congestion Points along Hussainganj to Alipur Marg

233. **Noise level monitoring**. Four monitoring stations, one each at Hussainganj at km 0.175, Hathgaon (near market) at km 26.800, Afoi at km 46.300 and Bela Mahavidyalay Gate at km 12.010 were selected on the basis of land use and density of habitation. Ambient noise level monitoring was done by an integrating sound level meter (SL-1352) of HTC, in dB(A). Outdoor noise measurements were made at a height of 1.5m, above the ground and away from sound reflecting sources like walls, buildings etc.The noise level as monitored for the project is shown in **Table III-5**. Noise levels seem to exceed both day and night limits at all the locations. Thismay due tovehicular traffic, congested areas and poor condition of pavement.

e. Haliyapur to Kurebhar to Bilwai (MDR 66E)

234. To assess the noise quality of the area, five monitoring stations were located at Bhawanigarh at km 5.100, Kurebhar at km 34.900, Birsinghpur at km 60.000, Haliyapur to Kurebhar, Dostpur at km 77.200 and Akhand Nagar at km 92.100. The noise level monitored for the project is given in **Table III-5.** The noise level during day time exceeds the prescribed standards at all the monitoring locations whereas the Leq value during night time was within the prescribed limit only at two monitoring locations out of five. Hence, from the result it can be concluded that the noise quality of the area is poor due to continuous presence of vehicular traffic in congested areas and commercial activities in the area.

f. Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E)

235. Main source of noise along Kaptanganj to Rudrapur is vehicular traffic due to congested areas and poor condition of pavement. Few points of congestion found along the road are in Gauribazar at km 40.750 and in Hata at km 22.500 (**Fig 89**).

Congestion Point in Gauribazar

Congestion Point in Hata

Fig. 89: Congestion Points along Kaptanganj-Rudrapur (MDR 25E)

236. A total of four monitoring stations were selected on the basis of land use and density of habitation. These monitoring stations were at Kaptanganj at km 0.000, Gauribazar at km 42.000, Rudrapur at km 58.000 and Mathaiya Tiwari at km 7.500.

237. The noise level monitored for the project is shown in **Table III-6**. As interpreted from the results, it is observed that the Leq value during day time exceeds the prescribed limit at 2 places i.e. at Gauribazar and Rudrapur monitoring stations whereas the Leq value at night time exceeds at Kaptanganj and Gauribazar monitoring stations. This may be due to heavy vehicular traffic in congested areas and commercial activities in the area.

g. Mohanlaganj to Maurawan Unnao Marg (MDR 52C)

238. The condition of pavement is fairly good along the road but the major source of noise is mainly due to traffic at congested locations in Mohanlalganj, Maurawan and Purwa.

239. To assess the noise quality of the area, four monitoring stations were located at Uttargaon at km 5.500, Maurawan at km 31.400, Sandoli Village at km 19.300 and Mangat Khera at km 51.100. The noise level monitored for the project is given in **Table III-6.** The noise levels at all the monitoring locations were within the prescribed limit.

h. Aliganj-Souron Marg (MDR 45W)

240. Main source of noise is vehicular traffic due to congested areas and poor condition of pavement. Few points of congestion found along the road are at Patiyaliat km 28.000, in Ganjdundwara at km 35.000, Sahavar at km 48.00 and end point of project road at Soron (**Fig 90**).

Congestion Point in Patiyali

Congestion Point in Ganjdundwara

Congestion Pointin Sahavar

Congestion Point in Soron

Fig. 90: Congestion Points along Aliganj-Soron Marg

241. A total of four monitoring stations were selected on the basis of land use and density of habitation. These monitoring stations were at Soron at km 61.500, Bhiloli at km 49.500, Garkha at km 41.400 and Alipur Dadar at km 30.600.

242. The noise level monitored for the project is shown in **Table III-6**. As interpreted from the results, it is observed that the Leq value during day time whereas the Leq value at night time is well within the prescribed standards.

Table III-5: Ambient Noise Monitoring Results along the Project Roads

Sl. No.	Road No.	Sampling Location*	Distance in (m) from Road Edge	L_{eq} Day dB(A)	L_{eq} Night dB(A)	Noise Standards		Category of Area
						Day	Night	
1	**MDR 82W**	NQ1	20	57.8	38.7	55	45	Residential
		NQ2	25	55.4	36.8	55	45	Residential
		NQ3	20	59.4	38.6	55/65	45/55	Residential/Commercial
2	**MDR 135W**	NQ4	-	57.2	37.9	55	45	Residential
		NQ5	-	59.4	38.6	55 /65	45/55	Residential/Commercial
		NQ6	-	52.3	36.5	50	40	Silence Zone
		NQ7	-	59.5	38.8	55 /65	45/55	Residential/Commercial
3	**MDR 58W**	NQ8	Road Side	59.5	38.7	55/65	55/65	Residential/Commercial
		NQ9	Road Side	57.7	36.9	55/65	55/65	Residential/Commercial
4	**MDR 81C**	NQ10	Road Side	72.4	64.0	65	55	Commercial
		NQ11	Road Side	77.3	62.7	65	55	Commercial
		NQ12	Road Side	72.7	50.6	55	45	Residential
		NQ13	Road Side	68.9	46.9	50	40	Sensitive
5	**MDR 66E**	NQ14	9	61.2	55.3	50	40	Sensitive
		NQ15	8	78.6	52.2	65	55	Commercial
		NQ16	8	55.3	44.6	55	45	Residential
		NQ17	7	58.4	51.5	50	40	Sensitive
		NQ18	7	63.5	45.8	55	45	Residential

Source: DPR Consultant

*Note:**Nanau-Dadau_NQ1**:Barla More at km 12.300; **NQ2**:Sihawali at km 17.100; **NQ3**:Charra Town at km 20.700; **Muzaffarnagar-Baraut_NQ4**:Tawli Village at km 10.400; **NQ5**:Shahpur Town at km 21.300; **NQ6**:Bijrol at km 56.600; **NQ7**:Baraut Town at km 62.100;**Bulandshahar-Anoopshahar_NQ8**:Anoopshahar bypass at km 39.600; **NQ9**:Amarpur at km 52.800; **Hussainganj-Alipur_NQ10**:Hussainganj at km 0.175; **NQ11**:Hathgaon (near market) at km 26.800; **NQ12**: Afoi at km 46.300; **NQ13**:Bela Mahavidyalay Gate at km 12.010; **Haliyapur-Kurebhar_ NQ14**:Bhawanigarh at km 5.100; **NQ15**: Kurebhar at km 34.900; **NQ16**:Birsinghpur at km 60.000; **NQ17**:Dostpur at km 77.200; **NQ18**:Akhand Nagar at km 92.100;

Table III-6: Ambient Noise Monitoring Results along the Project Roads

Sl. No.	Road No.	Sampling Location*	Distance in (m) from Road Edge	L_{eq} Day dB(A)	L_{eq} Night dB(A)	Noise Standards		Category of Area
						Day	Night	
6	**ODR24& MDR 25E**	NQ19	8	63.4	60.6	65	55	Commercial
		NQ20	10	65.3	62.7	65	55	Commercial
		NQ21	10	55.5	42.6	55	45	Residential
		NQ22	11	52.4	44.8	55	45	Residential

Sl. No.	Road No.	Sampling Location*	Distance in (m) from Road Edge	L_{eq} Day dB(A)	L_{eq} Night dB(A)	Noise Standards		Category of Area
						Day	Night	
7	**MDR 52 C**	NQ23	20	47.5	35.6	50	40	Silence
		NQ24	15	48.4	37.2	50	40	Silence
		NQ25	10	57.3	43.6	65	55	Commercial
		NQ26	15	52.4	40.2	55	45	Residential
8	**MDR 45W**	NQ27	25.0	52.3	40.2	55	45	Residential
		NQ28	10.0	63.4	48.2	65	55	Commercial
		NQ29	15.0	53.6	37.5	55	45	Residential
		NQ30	20.0	46.5	34.8	50	40	Silence

Source: DPR Consultant

*Note: **Naurangiya-Kaptanganj-Rudrapur_NQ19**: Kaptanganj at km 0.000;**NQ20**:Gauribazar at km 42.000; **NQ21:** Rudrapur at km 58.000; **NQ22**: Mathaiya Tiwari at km 7.500; **Mohanlaganj to Maurawan Unnao Marg_NQ23**:Near Ambalika Institute-Uttargaon at 5.500, **NQ24**:Near Community Health Centre Maurawan at km 31.400, **NQ25:**Sandoli Village Near Raj two wheeler service centre at km 19.300**, NQ26**:Mangat Khera at km 51.100**; Aliganj-Soron Marg_NQ27**:Soron at km 61.500, **NQ28**:Bhiloli at km 49.500,**NQ29**: Garkha at km 41.400, **NQ30:**Near Primary School- Alipur Dadar at km 30.600

C. Ecological Environment

1. Flora

243. Forest cover constitutes of around 6.88% (1141 sq.km) of total geographical area of U.P. Out of which 70% is reserved forest (798.63 sq.km), 8.5 % is protected forest (97 sq.km), mostly notified along the roads and rest is under unclassified forest. U.P has 1 National Park and 23 Wildlife Life Sanctuaries[10]. The forest types found in Uttar Pradesh can be divided into four broad categories like moist deciduous forest, dry deciduous forest, moist temperate forest, dry temperate forests and thorn forests. The moist deciduous forest occurs mainly in the western part of Ganga plain, particularly the Terai region and sub Himalayan tract. This type accounts for 15% of total forest area.

244. Dry deciduous forest are found in areas with long dry season and are widely scattered in Western Terai, the sub Himalayan zone and Ganga plain and accounts for 32% of total forest area.

245. The moist temperate forest cover nearly 14% of the total forest area is found in the hilly regions at altitude above 18,000 mamsl. The whole of the state is spotted with dry temperate type of forest with sal, khair, neem, babul. Thorn forests are the degenerated forms of dry deciduous forest with dominance of thorny trees and bushes because of the arid conditions.

246. None of the project roads pass through reserve forest, national park or wildlife sanctuaries. Forest map with roads superimposed on it is given in **Fig.91** place at the end of this chapter**.** However, part or whole of the lengths of project road have been notified as protected forest. Stretch wise details are given in following section.

247. The predominant tree species present along the project roads are Arjun (*Terminalia arjuna*), Babool *(Acacia nilotica)*, Neem (*Azadirachta indica*), Shisam (*Dalbergia sissoo*), Peepal (*Ficus religiosa*), Mango (*Mangifera indica*), Bargad (*Ficus benghalensis*), Kattha (*Morus sp.*), Labhera, Ashok (*Polyalthia longifolia)*, Shirish (*Albizia saman)*, Gular (*Ficus racemosa*), Jamun *(Syzygium cumini)*, Ber *(Ziziphus mauritiana)*, Poplar (*Populus sp.*), Safeda (*Eucalyptus sp.*), Mahua (*Madhuca longifolia*), Bael (*Aegle marmelos*), Imli (*Tamarindus indica*),Amaltas (*Cassia fistula*), Dudhi (*Holarrhena antidysentrica*), Kachnar (*Bauhinia variegate),* Sagwan (*Tectona grandis),* Bamboo (*Bambuseae sp.*), Jackfruit (*Artocarpus heterophyllus),* Khajur (*Phoenix dactylifera),* Pakad (*Ficus virens)*

248. Vacant spaces on both sides of the road which is owned by PWD and managed by Forest Department has been notified as Protected Forest (PF)along entire stretch of Nanau to Dadon, along Muzaffarnagar to Baraut Marg (MDR 135W) around 22 km(from km 9.000 to km 31.000) from Taoli Village and Ends at Budhana Village, along Mohanlalganj-Maurawan Unnao Margof about first 0.800 Km of the Project Road section (Mohanlalganj-Bani Road-NH24A; falling in Lucknow District) vide Order No. 155 / XIV-331-50 dated 10.02.1960 by the forest department **(Appendix 23)**andalong Hussainganj to Alipur Marg (MDR 81C) from Bahera Chowk at km 33.375 to Alipur Jita at km 48.675 vide Notification No. 3278/14-2-43/86 dated 7th August, 1986 (**Appendix 24**).Kaptanganj to Rudrapur road (MDR 25E) is not a notified Protected forest but SH-1 which crosses the project road in Hata is a notified PF.

249. Big orchards of Mango, Guavaand Jackfruit are common along the project roads which are shown in **Fig.92**and list of these orchards identified along the roads is given in **Appendix 25**.

[10] *India State of Forest Report, 2009*

Mango Orchard at km 3.100 in Budhana More along Muzaffarnagar-Baraut Road

Mango Orchard at km 11.100 in Tawli along Muzaffarnagar-Baraut Road

Mango Orchard at km 27.500 in Bhasana along Muzzaffarnagar-Baraut Road

Mango Orchard at km 4.000 along Haliyapur-Kurebhar-Bilwai Road

Mango Plantation at km 99.00 along Haliyapur-Kurebhar-Bilwai Road

Mango Orchard at km 32.100 along Haliyapur-Kurebhar-Bilwai Road

Mango Orchard at km 3.900 in Semara along Kaptanganj to Rudrapur Road

Mango Orchard at Km 24.400 in Hata alongKaptanganj to Rudrapur Road

Mango Orchard at Km 58.200 in Rudrapur along Kaptanganj to Rudrapur Road

Mango Orchard in Uttargaon at km 7.000 along Mohanlalganj-Maurawan Unnao Marg

Mango & Jackfruit Orchard in Maurawan at km 32.600 along Mohanlalganj-Maurawan Unnao Marg

Mango Orchard in Dhanwara at km 4.000 along Mohanlalganj-Maurawan Unnao Marg

Mango Orchard at km 30.950 along Aligang to Saron Road

Mango orchard at Km 43.500 along Aliganj to Soron Road

Guava Orchard at Km 46.000 along Aliganj to Soron Road

Fig. 92: Orchards along the Project Roads

250. The total number of trees present within 15 m from CL of the project road is as mentioned

Nanau – Dadon	-	4697
Bulandshahar to Anoopshahar	-	4277
Muzaffarnagar to Baraut Marg	-	10136
Hussainganj to Alipur Marg	-	2744
Haliyapur to Kurebhar to Bilwai	-	10526
Kaptanganj to Naurangia and	-	5005
Kaptanganj to Rudrapur	-	8278
Mohanlalganj to Maurawan Unnao Marg	-	8313
Aliganj-Soron Marg	-	9012

2. Fauna

251. Since the project roadsare not passing through any wildlife sanctuary or national park,the occurrence of wild animals are not likely, however animals like monkey, cow, bull, goat, avifaunal species have been found in abundance. The most common avifaunal species like peacock, crow, Common Indian Mynah, egret, kingfisher, coots, moorhen, grey francolin, jungle babblers, parakeets, dove, water hen, ducks etc. were spotted along the project roads. Amongst mammalian fauna domesticated buffalo, cattle, goat, horse, mule, dog, cat & wild rhesus monkeys were spotted while the presence of neelgai, hare, wolf, wild boar and Indian fox were also reported but not spotted. Animals driven carts like horse carts & bullock carts are used along the project roads. In Bulandshahar-Anoopshahar road presence of monkeys in groups has been observed at two locations (km 23.200 to km 23.400 & km 47 to km 48) near temples where passerby offer food materials to monkeys as part of religious offerings. This practice has made the locations accident prone and risky for the monkeys as well. Common faunal and avifaunal species observed along the project roads are given in **Fig 93.**

Fig.93: Common Faunal and Avifaunal species found along the ProjectRoads

252. No Notified Protected Area like National Park/Sanctuary/ Biosphere Reserve etc (covered under Wildlife Act, 1972) is located within 15 km aerial distance of proposed project roads except Nawabganj Priyadarshini Bird Sanctuary which is located at distance of approximately 11 km from the boundary of the proposed Mohanlalganj-Maurawan Unnao road (MDR 52C). In 1974, the Forest Department declared Nawabganj as a sanctuary. The jheel is fed by monsoon run-off and has an average depth of 1.0-1.5 m at maximum water levels. The water level fluctuates considerably, and much of the lake dries out by early summer. This lake is important for resident and migratory waterfowls. The most common avifauna found in the Nawabganj Bird Sanctuary is Pintail, Gadwall, Garganey Teal, Common Teal, Common Coot, Red Crested Po-chard, Common Po-chard, Mallard, Asian Open Bill Stork, Comb Duck, Purple Moorhen, Common Moorhen, Indian Moorhen, Spoonbill Duck, Black Headed Ibis, Purple Herone, Grey Heron, King Fisher, Sarus Crane, Shoveler, Little Grebe, Bronze Winged Jacana, Black Necked Stork and Wigeon. Among these, no endangered fauna are present in the Sanctuary but Greater Spotted Eagle (*Cangla cangla*) and Sarus Crane (*Antigone antigone*) are categorized as Vulnerable based on their population decreasing trend as per the IUCN (International Union for Conservation of Nature) Red list. During site survey it has been observed that the Sarus Crane visits the nearby open/agricultural places/ponds particularly in rainy season as shown in **Fig.94**.

Fig. 94: Common Avifauna found near Baknai Badaila Jheel

a. Benthic Flora and Fauna in Sai River

253. The most common flora and fauna found in Sai River crossing the project road Mohanlal ganj - Morwan at km 13.100, where a new parallel minor bridge has been proposed, are as mentioned.

254. **Flora.** *Pistia* stratiotes (jalkumbhi/ water lettuce), *Trapa natans* (water caltrop), *Otellia alismoides* (duck lettuce), *Nelumbo nucifera* (indian lotus), *Hygroryza aristata* (asian water grass), *Nymphaea nouchali* (blue lotus), *Echinochola colonum* (jungle rice), *Ludwigia actovalvis* (willow primrose) etc.

255. **Fauna.** *Labeo rohita* (Rohu)*, Catla catla* (Catla)*, Cirrhinus marigala* (Mrigal carp)*, Cirrhinus reva* (Reba carp)*, Puntius sarona, Puntius ticto* (Ticto barb, Firefin barb) *Nandus nandus* (Gangetic leaffish)*, Mystus tengara* (Tengara)*, Heteropneustes fossilis* (Catfish)*, Clarias batrachus* (Walking Catfish) *, Colisa fasciatus , Notopterus notopterus (*Bronze featherback)*, Osteobrama cotio* (Keti) *etc.*

3. Ramsar Convention Site

256. The stretch of the river Ganga from Brijghat to Narora as shown in **Fig. 95** is situated in the state of Uttar Pradesh. This stretch is shallow with intermittent deep-water pools but with significantly religious importance. It is the only Ramsar site falling in River/Streamwetland type in India. It was declared as Ramsar site on 08/11/2005. This stretch of river provides habitat for IUCN Red listed Ganges River Dolphin (*Platanista gangetica*), Gharial, Crocodile, 6 species of turtles, otters, 82 species of fish and more than hundred species of birds. Major plant species, some of which have high medicinal values, include *Dalbergia sissoo*, *Saraca indica*, *Eucalyptus globulus, Ficus bengalensis, Dendrocalamus strictus, Tectona grandis, Azadirachta indica* and aquatic *Eichhorina*.

Fig.95: A view of Upper Ganga River - Brijghat to Narora Stretch (Ramsar site no. 1574)

257. The Bulandshahar- Anoopshahar- (MDR 58W) road is outside the wetland boundary of Ramsar site and the nearest point is junction of Anoopshahar at km 39.700 which is 900m away from the wetland boundary as shown in **Fig.96**.The intervening land-use between the project road to the nearest point of River Ganga is a dense settlement of Anoopshahar hence negligible impact is anticipated for which necessary mitigation measures have been suggested.This river stretch has high Hindu religious importance for thousands of pilgrims and is used for cremation

and holy baths for spiritual purification. Major threats are sewage discharge, agricultural runoff, and intensive fishing because of which dolphins are not reported at this point as confirmed by forest department and local people

Fig. 96: Nearest distance of the project road from Wetland Boundary

D. Socio-Cultural Environment

1. Demographic profile

258. Uttar Pradesh is India`s most populous state with a geographical area of 2,40,928 Square km and a density of 828 persons/sq.km . As per 2011 census, total population is 199,581,477 of which males and females are 10,45,96,415 and 94,985,062 respectively.Literacy rate is 69.72 percent out of which male literacy stands at 79.24 percent while female literacy is at 59.26 percent.Sex Ratio is 828 for every 1000 male.The district profile along the project roads are given in **Table III-7.**

Table III-7: District Profile along the Project roads

Sl. No	District	Geographical Area(Sq.km.)	Density (Persons/ sq.km)	Total Population	Literacy Rate (%)	Sex Ratio
1.	**Nanau to Dadau (MDR 82W)**					
	Aligarh	3650	1,007	3,673,849	69.61	876
2.	**Muzaffarnagar to Baraut (MDR 135W)**					
a.	Muzaffarnagar	3008	960	2,827,154	70.11	886
b.	Baghpat	1321	986	1,302,156	73.54	858
3.	**Bulandshahar to Anoopshahar (MDR 58W)**					
	Bulandshahar	3719	940	3,498,507	76.23	892
4.	**Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)**					

Sl. No	District	Geographical Area(Sq.km.)	Density (Persons/ sq.km)	Total Population	Literacy Rate (%)	Sex Ratio
	Fatehpur	4152	640	2,675,384	68.78	900
5.	**Haliyapur to Kurebhar (MDR 66E)**					
	Sultanpur	4436	855	3,790,922	71.14	978
6.	**Kaptanganj-Hata-Gauri Bazar (MDR 25E) & Kaptanganj-Naurangia (ODR 24)**					
a.	Deoria	2535	1220	3,098,637	73.53	1013
b.	Kushinagar	2906	1,226	3,560,830	67.66	955
7.	**Mohanlalganj to Maurawan Unnao Marg (MDR 52C)**					
a.	Lucknow	2528	1,816	4,589,838	77.29	917
b.	Unnao	4589	682	3,110,595	68.29	901
8.	**Aliganj-Soron Marg (MDR 45W)**					
a.	Etah	4446	717	1,761,152	73.27	863
b.	Kanshiram Nagar	1993	736	1,438,156	62.3	879

Source: Census of India 2011

2. Archaeological/Religious/Educational structures

259. There are no Archeological sites / monuments present within 300 m from the project roads. However, recently a structure found while excavation in a village near Afoi village at km 47.00 along Hussainagnj to Alipur Marg has been notified as a protected monument under the Ancient Monuments and Archaeological Sites and Remains Act, 1958. This structure is at 1 km distance from the road and so no permission is required from the Archeological Survey of India.

260. In terms of religious structures there are temples, mosques, majars etc. present along the project roads as given in **Table III-8**and few photos of them shown in **Fig. 97.**

261. There are educational institutions present along the road which are as given in **Table III-8** and few photos shown in **Fig. 98.**

262. A detailed list of religious structures, educational institution and medical facilities present along all the project roads is given in **Appendix 26.**

Table III-8: Religious/Educational/Medical structures present along the Project Roads

Sl. No.	Structures	Nanau-Dadau (MDR 82W)	Bulandanshahar -Anupshahar (MDR 58W)	Muzzaffarnagar-Baraut (MDR 135W)	Hussainganj-Alipur Marg (MDR 81C)	Haliyapur-Kurebhar-Bilwai (MDR 66E)	Kaptanganj-Naurangia (ODR 24)	Kaptanganj-Rudrapur (MDR 25E)	Mohanlaganj-Maurawan Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
I.	**Religious Structures**									
1.	Temple	12	53	22	29	67	11	27	64	15
2.	Arti Sthal	-	-	-	-	-	-	-	-	1
3.	Samadhi	-	1	7	-	2	-	-	-	-
4.	Ashram	-	-	2	-	1	-	-	-	1
5.	Mosque	5	-	5	5	5	-	1	3	8
6.	Majar	2	1	-	3	9	-	-	3	1
7.	Dargah								1	-
8.	Peer	-	-	2	-	-	-	-	-	-
9.	Idgah	-	-	-	1	-	1	1	-	1
10.	Imam Bada	-	-	-	1	-	-	-	-	-
11.	Karbala	-	-	-	-	-	1	-	-	-
12.	Kabristan	-	-	1	-	2	-	-	-	-
	Sub-Total	19	55	39	39	86	13	29	71	27
II.	**Educational Institutions**									
13.	School	16	14	18	32	69	17	63	24	10
14.	College	5	9	14	12	8	2	9	3	4
15.	Madarsa	-	-	1	-	-		1	1	-
16.	Hostel	-	-	-	-	-	-	-	1	-
	Sub-Total	21	23	33	44	77	19	73	29	14
III	**Medical Facilities**	3	3	12	6	7	1	11	12	3
	TOTAL	**43**	**81**	**84**	**89**	**170**	**33**	**113**	**112**	**44**

Source: DPR Consultant

Temple along Kaptanganj-Rudrapur

Temple along Mohanlalganj-Unnao

Majar along Mohanlalganj-Unnao

Mosque along Aliganj-Soron

Fig. 97: Religious Structures along Project Roads

School along Kaptanganj-Naurangia

School along Mohanlalganj-Unnao

College along Nanau-Dadau

School along Haliyapur-Kudebhar-Bilwai

Fig. 98: Educational Institutions along Project Roads

3. Socio-economic Profile of Affected Persons (APs)

263. The socio-economic information of APs has been collected from the census survey and the key findings as presented in this section.

a. Social Category of APs

264. As per the census survey of all the eight project roads, 976 households are affected, the social stratification of which is like, 617 households (63.21%) are from other backward caste (OBC), 288 households (29.15%) are from general category. The others (6.66%) are from scheduled caste (SC) and rest 0.51% of households did not respond when enumerated during

the census survey. The detail of social grouping in the each project roads is presented in **Table III-9**. All the affected households are of Hindu and Muslim religion.

TableIII-9: SocialCategories ofthe APs along the Project Roads

S. No.	Road Name	Social Stratification								No. of Households
		General		SC		OBC		NA		
		No. of HH	%	No. of HH	%	No. of HH	%	No of HH	%	
1	Nanau to Dadau (MDR 82 W)	85	48.02	5	2.82	82	46.33	5	2.82	177
2	Bulandshar to Anoopshar (MDR 58W)	No Affected Persons								
3	Muzaffar Nagar to Baraut (MDR 135W)	-	-	3	9.38	29	90.62	-	-	32
4	Haliyapur – Kurebhar-Bilwai (MDR 66E)	37	21.76	19	11.18	113	66.47	-	-	170
5	Hussainganj-Alipur Marg (MDR 81 C)	25	19.23	10	7.69	95	73.08	-	-	130
6A	Naurangia – Kaptanganj (ODR 24)	10	33.33	5	16.67	15	50	-	-	30
6B	Kaptanganj – Rudrapur (MDR 25E)	33	44	4	5.33	38	50.67	-	-	75
7	Mohanlalganj-Maurawan (MDR 52C)	10	30.30	4	12.12	19	57.58	-	-	33
8	Aliganj-Soron Marg (MDR 45W)	88	26.75	15	4.56	226	68.69	-	-	329
	TOTAL	**288**	**29.5**	**65**	**6.66**	**617**	**63.21**	**5**	**0.51**	**976**

Source: Social Impact Assessment & Resettlement Plan

b. Number of APs

265. 7103 APs in total are being affected by the project roads which includes 3848 (54.17%) males and 3255 (45.83%) females. The details of APs being affected in the project roads along with average household size and sex ratio among APs are summarized in **Table III-10**.

TableIII-10: NumberofAPs along the Project Roads

Sl. No.	Road Name	Categories of Affected Persons				Total No. of APs	Avg. Household Size	Sex Ratio
		Male	%	Female	%			
1.	Nanau to Dadau (MDR 82 W)	705	52.69	632	47.23	1337	7.6	896
2.	Bulandshar to Anoopshar (MDR 58W)	No Affected Persons						
3.	Muzaffar Nagar	114	53.52	99	46.48	213	6.7	879

	to Baraut (MDR 135W)							
4.	Haliyapur – Kurebhar-Bilwai (MDR 66E)	625	52.88	557	47.12	1182	6.95	891
5.	Hussainganj-Alipur Marg (MDR 81 C)	388	53.37	339	46.63	727	5.3	873
6A.	Naurangia – Kaptanganj (ODR 24)	105	51.47	99	48.53	204	8.74	863
6B.	Kaptanganj – Rudrapur (MDR 25E)	388	54.34	326	45.66	714		
7.	Mohanlalganj-Maurawan (MDR 52C)	115	51.57	108	48.43	223	6.7	939
8.	Aliganj-Soron Marg (MDR 45W)	1408	56.25	1095	43.75	2503	7.6	778
	TOTAL	**3848**	**54.17**	**3255**	**45.83**	**7103**	**-**	**-**

Source: Social Impact Assessment & Resettlement Plan

c. Annual Income Level of the Affected Households

266. The census data revealed that 104 affected households (10.65%) of project roads are below poverty level. In Nanau-Dadau road and Muzaffarnagar-Baraut road, all the affected households are above poverty level. The State of Uttar Pradesh defines BPL category as INR 39,312 a year (INR.126/day and minimum of 26 days in a month: 126*26*12=39312). Most households (33.91%) earn between Rs.39312 to below 50000 annually. The average income level of affected households along the project roads is summarized in **Table III-11**.

TableIII-11: AnnualIncomeLevelofthe Affected Households along the Project Roads

S. No.	Road Name	Annual Income Categories (Rs.)										No. of House holds
		Below Poverty Line (Up to 39312)		Above 39312 and Below 50000		Above 50000 and up to 100000		Above 100000		NA		
		No. of HH	%	No. of HH	%	No. of HH	%	No. of HH	%	No of HH	%	
1	Nanau to Dadau (MDR 82 W)	0	0	102	57.63	39	22.03	32	18.08	4	2.26	177
2	Bulandshar to Anoopshar (MDR 58W)	No Affected Households										
3	Muzaffar Nagar to Baraut (MDR 135W)	0	0	13	40.63	8	25	11	34.38	-	-	32
4	Haliyapur – Kurebhar-Bilwai (MDR 66E)	5	2.94	47	27.65	21	12.35	89	52.35	-	-	170
5	Hussainganj-Alipur Marg (MDR 81 C)	7	5.38	86	66.15	26	20	11	8.46	-	-	130
6A	Naurangia – Kaptanganj (ODR	4	13.33	10	33.33	15	50.00	1	3.33	-	-	30

S. No.	Road Name	Annual Income Categories (Rs.)										No. of House holds
		Below Poverty Line (Up to 39312)		Above 39312 and Below 50000		Above 50000 and up to 100000		Above 100000		NA		
		No. of HH	%	No. of HH	%	No. of HH	%	No. of HH	%	No of HH	%	
	24)											
6B	Kaptanganj – Rudrapur (MDR 25E)	21	28.00	13	17.33	28	37.33	13	17.33	-	-	75
7	Mohanlalganj-Maurawan (MDR 52C)	9	27.27	7	21.21	7	21.21	10	30.30	-	-	33
8	Aliganj-Soron Marg (MDR 45W)	58	17.63	53	16.11	148	44.98	70	21.28	-	-	329
	TOTAL	**104**	**10.65**	**331**	**33.91**	**292**	**29.91**	**237**	**24.28**	**4**	**-**	**976**

Source: Social Impact Assessment & Resettlement Plan

267. The households along the road use cow dung cakes and use them to generate fuel for cooking etc. which was a common observation along the roads during site survey as shown in **Fig.99.**

Along Muzaffarnagar-Baraut Road

Along Bulandshahar-Anoopshahar Road

Fig. 99: Use of Cow dung cakes by Households along Project Roads

d. Vulnerable Affected Households

268. Vulnerable Households are defined as affected families who are: (i) below the poverty level as defined as Rs. 39312 annual family income by the state of Uttar Pradesh; (ii) headed by women and below the average income of affected households; (iii) headed by disabled or elderly and below the average income of affected households; (iv) scheduled tribes and marginalized scheduled castes.

269. In all the project roads, 65 scheduled caste (SC) households, 13 women headed households (WHHs), 1 physically handicapped (PH), 102 BPL households and 14 aged persons have been identified to be affected by the project. They will be treated as vulnerable households and special assistance will be provided as per the provisions of this RP.

TableIII-12: Vulnerable CategoriesofAffected Households along the Project Roads

Sl. No.	Vulnerable Categories	Nanau-Dadau (MDR 82W)	Bulandanshahar-Anupshahar (MDR 58W)	Muzzaffarnagar-Baraut (MDR 135W)	Haliyapur-Kurebhar-Bilwai (MDR 66E)	Hussainganj-Alipur Marg (MDR 81C)	Kaptanganj-Naurangia (ODR 24)	Kaptanganj-Rudrapur (MDR 25E)	Mohanlaganj-Maurawan Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
1.	SC Households	5	No Affected Households	3	20	10	5	3	4	15
2.	WHH Households	2		0	0	0	0	2	2	7
3.	Physically Handicapped (PH)	1		0	0	0	0	0	0	0
4.	Aged Person (Above 65 age)	2		0	0	12	0	0	0	0
5.	BPL Households	0		0	5	7	4	21	7	58
Vulnerable		**10**		**3**	**25**	**29**	**9**	**26**	**13**	**80**
Non-Vulnerable		**167**		**29**	**145**	**101**	**21**	**49**	**20**	**249**
Total Affected Households		**177**		**32**	**170**	**130**	**30**	**75**	**33**	**329**

Source: Social Impact Assessment & Resettlement Plan

e. Educational Status of APs

270. In all the project roads, a significant percentage of the affected persons (25.20%) are illiterate. 18.95 % APs are Matric (10th standard) and a limited percentage (10.24%) are graduate and above. The detail of each road is given in **Table III-13**.

TableIII-13: Educational Status ofAPs along the Project Roads

Sl. No.	Educational Category	Nanau-Dadau (MDR 82W)	Bulandanshahar-Anupshahar (MDR 58W)	Muzzaffarnagar-Baraut (MDR 135W)	Haliyapur-Kurebhar-Bilwai (MDR 66E)	Hussainganj-Alipur Marg (MDR 81C)	Kaptanganj-Naurangia (ODR 24)	Kaptanganj-Rudrapur (MDR 25E)	Mohanlaganj-Maurawan Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
1.	Illiterate	35	No Affected Households	12	61	27	18	17	9	67
2.	Primary	-		2	32	15	-	-	-	-
3.	Up to middle (7th standard)	39		4	21	44	9	4	3	55
4.	Below Matric (Below 10th standard)	36		4	-	3	2	23	4	80

Sl. No.	Educational Category	Nanau-Dadau (MDR 82W)	Bulandanshahar-Anupshahar (MDR 58W)	Muzzaffarnagar-Baraut (MDR 135W)	Haliyapur-Kurebhar-Bilwai (MDR 66E)	Hussainganj-Alipur Marg (MDR 81C)	Kaptanganj-Naurangia (ODR 24)	Kaptanganj-Rudrapur (MDR 25E)	Mohanlaganj-Maurawan Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
5.	Matric (10th standard)	33		7	33	20	1	15	1	75
6.	Intermediate	-		-	-	-	0	10	0	32
7.	Graduate and above	28		3	22	21	0	6	0	20
8.	NA	6		-	1	-	-	-	-	-
Total Affected Households		**177**		**32**	**170**	**130**	**30**	**75**	**33**	**329**

Source: Social Impact Assessment & Resettlement Plan

f. Occupational Status of APs

271. The finding of census survey in all the project roads revealed that out of 976 affected households (AHs), 87 (8.91%) APs are working as laborer. It is understood from the occupational pattern of households (excluding the non-working sections such as children and students and household workers) that 69.67% APs are doing businesses as their main occupation, 14.24% are engaged in agriculture work, 3.28% are employed in service sector while others are working as self-employed, professional and rural artisan. The details of occupational status of AHs are summarized in **Table III-14**.

Table III-14: Occupational Status of APs along Project Roads

Sl. No.	Educational Category	Nanau-Dadau (MDR 82W)	Bulandanshahar-Anupshahar (MDR 58W)	Muzzaffarnagar-Baraut (MDR 135W)	Haliyapur-Kurebhar-Bilwai (MDR 66E)	Hussainganj-Alipur Marg (MDR 81C)	Kaptanganj-Naurangia (ODR 24)	Kaptanganj-Rudrapur (MDR 25E)	Mohanlaganj-Maurawan Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
1.	Labor	6	No Affected Households	16	14	5	7	9	0	30
2.	Business	140		9	112	83	9	35	29	263
3.	Agriculture	13		5	40	28	14	15	2	22
4.	Service	3		2	3	1	0	8	2	13
5.	Professional	1		0	0	1	0	1	0	1
6.	Self Employed	2		0	0	2	0	3	0	0
7.	Rural Artisan	2		0	0	0	0	0	0	0
8.	Unemployed	0		0	1	10	0	4	0	0
9.	NA	10		0	0	0	0	0	0	0
Total Affected Households		**177**		**32**	**170**	**130**	**30**	**75**	**33**	**329**

Source: Social Impact Assessment & Resettlement Plan

E. Summary of Baseline Environment

272. A summary of bio-physical and socio-economic aspects along all the project roads is provided in **Table III-15.**

Table III-15: Baseline Environment along the Project Roads

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
I	**PHYSICAL ENVIRONMENT**								
1	District Location	Aligarh	- Muzaffarnagar - Baghpat	Bulandshahar	Fatehpur	Sultanpur	- Deoria - Kushinagar	- Lucknow - Unnao	- Etah - Kanshiram Nagar
2	Physiography	Part of Gangetic Plain Physiographic Division falling under the category of Alluvial plain terrain							
3	Topography	- Elevation is 182m amsl - Slope is <10m per km	- Elevation is 240m amsl - Slope is <10m per km	- Elevation is 195m amsl - Slope is <10m per km	- Elevation is 110m amsl - Slope is <10m per km	- Elevation is 95m amsl - Slope is <10m per km	- Elevation is 80 amsl - Slope is <10m per km	- Elevation is 98m amsl - Slope is <10m per km	- Elevation is 178m amsl - Slope is <10m per km
4	Geology	Alluvial sediments overlying Vindhyan group of rocks	Quaternary alluvium of Pleistocene age	Recent alluvium deposits of Holocene age and older alluvial plain of Pleistocene age	Sub-Recent to Recent rocks of the Gangetic alluvium	Quaternary Alluvium	Quaternary Alluvium deposits of Holocene & Pleistocene age	Quaternary Alluvium deposits of Holocene & Pleistocene age	Quaternary alluvium of Pliestocene and Holocene age
5	Seismicity	Moderate damage risk Zone III (MSK VII)	High damage risk Zone IV (MSK VIII)	High damage risk Zone IV (MSK VIII)	Low damage risk Zone II (MSK VI)	Moderate damage risk Zone III (MSK VII)	High damage risk Zone IV (MSK VIII)	Moderate damage risk Zone III (MSK VII)	Moderate damage risk Zone III (MSK VII)
6	Soil Type	Coarse loamy older alluvium, fine loamy and moderately saline calcareous alluvial soil	Coarse loamy well drained older alluvium (alfisols)	- Coarse loamy well drained older alluvium (alfisols)	Alfisols and excessively drained sandy younger alluvial soil (Entisols)	well drained fine loamy older alluvial soil categorized as Alfisols	silty, fine, non-calcareous soil along with alfisols	well drained fine loamy	well drained rich alluvium soil (Alfisols & Inceptisols)
7	Soil Quality Monitoring	at 1 location which shows medium soil fertility	at 2 locations which depicts high fertility potential	at 2 locations, shows medium fertility	at 2 locations, results show average fertility of the soil	at 3 locations which present good fertility potential of the soil in the area	at 2 places which shows fertile soil in the area	at 3 places which shows fertile soil	at 3 placeswhich states good fertility potential of the soil.

S.No	Baseline Feature		Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)		Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
8	Landuse		Predominant landuse is agricultural land (83%) followed by built –up, vegetation etc.	Predominant landuse is agricultural land (80%) followed by built –up, plantation etc.	Predominant landuse is agricultural land with 86% coverage followed by built up area, vegetation etc.	Dominated by agricultural land (88%) followed by settlements, water bodies etc.	Predominantly agricultural landuse (89%) followed by built-up, water bodies etc.	Predominantly agricultural landuse (88-90%)		Predominantly agricultural landuse (89%) followed by settlements, water bodies etc.	Predominantly agricultural landuse (82%) followed by settlements, plantation etc.
9	Drainage		- Yamuna and Ganga sub Basin -drained by tributaries of Yamuna (river Karwan, Sirsa and Sengar) and Ganga river (Rind, Isan, Nin and Kali Nadi).	- Yamuna sub basin - Major rivers are Hindon and Krishna	- Ganga basin - drained by small rivulets emerging from kali nadi	- border of Yamuna and Ganga sub basin - Major river is Ganga flowing parallel to the road	- Gomti sub basin and Ganga basin - drained by Gomti and Ghaghra, tributaries of Ganga	- Ghaghra-Gandak sub basin - drained by Gandak and Rapti rivers, tributaries to Ghaghra river		- Sai sub basin of Ganga basin - drainage of the area is controlled by river Ganga, Sai and its tributaries	- Kali sub-basin of Ganga basin - drained byGanga and its tributaries namely Kali, Isan, Burhi Ganga Arind and Bargash
10	Cross Drainage structures	Major Bridges	1 No	Nil	Nil	Nil	Nil	ODR 24 1 No	MDR 25E 1 No	Nil	Nil
		Minor Bridges	6 Nos	4 Nos	8 Nos	2 Nos	12 Nos	1 No	1 No	9 Nos	Nil

S.No	Baseline Feature		Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)		Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
		Culverts	56 Nos	89 Nos, (51 pipe culverts, 34 slab culverts, 4 & Arch culvert)	44 Nos, (14 pipe culverts, 21 Arches & 9 slab culverts)	110 Nos, (77 pipe culverts, 29 slab culverts & 5 Arch culverts)	196 Nos, (92 pipe culvert, 100 slab culverts and 4 Arch culverts)	36 Nos, (17 pipe culverts, 18 culverts & 1 arch culvert)	80 Nos (27 pipe culverts, 33 slab culvert & 20 arch culvert)	109 Nos, (48 pipe culverts, 30 slab culverts and 31 Arch culverts)	84 Nos, (64 pipe culverts, 17 slab culverts and 3 Arch culverts)
11	Surface Water Resources[11]		- 5 ponds, 8 canals, 1 nallah, 53 minor streams and kali river at km 6.910 present along the project road.	- 6 ponds, 11 canals, 82 small water channels, Hindon crosses at km 30.110 and Krishna at km. 51.650	- 2 ponds, 15 canals & 2 nallahs crosses the project road	- 26 ponds, 4 nallahs, 3 canals and 105 small water channels	- 18 ponds, 22 canals & 6 nallahs crossing the alignment	**ODR 24** 5 ponds, 6 canals and Choti Gandak crosses at km 0.200 **MDR 25E** 8 ponds, 12 canals and Mawan nallah crosses at km 3.200		-26 ponds, 14 canals, 2 nallahs & Sai River at km 13.100 along the alignment -Baknai Badaila Jheel found along km 46.900 to km 47.500	- 3 canals crosses the project road at km 39.550, km 47.450 and km 50.450

[11] *Within 25 m from centerline of the project road*

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
12	Surface water Quality	- 1 pond sample monitored - conforms to Class C criteria	- 2 pond samples monitored - both do not conform to Class C standards w.r.t BOD and Total coliforms - but can be used for WL propagation & fisheries (DO-4mg/l or more) and irrigation use	-1 Canal sample monitored - conforms to Class C standards	- 1 Ganga canal sample monitored - conforms to Class B standards (for bathing) - also can be used as a drinking water source after conventional treatment and disinfection	- 2 pond samples monitored - conforms to Class C standards (drinking water source after conventional treatment and disinfection).	- 2 samples monitored, one from river and the other from pond, - conforms to Class C standards	- 2 pond samples monitored - conforms to Class C standards w.r.t pH, DO & Total Coliform except BOD	- 2 pond samples monitored - conforms to Class C standards w.r.t pH, DO & Total Coliform except BOD
13	Ground Water Resources[12]	- 2 abandoned wells & 102 hand pumps present along the road	- 128 hand pumps along the road	- 122 hand pumps along the road	- 13 borewells, 226 hand pumps, 2 municipal taps and 23 wells along the road	- 452 hand pumps and 15 wells along the road	**ODR 24** - 205 hand pumps, 1 well and 1 Pump set **MDR 25E** - 297 hand pumps and 5 taps	- 147 hand pumps and 6 wells	- 143 hand pumps along the road
14	Ground water level	- 2 to 21 mbgl (Pre-monsoon) - 1.9 to 17 mbgl (Post-monsoon)	- 3.20 to 9.95mbgl (Pre-monsoon) - 2.5 to 7.95 mbgl (Post-monsoon)	- 3.35 to 14.40 mbgl (Pre-monsoon) - 2.00 to 13.35 mbgl (Post-monsoon)	- 2.20 to 27.13 mbgl (Pre-monsoon) - 2.08 to 27.13 mbgl (Post-monsoon)	- 2.97 to 14.58 mbgl (Pre-monsoon) - 0.98 to 12.12 mbgl (Post-monsoon)	- 2.8 to 4.5 mbgl (Pre-monsoon) - 1.15 to 3.27 mbgl (Post-monsoon)	- 1.10 to 15.65 mbgl (Pre-monsoon) - 0.70 to 14.80 mbgl (Post-monsoon)	- 8.00 to 12.00 mbgl (Pre-monsoon) - 3.00 to 9.00 mbgl (Post-monsoon)
15	Stage of GW development	82.2% i.e. Safe	82% i.e Semi-critical	71.81% i.e. Semi-critical	67.33% i.e. Safe	72% i.e. Safe	44% i.e. Safe	81.21% i.e Semi- critical	76% i.e Semi-critical

[12] *Within 25 m from centerline of the project road*

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
16	Ground Water Quality	- 3 handpump samples analysed - conform to drinking water standards of IS:10500 (2012)	- 3 handpump samples monitored - conform to drinking water standards of IS:10500 (2012)	- 2 samples from hand pumps collected - conforms to drinking water standards of IS:10500	- 2 samples from hand pumps analysed - conforms to drinking water standards of IS:10500 (2012)	- 3 samples from hand pumps monitored - conforms to drinking water standards of IS:10500 (2012)	- 2 samples from hand pumps assessed - conforms to drinking water standards of IS:10500 (2012)except Iron (3.82 mg/l) which exceeds the limit at Rudrapur sample	- 4 hand pump samples monitored - conforms to drinking water standards of IS:10500 (2012)except Iron in Mangat Khera which is 0.34 mg/l against 0.30 mg/l.	- 2 handpump samples monitored - conforms to drinking water standards of IS:10500 (2012)
17	Climate	Tropical monsoon sub humid type of climate							
18	Rainfall[13]	549.8 mm	557– 663 mm	600 mm	681 mm	1007 mm	721-1203 mm	634 mm	512 - 721 mm
19	Temperature	Annual mean minimum and maximum temperature are 18.9°C and 31.2°C (nearest IMD station at New Delhi)			Annual mean minimum and maximum temperature are 18.3°C and 32°C (nearest IMD station at Lucknow)		Annual mean temperature varies from 19.2^0C to 32.0^0C (nearest IMD station at Gorakhpur)	Annual mean minimum and maximum temperature are 18.3°C and 32°C (nearest IMD station at Lucknow)	Annual mean minimum and maximum temperature are 18.9°C and 31.2°C (nearest IMD station at New Delhi)

[13] *Annual Average Rainfall of 5 years (2009-2013)-IMD*

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
20	Wind	Annual mean wind speed is 9.5 km/hr. Mean monthly maximum and minimum wind speed is 13.7 km/hr and 6.1 km/hr respectively			Annual mean wind speed is 8 km/hr. Mean monthly maximum and minimum wind speed is 11.7 km/hr and 4 km/hr respectively		Annual mean wind speed is 4.1 km/hr. Mean monthly maximum and minimum wind speed is 6.7 km/hr and 1.7 km/hr respectively	Annual mean wind speed is 8 km/hr. Mean monthly maximum and minimum wind speed is 11.7 km/hr and 4 km/hr respectively	Annual mean wind speed is 9.5 km/hr. Mean monthly maximum and minimum wind speed is 13.7 km/hr and 6.1 km/hr respectively
21	Relative Humidity	Annual mean relative humidity in the morning is 63% and 42% in the evening Mean monthly relative humidity in the morning varies from 80% to 37 % whereas in the evening from 20% to 68%			Annual mean relative humidity in the morning is 68% and 50% in the evening Mean monthly maximum relative humidity in the morning varies from 86% to 36% whereas in the evening from 20% to 77%		Mean monthly maximum relative humidity in the morning varies from 84% to 43% whereas in the evening from 25% to 77%	Annual mean relative humidity in the morning is 68% and 50% in the evening	Annual mean relative humidity in the morning is 63% and 42% in the evening
22	Air Environment								
a.	Pollution Sources	- dust from broken pavement /kuchha road - emissions from brick kilns - 13 brick kilns (200m CL)	- 27 brick kilns (200m CL) - 15 small scale sugarcane factories within 60 m - 2 Industries within 35 of CL	- 7 brick kilns - 1 kolu	- vehicular traffic - dusty roads - 4 brick kilns within 100 m CL	- vehicular traffic - brick kilns - kolu (jaggery factory)	- vehicular traffic - dusty roads - 1 Rice Mill in MDR 25E	- vehicular traffic - 6 brick kilns within 100 m CL -One Small Oil Extractor & Flour Mill and one Pipe Industry	- 16 brick kilns within 200m of CL - vehicular traffic - dust from broken pavement

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
b.	Air quality	- 2 locations - $PM_{2.5}$ (28.3-39.2 $\mu g/m^3$) - PM_{10} (62.5-75.4 $\mu g/m^3$) - NOx (15.8-20.8 $\mu g/m^3$) - SO_2 (11.7-13.2 $\mu g/m^3$) - CO (1.03-1.28 mg/m^3) - conform to NAAQS, 2009	- 3 locations - $PM_{2.5}$ (20.1-32.4 $\mu g/m^3$) - PM_{10} (51.6-65.2 $\mu g/m^3$) - NOx (15.3-21.5 $\mu g/m^3$) - SO_2 (9.7-13.1 $\mu g/m^3$) - CO (1.08-1.31 mg/m^3) - conform to NAAQS, 2009	- 2 locations - $PM_{2.5}$ (30.3-46.4 $\mu g/m^3$) - PM_{10} (62.5-83.8 $\mu g/m^3$) - NOx (22.4-24.6 $\mu g/m^3$) - SO_2 (14.1-16.3 $\mu g/m^3$) - CO (1.40-1.62 mg/m^3) - conform to NAAQS, 2009	- 3 locations - $PM_{2.5}$ (52.0-90.0 $\mu g/m^3$) - PM_{10} (80.6-120.0 $\mu g/m^3$) - NOx (33.0-40.2 $\mu g/m^3$) - SO_2 (11.6-12.3 $\mu g/m^3$) - CO (0.73-1.54 mg/m^3) - PM_{10}& $PM_{2.5}$ at 2 locations above permissible limit.	- 5 locations - $PM_{2.5}$ (63.0-90.0 $\mu g/m^3$) - PM_{10} (98.0-131.0 $\mu g/m^3$) - NOx (33.0-40.2 $\mu g/m^3$) - SO_2 (37.0-39.4 $\mu g/m^3$) - CO (1.00-1.50 mg/m^3) - $PM_{2.5}$ value at all stations and PM_{10} value at one location exceeds the prescribed norms	- 4 locations - $PM_{2.5}$ (58.2-65.6 $\mu g/m^3$) - PM_{10} (94.3-120.0 $\mu g/m^3$) - NOx (34.9-40.2 $\mu g/m^3$) - SO_2 (12.0-13.0 $\mu g/m^3$) - CO (0.8-1.30 mg/m^3) - PM_{10}exceeds in 2 stations whereas $PM_{2.5}$ exceeds in three locations.	- 4 locations - $PM_{2.5}$ (47-49.58 $\mu g/m^3$) - PM_{10} (76.5-81.0 $\mu g/m^3$) - NOx (18.14-19.61 $\mu g/m^3$) - SO_2 (12.24-13.16 $\mu g/m^3$) - CO (0.75-0.83 mg/m^3) - conform to NAAQS, 2009	- 3 locations - $PM_{2.5}$ (47.08-48.44 $\mu g/m^3$) - PM_{10} (79.14-81.09 $\mu g/m^3$) - NOx (18.11-20.28 $\mu g/m^3$) - SO_2 (12.06-13.08 $\mu g/m^3$) - CO (0.81-0.84 mg/m^3) - conform to NAAQS, 2009
23	Noise Quality	- 3 stations - L_{eq} day (55.4-59.4) - L_{eq} night (36.8-38.7) - day time noise exceeds but night time noise within prescribed limit	- 4 stations - L_{eq} day (52.3-59.5) - L_{eq} night (36.5-38.8) - day time noise exceeds but night time noise within prescribed limit	- 2 stations - L_{eq} day (57.7-59.5) - L_{eq} night (36.9-38.7) - noise level during day and night time within prescribed limit	- 4 stations - L_{eq} day (68.9-77.3) - L_{eq} night (46.9-64.0) - Noise levels exceed both day and night limits at all the locations.	- 5 stations - L_{eq} day (55.3-78.6) - L_{eq} night (44.6-55.3) - Noise level during day exceeds at all locations whereas during night it exceeds at 3 locations.	- 4 stations - L_{eq} day (52.4-65.3 dBA) - L_{eq} night (42.6-62.7 dBA) - Day time and night time noise levels exceed the prescribed limit at 2 locations.	- 4 stations - L_{eq} day (47.5-52.4 dBA) - L_{eq} night (35.6-43.6 dBA) - noise level during day and night time within prescribed limit	4 stations - L_{eq} day (46.5-63.4 dBA) - L_{eq} night (34.8-48.2 dBA) - noise level during day and night time within prescribed limit
II	**BIOLOGICAL ENVIRONMENT**								
24	Forest type	Dry Temperate type of forest							

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)		Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
25	Protected Forest	Entire length notified as PF vide Order No. 155 / XIV-331-50 dated 10.02.1960	notified protected forest from chainage km 9.000 to km 31.000 vide Order No. 155 / XIV-331-50 dated 10.02.1960	project road is not a notified protected forest	RoW from Bahera Chowk at km 33.375 to Alipur Jita at km 48.675 is notified as protected forest vide Notification No. 3278/14-2-43/86 dated 7th August, 1986	project road is not a notified protected forest.	The project road is not a notified protected forest. But SH-1 crosses MDR 25E near Hata which is a notified PF		about first 0.800 Km of the Project Road section (Mohanlalganj-Bani Road-NH24A; falling in Lucknow District) is notified as Protected Forest	project road is not a notified protected forest.
26	Protected Area	No Notified Protected Area like National Park/Sanctuary/ Biosphere Reserve etc. (covered under Wildlife Act, 1972) is located within 15 km aerial distance from the project road							Nawabganj Bird Sanctuary located within 15 km aerial distance	No PA within 15 Km
27	Predominant Flora	- Arjun, Babool, Neem, Shisam, Peepal, Mango, Bargad etc. - Mango, guava orchards also present	- Khair, Sheesham, Kanju, Arru, Babool etc. - Mango, guava and pomegranate orchards are common	- Jamun, Ashok, Neem, Arjun, Babool, Shisam, Mango, Bargad etc.	- Jamun, Neem, Babool, Shisam, Mango, Bargad, Pipal and Eucalyptus	- dhak, shisham, neem, babool, gooler, mahua, mango, kachnar, amaltas, jamun, sagaun and Arjun - Orchards of Mango, guavas etc. are common	- Ghutail, Arjun, Jamun, Shisham, Kanji, Baikain, Aam, Mahua, Sagwan, Babool, Peepal, Bargad, Semal and Bamboo		- Shisham, dhak, babul, neem, peepal, ashok, khajur, mango and gular trees	- Arjun, Babool, Neem, Shisam, Peepal, Mango, Bargad, Kanji, Ashok, Sirsa, Guler, Jamun, Ber, Poplar, Eucalyptus, Mahua and Bel
28	Trees[14]	4697	10136	4277	2744	10526	ODR 24 5005	MDR 25E 8278	8313	9012

[14] *Within 15 m from Center line*

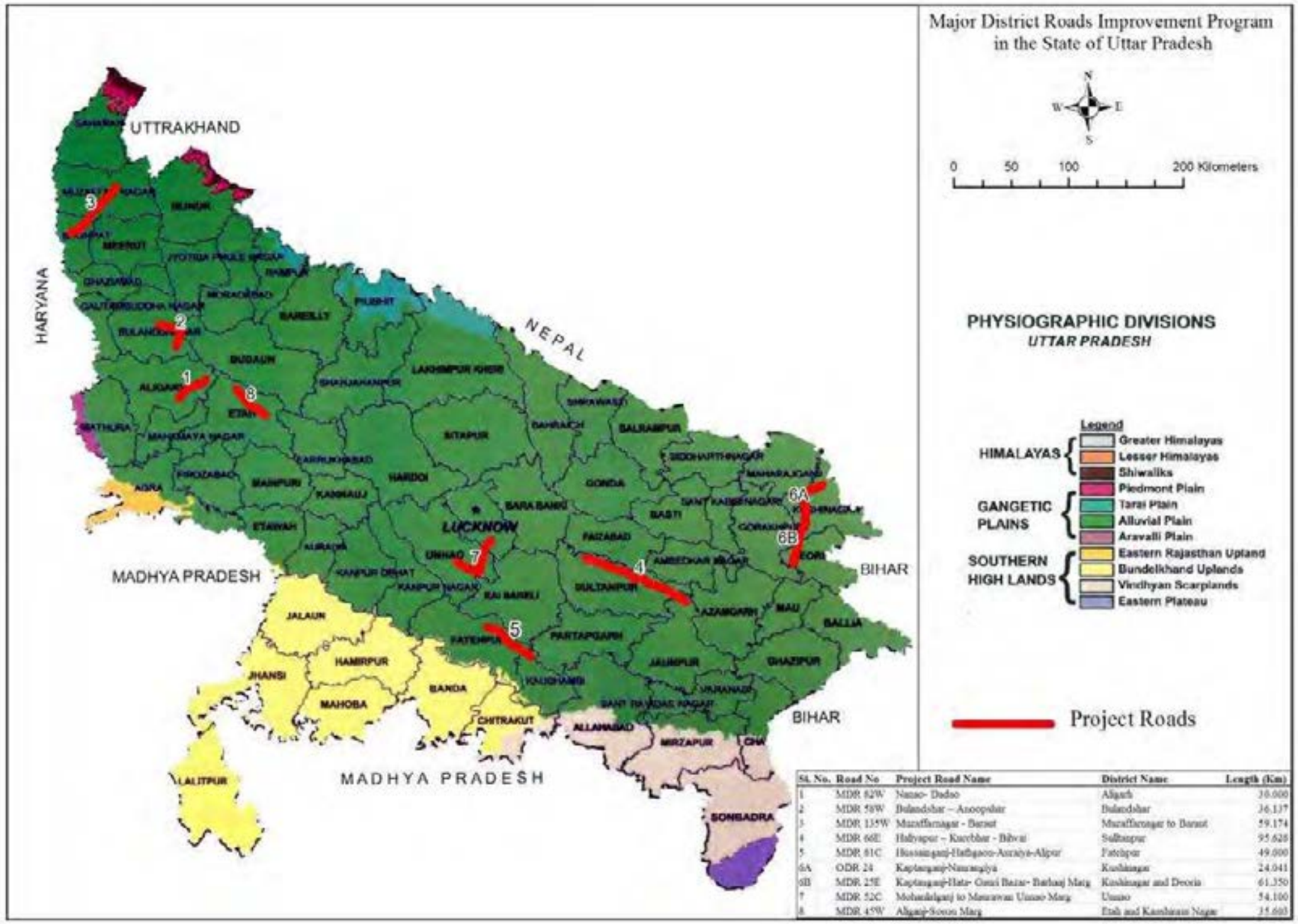
S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
29	Fauna	Peacock, crow, Common Indian Mynah etc.buffalo, cattle, goat, horse, etc were spotted and neelgai, hare and Indian fox reported.	Wild pig, duck, peacock, water hen, parakeets, dove, bullock and horse driven carts are commonly used	Buffalo, cattle, goat, horse, mule, dog, cat & lots of monkeys were observed. Neelgai, wolf, wild boar, etc were reported but not spotted	Presence of Nilgai, Wolf, Jackal and Monkey were reported during consultation.Buffalo, cattle, goat, horse etc. were spotted	Buffalo, cattle, goat, dog, monkey & cat etc were spotted Wolf, jackal, fox, hare and neelgai were reported during consultation	Nilgai, monkey, hare, domesticated cattle, horse, Common Myna, House crow etc. are common wild animals & avifaunal species	Nawabganj Bird Sanctuary is important for resident and migratory waterfowl.No endangered fauna in the Sanctuary but Greater Spotted Eagle (Cangla cangla) and Sarus Crane (Antigone antigone) are Vulnerable as per the IUCN red list Other common wild animals are Nilgai, monkey Vultures, Kites, Bulbul, Myna, cattle, horse etc	Blue Bull, Jungle Cat, Wild Boar, Hyena, hare, mongoose, Lizards, Bats Vultures, Kites, Woodpecker, cattle, horse etc forms the common wild animals sighted in the project area.

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)		Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)		Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)	
30	Ramsar Convention Site	-	-		Upper Ganga (Brijghat –Narora Stretch) has been declared as a Ramsar Convention site but the project road is outside the wetland boundary of Ramsar site and the nearest point is junction of Anoopshahar at km 39.700. which is 900m away from it	-	-	-		-		
III	**SOCIO-ECONOMIC ENVIRONMENT**											
31	District Demographic Profile											
a.	GA (Sq.km.)	3650	Mf Nagar	Baghpat	3719	4152	4436	Deoria	Ku. Nagar	4589	Etah	Kanshi N
			3008	1321				2535	2906		4446	1993
b.	Total Population (in lakhs)	36.73	28.27	13.02	34.98	26.75	37.90	30.98	35.60	31.10	17.61	14.38
c.	Population Density (Persons/sq. km)	1007	960	986	940	640	855	1220	1226	682	717	736
d.	Sex ratio	876	886	858	892	900	978	1013	955	901	863	879
e.	Literacy Rate (%)	69.61	70.11	73.54	76.23	68.78	71.14	73.53	67.66	68.29	73.27	62.3

S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
32	Religious Structure	19	39	55	39	86	42	71	27
33	Educational Institution	21	33	23	44	77	92	29	14
34	Medical Facility	3	12	3	6	7	12	12	3
35	Socio-economic Profile of Affected Persons (APs)								
a.	Number of Affected Households (AHs)	AHs-177 (General-48.02%, SC-2.82%, OBC-46.33%,NA-2.82%)	AHs-32 (OBC-90.62%,SC-9.38%)	Nil	AHs-130 (OBC-73.08%, General-19.23, SC-7.69%)	AHs-170 (OBC-66.47%, General-21.76%, SC-11.18%)	AHs-57 (OBC-60.36%, General-27.14%, SC-12.5%)	AHs-33 (OBC-57.58%, General-30.30%, SC-12.12%)	AHs-1130 (General-29.29%, SC-2.39%, OBC-68.32%)
b.	Number of Affected Persons (APs)	APs-1337 (Male-52.69% Female-47.23%)	APs-213 (Male-53.52% Female-46.48%)	Nil	APs-727 (Male-53.37% Female-46.63%)	APs-1182 (Male-52.88% Female-47.12%)	APs-602 (Male-52.75% Female-47.25%)	APs-223 (Male-51.57% Female-48.43%)	APs-8884 (Male-57.28% Female-42.72%)
c.	Sex Ratio among APs	896	879	Nil	873	891	863	939	746
d.	Annual Income of AHs (Rs.)	No BPL Majority(57.63%) earn above 39312 and below 50000	No BPL Majority(40.63%) earn above 39312 and below 50000	Nil	5.38% BPL Majority(66.15%) earn above 39312 and below 50000	2.94% BPL Majority(52.35%) earn above 100000	22.78% BPL Majority(31.57%) earn b/w 39312-50000 followed by 28.11% b/w 50000-100000	27.27% BPL Majority(30.30%) earn above 100000	14.69% BPL Majority(44.6%) earn b/w 50000-100000
e.	Vulnerable Affected Households	10	32	Nil	29	25	19	13	155

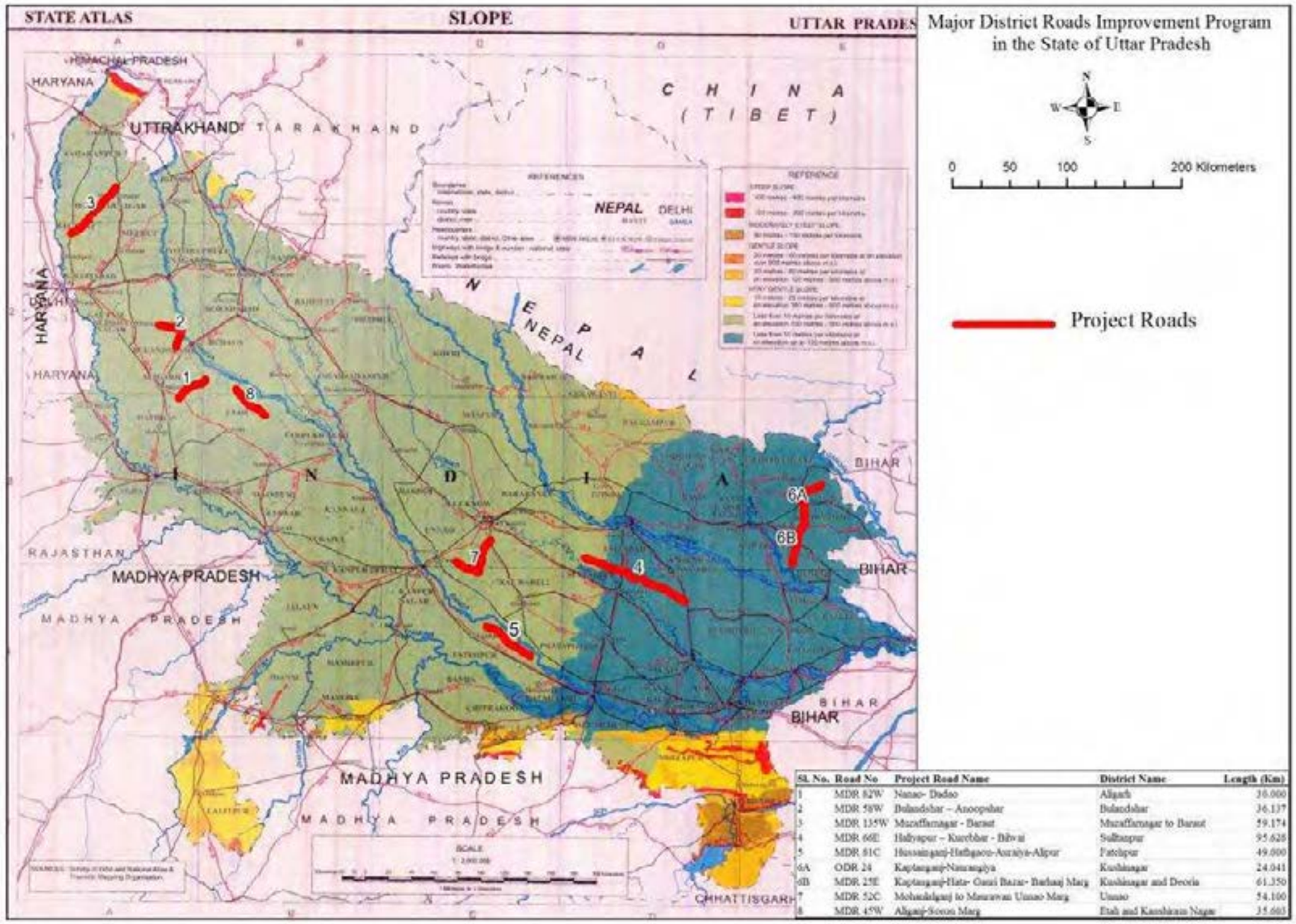
S.No	Baseline Feature	Nanau- Dadau (MDR 82W)	Muzaffarnagar to Baraut Marg (MDR 135W)	Bulandshahar to Anoopshahar (MDR 58W)	Hussainganj to Alipur Marg (MDR 81C)	Haliyapur to Kurebhar (MDR 66E)	Naurangiya - Kaptanganj – Rudrapur (ODR 24 and MDR 25E)	Mohanlalganj-Unnao Marg (MDR 52C)	Aliganj-Soron Marg (MDR 45W)
f.	Educational Status of APs	Illiterate-19.7% Majority(22.03%) upto 7th Std. followed by 20.34% below Matric	Illiterate-37.5% Majority(21.88%) upto Matric	Nil	Illiterate-20.77% Majority(33.85%) upto 7th Std. followed by 16.15% Graduation and above	Illiterate-35.88% Majority(19.41%) upto Matric followed by 18.82% below Matric	Illiterate-21.05% Majority(38.60%) upto 7th Std. followed by 21.05% below Matric	Illiterate-27.27% Majority(27.27%) upto Intermediate followed by 15.15% upto Matric	Illiterate-22.57% Majority(24.42%) upto Matric followed by 22.92% Intermediate
g.	Occupational Status of APs	Laborer-3.39% Majority (79.10%) in Business	Laborer-50% Majority (28.13%) in Business followed by 15.63% in Agriculture	Nil	Laborer-3.85% Majority (63.85%) in Business followed by 21.54% in Agriculture	Laborer-8.24% Majority (65.88%) in Business followed by 23.53% in Agriculture	Laborer-15.79% Majority (31.58%) in Agriculture followed by 29.82% in Business	Majority (87.88%) in Business followed by 6.06% each in Agriculture & Service	Laborer-5.84% Majority (88.85%) in Business

Fig. 14: Physiography UP



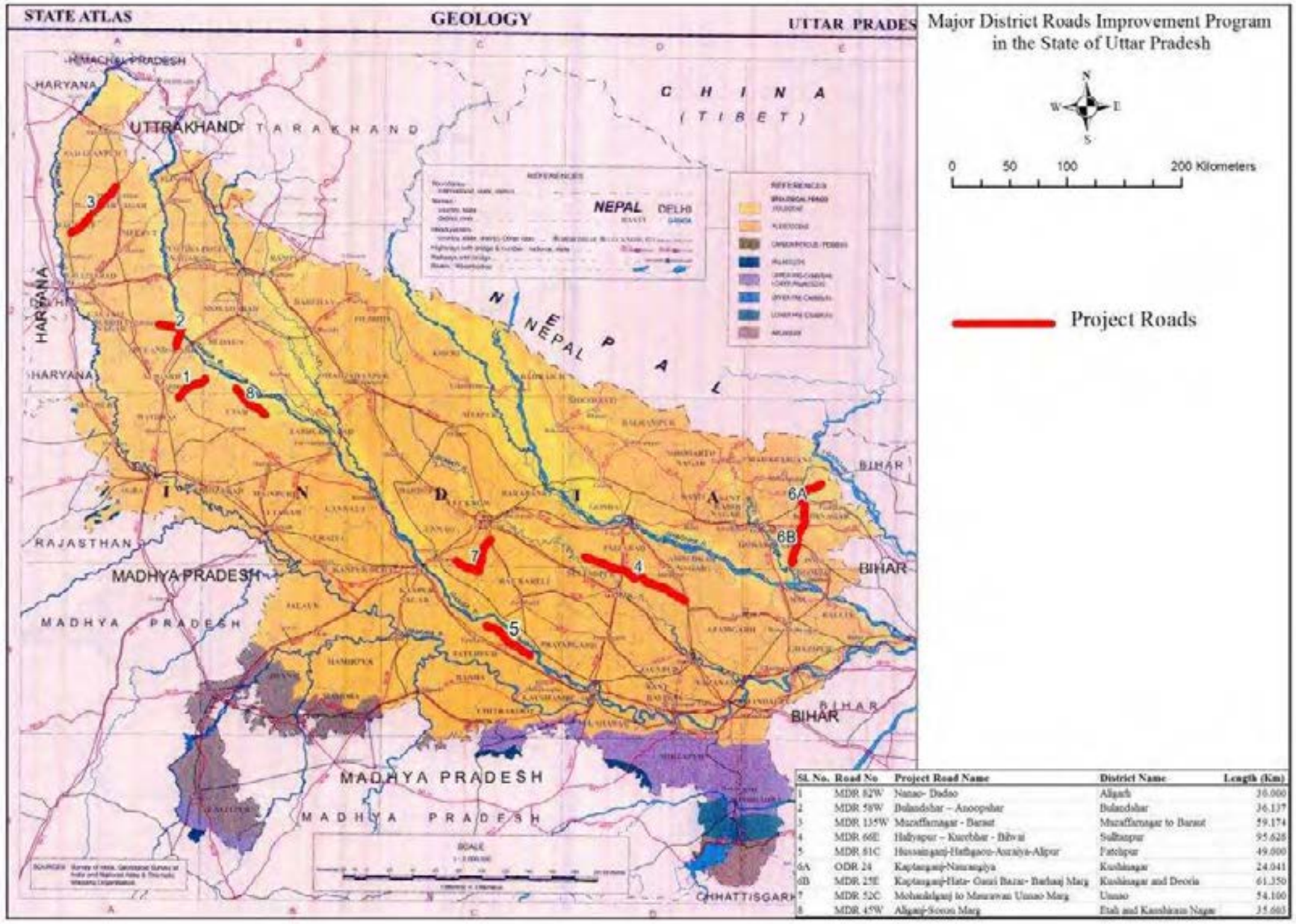
Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 62W	Nanao- Dadso	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Barast	Muzaffarnagar to Barast	59.174
4	MDR 66E	Hallyapur – Kasrohar - Bibvai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Asraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Naurangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Ganai Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauranwan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Sonon Marg	Etah and Kanshiram Nagar	35.600

Fig. 15: Slope Map UP



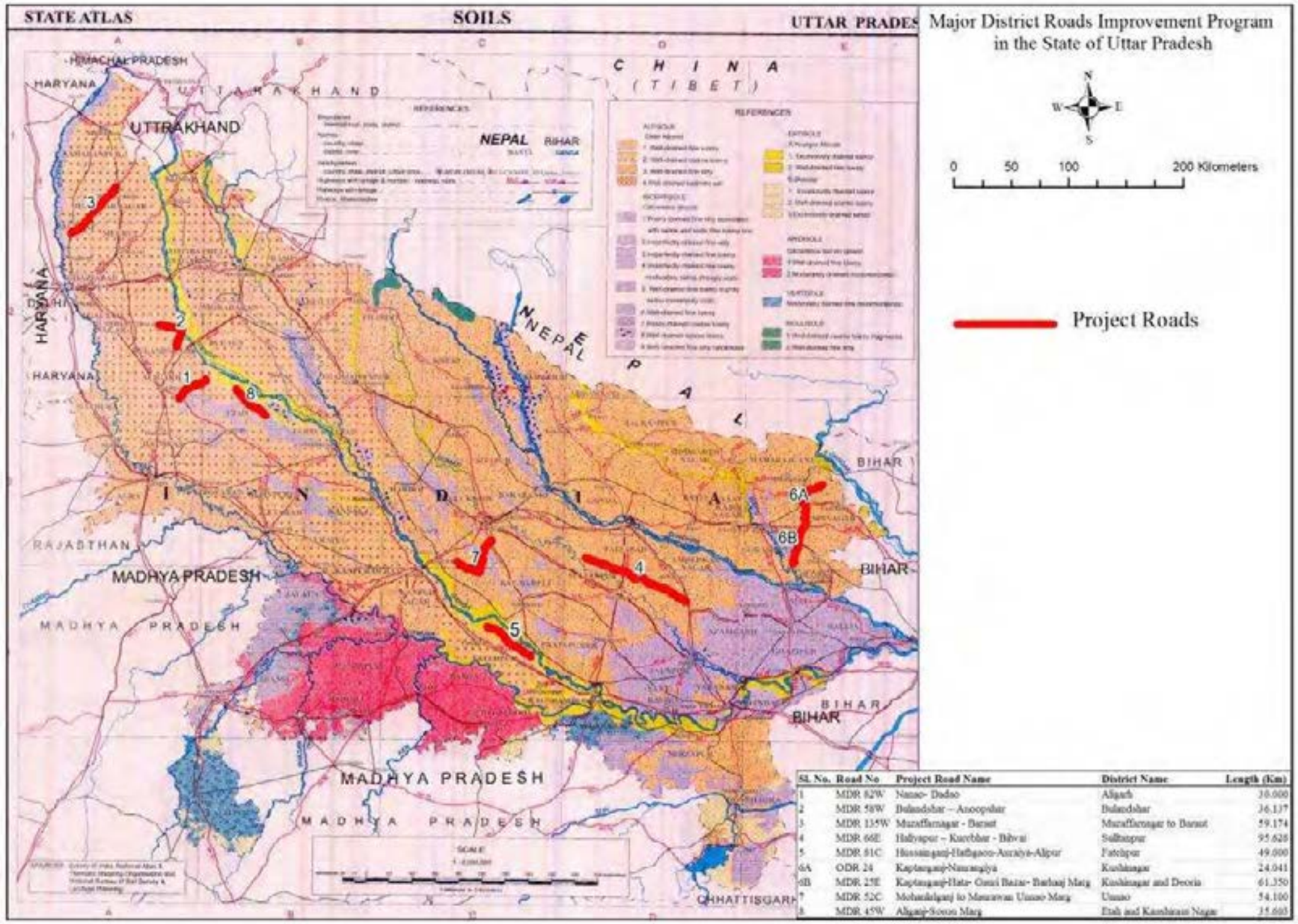
Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanao- Dadao	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Baraut	Muzaffarnagar to Baraut	59.174
4	MDR 66E	Hathyapur – Kurebhar - Bibvai	Sultanpur	95.625
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Narangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Ganj Bazar- Barhaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauranwan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Sonon Marg	Etah and Kanshiram Nagar	35.603

Fig. 16: Geology Map UP



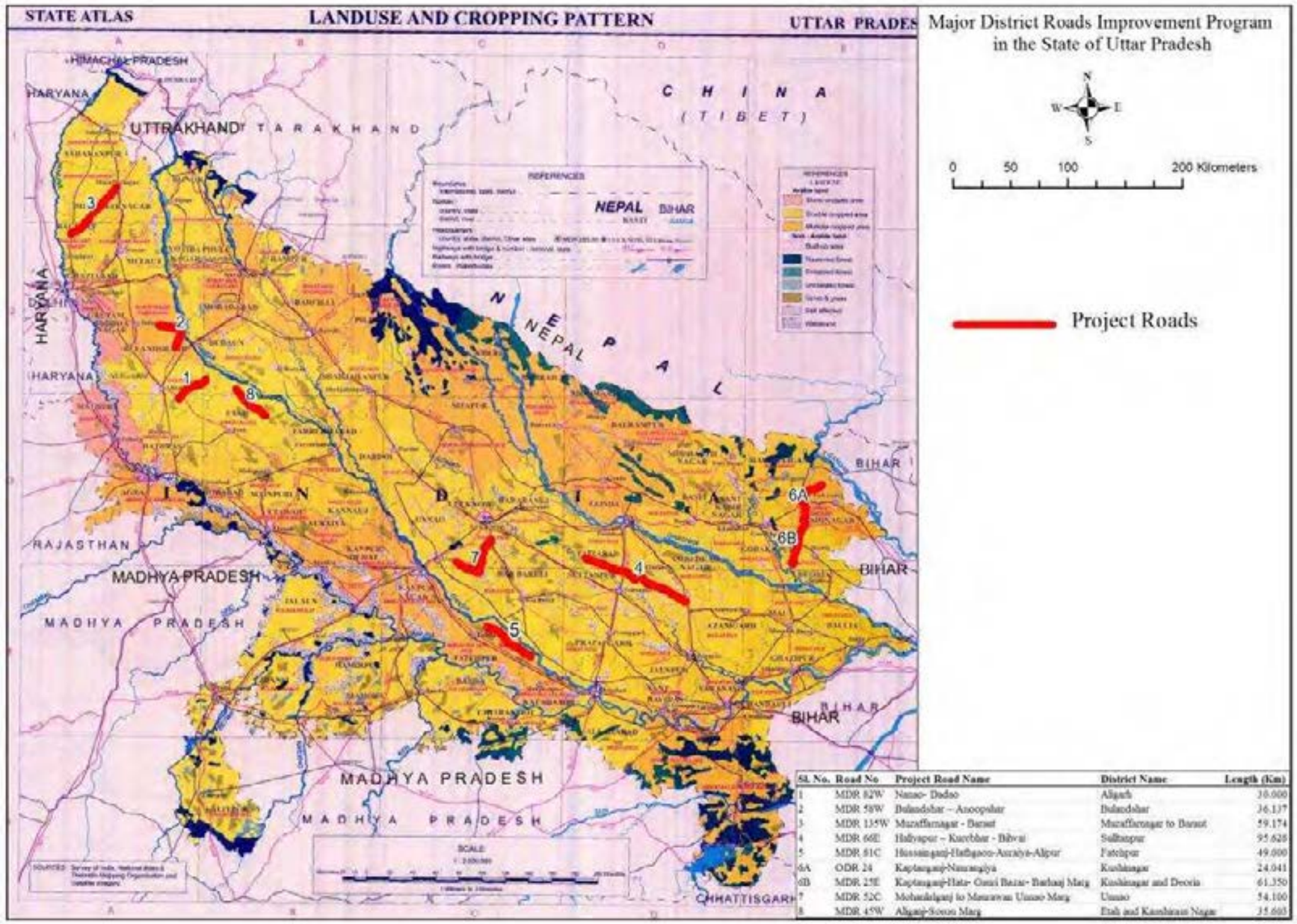
Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanao- Dadao	Aligarh	38.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Barnat	Muzaffarnagar to Barnat	59.174
4	MDR 66E	Hathyapur – Kurchhar - Bibvai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Nanamjiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Ganni Bazar- Barhaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauranwan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Sonon Marg	Etah and Kanshiram Nagar	35.603

Fig. 17: Soil Map UP



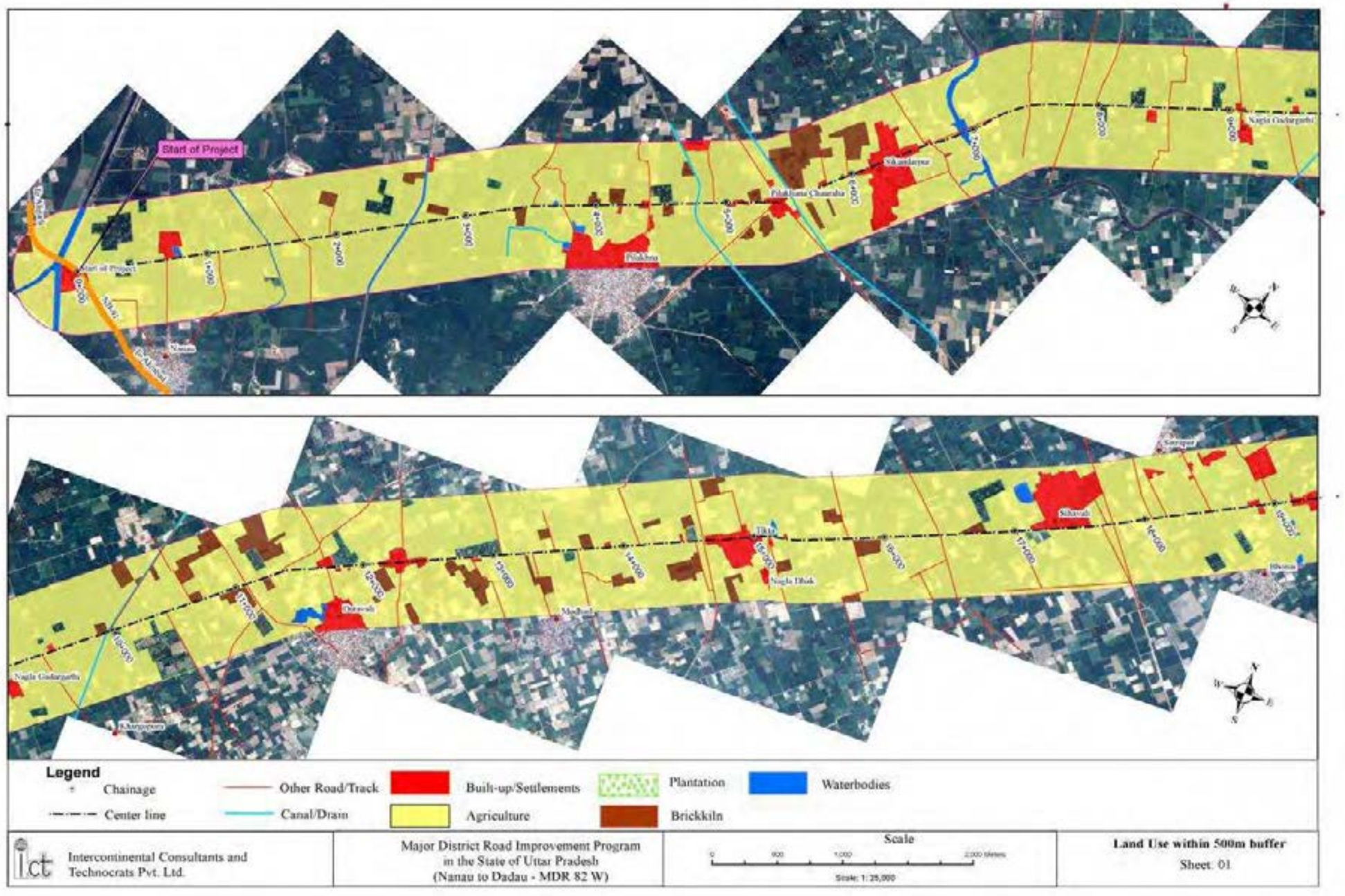
Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanao- Dadso	Aligarh	10.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Barnat	Muzaffarnagar to Barnat	59.174
4	MDR 66E	Hathyapur – Kurrbhar - Bibvai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Nauranglya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauranwan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Soron Marg	Etah and Kanshiram Nagar	35.600

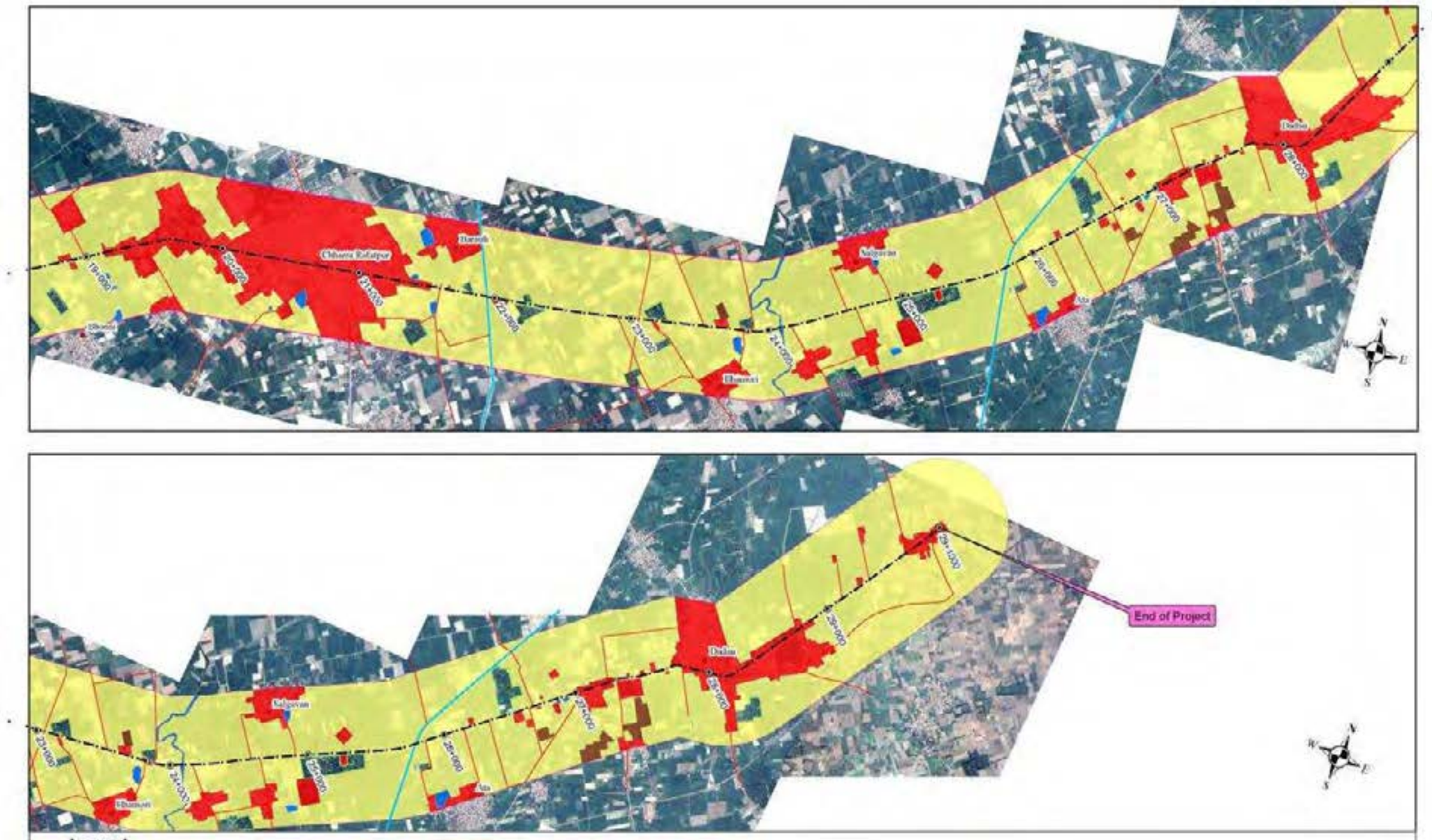
Fig. 18: Landuse Map UP



Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanao- Dadao	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Barnat	Muzaffarnagar to Barnat	59.174
4	MDR 66E	Hathyapur – Kurvibar - Bibwai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Naurangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauranwan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Sonon Marg	Etah and Kanshiram Nagar	35.603

Fig. 20: Waste Dumping along the Project Roads





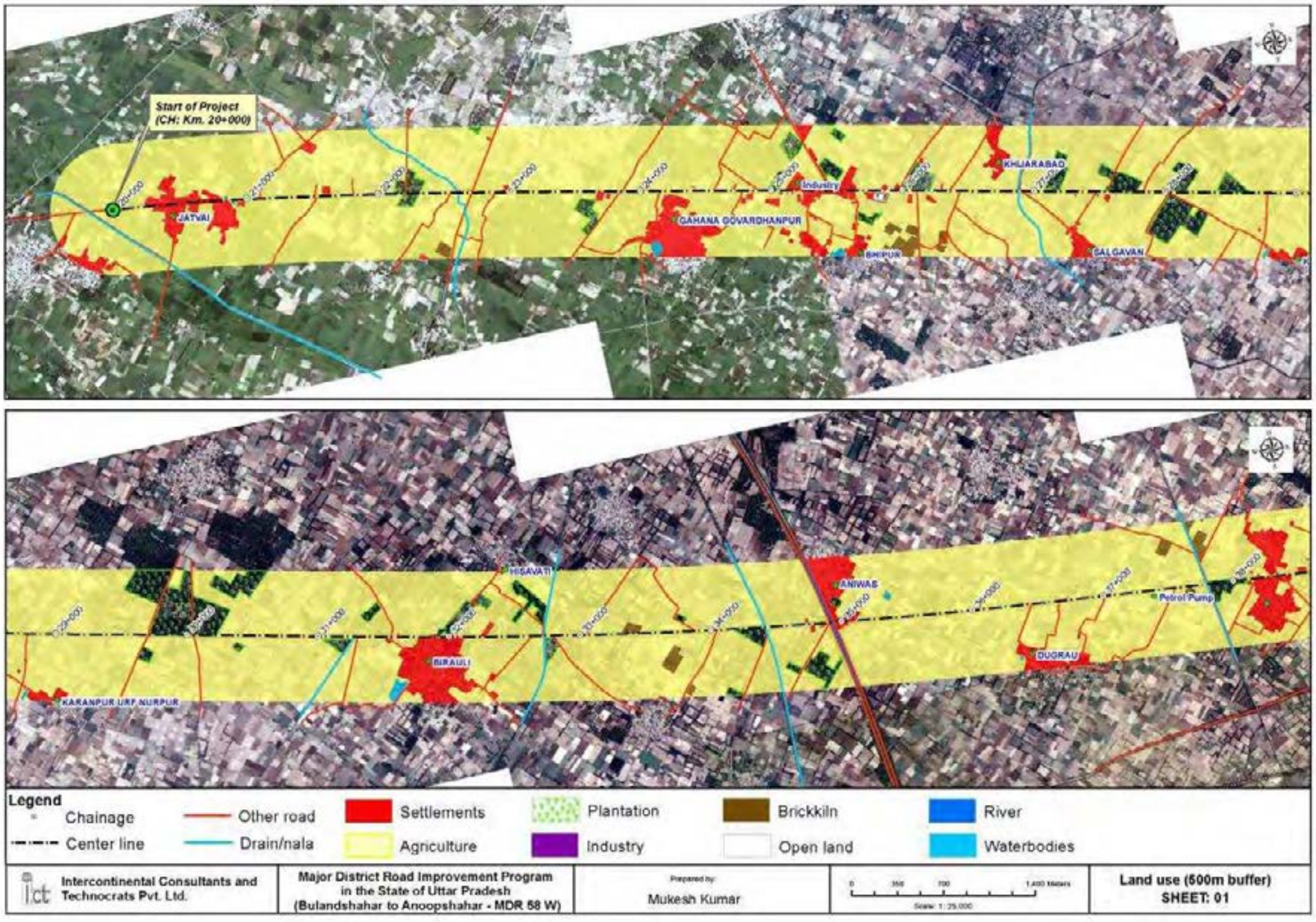
Legend

Chainage | Other Road/Track | Built-up/Settlements | Plantation | Waterbodies

Center line | Canal/Drain | Agriculture | Brickkiln

Intercontinental Consultants and Technocrats Pvt. Ltd.	Major District Road Improvement Program in the State of Uttar Pradesh (Nanau to Dadau - MDR 82 W)	Scale: 1: 25,000	**Land Use within 500m buffer** Sheet: 02

Fig. 23: Bulandshar anoopshahar




ANUPSHAHAR
JAFRABAD URF GANGABAS BANGAR
KARANPUR KALAN
Petrol Pump
ACHALPUR
SURAJPUR MAKHANIA
VIRPUR
RAJAUR
BRAULI
AMARPUR
ACHALPUR
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Industry
Brickkiln
Open land
River
Waterbodies
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Bulandshahar to Anoopshahar - MDR 58 W)
Prepared by:
Mukesh Kumar
Scale: 1: 25,000
Land use (500m buffer)
SHEET: 02

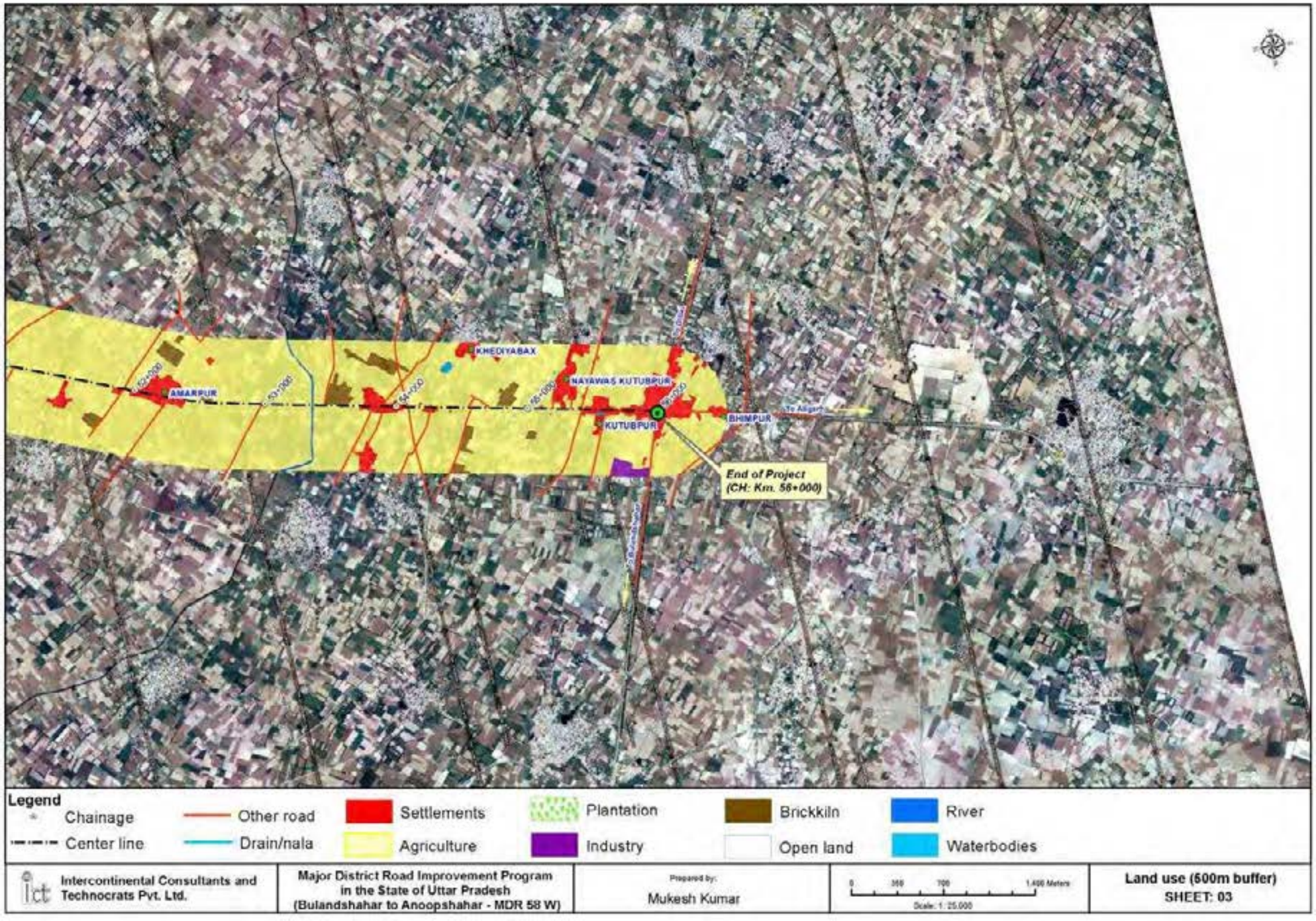
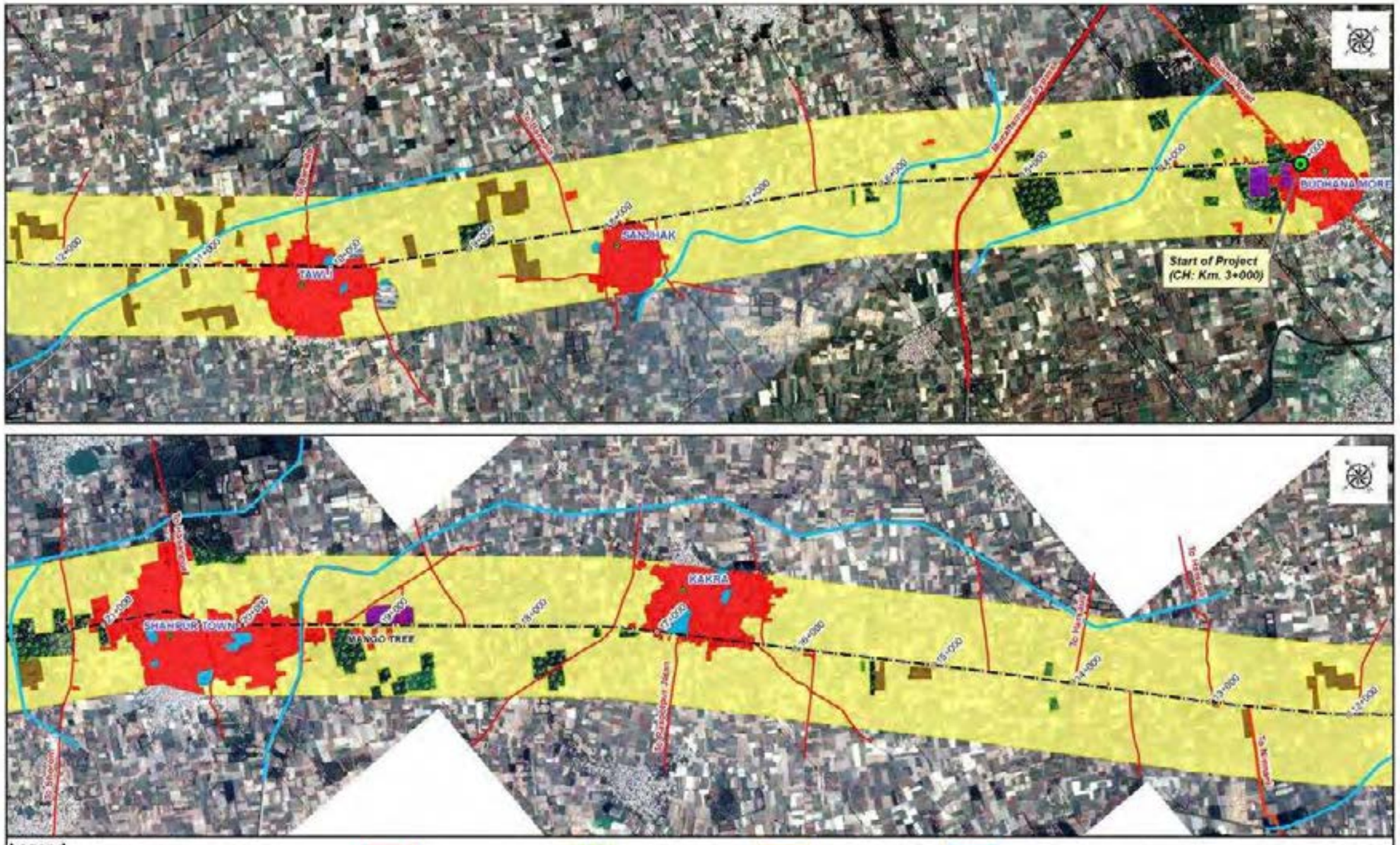
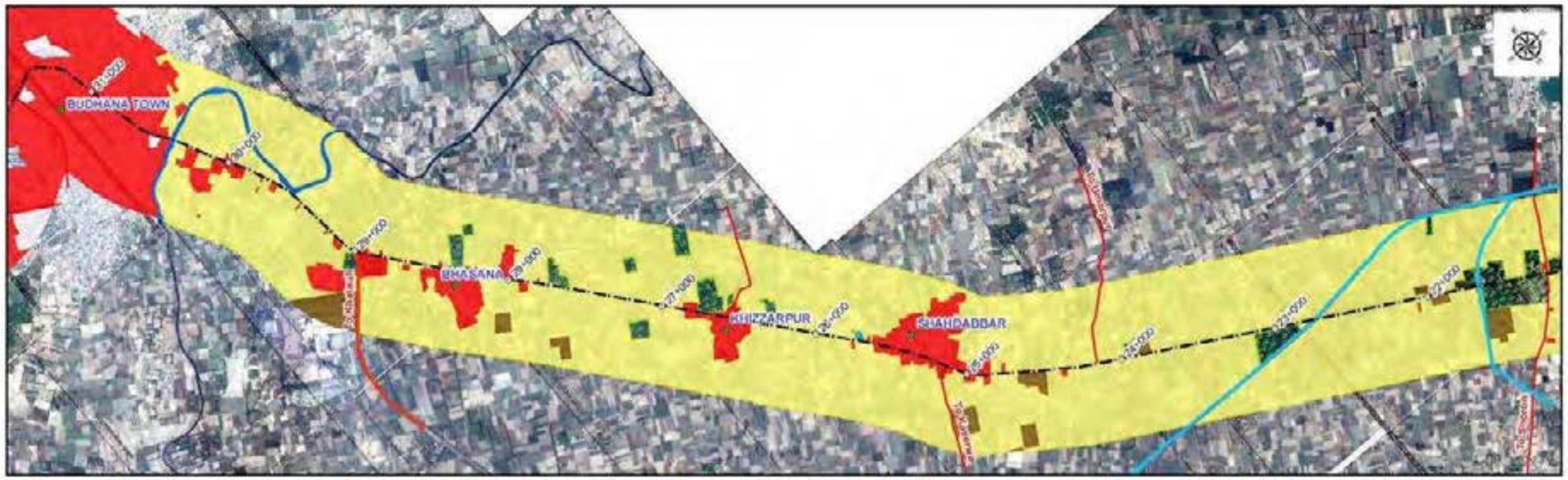
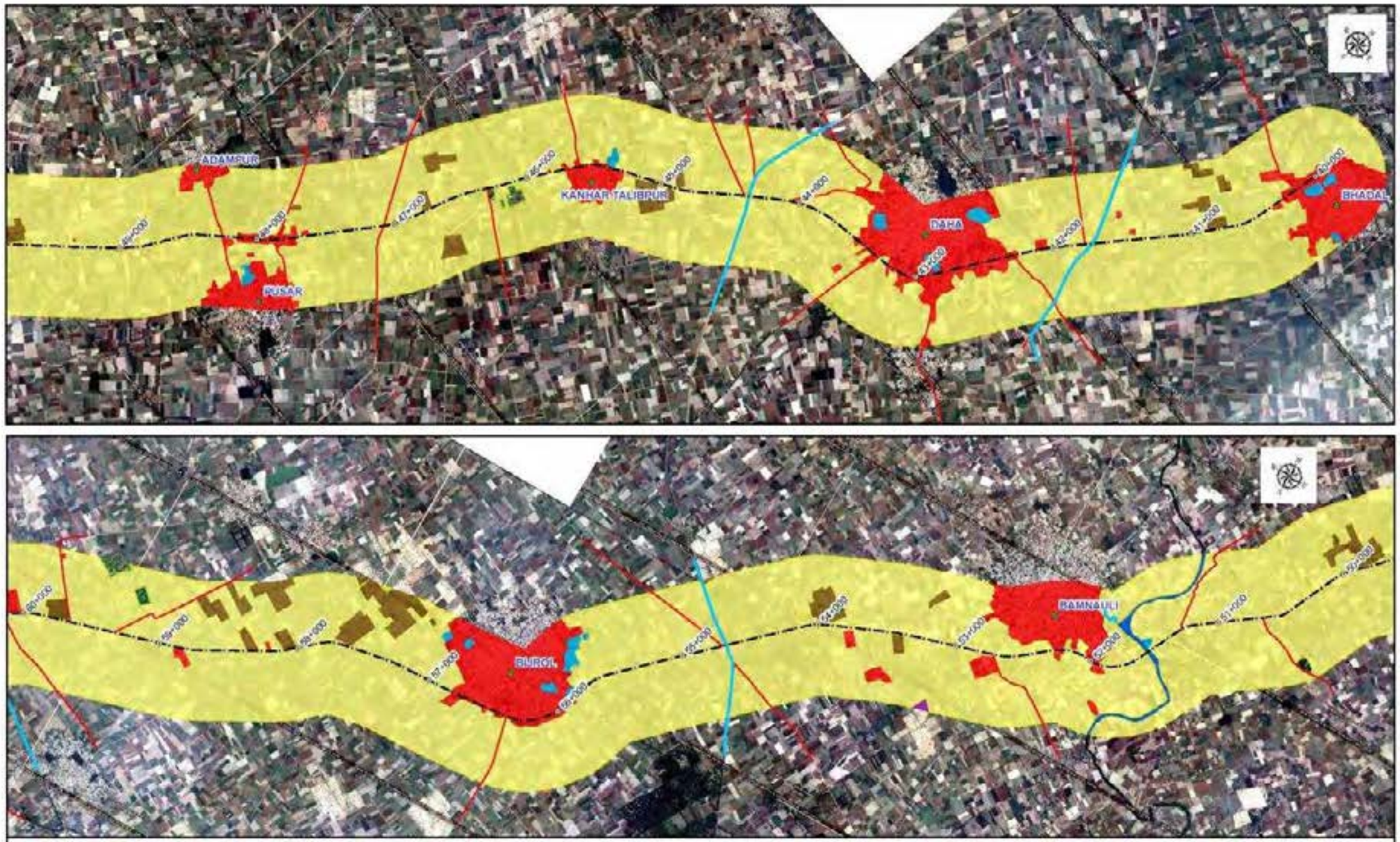

KHEDIYABAX
AMARPUR
NAYAWAS KUTUBPUR
KUTUBPUR
BHIMPUR
To Aligarh
End of Project
(CH: Km. 56+000)
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Industry
Brickkiln
Open land
River
Waterbodies
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Bulandshahar to Anoopshahar - MDR 58 W)
Prepared by:
Mukesh Kumar
0 350 700 1,400 Meters
Scale: 1: 25,000
Land use (500m buffer)
SHEET: 03

Fig. 25: Land Use map Muzaffarnagar Barot




BUDHANA TOWN
BHASANA
KHIZZARPUR
SHAHDABBAR
BUDHANA TOWN
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Industry
Brickkiln
Graveyard
River
Waterbodies
Open land
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Muzaffarnagar to Baraut - MDR 135 W)
Prepared by:
Mukesh Kumar
0 250 700 1,400 Meters
Scale: 1: 25,000
Land use (500m buffer)
SHEET: 02


ADAMPUR
KANHAR TALIBPUR
RAHA
BHADAL
RUSAR
BURGI
RAMNAULI
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Industry
Brickkiln
Graveyard
River
Waterbodies
Open land
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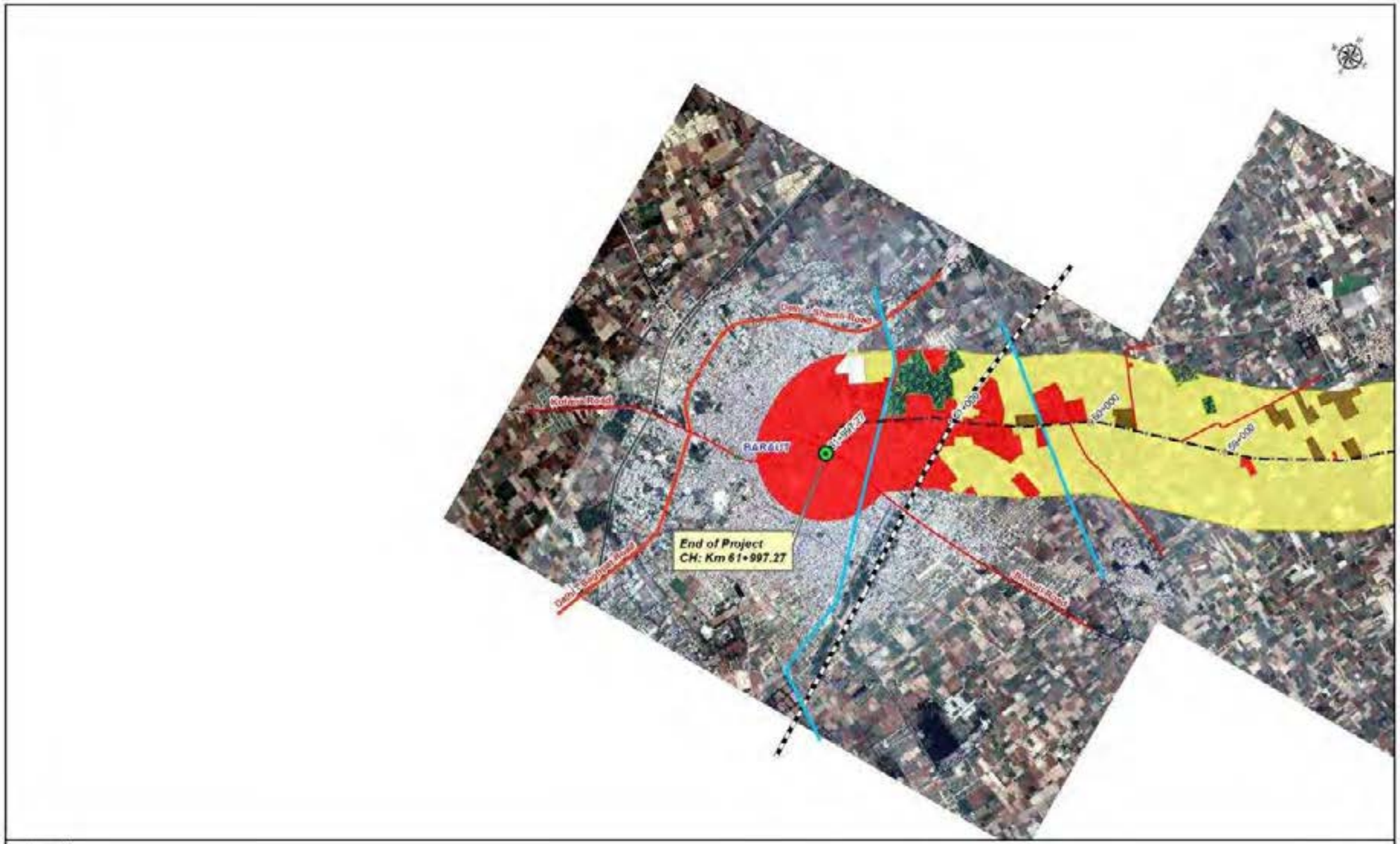
Major District Road Improvement Program in the State of Uttar Pradesh (Muzaffarnagar to Baraut - MDR 135 W)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 03



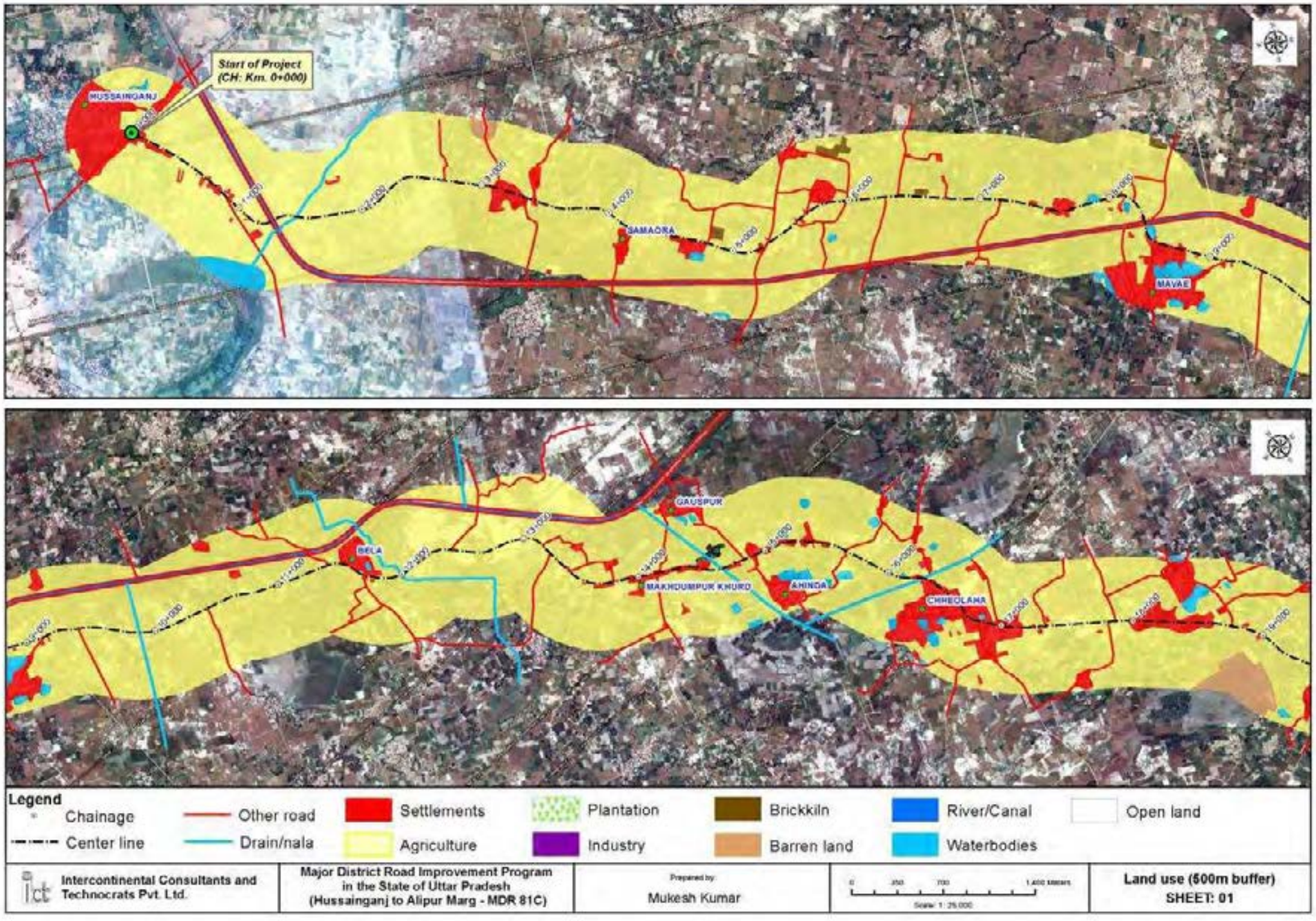
Legend

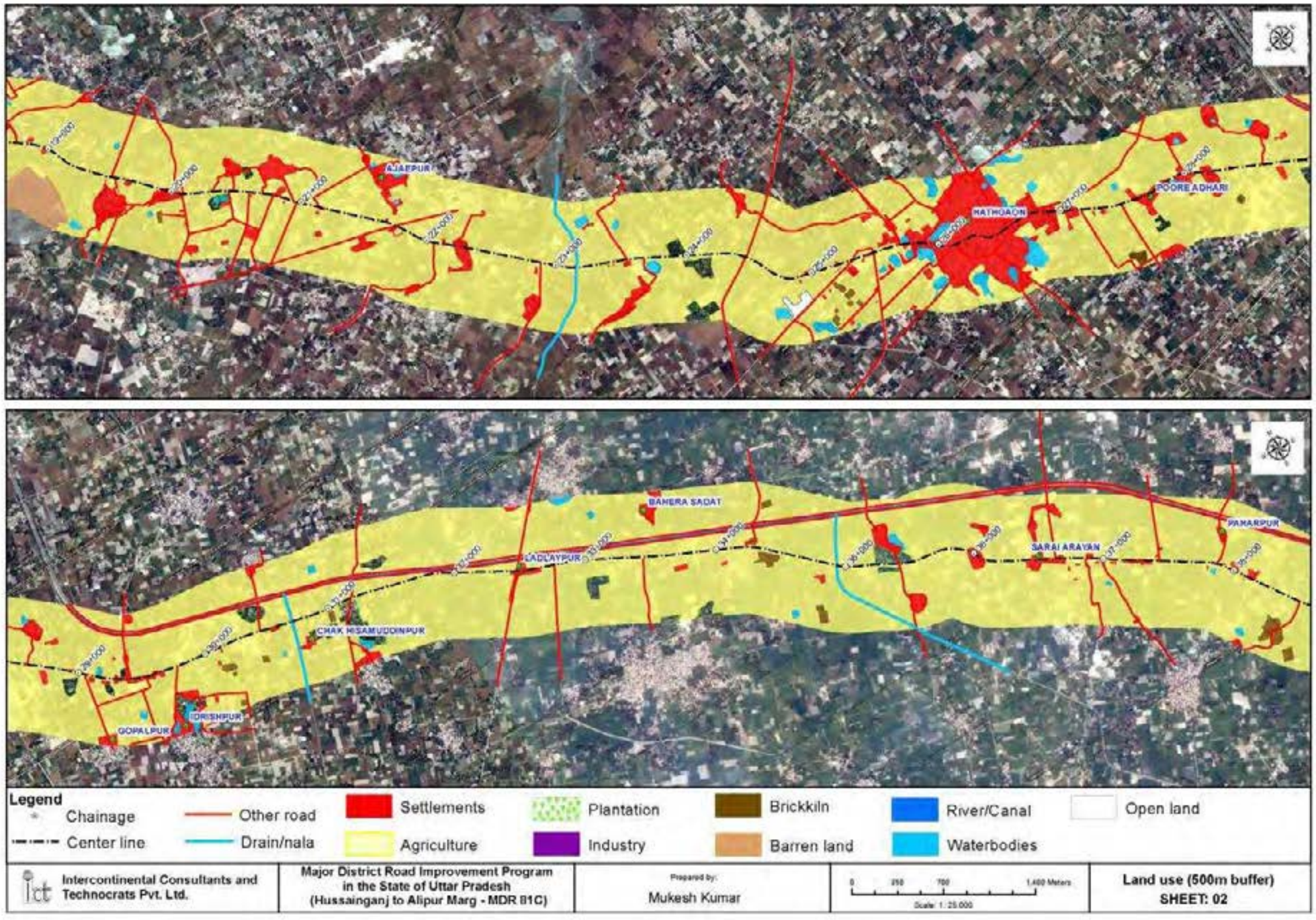
Chainage | Other road | Settlements | Plantation | Brickkiln | River | Open land

Center line | Drain/nala | Agriculture | Industry | Graveyard | Waterbodies

Intercontinental Consultants and Technocrats Pvt. Ltd.	Major District Road Improvement Program in the State of Uttar Pradesh (Muzaffarnagar to Baraut - MDR 135 W)	Prepared by: Mukesh Kumar	0 350 700 1,400 Meters Scale: 1: 25,000	Land use (500m buffer) SHEET: 04

Fig. 27: Land Use Map Hussainganj-Alipur




AJAIPUR
RATHGAON
POORE ADHARI
BAHERA SADAT
LADLAYPUR
SARAI ARAYAN
PANARPUR
CHAK MISAMUDDINPUR
GOPALPUR
DRISHPUR
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Industry
Brickkiln
Barren land
River/Canal
Waterbodies
Open land
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Hussainganj to Alipur Marg - MDR 81C)
Prepared by:
Mukesh Kumar
0 350 700 1,400 Meters
Scale: 1: 25,000
Land use (500m buffer)
SHEET: 02

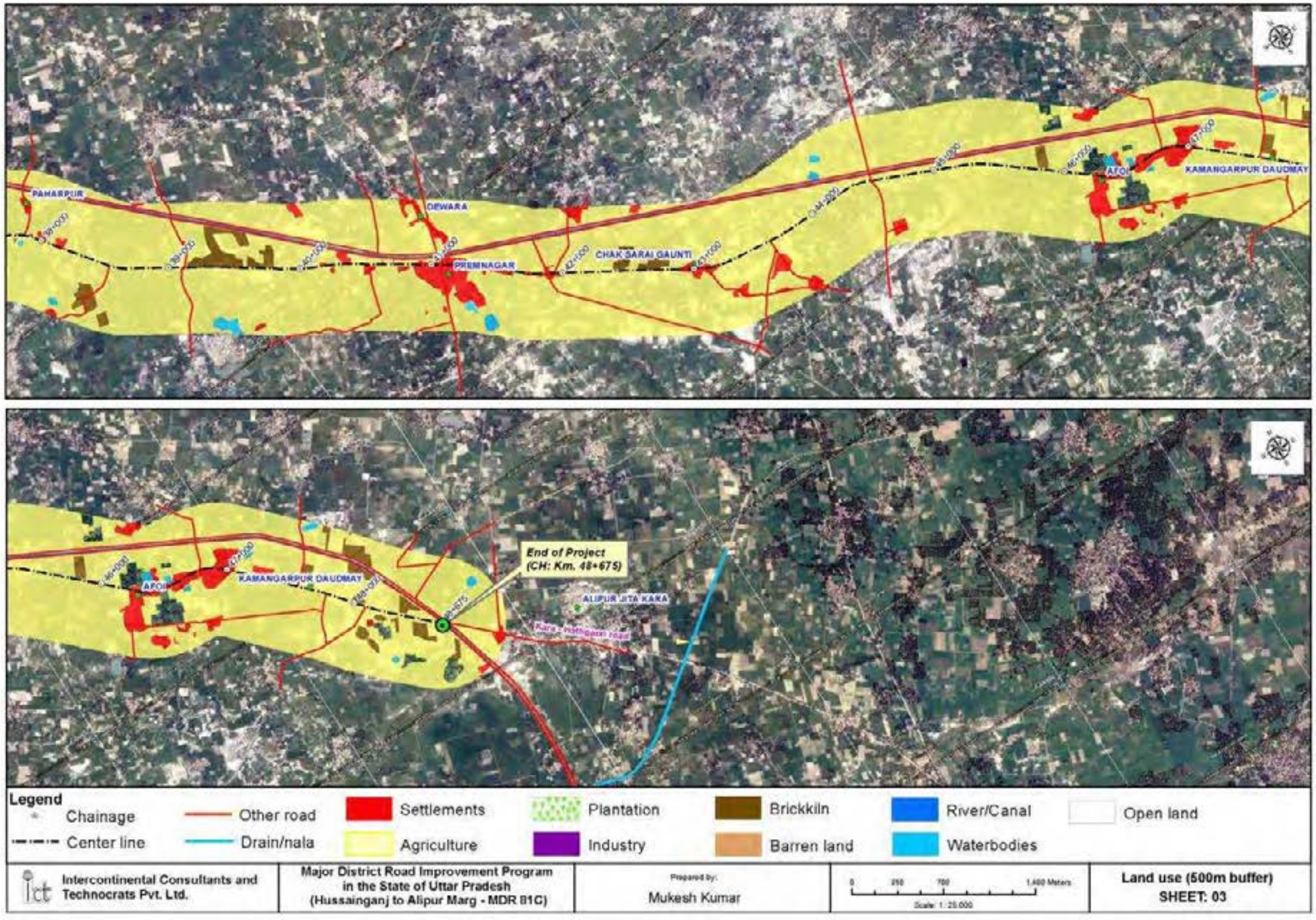
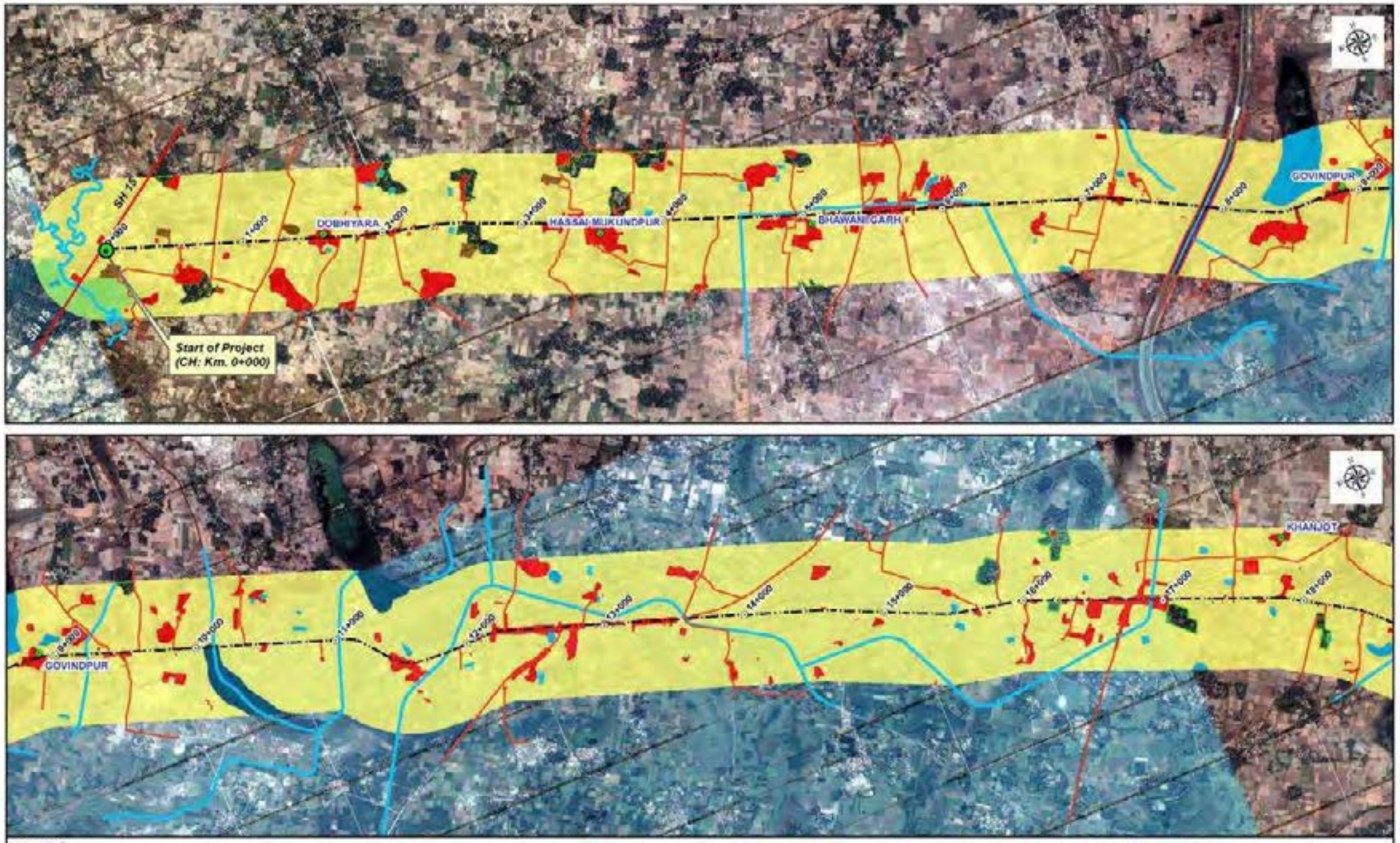
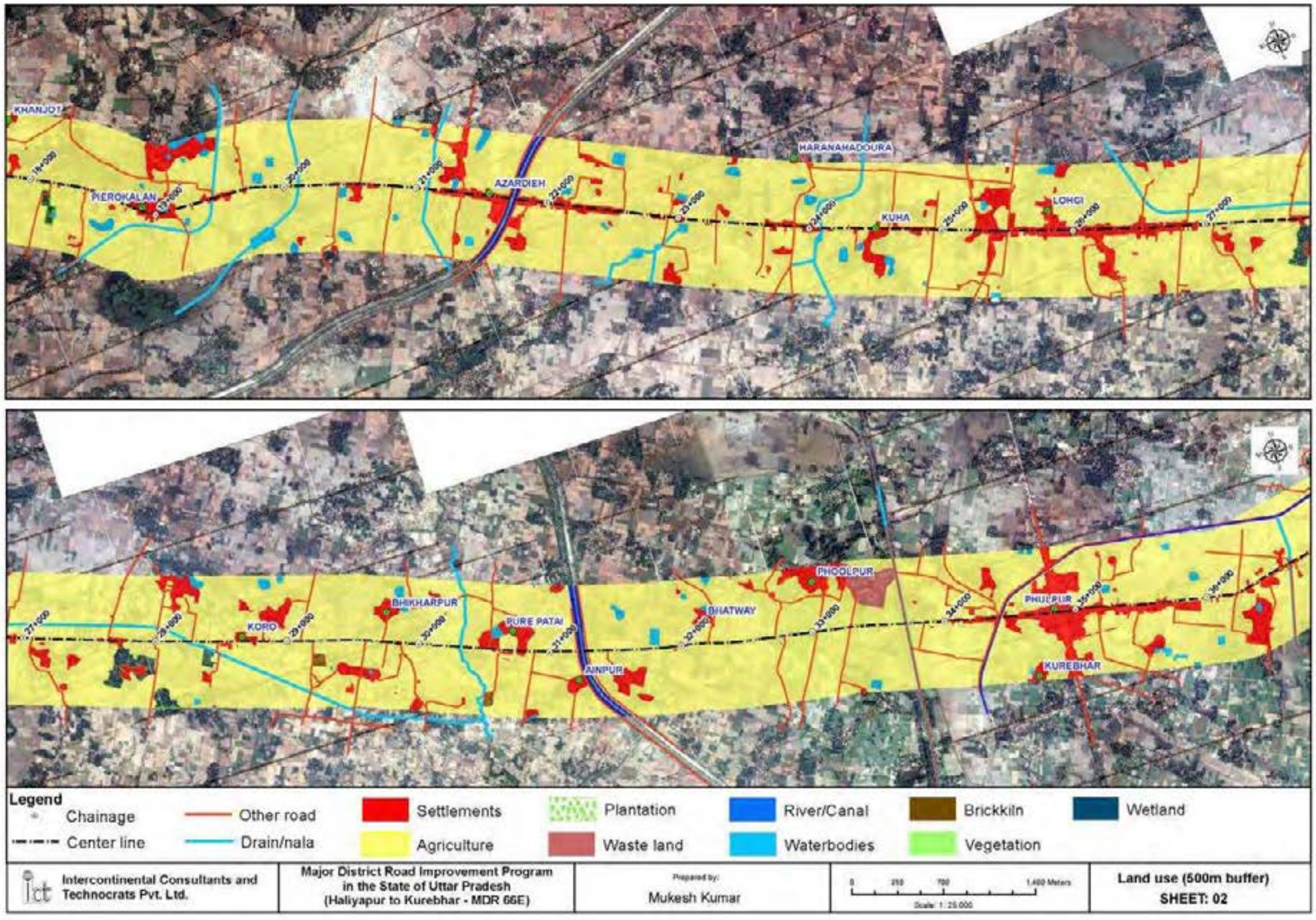
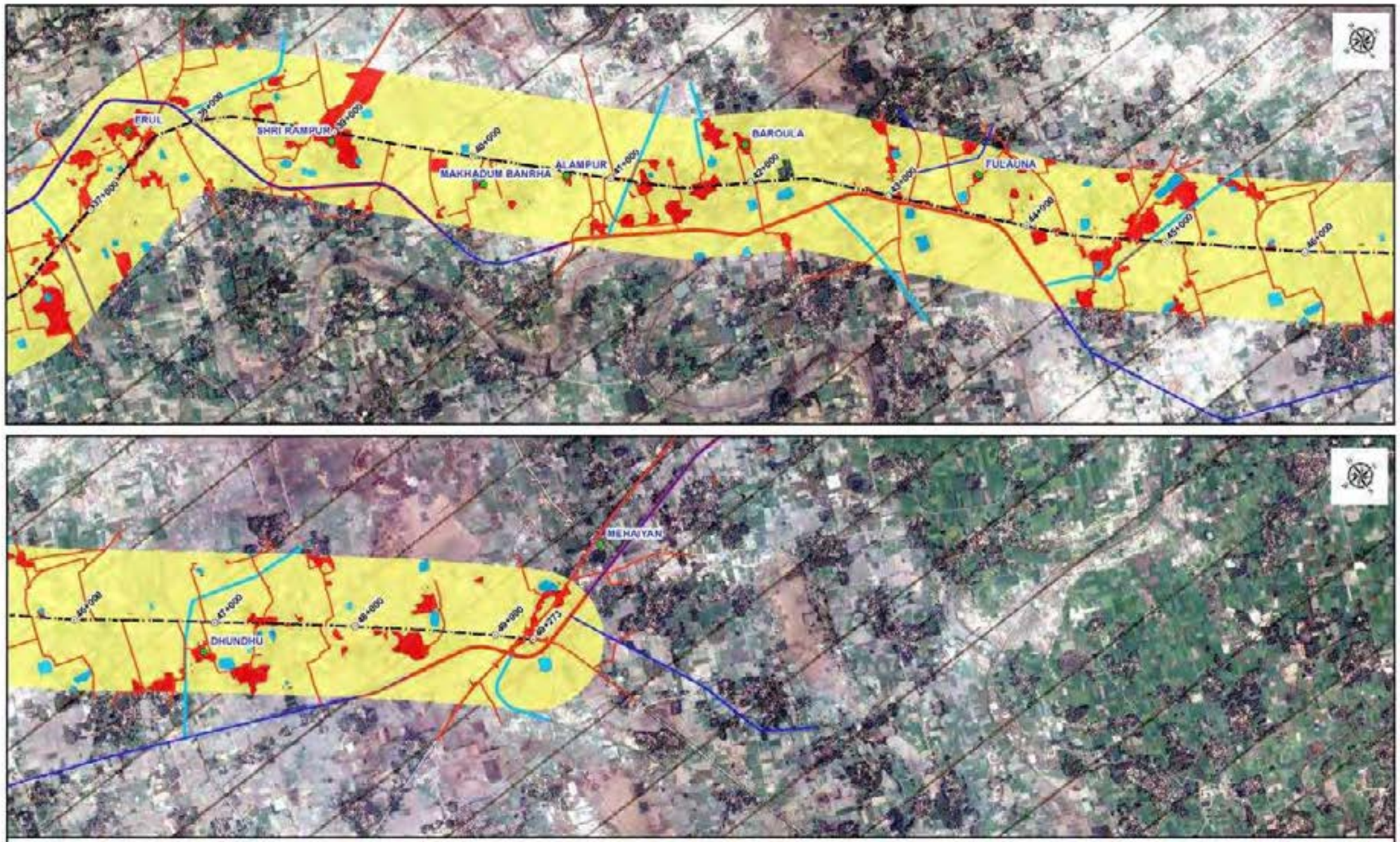
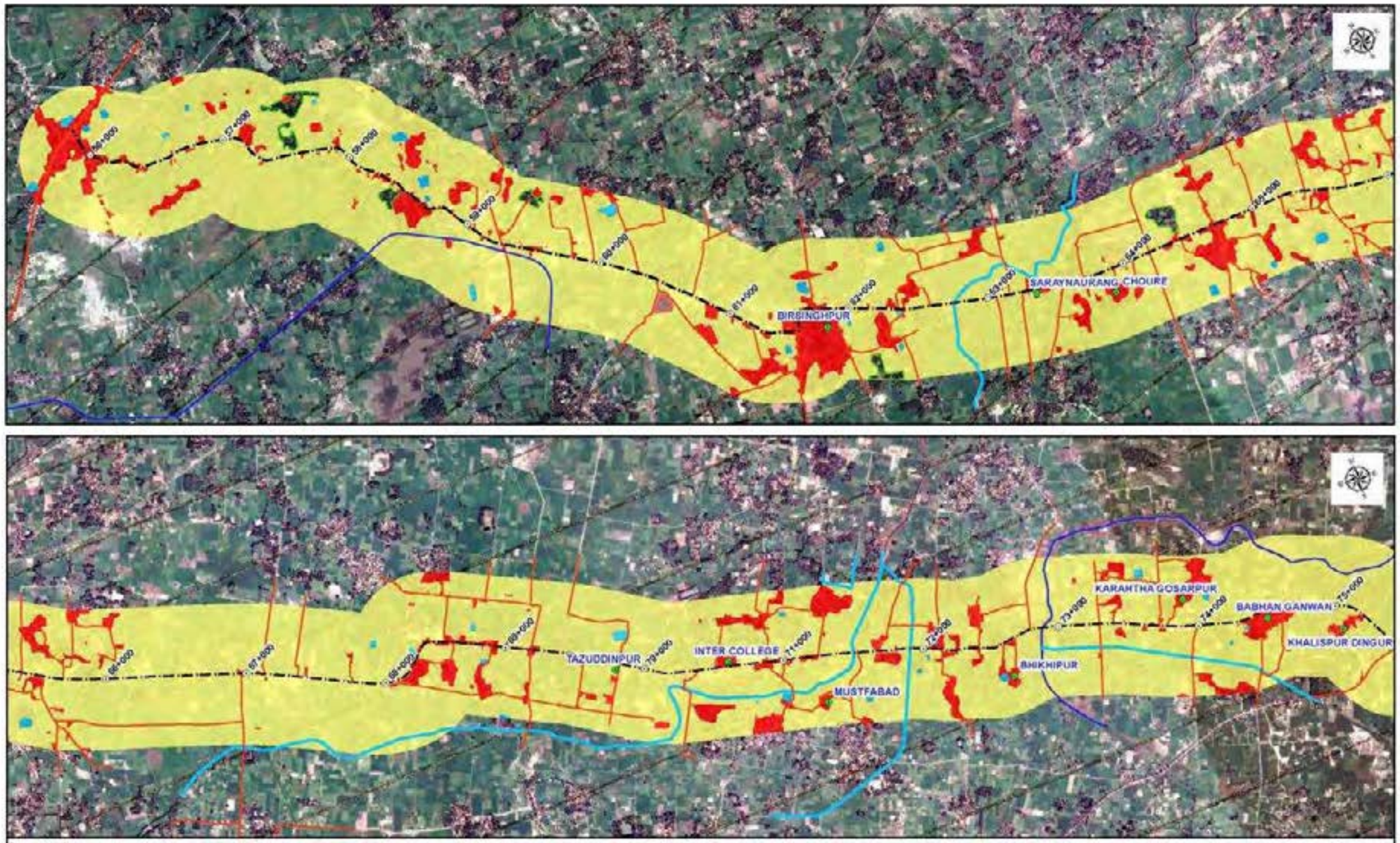

PAHARPUR
DEWARA
PREMNAGAR
CHAK SARAI GAUNTI
KAMANGARPUR DAUDMAT
End of Project
(CH: Km. 48+675)
ALIPUR JITA KARA
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Industry
Brickkiln
Barren land
River/Canal
Waterbodies
Open land
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Hussainganj to Alipur Marg - MDR 81C)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 03

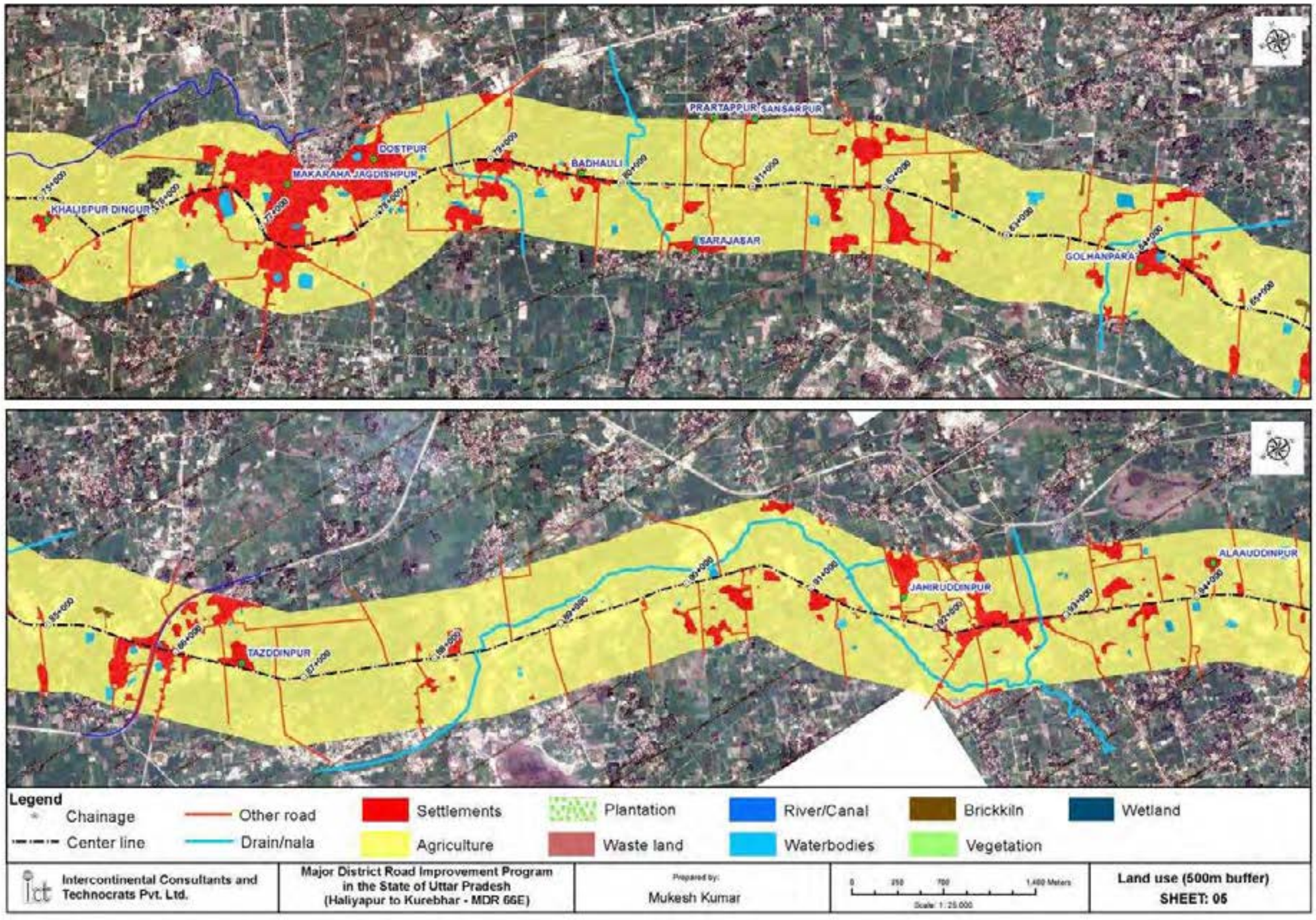
Fig. 29: Land Use Map Haliyapur – Kurebhar




KHANJOT
PIEROKALAN
AZARDIEH
HARANAHADOURA
KUHA
LOHGI
KORO
BHIKHARPUR
PURE PATAI
AINPUR
BHATWAY
PHOOLPUR
PHULPUR
KUREBHAR
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Waste land
River/Canal
Waterbodies
Brickkiln
Vegetation
Wetland
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Haliyapur to Kurebhar - MDR 66E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 02


ERUL
SHRI RAMPUR
MAKHADUM BANRHA
ALAMPUR
BAROULA
FULAUNA
DHUNDHU
MEHAIYAN
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Waste land
River/Canal
Waterbodies
Brickkiln
Vegetation
Wetland
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Haliyapur to Kurebhar - MDR 66E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 03


SARAYNAURANG CHOURE
BIRSINGHPUR
KARAMTHA GOSARPUR
BABHAN GANWAN
KHALISPUR DINGUR
BAKHIPUR
INTER COLLEGE
TAZUDDINPUR
MUSTFABAD
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Waste land
River/Canal
Waterbodies
Brickkiln
Vegetation
Wetland
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Haliyapur to Kurebhar - MDR 66E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 04


PRARTAPPUR SANSARPUR
DOSTPUR
MAKARAHA JAGDISHPUR
BADHAULI
KHALISPUR DINGUR
SARAJASAR
GOLHANPARA
TAZDDINPUR
JAHIRUDDINPUR
ALAAUDDINPUR
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Waste land
River/Canal
Waterbodies
Brickkiln
Vegetation
Wetland
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Haliyapur to Kurebhar - MDR 66E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 05

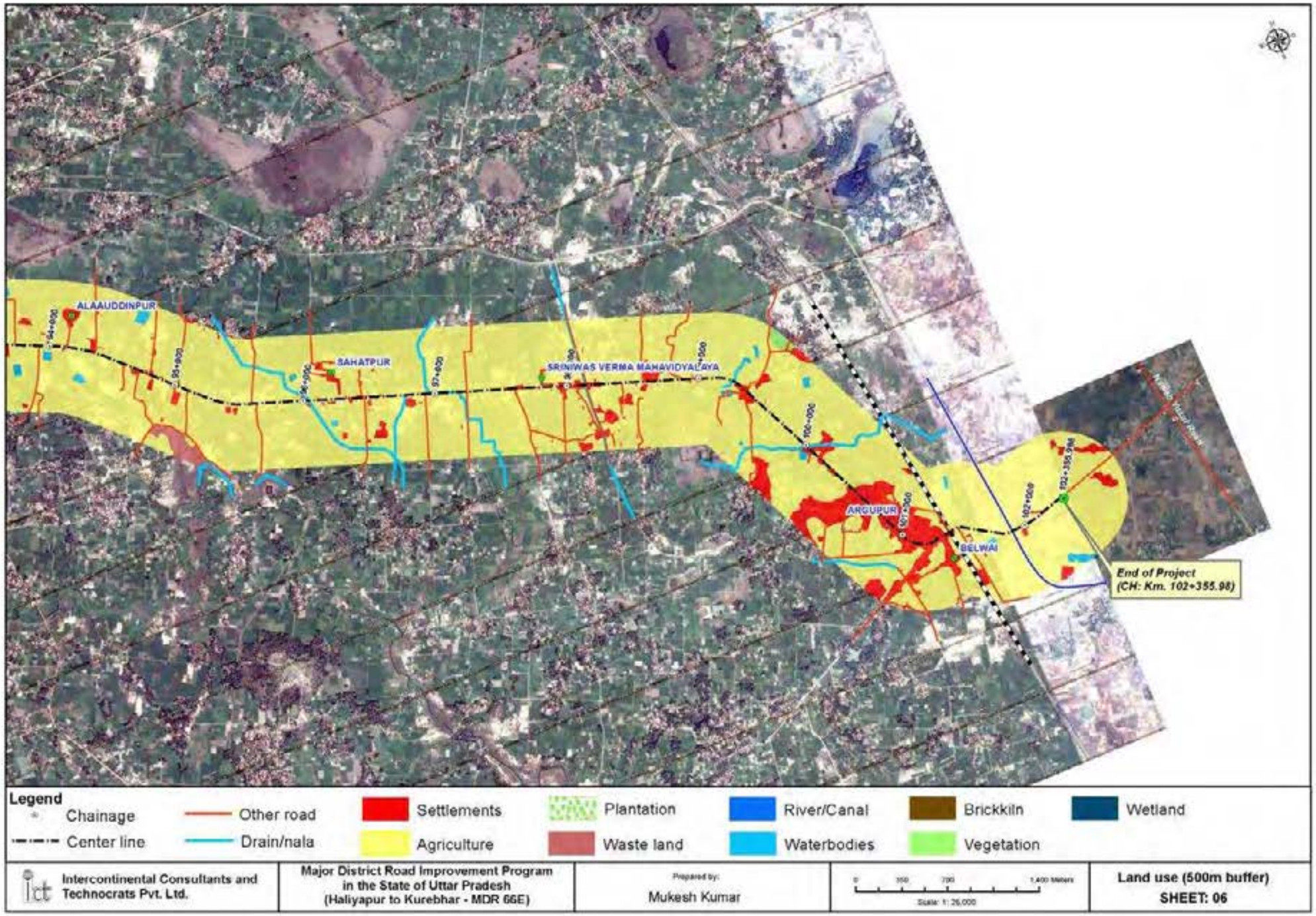
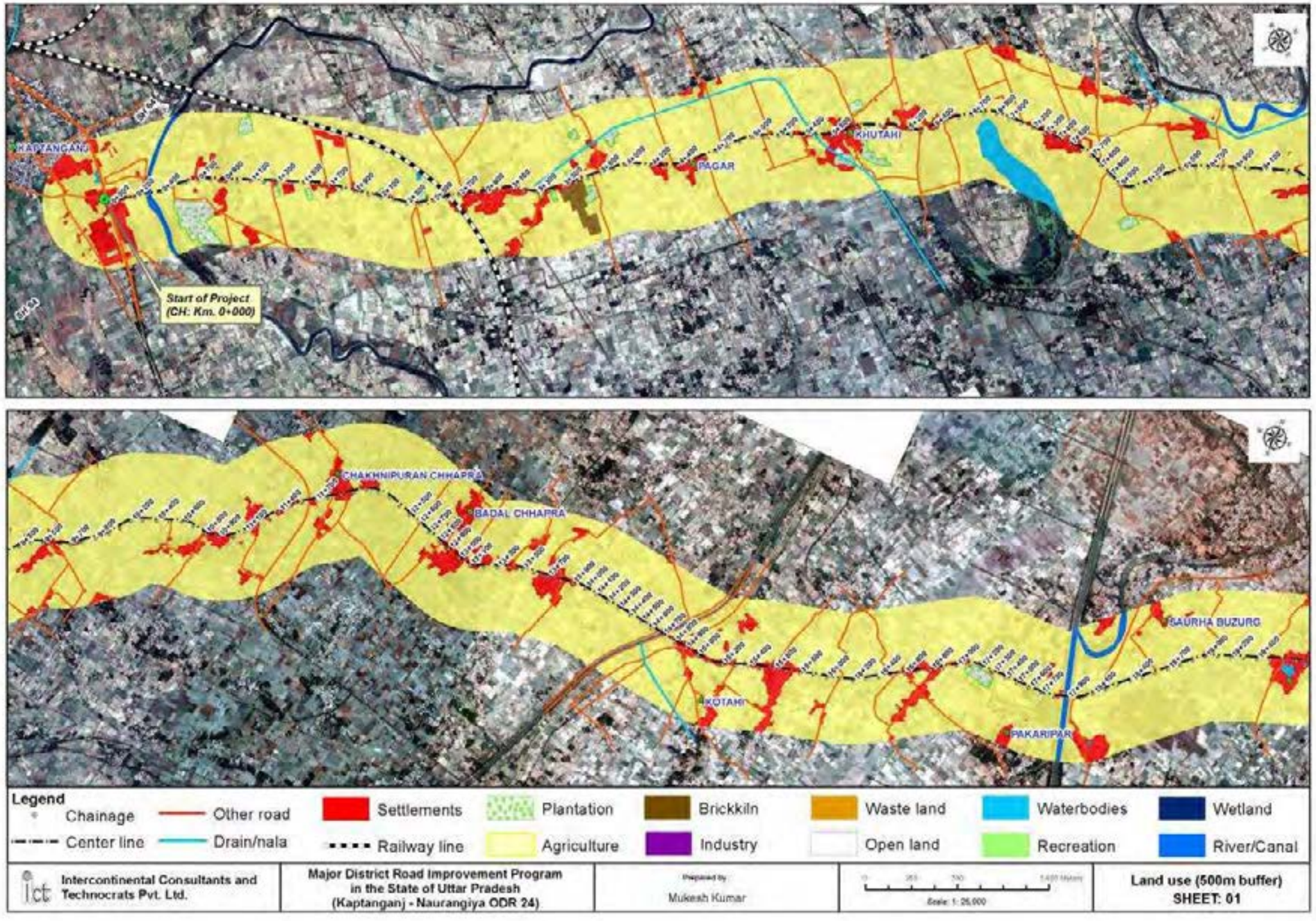

ALAAUDDINPUR
SAHATPUR
SRINIWAS VERMA MAHAVIDYALAYA
ARGUPUR
BELWAI
End of Project
(CH: Km. 102+355.98)
Legend
Chainage
Center line
Other road
Drain/nala
Settlements
Agriculture
Plantation
Waste land
River/Canal
Waterbodies
Brickkiln
Vegetation
Wetland
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Haliyapur to Kurebhar - MDR 66E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 06

Fig. 31: Land Use Map (Kaptanganj - Naurangia)



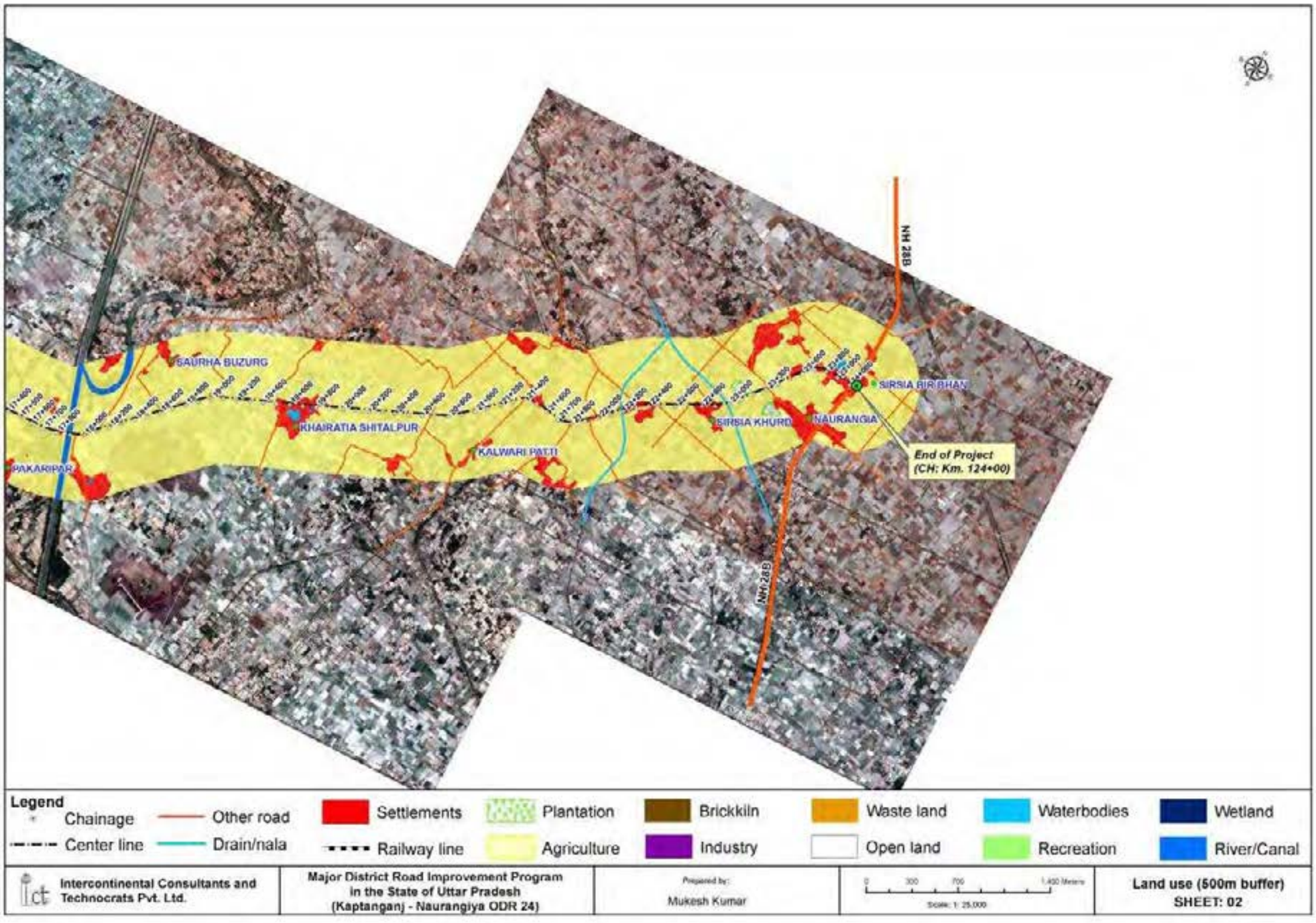
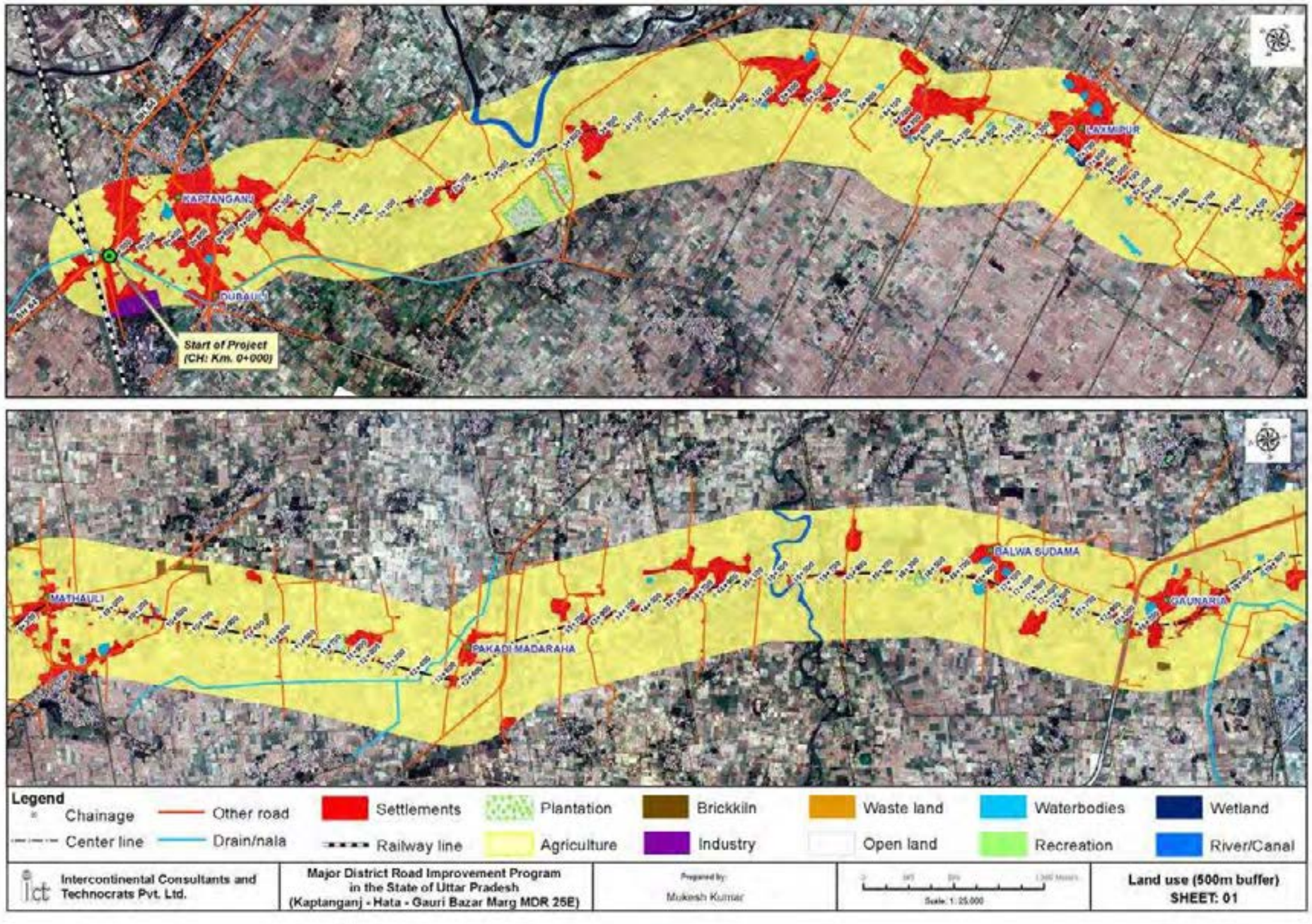
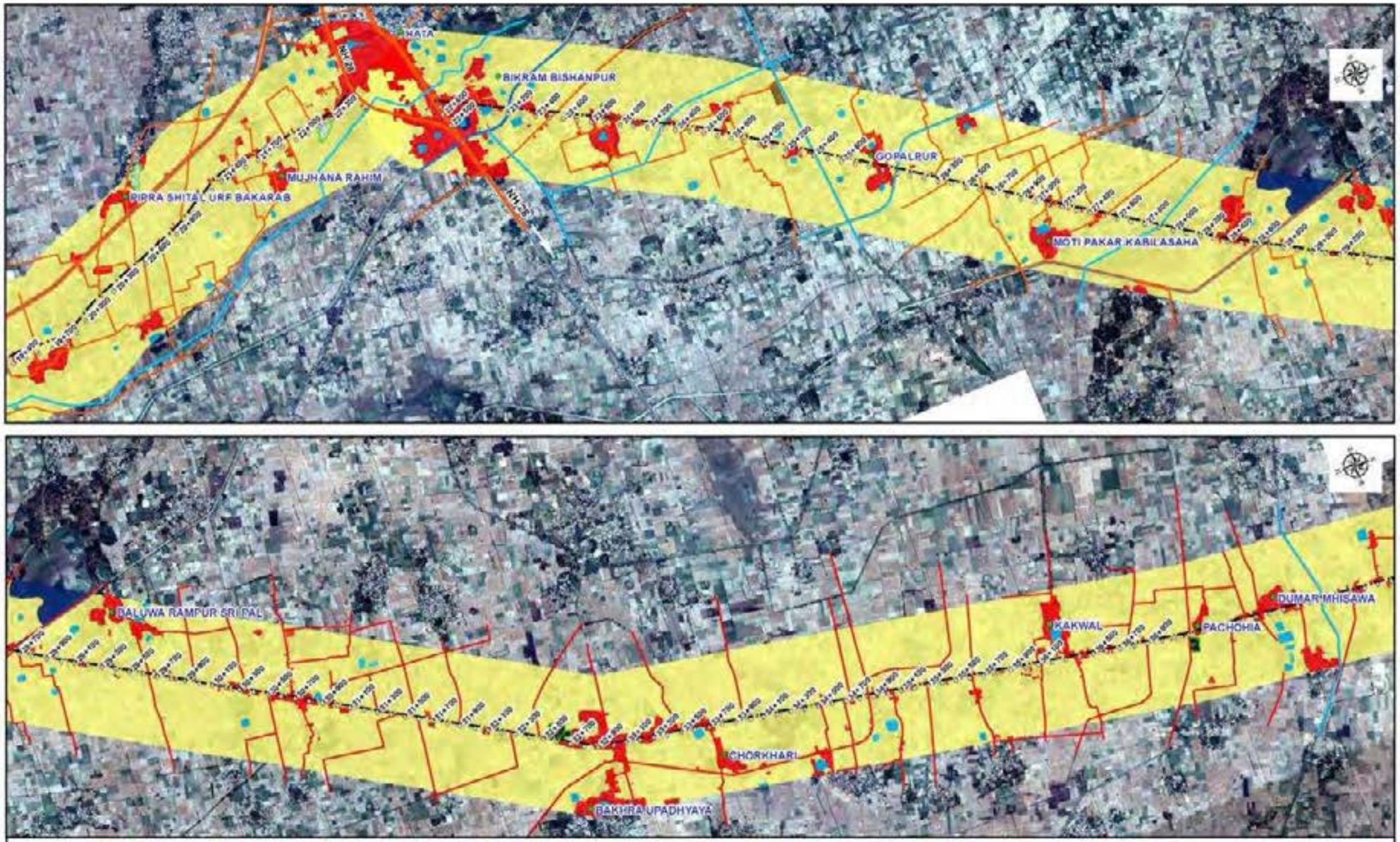
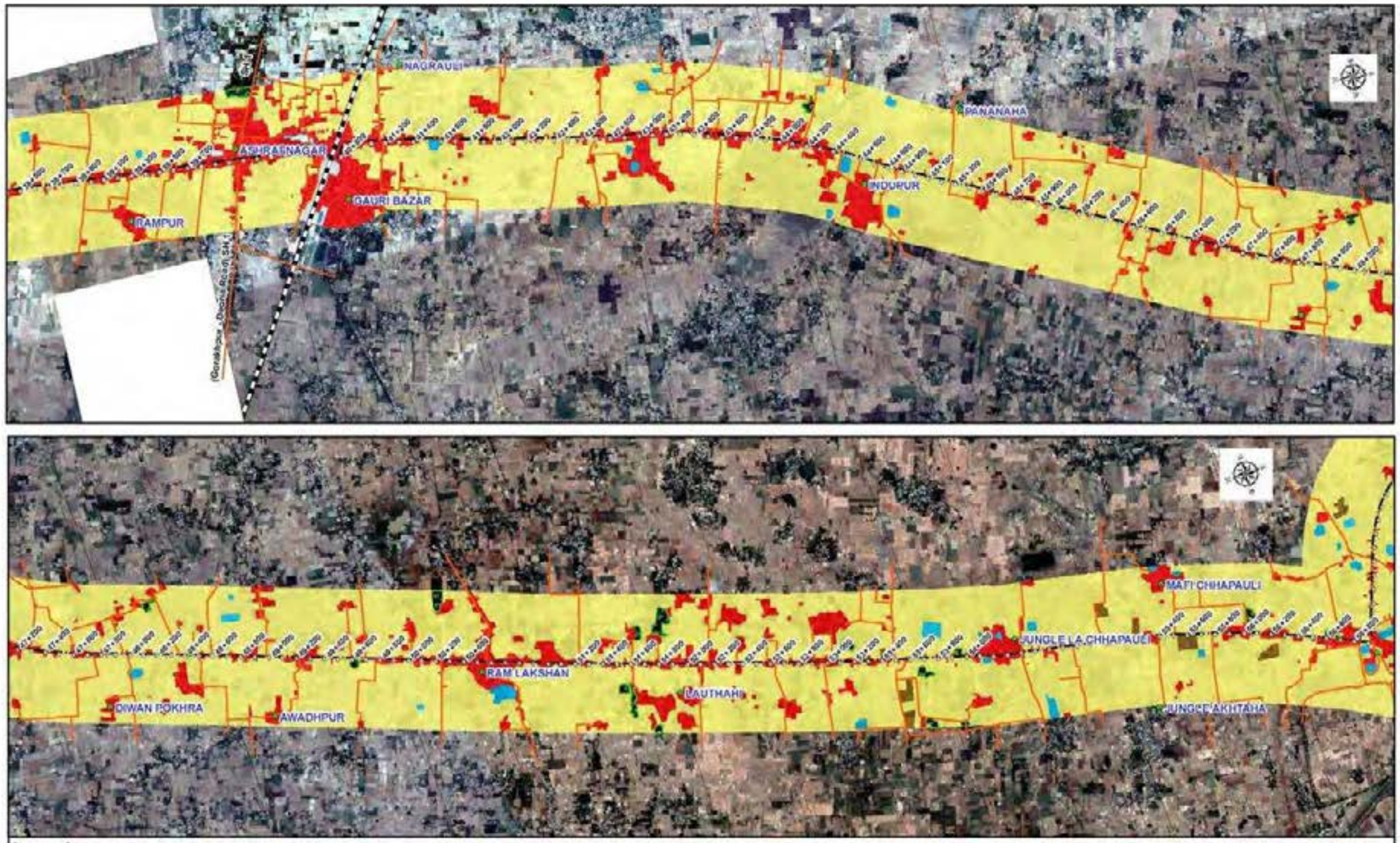

SAURHA BUZURG
KHAIRATIA SHITALPUR
KALWARI PATTI
PAKARIPAR
SIRSIA BIR BHAN
SIRSIA KHURD
NAURANGIA
End of Project
(CH: Km. 124+00)
NH 28B
NH 28B
Legend
Chainage
Other road
Settlements
Plantation
Brickkiln
Waste land
Waterbodies
Wetland
Center line
Drain/nala
Railway line
Agriculture
Industry
Open land
Recreation
River/Canal
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Kaptanganj - Naurangiya ODR 24)
Prepared by:
Mukesh Kumar
0
300
700
1,400 Meters
Scale: 1: 25,000
Land use (500m buffer)
SHEET: 02

Fig. 33: Land Use Map (Kaptanganj - Rudrapur)




HATA
BIKRAM BISHANPUR
GOPALRUR
MOTI PAKAR KARILASAHA
MUJHANA RAHIM
RIBRA SHITAL URF BAKARAB
DALUWA RAMPUR SRI PAL
KAKWAL
PACHOHIA
DUMARIMHISAWA
CHORKHARI
BAKHRA UPADHYAYA
Legend
Chainage
Center line
Other road
Drain/nala
Railway line
Settlements
Agriculture
Plantation
Industry
Brickkiln
Open land
Waste land
Recreation
Waterbodies
River/Canal
Wetland
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Kaptanganj - Hata - Gauri Bazar Marg - MDR 25E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 02


NAGRAULI
PANANAHA
ASHRAINAGAR
GAURI BAZAR
INDURUR
RAMPUR
MATI CHHAPAULI
JUNGLE LA CHHAPAULI
RAM LAKSHAN
BAUTHAHI
DIWAN POKHRA
AWADHPUR
JUNGLE AKHTAHA
Legend
Chainage
Other road
Settlements
Plantation
Brickkiln
Waste land
Waterbodies
Wetland
Center line
Drain/nala
Railway line
Agriculture
Industry
Open land
Recreation
River/Canal
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Kaptanganj - Hata - Gauri Bazar Marg - MDR 26E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 03

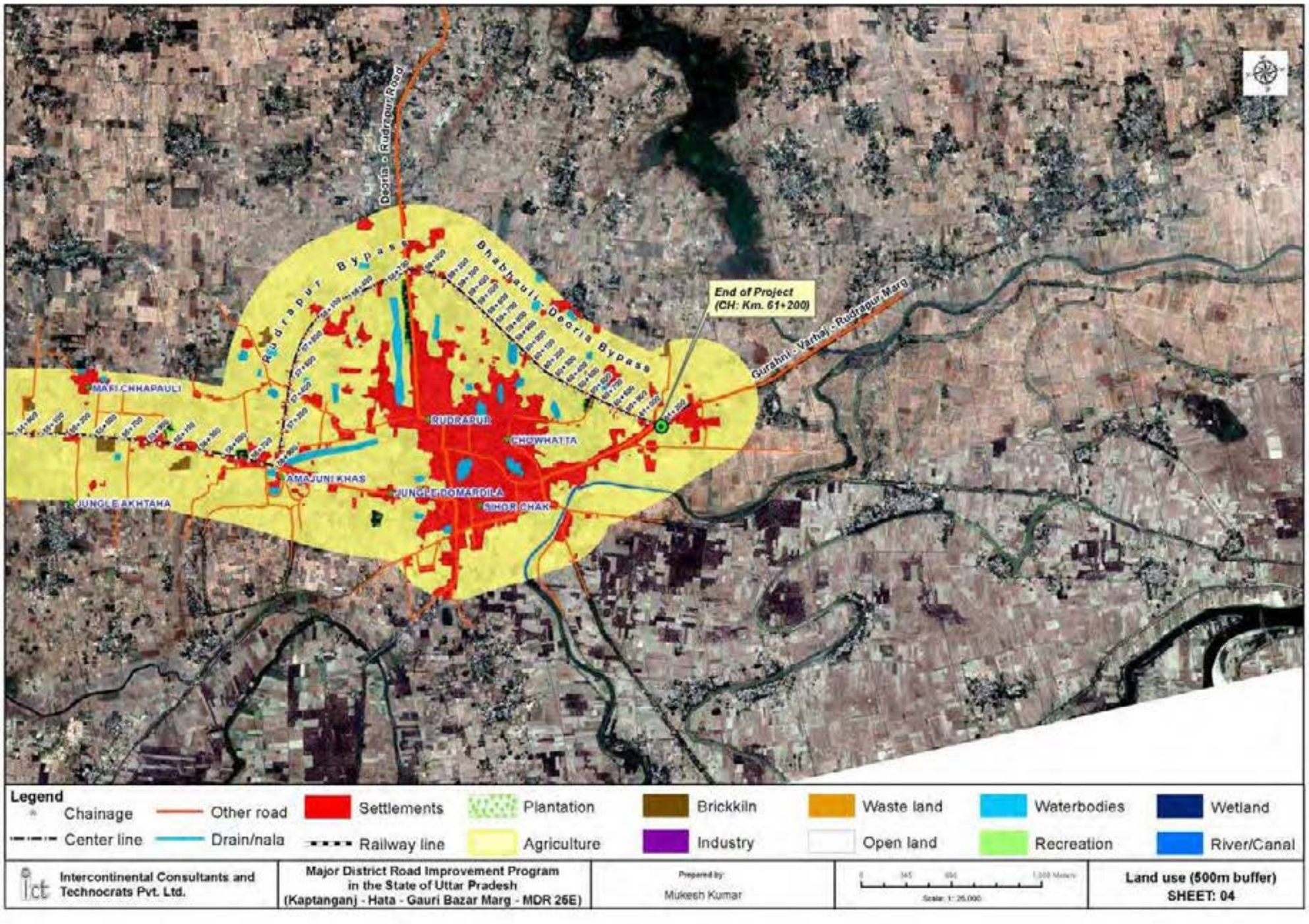
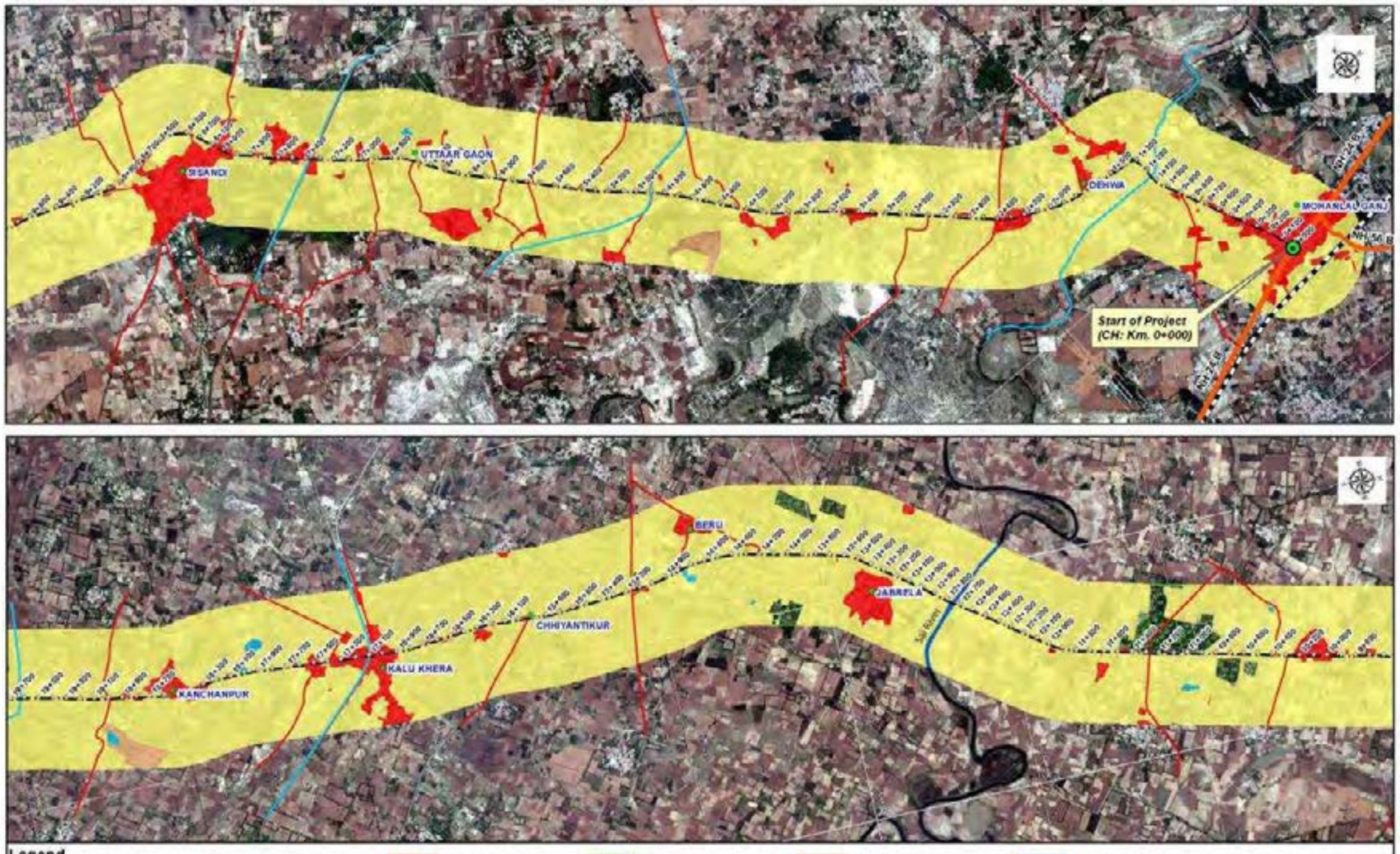
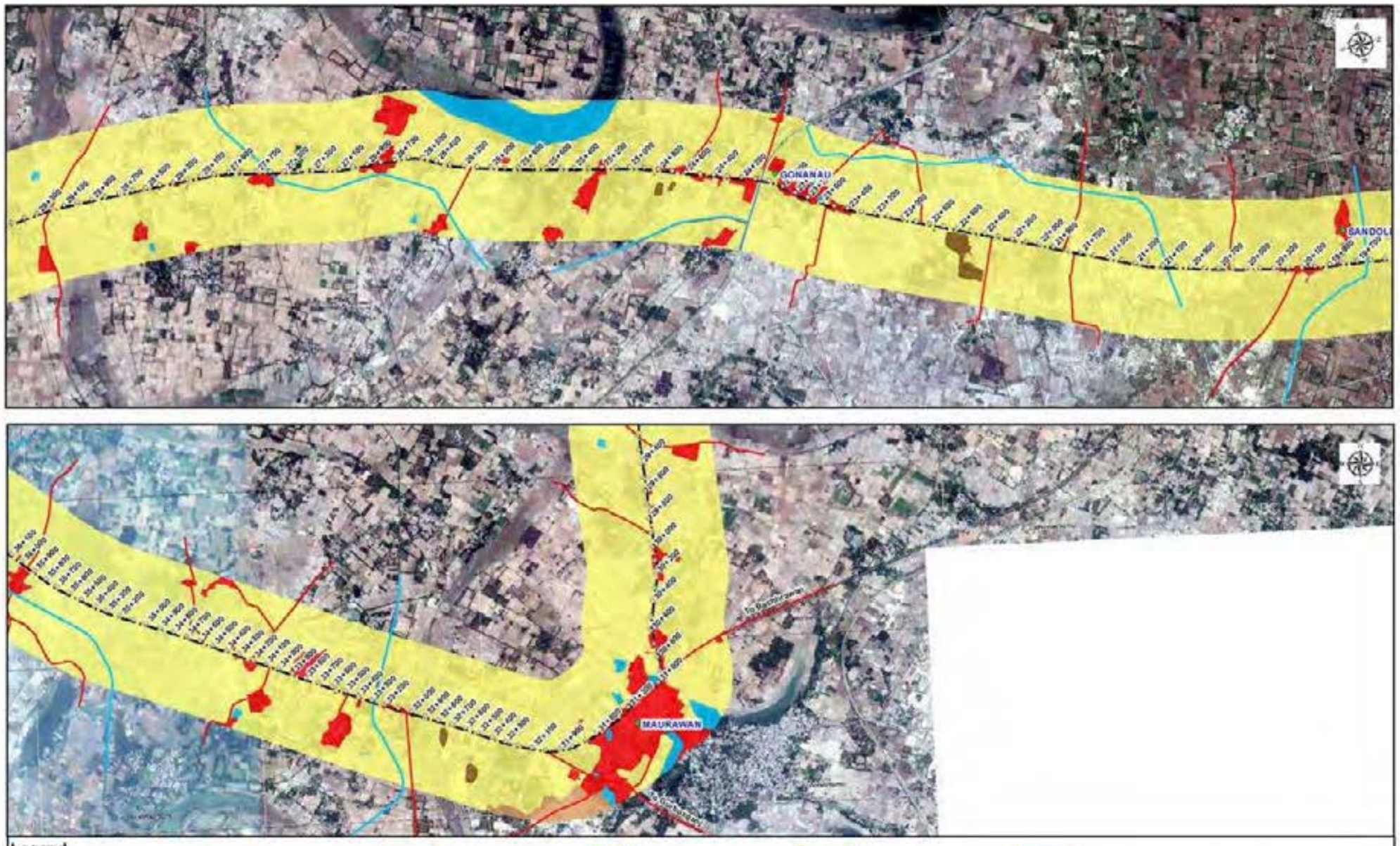

Deoria - Rudrapur Road
Rudrapur Bypass
Bhabhauli - Deoria Bypass
End of Project
(CH: Km. 61+200)
Gurahni - Varhaj - Rudrapur Marg
MAHUCHHAPAULI
RUDRAPUR
CHOWHATTA
AMAJUNI KHAS
JUNGLE DOMARDIKA
SIHOR CHAK
JUNGLE AKHTAHA
Legend
Chainage
Other road
Settlements
Plantation
Brickkiln
Waste land
Waterbodies
Wetland
Center line
Drain/nala
Railway line
Agriculture
Industry
Open land
Recreation
River/Canal
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Kaptanganj - Hata - Gauri Bazar Marg - MDR 25E)
Prepared by:
Mukesh Kumar
Land use (500m buffer)
SHEET: 04

Fig. 35: Land Use Map (Mohanlalganj - Unnao)



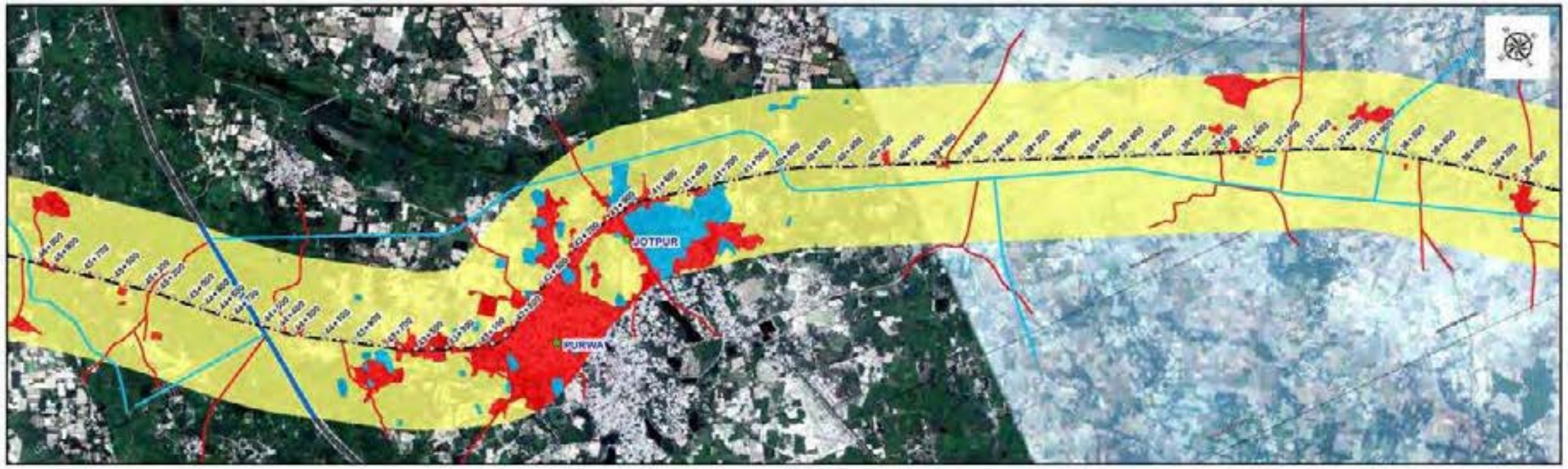


Legend

Chainage | Other road | Settlements | Plantation | Brickkiln | River

Center line | Drain/nala | Railway line | Agriculture | Waste land | Waterbodies

Intercontinental Consultants and Technocrats Pvt. Ltd.	Major District Road Improvement Program in the State of Uttar Pradesh (Mohanlalganj to Maurawan Unnao Marg - MDR 52C)	Prepared by: Mukesh Kumar	0 375 750 1,500 Meters Scale: 1: 26,000	Land use (500m buffer) SHEET: 02



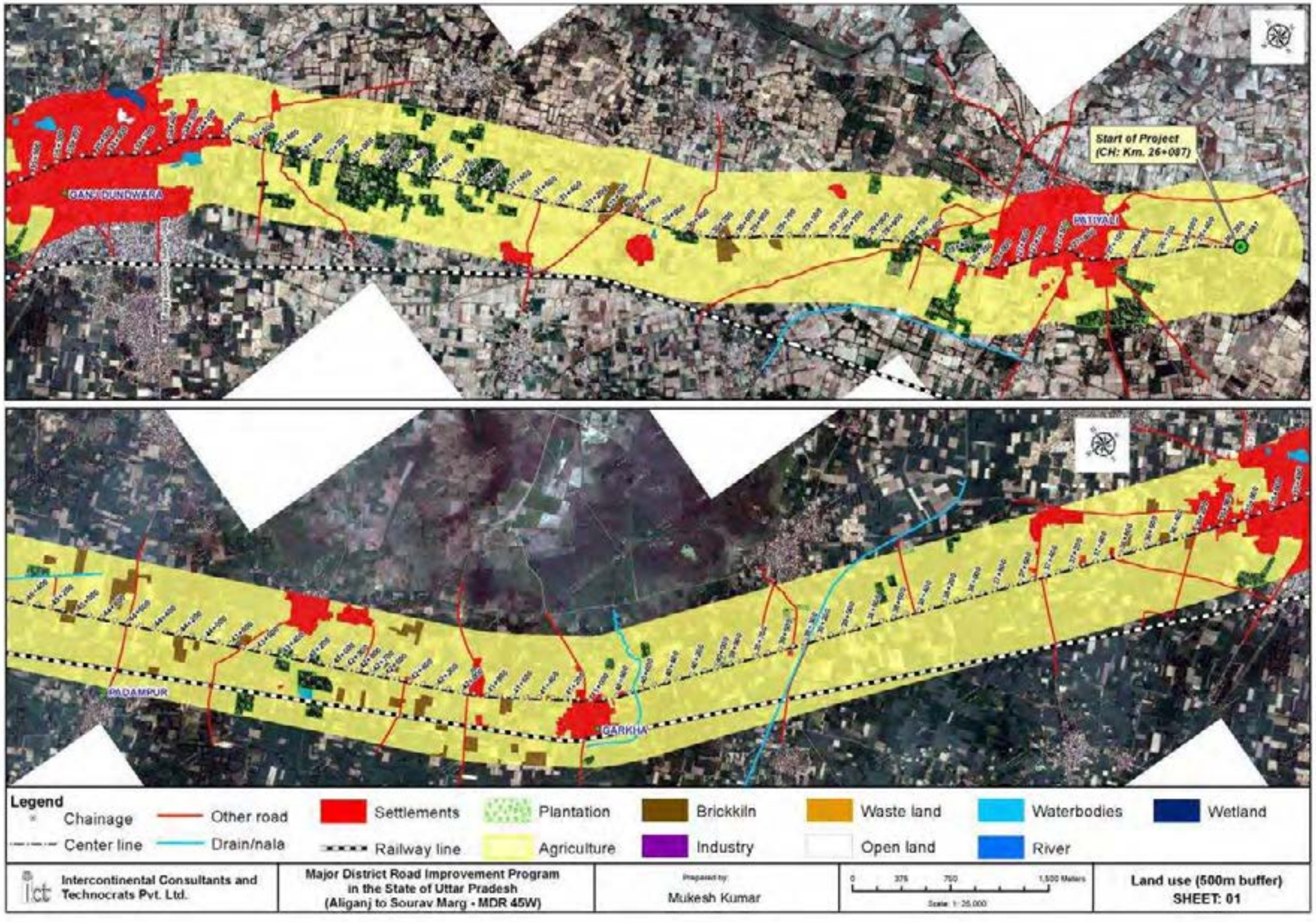
Legend

Chainage | Other road | Settlements | Plantation | Brickkiln | River

Center line | Drain/nala | Railway line | Agriculture | Waste land | Waterbodies

Intercontinental Consultants and Technocrats Pvt. Ltd.	Major District Road Improvement Program in the State of Uttar Pradesh (Mohanlalganj to Maurawan Unnao Marg - MDR 52C)	Prepared by: Mukesh Kumar	0 375 750 1,500 Meters Scale: 1: 25,000	Land use (500m buffer) SHEET: 03

Fig. 37: Land Use Map LU (Aliganj - Soron)



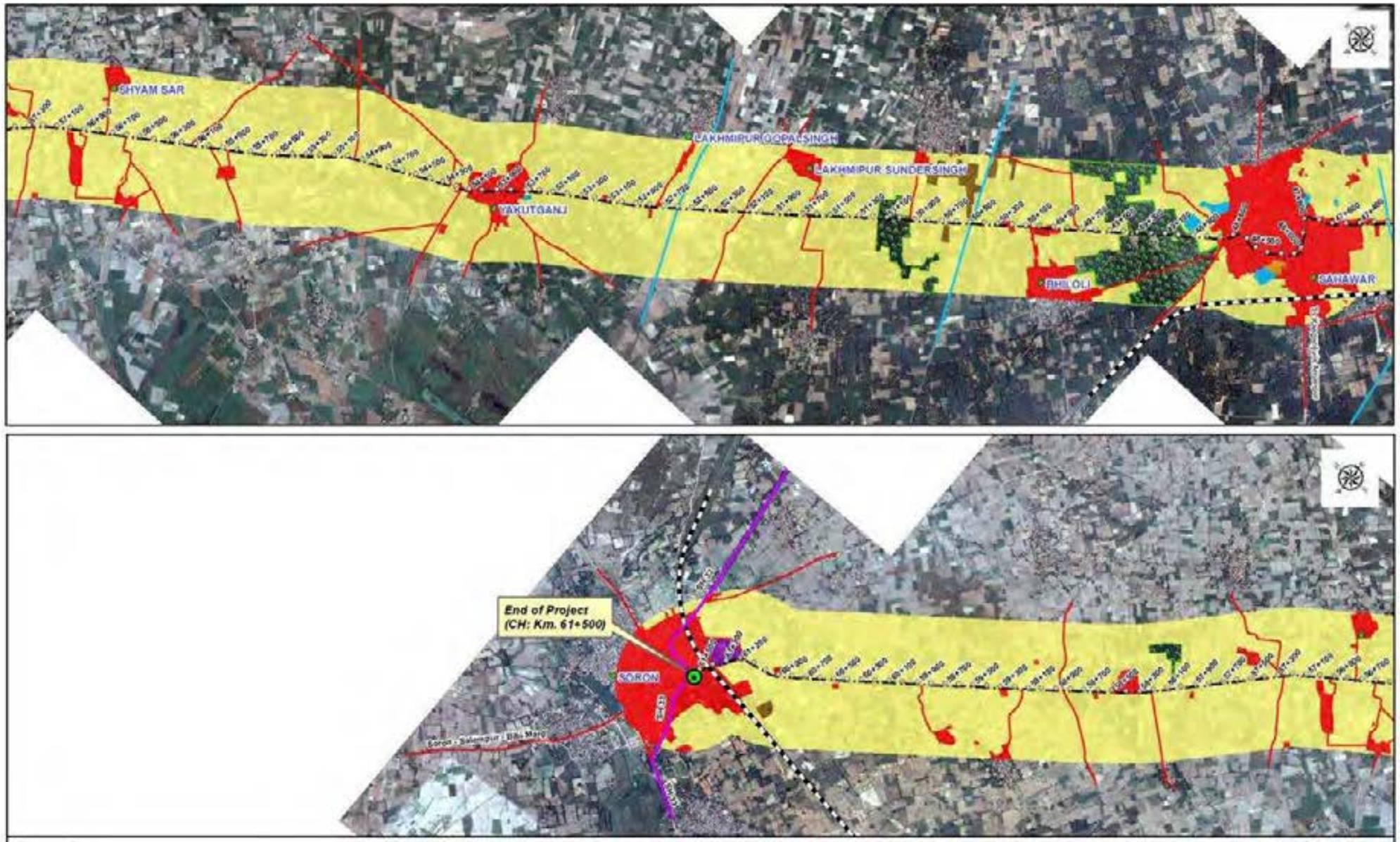
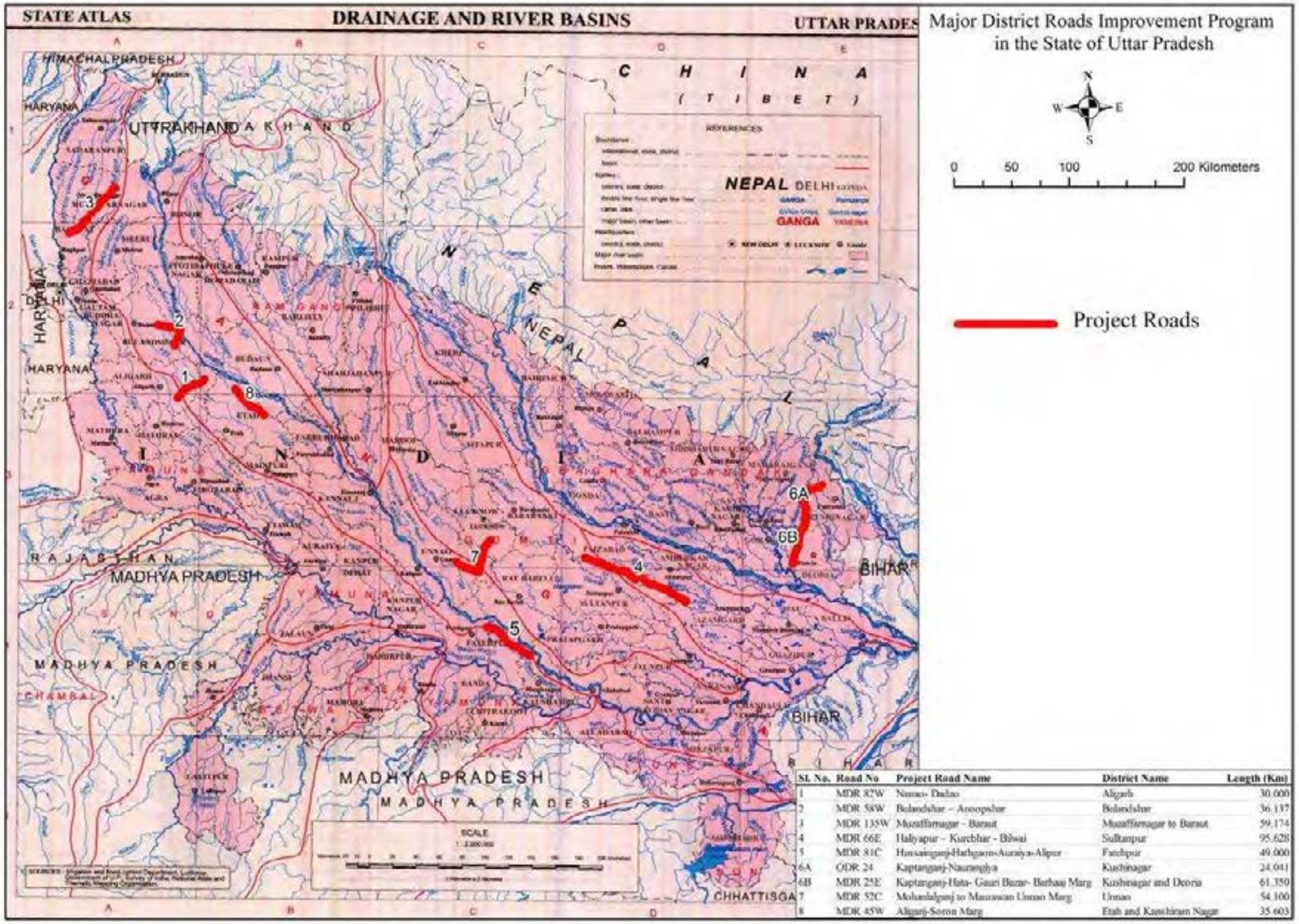
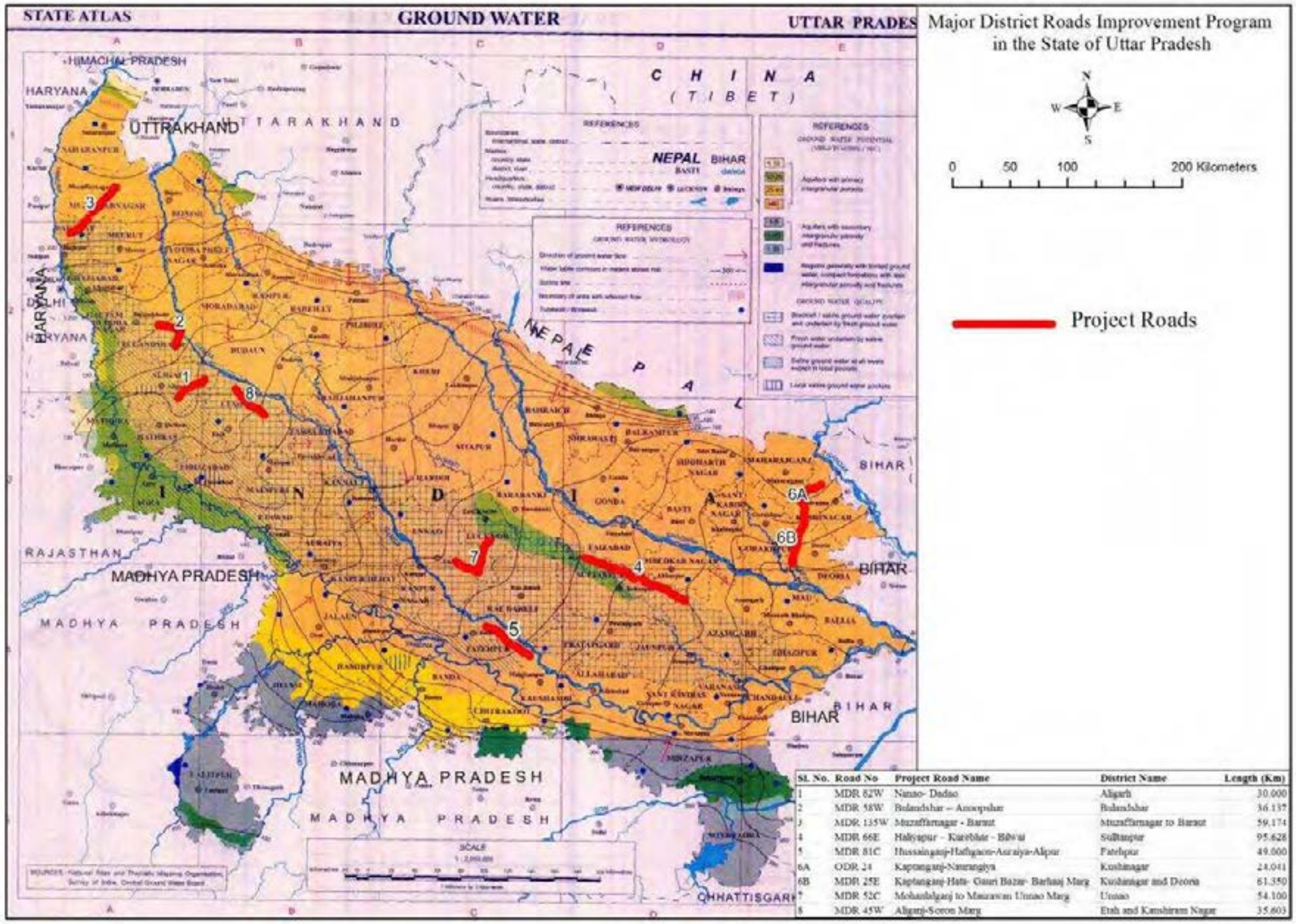

SHYAM SAR
YAKUTGANJ
LAKHMIPUR GOPALSINGH
LAKHMIPUR SUNDERSINGH
BHILOLI
SAHAWAR
End of Project
(CH: Km. 61+500)
SORON
Legend
Chainage
Other road
Settlements
Plantation
Brickkiln
Waste land
Waterbodies
Center line
Drain/nala
Railway line
Agriculture
Industry
Open land
Wetland
Intercontinental Consultants and Technocrats Pvt. Ltd.
Major District Road Improvement Program in the State of Uttar Pradesh (Aliganj to Sourav Marg - MDR 45W)
Prepared by:
Mukesh Kumar
0
375
750
1,500 Meters
Scale: 1: 25,000
Land use (500m buffer)
SHEET: 02

Fig. 38: Drainage Map



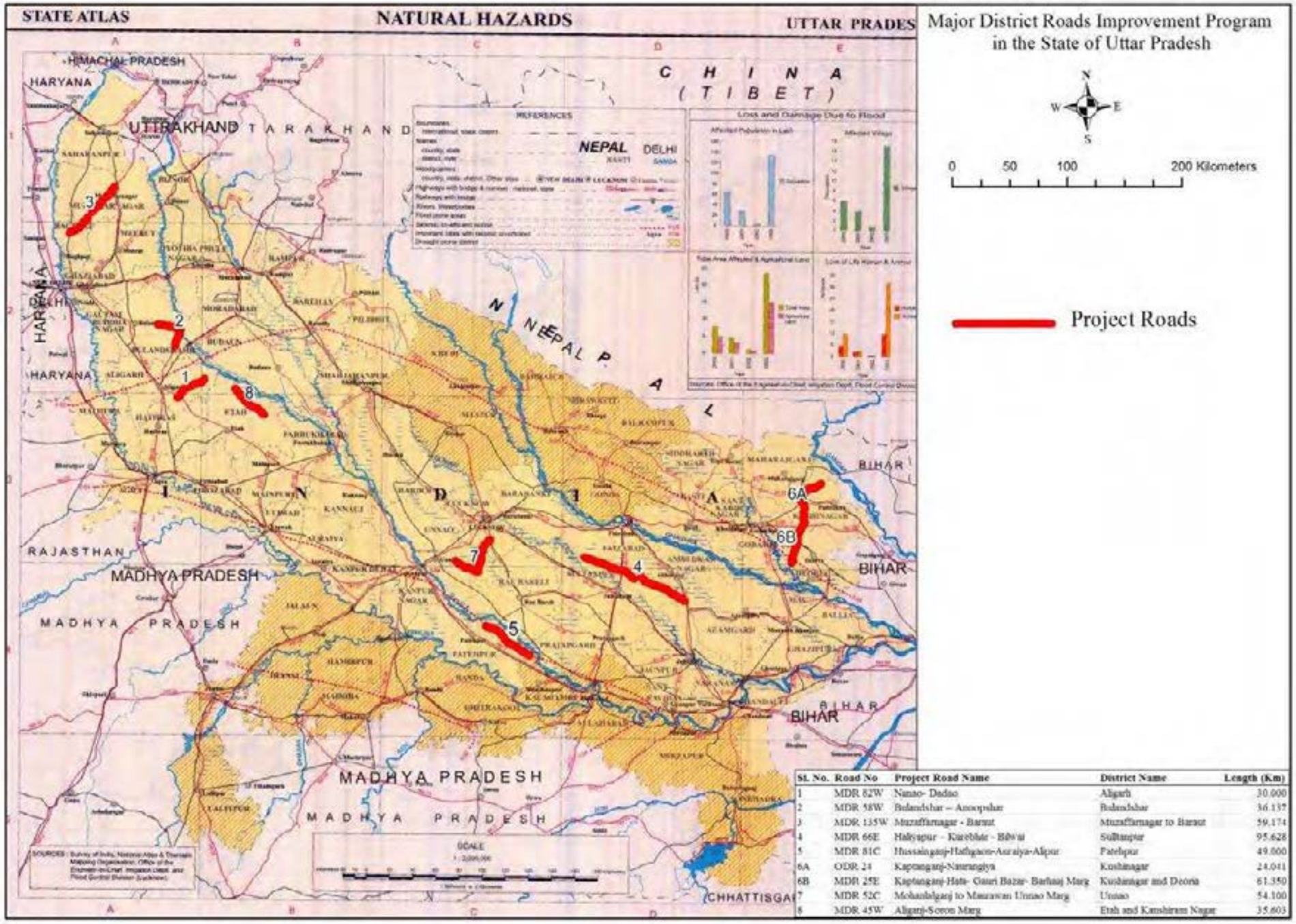
Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanao- Dadao	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Baraut	Muzaffarnagar to Baraut	59.174
4	MDR 66E	Haliyapur – Kurebhar - Biwai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Naurangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauawan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Soron Marg	Etah and Kanshiram Nagar	35.603

Fig. 62: Ground Water Map-UP



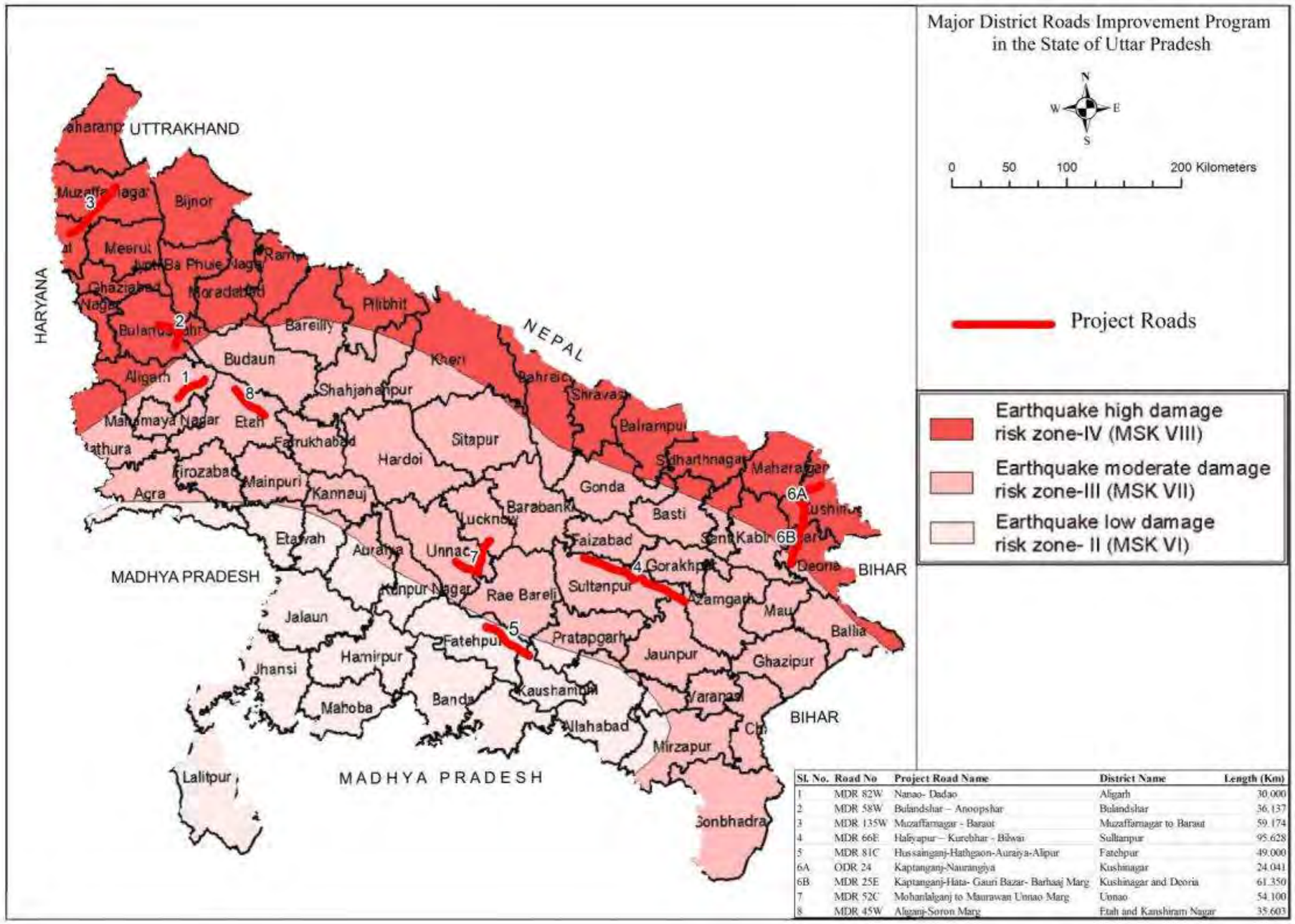
Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanso- Dadso	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Baraut	Muzaffarnagar to Baraut	59.174
4	MDR 66E	Haliyapur – Kurebhar - Bilwai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Asraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Naurangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Maurawan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Soron Marg	Etah and Kanshiram Nagar	35.603

Fig. 78: Hazards Map UP



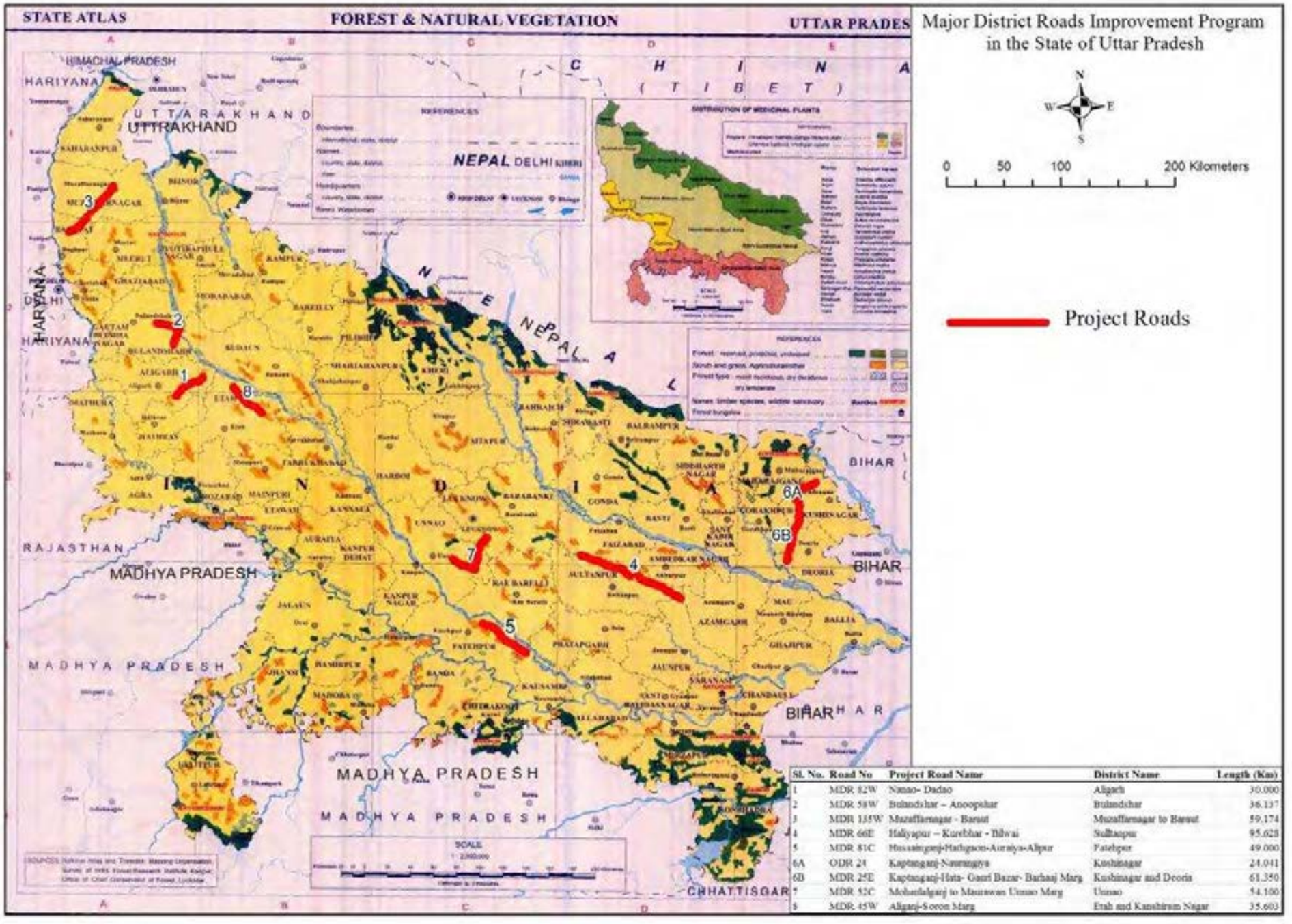
Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanso- Dadao	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.135
3	MDR 135W	Muzaffarnagar - Baraut	Muzaffarnagar to Baraut	59.174
4	MDR 66E	Haliyapur – Kurebhar - Bilwai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Narangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauranwan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Soron Marg	Etah and Kanshiram Nagar	35.603

Fig. 79: Earthquake Map UP



Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nanao- Dadao	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Baraut	Muzaffarnagar to Baraut	59.174
4	MDR 66E	Hafeyapur – Kurebhar - Biswa	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Alipur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Naurangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Maurawan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Soron Marg	Etah and Kanshiram Nagar	35.603

Fig. 91: Forest & WLS



Sl. No.	Road No	Project Road Name	District Name	Length (Km)
1	MDR 82W	Nimao- Dadao	Aligarh	30.000
2	MDR 58W	Bulandshar – Anoopshar	Bulandshar	36.137
3	MDR 135W	Muzaffarnagar - Barsut	Muzaffarnagar to Barsut	59.174
4	MDR 66E	Haliyapur – Kurebhar - Bilwai	Sultanpur	95.628
5	MDR 81C	Hussainganj-Hathgaon-Auraiya-Allpur	Fatehpur	49.000
6A	ODR 24	Kaptanganj-Naurangiya	Kushinagar	24.041
6B	MDR 25E	Kaptanganj-Hata- Gauri Bazar- Bachaaj Marg	Kushinagar and Deoria	61.350
7	MDR 52C	Mohanlalganj to Mauawan Unnao Marg	Unnao	54.100
8	MDR 45W	Aliganj-Soron Marg	Etah and Kanshiram Nagar	35.603

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

272. Based on the baseline profile generated for the study areas and project interventions, assessment of likely positive and negative impacts has been done for design, construction and operation phases. Mitigation measures have been devised based on the nature of impacts.

A. Design Stage

273. Impacts can be reduced to considerable extent in the planning stage itself. Aspects considered in case of improvements of the Major District roads to minimize the impacts are as follows:

1. Improvement within Existing RoW

274. Improvement of the roads has been proposed within the existing RoW without any additional land acquisition. This factor alone reduces impact like conversion of land to hard surface, loss of agricultural land, loss of structures and livelihood, and loss of trees.

2. Ecological Sensitivity

275. The proposed design follows existing alignments only does not pass through any National Park or Wildlife Sanctuary, eco sensitive zones or reserve forest thus reducing the sensitivity of the project in terms of biodiversity.

276. Vacant spaces on both sides of few road stretches owned by PWD has been notified as protected forest that includes the whole stretch of Nanau to Dadon (MDR 82W), Taoli village at km 9.000 to Budhana village km 31.000 of Muzaffarnagar to Baraut (MDR 135W), km 0 to km 0.800 of Mohanlalganj to Maurawan Unnao Marg (MDR 52 C) and from Bahera Chowk at km 33.375 to Alipur Jita at km 48.675 of Hussainganj to Alipur Marg (MDR 81C). Approximately78.76 ha of protected forest will be diverted. In case of Naurangia - Kaptanganj – Rudrapur, SH-1 crosses MDR 25E (KB) near Hata which is a notified PF. Nearly 37873 trees are likely to be cut that are present within 10 m of CL or formation width out of 62988 that are present within RoW**(Table IV-1**). The trees cut will be compensated at the ratio of 1:3. Additional compensatory afforestation shall be done @ 1:2 at available spaces along the road.**Volume-II of IEE Report**gives the detailed list of trees to be impacted.

277. The project road of Mohanlalganj to Unnao is at a distance of approximately 11 km from Nawabganj Bird sanctuary which is visited by migratory birds during winter season (November to February). The stretch of Upper Ganga River from Brijghat to Narora has been identified as Ramsar site (no. 1574). The Bulandshahar- Anoopshahar- (MDR 58W) road lies near the Ramsar site but is outside its wetland boundary. The nearest point is junction of Anoopshahar at km 39.700 which is 900m away from the wetland boundary. The stretch of river near project site is highly polluted and shallow. Hence, not much impact is anticipated. The proposed alignments are designed to follow the existing roads so as to avoid any kind of direct impact on them. Details of these two protected areas, anticipated impact on them and their mitigation measures to be taken up during construction and operation is given later in this chapter.

Table IV-1: Trees to be cut and PF to be diverted

Road stretches	Trees to be felled (No.) within 10 m from CL			Trees within the RoW (approx. 15m from CL)			PF (Ha)
	LHS	RHS	Total	LHS	RHS	Total	
MDR 82W (ND)	1786	1853	3639	2353	2344	4697	38.00
MDR 81C (HA)	753	966	1719	1204	1540	2744	20.00
MDR 135W (MB)	1757	2120	3877	4322	5814	10136	20.00
MDR 66E (HK)	3866	3261	7127	5662	4864	10526	0
MDR 58W (BA)	789	768	1557	2032	2245	4277	0
ODR24 (KN)	1705	1806	3511	2422	2583	5005	0
MDR 25E (KB)	3067	2573	5640	4181	4097	8278	0
MDR 52 C (MM)	2422	2004	4426	4332	3981	8313	0.756
MDR 45W (AS)	3133	3244	6377	4436	4572	9012	0
Total	**19278**	**18595**	**37873**	**30944**	**32040**	**62988**	**78.76**

Source: DPR Consultants

3. Widening of road along with drainage system

278. The roads are designed to be widened along with road side drain on both side in urban areas that will help avoid accumulation of road runoff or waste water. Improvement of cross drainage structures will facilitate better drainage. Finished road level has been raised at 166 stretches and along a length of 115.86 km where localized flooding occurs. Road wise breakup is given in **Table IV-22** of this chapter.

4. Improving pavement condition

279. Pavement roughness will be improved from 6-7m/km to 2.5 to 3m/km on the project roads after improvement. This will avoid congestion in the future, optimal travel speed, and less vehicular emissions.

5. Planning for pre- construction activities

280. Relocation of structures, tree cutting, utility (electric poles, hand pump, water supply line etc) shifting shall be done prior to start of construction work with due permission of the competent authorities. Prior information will be provided to the immediate communities at least 2 weeks in advance for possible temporary disruption of services.

6. Design for safety provisions

281. including retro-reflective warning sign boards and rumble strips near school, hospital, and religious places, road markings, road lighting and crash barriers on cross drainage structures or raised embankments as per relevant IRC codes and standards are incorporated in the design. Provision of side-walks / pedestrian zone / foot path along the road near habitat areas, school, and hospital shall be made. Zebra crossing with informatory warning sign on approach to school, shall be provided for speed limit. Elimination of black spots by controlling speed through provision of speed breakers/ rumble strips and other design considerations as per IRC codes were done. IRC35:1997 is for pavement markings and IRC: 67-2010 and subsequent revisions and IRC:SP:31-1992 for road signs. Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, and pedestrian guardrails shall be used as applicable.

282. Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993. IRC:SP:32-1988 shall be followed for ensuring safety of children.

B. Construction & Operation Stage

1. Micro climate

a. Impact during construction

283. The micro climatic conditions may experience certain changes during the construction phase. Temperature may increase temporarily at the construction site due to removal of trees and operation of machineries / vehicles. This impact however will be localized.

b. Mitigation during construction

284. Periodical sprinkling of water shall be done to keep the temperature in control at the construction site.

c. Impact during operation

285. The initial years of operation shall face slight higher temperature because road side tree cover will be removed. More over the asphalt pavement being a black body would absorb maximum heat and radiate it back to heat up the atmosphere. This impact would however be short term and localized.

d. Mitigation during operation

286. Over the years trees planted at the ratio of 1:2 along the roads will help in managing the temperature.

2. Topography

287. All the project road fall in plain terrain and are existing hence no significant change in topography is anticipated. However, height shall be raised above the ground wherever embankments are proposed (166 stretches and along a length of 115.86km) and also along the approaches of new proposed bridges. Opening of borrow areas may result in change of topography which shall be minor and localized.

3. Geology

a. Impact

288. Impact of the proposed activity on the geological resources will occur from the extraction of materials primarily from identified and approved quarries .The large-scale extraction of streambed materials, mining and dredging below the existing streambed, and the alteration of channel-bed form and shape leads to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology. These impacts may cause: the undercutting and collapse of river banks, the loss of adjacent land and/or structures, upstream erosion as a result of an increase in channel slope and changes in flow velocity, and downstream erosion due to increased carrying capacity of the stream, downstream changes in patterns of deposition, and changes in channel bed and habitat type. Chemical/fuel spills from equipments and machinery involved in dredging may cause degradation of water quality for downstream users, and poisoning of aquatic life.

289. No fishing was observed or reported in the sand mining areas identified for the project roads. This is mainly because all river beds are dry for most part of the year. Moreover, any extraction of river bed material is regulated by different authorities like State Environmental Impact Assessment Authority, State Pollution Control Board and State Mining Department with an objective of to conserve top soil, minimize impact on aquatic biodiversity, hydrological regime etc. by haphazard and unscientific mining of minor minerals. Moreover, the project will utilize river bed materials from existing licensed quarries with all stipulated conditions of above mentioned authorities.

290. Quantity of stone aggregates/sand required is negligible compared to the existing available quantities. Moreover the stones/sands will be obtained from existing quarries/ mines which have all valid permits applicable under law. No new quarries are proposed. Hence, no significant impacts are anticipated on the geology of the region. The amount of stone aggregates and sand required would be as given in **Table IV-2**. Queries identified are given in **Appendix 27.**

Table IV-2: Requirement of aggregate and sand

Road stretches	Stone Aggregate (Cum)	Sand (Cum)
MDR 82W-Nanau to Dadon (ND)	238528	22787
MDR 81C-Hussainganj to Alipur Marg (HA)	29322	21099
MDR 135W-Muzzaffarnagar to Baraut (MB)	375476	34726
MDR 66E-Haliyapur to Kurebhar (HK)	92421	68601
MDR 58W- Bulandansharar to Anupshahar (BA)	254942	24338
ODR24 (KN) & MDR 25E (KB)- Naurangiya - Kaptanganj – Rudrapur	73767	54307
MDR 52 C-Mohanlaganj to Maurawan Unnao Marg (MM)	315436	35585
MDR 45W- Aliganj to Saurav Marg (AS)	264671	28896
Total	**1644563**	**290339**

Source: DPR Consultant

4. Mitigation

291. The contractor shall certify that the mines and quarry areas are being managed in an environment friendly manner i.e. shall be maintained & operated in accordance to the stipulated conditions given in their respective environment clearance letters.

5. Natural Hazard- Earthquake

292. Out of 8 Project roads, 3 road stretches fall in high damage risk zone IV (MSK VIII) as per Building Material and Technology Promotion Council (BMTPC) i.e Kaptanganj to Naurangiya (ODR 24) & Kaptanganj to Rudrapur (MDR 25E), Muzzaffarnagar to Baraut (MDR 135W), Bulandansharar to Anupshahar (MDR 58W). Four roads fall in moderate damage risk zone III (MSK VII)i.e. Nanau to Dadon (MDR 82W), Haliyapur to Khurebhar (MDR 66E), Mohanlaganj to Maurawan Unnao Marg (MDR 52C) and Aliganj-Soron Marg (MDR 45W). Only one project road falls in low damage risk zone II (MSK VI) i.e. Hussainganj to Alipur Marg (MDR 81C).

a. Impact

293. Earthquake may break or cause cracks on pavement, bridge or culverts that in turn may disrupt traffic flow, cause damage to the vehicles or life of road users.

b. Mitigation

294. No mitigation required because span and length of new bridges proposed does not qualify for Seismic Analysis in Terms of IRC Code, However proper precaution shall be taken during design and construction to withstand earthquake.

6. Soil

a. Impacts during construction

295. **Loss of productive soil due to change in land use.** Excavation of earth from borrow areas may lead to loss of productive top soil. Similarly, land area used for locating construction/ labor camp may lose its productivity, if it is not restored to its original stage after closure of the construction camp.

296. **Soil erosion.** Though the study areas are not much prone to soil erosion, it may take place at micro level near bridges and culverts, along the banks of river, ponds and places where vegetation is cleared. Loss of soil due to run off from earth stock-piles may also lead to siltation of nearby water bodies.

297. **Soil compaction.** Soil compaction may take place along the haulage roads, at the construction site and camps due to movement of vehicles, placement of heavy machineries in agricultural / productive land. Excessive compaction often leads to reduced soil aeration and reduced soil aeration affects root metabolism and plants ability to take up nutrients and water. This can adversely impact the productivity of soil. This impact however can be reversed.

298. **Soil contamination.** Contamination of soil may result due to solid/ liquid waste disposed from construction camps, leakage and spillage of fuel and lubricants from construction vehicles, improper disposal of construction wastes and spoils.

299. **Borrow areas.** Requirement of soil for filling shall be met by the amount of soil to be generated by cutting as far as possible and the quantity of earth required for different project road is given in **Table IV-3.** Spoil shall be reused in construction and excess spoil shall be disposed of in consultation with local people. It shall be ensured by the contractor that the stored spoil does not get contaminated due to dumping of municipal wastes. If contaminated, it shall not be reused or disposed openly. The contractor shall prepare a site waste management plan (as part of a CEMP) prior to start of construction work detailing out all measures to deal with and dispose of all construction related waste in accordance to the MoRTH guidelines on “Earthwork Erosion Control and Drainage” and E World Bank’s (WB) EHS guidelines. The contractor also has to ensure that the construction waste disposal site does not become a common site for municipal waste dumping . Excess soil if any, shall be disposed in consultation with the local people so that it can be used for filling up any low lying land or construction purpose by the villagers. Identified borrow areas are given in **Appendix 27.** Borrow areas identifiedin the ponds shall help them de-slit and deepen hence increasing their volumetric capacity.Additional borrow areas shall be identified during construction if any such requirement arises. Quantity estimated to be required for the project roads are very less compared to the available quantities.

Table IV-3: Earthwork involved in the project roads

Road stretches	Earth work Filling (Cum)	Earth Work cutting (Cum)	Earth required (cum)
MDR 82W (ND)	108896	39466	81270

Road stretches	Earth work Filling (Cum)	Earth Work cutting (Cum)	Earth required (cum)
MDR 81C (HA)	67268	46755	34539
MDR 135W (MB)	77136	373804	2375
MDR 66E (HK)	137780	297870	40486
MDR 58W (BA)	39064	70885	3622
ODR24 (NK) & MDR 25E (KB)	120943	143646	55555
MDR 52 C (MM)	49294	328628	775
MDR 45W (AS)	23960	159731	4228
Total	610928	1460785	217847

Source: DPR Consultants

b. Mitigation during construction

300. **Save productive soil.** The top soil from the productive land shall be preserved and reused for plantation purposes. It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. It shall be ensured that the land taken on lease for access road and construction camp is restored back to its original land use before handing it over back to land owner. Agricultural and forest land shall be avoided as far as possible to be used as borrow areas.

301. **Protection from soil erosion.** The protection measures for soil erosion are-

- Bank protection measures shall be taken in the form of turfing/ stone pitching as necessary or as applicable under IRC:56-1974.
- Side slopes of the embankment shall not be steeper than 1:2 and turfing of embankment slopes shall be done along the stretch.
- Construction work shall not be done during monsoon season
- Soil excavated shall be piled with height not more than 2 m and slope should not be steeper than 1:2. It shall be covered with tarpaulin.
- The borrowing/excavation activity shall be restricted to a maximum depth of 2 m below general ground level at the site.

302. **Borrow area management.** MoRTH guidelines on “Earthwork Erosion Control and Drainage” in section 300 shall be followed by contractor for selection and management of borrow pits. The contractor will comply with the following.

- Borrow areas should not be opened on agricultural land until and unless inevitable i.e. no suitable uncultivable land in the vicinity for borrowing or private landowners are willing to allow borrowing in their fields.
- Along the roadside, borrow pits should be located 5m away from the toe line.
- Borrow areas along road side, if permitted by the engineer shall not be dug continuously.
- The loss of productive and agriculture soil should be minimum.
- The loss of vegetation shall be minimum& sufficient quality of soil shall be available.

303. After identification of borrow areas, the Contractor will provide periodic reports to the CSC ensuring the following-

- In no case the depth of borrow area should exceed 2m from the existing ground level.
- The depth of the pits shall be so regulated that their bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of the bank.
- In case of cultivable land, top soil (15cm) should be preserved and stockpiled.
- Ridges of not less than 8m width should be left at intervals not exceeding 300m. Small drains to be cut through the ridges to facilitate drainage.
- No pit shall be dug within the offset width of a minimum of 10m
- Water pooling to be avoided/managed so that no disease spread due to water stagnation.
- Borrow pits should be located at least 1000m away from settlements.
- Precautionary measures as the covering of vehicles will be taken to avoid spillage during transportation of borrow area.
- The unpaved surfaces used for the haulage of borrow materials should be maintained properly for dust suppression.
- Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction facility is operating at the place of deposition, to minimize dust pollution.
- Borrow pits located near settlements will be re-developed immediately after borrowing is completed. If spoils are dumped, that will be covered with a layers of stockpiled topsoil in accordance with compliance requirements with respect MOEF/SPCB guidelines.
- Excess unused earth generated from cutting along the roads may also be used for rehabilitation of borrow areas.
- Borrow area near to any surface water body will be at least at a distance of 15m from the toe of the bank or high flood level, whichever is maximum.
- During rains appropriate measures to be taken to minimize soil erosion, silt fencing to be provided as directed by Engineer/Environment Officer.

304. Redevelopment of the borrow areas to mitigate the impact will be the responsibility of the contractor. Rehabilitation process shall be undertaken immediately within 6 months of the excavation. The contractor shall evolve site-specific redevelopment plans for each borrow area locations, which shall be implemented after the approval of the Engineer. Borrow areas might be used for aquaculture in case landowner wants such development. In that case, such borrow area will be photographed after their post use restoration and Environment Expert of Supervision Consultant will certify the post use redevelopment.

305. The Contractor will keep record of photographs of various stages i.e., before using materials from the location (pre-project), for the period borrowing activities (construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area.

306. **Prevent soil compaction.** The contractor will implement the following:

- Movement of vehicles and machineries shall be restricted to the designated haulage routes.
- The routes shall avoid productive land as far as possible.
- In case of no option than to use a productive stretch of land, the top soil shall be stripped off and stored. In case it has to be stored for more than a month, the

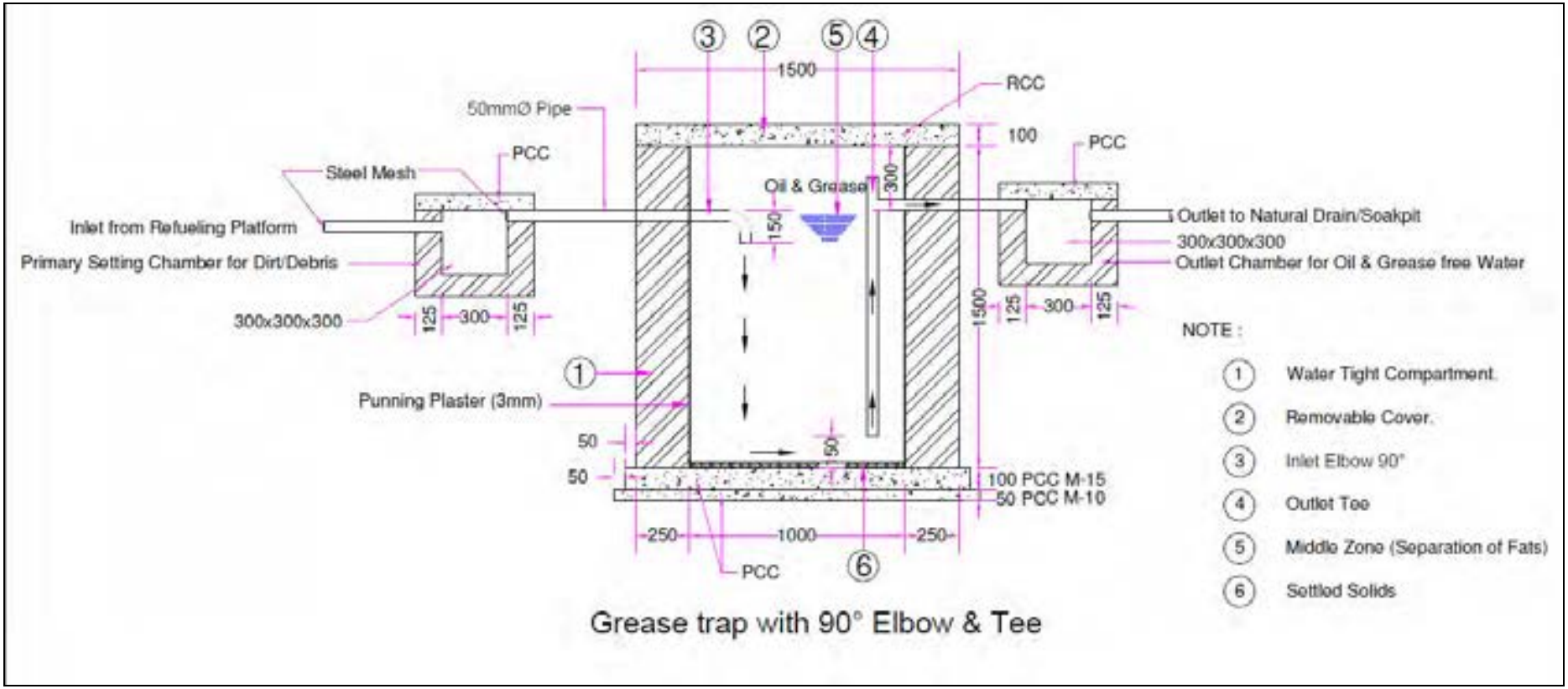
stockpile is to be stabilized within 7 days of forming. The stabilization shall be carried out through temporary seeding. It consists of planting rapid growing annual grasses or small grains, to provide initial, temporary cover for erosion control.

- After the construction is over the land shall be restored by tilling and then adding the stored top soil.

307. **Prevent soil contamination.** The contractor will implement the following:

- Fuel and lubricants shall be stored and refueling shall be done at the predefined storage location and away from drainage channels.
- The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 110% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to an oil/grease interceptor prior to final disposal. An indicative design (capacity to be decided by the contractor) is given in Fig. 100.The contractor shall produce a pollution management plan (as part of a CEMP) prior to construction detailing on minimization measures of pollution risk in accordance to the General Standards for discharge of Environmental pollution into inland water bodies as per Schedule VI of the Environment (Protection) rules,1986 and WB's EHS guidelines
- The Contractor Shall not Store or Carry out Refuelling activity within 25m of the Handpump being used for drinking Purpose.

Fig. 100: Indicative Design for Grease Trap with 90^0 Elbow & Tee



308. The trap shall have an inlet chamber for primary settlement of dirt and debris. It will also have an outlet chamber for receiving the clean water which will be readily directed to any natural water channel or a soak pit. It will have an inlet elbow of 90 degree and outlet Tee (PVC pipe of 2.5" diameter). The grit will settle at the bottom and oil/ grease being lighter in density will rise to the top of the water level. Clean water from the middle zone will be collected in the outlet chamber. . The contractor shall ensure that the quality of treated water conforms to the General Standards for discharge of Environmental pollution into inland water bodies as per Schedule VI of the Environment (Protection) rules,1986 as given in **Appendix 28** and WB's EHS guidelines.

- Construction camps shall be provided with packaged sewage treatment plants/ mobile toilets/ septic tank.
- Scarified bitumen shall be reused for pavement making.

c. Impacts during operation

309. During operation stage oil spillage from vehicles in case of accident can contaminate the adjacent agricultural land.

d. Mitigation during Operation

310. A contingency plan shall be prepared to handle any such spills so as to save the agricultural land. Since most of the length of the project roads cross through agricultural land, this measure would be necessary.

311. *First* step shall be to stop the spill by Turning off nozzles or valves from the leaking container, if it can be done safely. Or use wooden plug, bolt, band or putty on a puncture-type hole.

312. Second, if it cannot be stopped, a pan or container shall be used to collect the oil.

313. *Third,* for the oil that has already spread, locally available sorbents shall be used like sand, straw, sawdust, wood chips or dirt, chicken feather, cork from road side shall be put on the oil contaminated location and removed after a while, immediately replacing it with a fresh layer of sorbent. This step shall be repeated based on the extent of oil spillage.

7. Construction Waste

a. Impact during construction

314. Construction waste in the form of scarified bitumen and demolition waste are likely to get generated. Scarified or dust bitumen are hazardous for human health. It can cause irritation, redness, occasional drying and peeling of skin, burning, swelling and watering of eye. Bitumen is also inflammable in the presence of ignition source when heated above flash point temperature. They are also inflammable. It is considered as hazardous waste with adverse impact on the environment.

b. Mitigation during construction

315. All excavated materials from roadway, shoulders, verges, drains, cross drainage and the like will be the property of the EA and will be used for backfilling embankments, filling pits, and landscaping.

- Debris generated due to the dismantling of the existing road will be suitably reused in the proposed construction, subject to the suitability of the materials and approval of the Environmental Expert of CSC as follows:

- The sub grade of the existing pavement shall be used as embankment fill material.
- The existing base and sub-base material shall be recycled as sub-base of the haul road or access roads
- The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc.

- The Contractor shall suitably dispose unutilized debris materials either through filling up of borrow areas located in wasteland or at pre-designated disposal locations, subject to the approval of the CSC.
- In case of disposal of unused bitumen, Hazardous Material (Management, Handling and Transboundary Movement) rules, 2008 shall be followed.
- At locations identified for disposal of residual bituminous wastes, the disposal will be carried out over a 60 mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water.
- Bitumen shall be stored away from ignition sources
- The stocked bitumen shall be covered with a layer of soil and planted with small shrubs or grass so as to stabilize the soil in an environment friendly way.
- Dumping site identified shall not be within 1.5 km from habitation and forest areas and 500 m from ponds.
- Consent from the village council has to be obtained before finalizing the location
- All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, will be considered incidental to the work and will be planned and implemented by the Contractor as approved and directed by the CSC .
- The pre-designed disposal locations will be a part of Comprehensive Solid Waste Management Plan to be prepared by Contractor and shall be approved by CSC.
- Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area.
- The contractor shall ensure that municipal waste /construction waste etc is managed in line with the WB's EHS guidelines, National laws and Policies and forms part of CEMP to be developed by Conractor and approved by CSC,
- The Contractor shall treat the bio degradable waste either by Vermi Composting or Organic Waste Convertor.
- Only inert non hazardous waste shall be buried in Landfill site after approval of CSC.

8. Drainage & hydrology

a. Impact during construction

316. Anticipated impacts include obstruction in flow of water due to dumping of Scarified material / Construction Waste in streams.

b. Mitigation during construction

317. The Contractor shall implement the following:

- No construction material shall be stored near the streams.
- Construction waste shall be reused to the extent possible in the re construction,

temporary traffic diversions etc and excess waste shall be disposed in the manner provided in EMP in environment friendly manner and in no case shall be disposed in streams crossing the roads.

- Silt fencing/ sediment barrier shall be installed along the bank of river or streams to control the sediment.
- Sites of re construction / widening of culverts, widening / construction /repair of bridges shall be immediately cleaned after the works. All Rivers crossing the project roads except river Sai and Gandhak are seasonal rivers, so work of construction / widening / repairs of bridges shall be carried out in non-monsoon season.

c. Impact during Operation

318. The drainage channels may get sediment or filled with aquatic plants thus reducing the flow and volumetric capacity of the water channels resulting in clogging of drains and spilling of water on the road in urban area.

d. Mitigation during Operation

319. Cleaning of cross drainage structures and Lateral drains prior to monsoon shall be carried out so that they can accommodate the increased water flow during heavy rains.

9. Water Environment

a. Stagnant Surface Water bodies- Ponds

320. Few ponds, especially those starting within the RoW might be partially reclaimed due to widening and construction of the road as per IRC specifications. This may reduce the volumetric capacity of the ponds. Ponds nearer / adjacent to road and having intervening land use between pond and road as open areas may be impacted in terms of Siltation and contamination due to entering of Surface run off laden with sediment and oil and grease. To assess the degree of above impacts, few criteria have been identified as given below:

- Distance of the pond from center line- If it is within 10 m it is likely to get reclaimed partially; if within 10 to 12 m of CL the pond will have high risk of siltation as well as contamination due to oil spill/leakage. Impact is anticipated to be moderate if a pond lies between 12 to 15 m of CL and low if it lies beyond 15 m from CL. Siltation of the shallow open area may cover and destroy growth of the organisms. Natural siltation process is not a threat to the ponds but construction activities may trigger it to manifold. Oil contamination of ponds may be harmful for the aquatic species especially fishes. This may lead to carrying of hydro carbons into the food chain.
- Area of reclamation- In case of reclamation, if it is more than 50% of the total pond area, the risk is high, if it is between 25 to 50% of the area risk would be moderate and in case of reclamation being less than 25%, risk would be low.
- Use of the pond- If the ponds are being presently used for irrigation, rainwater storage, bathing/ washing or fishing they are assumed to be more sensitive and impacts are likely to be on higher side than those used for dumping solid/ liquid waste.

321. The degree of impacts has been assessed based on the combination of the above

criteria and termed as following:

- Severe degree of impact- In case a pond is used for irrigation, rainwater storage, bathing/ washing or fishing and reclamation is more than 25% it is considered to have severe impact; if it lies within 12 m from the CL it is likely have severe impact in terms of siltation and oil contamination both and if it lies within 15 m it is likely to face severe impacts in terms of oil contamination. A pond used for fishing even if lies beyond 15 m may face severe impact of oil spill.
- Moderate degree of impact- In case a pond is used for irrigation, rainwater storage, bathing/ washing or fishing and reclamation is less than 25% impact is likely to be moderate; If it is a waste dumping pond and is getting reclaimed by more than 50% it is likely to have moderate impact. If a pond is being used for rainwater recharge and falls within 12 to 15m of CL or a waste water pond lies within 12 m of CL, they are likely to have moderate impact in terms of siltation; Any waste water pond falling within 12m will face moderate impact in terms of oil spill; ponds used for irrigation, bathing/ washing, rainwater recharge if falls beyond 15 m may face moderate impact in terms of oil spill.
- Low degree of impact-Impact would be low in case of waste dumping ponds in case of reclamation upto 50%, falling between 12 to beyond 15 m in terms of siltation and oil spill. Ponds used for bathing/ washing and irrigation and falling within 12 to 15 m from CL may have low degree of impact.
- Negligible degree of impact- Ponds used for irrigation, rainwater storage, bathing/ washing or fishing may have negligible impact in terms of siltation when located beyond 15 m from the center line.

322. The following **Table IV-4** shows the matrix for degree of impacts that has been assessed for the both construction and operation period.

Table IV-4: Matrix for degree of Impacts

Features/ Impacts		**Uses**				
		waste water	**bathing /washing**	**Irrigation**	**rainwater storage**	**Fishing**
Reclamation	>50% of Area	3	4	4	4	4
	25 -50% of Area	2	4	4	4	4
	0 to 25% of Area	2	3	3	3	3
Siltation	High risk (within 12 m from CL)	3	4	4	4	4
	moderate risk (Within 12 to 15 m from CL)	2	2	2	3	4
	Low risk (Beyond 15m from CL)	2	1	1	1	1
Oil spill	High risk (within 12 m from CL)	3	4	4	4	4
	moderate risk (Within 12 to 15 m from CL)	2	4	4	4	4
	Low risk (Beyond 15m from CL)	2	3	3	3	4
4		3		2		1

Features/ Impacts		Uses				
		waste water	bathing /washing	Irrigation	rainwater storage	Fishing
Severe		Moderate		less		Negligible

Source- PPTA Consultant

323. The following **Table IV-28** gives a summary of degree of impacts on ponds during construction and operation period. **Table IV-6 & Table IV-7** gives a summary of the number of ponds likely to face different nature of impacts during construction and operation. Detailed impacts are given in **Appendix 29.** Photographs of few impacted ponds are given in **Fig. 101.**

324. Based on the above analysis of all the project roads, it is observed that 28 ponds are likely to be impacted severely out of 89 ponds within 25 m from the CL. 49 ponds are likely to be moderately impacted, 8 ponds will be low and 4 will be negligibly impacted. The severity of impact is assessed to be more during construction. 36 ponds are likely to get reclaimed partially. Out of it, only 1 pond is likely to be reclaimed by >50%, 4 ponds by 25 to 50% and 31 ponds less than 25%. In case of siltation and oil spill 86 out of total 89 ponds are likely to be impacted. Out of 86 ponds, around 45 are likely to face high risk, 32 may have moderate impact and 9 ponds may have low impact.

325. Impacts during operation will be less severe than that of construction. Moderate to low impact is anticipated in terms of siltation and oil contamination. Around 48 ponds are likely to be moderately impacted and 38 would have low impact (**Table IV-7**).

Table IV-5: Degree of impact on ponds

Road stretches	Degree of Impact				
	Severe	Moderate	Low	Negligible	Total
MDR 82W (ND)	1	3	1	0	5
MDR 81C (HA)	8	6	3	1	18
MDR 135W (MB)	4	2	0	0	6
MDR 66E (HK)	4	11	1	2	18
MDR 58W (BA)	1	1	0	0	2
ODR 24 (KN)	2	3	0	0	5
MDR 25E (KB)	2	3	2	1	8
MDR 52 C (MM)	6	20	1	0	27
MDR 45W (AS)	0	0	0	0	0
Total	**28**	**49**	**8**	**4**	89

Source- PPTA Consultant

Table IV-6: Number of ponds to be impacted and nature of impact during construction

Road stretches	Reclamation				Siltation				Oil spill				Total ponds
	0-25%	25-50%	>50%	Total	High	Moderate	Low	Total	High	Moderate	Low	Total	
MDR 82W (ND)	1	1	0	**2**	4	0	1	**5**	4	0	1	**5**	**5**
MDR 81C (HA)	7	2	0	**9**	12	2	3	**17**	12	2	3	**17**	**18**
MDR 135W (MB)	4	0	0	**4**	6	0	0	**6**	6	0	0	**6**	**6**
MDR 66E (HK)	12	0	0	**12**	7	8	1	**16**	7	8	1	**16**	**18**
MDR 58W (BA)	0	0	1	**1**	1	1	0	**2**	1	1	0	**2**	**2**
ODR 24 (KN)	0	0	0	**0**	2	3	0	**5**	2	3	0	**5**	**5**
MDR 25E (KB)	0	0	0	**0**	2	4	1	**7**	2	4	1	**7**	**8**
MDR 52 C (MM)	7	1	0	8	12	14	1	27	12	14	1	27	27
MDR 45W (AS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	31	4	1	36	46	32	8	86	46	32	8	86	89

Source- PPTA Consultant

Table IV-7: Number of ponds to be impacted and nature of impact during operation

Road stretches	Siltation				Oil spill				Total ponds
	High	Moderate	Low	Total	High	Moderate	Low	Total	
MDR 82W (ND)	0	4	1	**5**	0	4	1	**5**	**5**
MDR 81C (HA)	0	12	5	**17**	0	12	5	**17**	**18**
MDR 135W (MB)	0	6	0	**6**	0	6	0	**6**	**6**
MDR 66E (HK)	0	5	11	**16**	0	5	11	**16**	**18**
MDR 58W (BA)	0	1	1	**2**	0	1	1	**2**	**2**
ODR 24 (KN)	0	2	3	**5**	0	2	3	**5**	**5**
MDR 25E (KB)	0	2	5	**7**	0	2	5	**7**	**8**
MDR 52 C (MM)	0	16	11	**27**	0	16	11	**27**	**27**
MDR 45W (AS)	0	0	0	**0**	0	0	0	**0**	**0**
Total	**0**	48	38	86	0	48	38	86	**89**

Source- PPTA Consultant

At km 3.78 (LHS) in Pilakhna- 9 m from CL along Nanau –Dadon road

At km 0.80 (LHS) in Nanau- 10 m from CL along Nanau – D adao road

At km 25.49 (RHS) in Shabadar- 7m from CL along Muzzaffarnagar to Baraut

At km 61.55 (LHS) in Baraut – 7m from CL Along Muzzaffarnagar to Baraut

At km 23.5 (RHS) in Ajaipur Kudaila- 9 m from CL along Hussainganj to Alipur Marg

At km 13.5 (LHS) in Gossain Ki Sarai– 6.5 m from CL along Hussainganj to Alipur

At km 48.05 (LHS) in Virpur- 5 m from CL along Bulandansharar to Anupshahar

At km 20.85 (LHS) in Jatvai - 16 m from CL along Bulandansharar to Anupshahar

At km 3.67 (LHS) In Churihar ke Purwa -8 m from CL along Haliyapur to Kurebhar

At km 14.45 (LHS) in Bhulaiaehar ka Purwa - 15m from CL along Haliyapur to Kurebhar

At km 49.00(LHS) in Lungarpur -15 m from CL along Mohanlalganj-Unnao

At km 32.300 (LHS) in Maurawan-10 m from CL alongMohanlalganj-Unnao

At km 10.00 (LHS) in Wakilganj-10 m from CL along Kaptanganj-Rudrapur

At km 17.400 (LHS) in Chargharwa- 15m from CL along Kaptanganj-Naurangia

Sai river at km 12.8 across Mohanlalganj to Unnao road

Fig. 101: Photographs of few ponds/rivers out of those to be impacted

e. Impact During construction

326. Water quality of ponds and flowing water bodies may get polluted due to siltation, spillage of oil, disposal of construction materials. Oil spill from the operation of the mechanical workshop, diesel pumps, diesel storage, transportation and transfer may cause water pollution. Detailed analyses of impact on ponds have been done collectively in the following section. There are 36 ponds partially falling within 10 m of CL that are likely to be reclaimed partially out of which only 1 (at km 48.050 along MDR 58W) will be reclaimed by more than 50%. Details of reclamation are given in **Table IV-8 (**extracted from **Appendix 29).** Total 86 ponds (along with those getting reclaimed) out of 89 ponds are likely to face siltation and contamination due to road surface runoff / oil spill out during construction (**Table IV-6).** These 89 ponds are those whose area starts within 25 m from CL except for one pond at km 58.5 in Rudrapur along MDR-25E (KB). This pond is at 30m distance from the CL on RHS and of great religious importance and so has been considered in this study. Impact on this pond has been assessed to be negligible. 3 other ponds despite being within 25m of CL are not getting impacted due to presence of intervening structures. Pond wise details of impacts and mitigation are given **Appendix 29.**

327. After ponds are reclaimed or those lying just adjacent to the road may face problem of slope stability which may pose a threat to road's stability also.

328. Siltation of the shallow open area may cover and destroy these areas and micro-organisms breeding there. Natural siltation process is not a threat to the ponds but construction activities may trigger it to manifold.

329. Oil contamination of ponds/ rivers may be harmful for the aquatic species. Animals are also at risk from ingesting oil, which can reduce the animal's ability to eat or digest its food by damaging cells in the intestinal tract. This may also affect the human food chain[15]. Oil spill during construction may occur from refueling platforms or fuel storing stations or if any accident takes place on the road.

330. Most of the ponds are presently being used as disposal grounds but measures shall be taken to ensure they do not get degraded further due to road activities.

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[15] *Understanding of Oil spill and Oil spill response, 1999,US EPA Archive document, EPA Office of Emergency and Remedial Response.*

Table IV-8: Details of loss of water bodies due to partial reclamation

Sl. No.	Chainage	Side	Distance from CL (m)	Total area(sqm)	Loss of area	Loss of volumetric capacity (cum)
Nanau Dadon-MDR 82W						
1	*0.73*	*LHS*	*5*	*241.80*	*90.00*	*45.00*
2	*11.1*	*RHS*	*8*	*1350.00*	*38.00*	*19.00*
Hussainganj to Alipur-MDR 81C						
3	*13.500*	*RHS*	*6.5*	*810.00*	105.00	157.50
4	*13.600*	*LHS*	*5.0*	*200.00*	100.00	150.00
5	*14.900*	*LHS*	*3.5*	*247.00*	123.50	154.38
6	*16.350*	*LHS*	*4.5*	*702.00*	143.00	71.50
7	*18.600*	*LHS*	*4.0*	*500.00*	60.00	60.00
8	*19.000*	*LHS*	*6.0*	*300.00*	60.00	90.00
9	*23.500*	*RHS*	*9.0*	*1750.0*	25	25
10	*28.500*	*RHS*	*4.5*	*1200.0*	110	165
11	*35.800*	*LHS*	*8.0*	*50.0*	10	10
Muzaffarnagar to Baraut-MDR 135W						
12	16.770	RHS	6	16799	428	856
13	25.490	RHS	7	1344	126	220.5
14	45.400	RHS	8	2030	58	29
15	61.550	LHS	7	2416	207	51.75
Haliyapur to Kurebhar (MDR 66E)						
16	1.600	LHS	7	352	15	3.75
17	3.670	RHS	8	1080	54	54
18	19.025	LHS	6.5	2542	164.5	123.375
19	37.260	LHS	7	1170	90	22.5
20	47.090	LHS	6	700	64	48
21	48.240	RHS	6	575	36	18
22	58.280	Both Sides	5	1980	85	63.75
23	61.730	LHS	6.5	1575	269.5	67.375
24	62.320	RHS	8	1512	48	48
25	77.000	RHS	5	2100	350	87.5
26	90.050	LHS	7	3328	138	172.5
27	91.400	Both Sides	8	3078	60	75
Bulandshahar to Annopshahar (MDR 58W)						
28	*48.050*	*RHS*	5	250	150	112.5
Mohanlalganj to Maurawan to unnao Marg (MDR-52 C)						
29	0.280	LHS	9	770	35	52.5
30	8.000	RHS	5	1000	100	150
31	8.050	Both side	7	1000	280	560
32	8.300	LHS	8	2500	30	45
33	8.300	RHS	8	450	30	75
34	8.600	LHS	8	300	30	90
35	31.200	LHS	8	400	40	80
36	32.900	RHS	7	900	90	90

Source- PPTA Consultant

f. Mitigation during construction

331. Mitigation measures to be taken are as follows:-

- Capacity of ponds being reclaimed shall be maintained either by increasing the depth of pond or by increasing the area. Ponds used for domestic purpose and fishing shall preferably be extended in area subject to availability of land.
- Retaining walls has been suggested in ponds which are either being reclaimed or are adjacent to the road as stability measure for side of pond and the road both, which shall be confirmed by the CSC prior to work. The details are as under.
- Intercepting Channel or ditch shall be constructed along the periphery of the ponds near construction site. Surface run off shall be intercepted by the channel and diverted to sedimentation pit before discharging into ponds. These ditches shall be restored immediately after completion of construction work adjacent to the ponds. In case of space crunch the channel being dug for construction of side drains can also be used as intercepting ditch along with sedimentation pit for arresting silt/ sediments from clogging the pond.
- NGO's shall carry out awareness campaign about importance of ponds and measures to improve them.
- Cleaning of pond shall be done if required.
- The following engineering interventions are provided in the civil works contract:
  - Out of 89 ponds, retaining wall (592 m) is proposed for 20 ponds and silt fencing (637 m) shall be done around 49 ponds, intercepting ditches shall be provided along 21 ponds (in 13 ponds the ditch shall be provided along with silt fencing). 9 ponds are identified for enhancement. Details of enhancement are given in **Chapter 6**. While construction of retaining wall and providing enhancement measures it shall be taken care that silt fencing are provided as per requirement. These shall be finalized by the contractor during construction with the approval of Environmental expert of CSC. Pond specific mitigation measures are given in **Appendix 29.** Summary of the measures proposed for stagnant water bodies are as given in **Table IV-9.**
  - Despite the fact that many of the ponds act as disposal site for solid and liquid waste, they have been considered for protection in the form of silt fencing during construction so as ***not to further degrade*** them. This is because dried water hyacinth that grows due to eutrophication has huge potential to be used as food for livestock rearing in the villages in combination with paddy straw and mustard cake in the ratio of 23:3.5:1.5[16]. It is a nutritious diet and can be widely used during food shortage for live stocks.

[16] *Ingvason, P.A., 1969 The golden of Iceland. World Crops, 21(3):218–20. Referred from Handbook of utilization of Aquatic plants, Fisheries and Agricultural Department, FAO, 1979.*

Table IV-9: Measures proposed for ponds

Road stretches	Protection measure							Enhancement of pond
	Total Ponds	Retaining wall *		Silt fencing during construction		Intercepting ditch & sedimentation pit	Nil	
		Number	Length(m)	Number	Maximum Length (m)			
MDR 82W (ND)	5	0	0	4	74	0	0	1
MDR 81C (HA)	18	9	170	7	44	3**	1	1
MDR 135W (MB)	6	3	140	1	161	1	0	1
MDR 66E (HK)	18	3	112	10	79	1+1**	2	2
MDR 58W (BA)	2	1	54	1	39	0	0	0
ODR 24 (KN)	5	0	0	5	100	1**	0	0
MDR 25E (KB)	8	0	0	6	70	3**	0	2
MDR 52 C (MM)	27	4	116	15	150	6+5**	0	2***
MDR 45W (AS)	0	0	0	0	0	0	0	0
Total	89	20	592	49	717	8+13**	3	9
*Along with Deepening and cleaning if required. While construction of retaining walls or enhancement it shall be taken care that silt fencing are provided as per requirement.								
** Along with silt fencing								
*** Including Baknai Badela jheel that has been considered for silt fencing also during construction								

Source- PPTA Consultant

1. Silt Fencing and Intercepting ditch with sedimentation chamber

332. Silt fence is a linear fence installed at the edge of earth disturbances. The purpose of silt fence is to protect downslope surface waters bodies by removing suspended solids from runoff prior to leaving the site. This is a temporary structure used to protect the water bodies during construction activity.

333. **Inclusion criteria.** Silt fencing is proposed for fresh water ponds (those used for irrigation, domestic purposes, rainwater storage and no waste is dumped into it) falling within 20m from CL. In two exceptional cases Baknai Badela Jheel at 25 m from CL along MDR 52 C and a pond of high religious importance in Rudrapur along MDR-25E (KB) at 30 m from CL has been considered for silt fencing beyond 20 m from CL. Intercepting ditch and sedimentation pit shall be provided along with silt fencing for ponds between 10 to 15m during monsoon season when the generation of road runoff is likely to be more since the impact would be high to moderate. Within 10m only silt fencing is proposed though the impact is high because of space crunch. Beyond 15 m also only silt fencing is proposed as the impact would be low.

334. In case of waste water ponds Silt fencing has been considered only for those ponds falling within 10 m of CL. For others within 20 m of CL intercepting ditch with sedimentation pit shall be constructed. In case of space crunch where the ponds are falling within 10 m, the channel dug for side drains can also be used temporarily as intercepting ditch.

335. River/ canals across the project roads shall be provided with silt fencing along the banks

on both sides.

336. Locations and indicative design for silt fencing are given however the decision shall be taken by the contractor with the approval of Environment Expert of CSC based on the site conditions.

337. **Indicative design for silt fencing.** The poles shall be fixed at least 6 to 8feet apart and the fabric fastened to it. A back filling area of 150x150 mm shall be made on the land side by turning the fence at the base and filling it with mud. This is to provide stability to the fence. Length of fence shall be more by 2 m on each end along the length of the pond facing the road **Fig. 102 & 103** (TCS for Silt fencing). In case of rivers or canals the slit fencing shall extend upto 5 m from the bridge edge along the bank on both side of the river/ canals.

338. Maximum tentative length of silt fencing required at a time ranges from 39 m in Bulandshahar – Anoopshahar to 161 m (**Table IV-9)** in Muzaffarnagar - Baraut road. Since these are temporary structures and can be reused any number of times, these are to be erected along a particular pond only when construction work would take place in the vicinity of that pond. Later it can be re used along another pond. Keeping that in view only the maximum required length shall be considered for cost estimation. A tentative list of locations proposed for silt fencing and intercepting ditch is given in **Table IV-10** (extracted from **Appendix 29**).

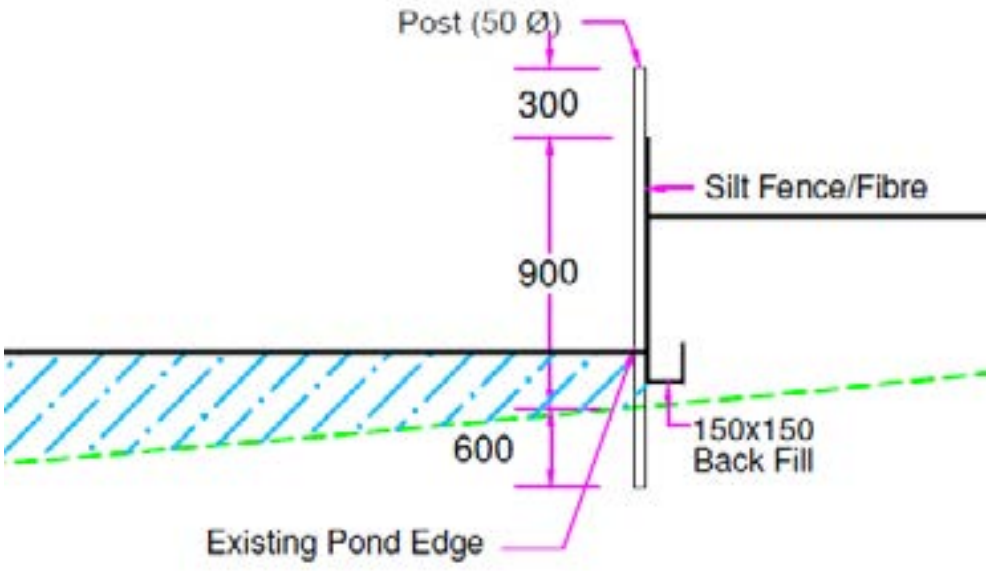


Fig 102: TCS for silt Fencing

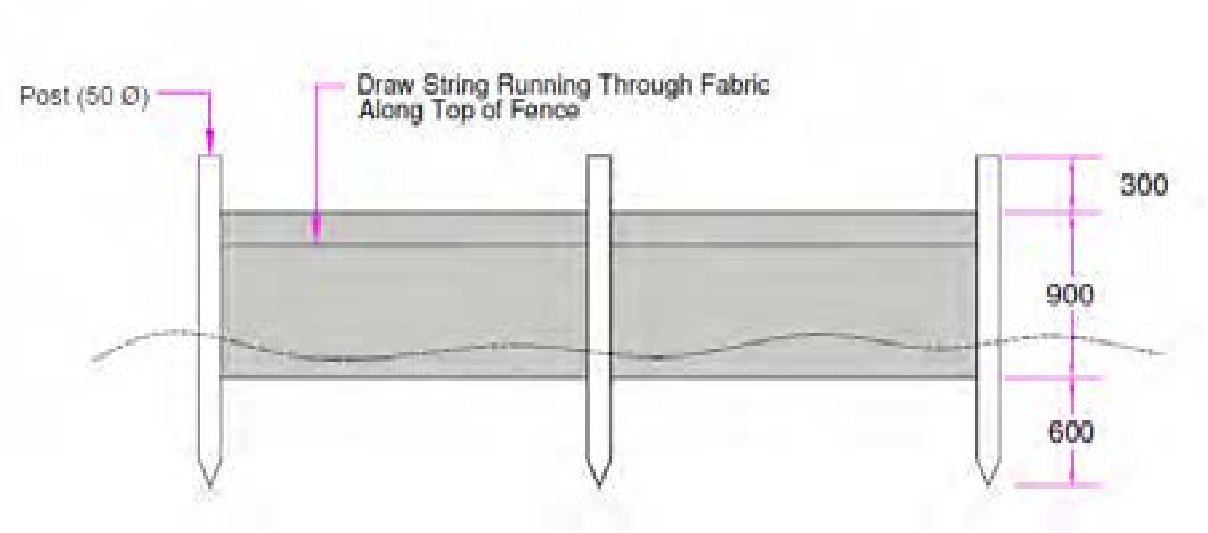


Fig 103: Front View of silt Fencing

339. **Indicative design for intercepting ditch and sedminatation chamber.** A narrow trapezoidal linear ditch of 0.5m depth with 3 inch brick lining shall be dug between the road and the pond (in case of silt fencing it shall be between the road and silt fence). The length of intercepting ditch shall be extended at least up to 1 m beyond the pond edge on both side. A sedimentation pit of 1.5 m depth shall be constructed on both side of the ditch with length and width of 1x 1m. An outlet (to pond) shall be given at 0.25m from the top of the pit to avoid overflow of water. This would be an open pit. But for the matter of safety a removable cover made of wood or concrete slab shall be used over the pit. The ditch and pit shall be designed as per site conditions. Schematic drawing is given in **Fig. 104.**

Fig. 104: Schematic diagram of intercepting ditch and sedimentation pit

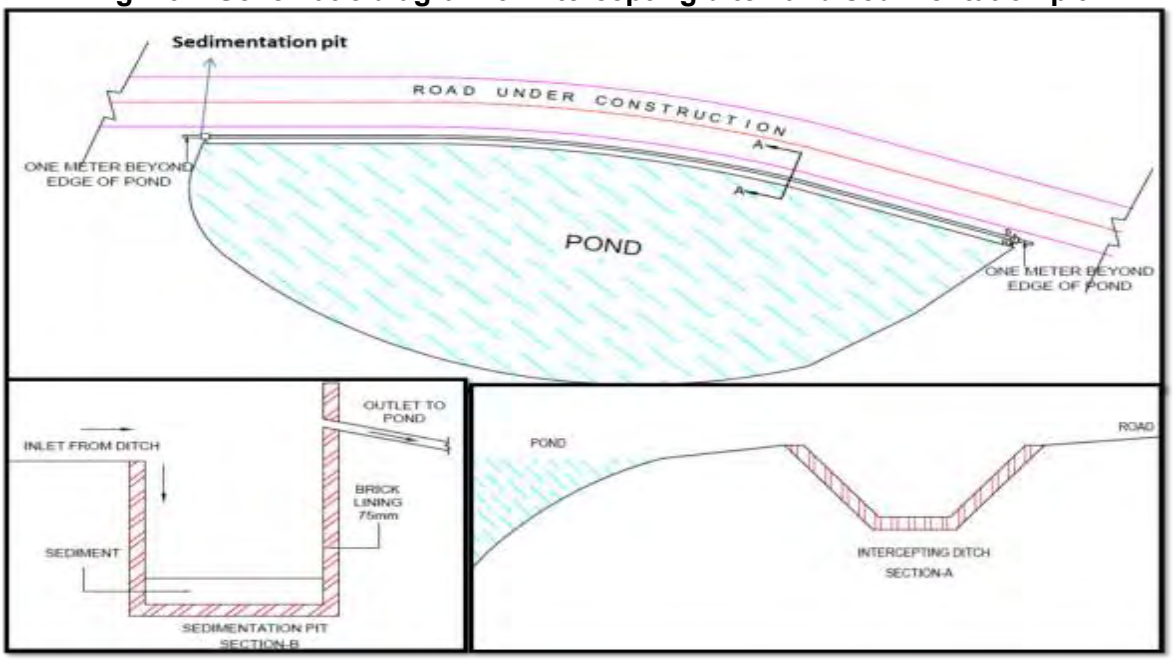


Table IV-10: Locations proposed for silt fencing and intercepting ditch with sedimentation pit

Only Silt fencing				Only Intercepting ditch + sedimention pit				Both			
Chainage(km)	***Side***	***Distance from CL(m)***	***Use***	***Chainage(km)***	***Side***	***Distance from CL(m)***	***Use***	***Chainage (km)***	***Side***	***Distance from CL(m)***	***Use***
Nanao to Dadao (MDR 82W)											
0.73	*LHS*	*5*	*WW*	-	-	-	-	-	-	-	-
0.8	*LHS*	*10*	*WW*	-	-	-	-	-	-	-	-
3.78	*LHS*	*10*	*IR*	-	-	-	-	-	-	-	-
11.1	*RHS*	*8*	*WW*	-	-	-	-	-	-	-	-
Hussainganj to Alipur (MDR 81C)											
19.400	*LHS*	*20.0*	*SR*	-	-	-	-	*36.800*	*LHS*	*12.0*	*SR*
21.050	*RHS*	*10.0*	*DU*	-	-	-	-	*46.600*	*RHS*	*13.0*	*SR*
23.500	*RHS*	*12.0*	*SR*	-	-	-	-	*47.600*	*LHS*	*15.0*	*DU*
39.100	*LHS*	*20.0*	*SR*	-	-	-	-	-	-	-	-
Muzaffarnagar to Baraut (MDR 135W)											
16.770	RHS	6	WW	10.230	RHS	12	WW	-	-	-	-
Haliyapur to Kurebhar (MDR 66E)											
1.600	LHS	7	WW	14.450	LHS	15	WW	20.410	RHS	15	DU
19.025	LHS	6.5	WW	-	-	-	-	-	-	-	-
37.260	LHS	7	WW	-	-	-	-	-	-	-	-
47.090	LHS	6	WW	-	-	-	-	-	-	-	-
48.240	RHS	6	WW	-	-	-	-	-	-	-	-
58.280	Both Sides	5	WW	-	-	-	-	-	-	-	-
61.730	LHS	6.5	WW	-	-	-	-	-	-	-	-
68.250	LHS	18	DU	-	-	-	-	-	-	-	-
77.000	RHS	5	WW	-	-	-	-	-	-	-	-
Bulandshahar to Annopshahar (MDR 58W)											
20.850	*LHS*	16	IR	-	-	-	-	-	-	-	-
Kaptanganj to Naurangia (ODR-24)											
6+700	both side	crossing	SR	-	-	-	-	19.600	RHS	15.0	SR
12.400	LHS	10.0	SR	-	-	-	-	-	-	-	-
16.600	Both Side	crossing	SR	-	-	-	-	-	-	-	-
16.700	LHS	10.0	SR	-	-	-	-	-	-	-	-
Kaptanganj to Varhaaj (MDR-25E)											
32.100	LHS	10.0	SR	-	-	-	-	24.100	RHS	15.0	SR
56.400	crossing	crossing	SR	-	-	-	-	45.900	RHS	15.000	SR
59.700	LHS	20.000	SR	-	-	-	-	55.700	RHS	15.000	SR
Mohanlalganj to Maurawan to unnao Marg (MDR-52 C)											
0.280	LHS	9	WW	2.48.	LHS	11	WW	15.200	LHS	12	SR
6.800	crossing	crossing	IR	18.500	RHS	15	WW	17.200	RHS	15	IR
7.800	RHS	10	WW	18.670	LHS	15	WW	17.800	RHS	15	SR
7.850	LHS	10	WW	19.920	LHS	15	WW	49.00	LHS	15	SR
8.000	RHS	5	WW	24.000	RHS	20	WW	49.200	RHS	15	F
8.050	Both side	7	WW	44.800	RHS	12	WW	-	-	-	-
8.300	LHS	8	WW	-	-	-	-	-	-	-	-
28.300	LHS	10	SR	-	-	-	-	-	-	-	-
32.300	LHS	10	WW	-	-	-	-	-	-	-	-
33.700	crossing	crossing	WW	-	-	-	-	-	-	-	-
Note: WW-waste water pond ;IR-irrigation; SR-storage of rainwater; DU-Domestic use; F-Fishing											

Source- PPTA Consultant

2. Provision for protection of pond through retaining wall

340. **Criteria for inclusion.** The criteria for inclusion are as follows:-

- If the pond is proposed to be reclaimed partially.
- If the pond edge is likely to affect road stability or bank slope stability
- In case of waste water ponds that are getting reclaimed the contractor under CSC's supervision shall decide whether to provide retaining wall based on the factor of road stability.

341. **Indicative design.** Retaining wall of reinforced concrete cement shall be erected along pond bank through the length facing the RoW. The height of the wall shall be at least upto the road level. The wall shall extend upto 1.3 m below the existing pond bed level or the pond soil (old / wet) strength would not be enough to hold the wall. The top width shall be 0.3 m and the base width shall not be less than 2.9 m. Tentative detailed design is given in **Fig. 105** and locations are given in **Table IV-11.**

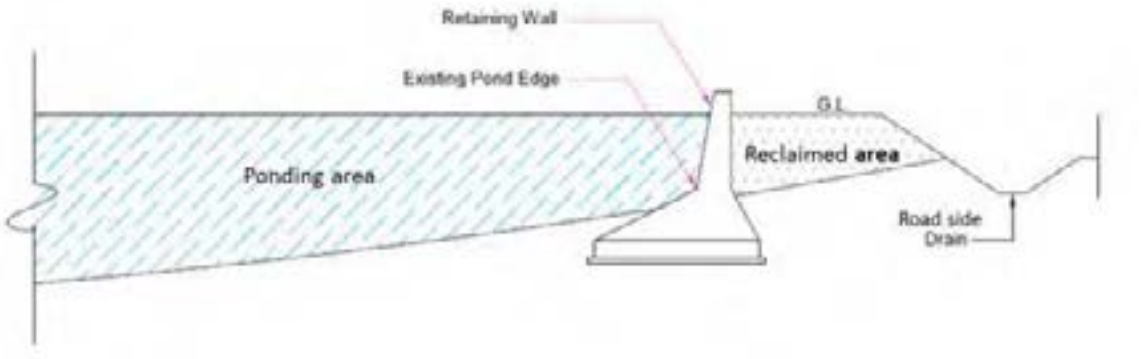


Fig. 105: Schematic diagram for retaining wall

Table IV-11: Locations proposed for retaining wall along ponds

Chainage (km)	*Side*	*Distance from CL(m)*	*Use*	*Reason*
Hussainganj to Alipur (MDR 81C)				
13.500	*RHS*	*6.5*	*SR*	Preventing direct road runoff to ponds + maintain stability of road and pond bank slope
13.600	*LHS*	*5.0*	*SR*	
14.900	*LHS*	*3.5*	*SR*	
16.350	*LHS*	*4.5*	*SR*	
18.600	*LHS*	*4.0*	*DU*	
19.000	*LHS*	*6.0*	*SR*	
23.500	*RHS*	*9.0*	*SR*	
28.500	*RHS*	*4.5*	*SR*	
35.800	*LHS*	*8.0*	*SR*	
Muzaffarnagar to Baraut (MDR 135W)				
25.490	RHS	7	DU	Do
45.400	RHS	8	DU	
61.550	LHS	7	DU	
Haliyapur to Kurebhar (MDR 66E)				
3.670	RHS	8	DU	Do

Chainage (km)	*Side*	*Distance from CL(m)*	*Use*	*Reason*
62.320	RHS	8	F/IR	
90.050	LHS	7	DU/F/IR	
Bulandshahar to Annopshahar (MDR 58W)				
48.050	*RHS*	5	IR/SR	Do
Mohanlalganj to Maurawan to unnao Marg (MDR-52 C)				
8.300	RHS	8	IR	Do
8.600	LHS	8	SR	
31.200	LHS	8	SR	
32.900	RHS	7	SR	
Note: WW-waste water pond ;IR-irrigation; SR-storage of rainwater; DU-Domestic use; F-Fishing				

Source- PPTA Consultant

g. Impact during operation

342. Impacts during operation will be far less severe than that of construction. Moderate to low impact is anticipated in terms of siltation and oil contamination. Around 48 ponds are likely to be moderately impacted and 38 would have low impact (**Table IV-7**). Impact of siltation to the said degree would take place in case of rainfall during monsoon that would which will be a seasonal phenomenon. And oil contamination may happen in case of accident of an oil tanker or any other vehicle near the water bodies which is likely to be a very rare phenomenon. Mosquito breeding may takes place in ponds, however very less significant in permanent and fish breeding pondscompared to shallow temporary and small water logged areas. It isthe shallow areas of ponds along the margins (< 1ft of depth) where generally weeds, debris, emergent grasses shelters the mosquito larvae and protects them from fish and predators.[17]

h. Mitigation during Operation

- Slope stabilization measure like turfing along the raised embankment of road will prevent siltation, if any, during the operation period.
- Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space.
- It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection.

3. Flowing surface water- river/ canals/ streams

a. Impact during construction

343. 23 minor bridges to be widened and 6 to be reconstructed are across canals and 5 to be

[17]Virginia Department of Health accessed from http://www.vdh.virginia.gov/lhd/CentralShenandoah/EH/WNV/mosquito_breeding_habitats.htm on 18.08.2015

widened are on seasonal streams. There is a major bridge across river Kali, a non perenial river, at km 7+00 along Nanau - Dadon road that will be retained with minor improvements. Summary of cross drainage structures and improvement proposals are given is **Table IV-12.** 2 new bridges (parallel to existing) are proposed across canals at km 14+590 and km 17+700 in Kaptanganj to Naurangia road. 2 new bridges (parallel to existing) are proposed across a canal at km 44+5 and Sai river at km 12.8 in Mohanlalganj to unnao road. Sai river is perennial and its aquatic flora and fauna is likely to get impacted. Turbidity is likely to increase due to drilling / dredging /piling for erection of column and slope disturbance along the bank of the river. Increased load of fine sediment will make the water more turbid. If the concentrations are exceptionally high (>185 mg/l), smaller fish can be harmed. Heavier sediment may smother the algae growing in the lower strata and would alter the substratum of the watercourse. Excessive sediment loads/ siltation may also mean disruption to areas where fish lay their eggs. Increase in turbidity may also lead to increase in temperature which would be harmful for aquatic species.

344. Degradation of water quality is also possible due to accidental discharges into watercourses from drainage of workers' camps and from spillage in vehicle parking and/or fuel and lubricant storage areas. Contamination of water due to chemicals present in paints used on bridges is also possible. There are no significant uses like bathing or washing reported within 3 km downstream of the river from the proposed bridge (parallel to existing bridge) location across Sai river, however a bathing ghat is observed in the upstream side which is not under frequent use and hence no significant impact is anticipated.

Table IV-12: Cross drainage structures and proposed improvements

Sl. No.	Road stretch	Major bridge	Minor bridge	Culverts	Side Drains
1	**MDR 82W** (ND)	1 major bridge	6 minor bridge	56 culverts-32 are Pipe culverts and 24 are Slab/Arch culverts	Lined Drain 2 x 7.150 =14.300 Unlined Drain 2 x 22.786 =45.572
		To be retained with minor repairing	5 to be widened & 1 to be reconstructed	Out of all, 15 Culverts are to be widened, 28 culverts are to be reconstructed, 8 Culverts are Abandoned & 5 Culverts are retained with minor repairing	
2	**MDR 135W** (MB)	2 major bridges	4 minor bridges	89 culverts- 52 are Pipe culverts and 37 are Slab/Arch culverts.	Lined Drain 2 x 12.5335 = 25.067 Unlined Drain 46.570 x2=93.140
		To be retained with repairing	2 are to be retained with repairing and other 2 are to be reconstructed with box	5 Culverts are to be widened, 67 culverts are to be reconstructed, 2 Culverts are Abandoned & 15 Culverts are retained with minor repairing.	
3	**MDR 66E** (HK)	Nil	12 minor bridges	196 culverts- 92 are Pipe culvert, 100 are Slab culvert & 4 are Arch culvert	lined Drain 2 x 29.870=59.740 km Unlined Drain,2 x 65.88=131.516
			3 are to be retained with repairing and 9 are to be widened with box	9 Culverts are to be widened, 113 culverts are to be reconstructed, 18 Culverts are Abandoned & 56 Culverts are retained with repairing.	

Sl. No.	Road stretch	Major bridge	Minor bridge	Culverts	Side Drains
4	**MDR 58W** (BA)	Nil	8 minor bridges	44 culverts- 14 are Pipe culverts, 21 are Arches and 9 are Slab Culverts	Lined Drain 2 x 6.870 = 13.740 Unlined Drain 2 x 29.250 = 48.500
			6 minor bridges are to be repaired and widened and 2 minor bridges are to be reconstructed.	24 Culverts are to be widened, 13 culverts are to be reconstructed, and 3 Culverts are Abandoned & 4 Culverts are retained with minor repairing.	
5	**MDR 81C** (HA)	Nil	2 minor bridges	110 culverts- 77 are Pipe culverts and 33 are Slab/Arch culverts	lined Drain 2 x 6.65=13.300 km Unlined Drain,2 x 29.025= 58.05 km
			To be widened with box	6 culverts are to be abandoned, 59 culverts are to be re-constructed, 1 culvert is to be retained with repairing and 44 culverts are to be widened.	
6	**ODR 24** (KN)	1 retained with minor repair	4 minor bridges	36 culverts	lined Drain 2 x 14.040=14.080 km, Unlined Drain.2 x 17.200=34.400
			1 to be reconstructed, 1 to be retained with minor repair & 2 new bridges	1 culvert to be widened, 13 reconstructed, 4 abandoned and 18 to be retained with minor repair	
	MDR 25E (KB)	1 retained with minor repair	6 minor bridges	80 culverts	lined Drain 2 x 24.030=48.060 km, Unlined Drain 2 x 37.320=74.640
			4 to be widened and 2 to be retained with minor repair	34 to be widened, 36 reconstructed, 3 abandoned and 7 retained with minor repair	
7	**MDR 52 C** (MM)	Nil	9 Minor bridges	109 culverts	lined Drain 2 x 20.40=40.4 km, Unlined Drain 2 x 87.83=175.66 km
			4 to be retained with repairing; 2 new parallel bridges; 2 to be widened 1 to be reconstructed	58 to be reconstructed; 41 to be retained with repairing; 7 to be abandoned 3 to be widened	
8	**MDR 45W** (AS)	Nil	Nil	84 culverts	lined Drain 2 x 20.10=40.2 km, Unlined Drain 2 x 50.91=101.82 km
				8 to be abandoned; 56 to be reconstructed, 14 to be retained with repairing. 6 to be widened	

b. Mitigation during Construction

345. The mitigation measures to be taken during construction are as follows:

- Silt fencing shall be provided along the river banks/canal up to at least 5m from the bridge edge on both side of the river.
- Cofferdam with materials that cannot be brought into suspension by flowing waters shall be used for construction of piers.

- Bridge/ culvert construction activity shall be carried out in the non- monsoon season to minimize the impact.
- Turbidity curtain/ Piling protector made of impermeable fabric shall be used around piles while removal and construction of cofferdams so that turbidity increase is contained within the curtain area. The curtains shall be removed only after minimum 12 hours of finishing piling and monitoring turbidity which shall not exceed 10 NTU and temperature shall not exceed 30 + 2°C.
- Provision of cover of tarpaulins or other material under the bridge to prevent debris, wastes and toxic compounds from entering the stream.
- Piling Protectors can effectively catch paint, moss, growth, and other contaminants in the areas. This keeps pollutants contained to the source and prevents unwanted materials from spreading around
- Use of lead-based paints in painting bridge components shall be strictly prohibited.
- Construction debris/oily waste shall not be dumped in the water body in any case.
- Immediately after completion of the work, the construction waste, if deposited on river or canal bed shall be removed.
- Proper storage of contaminated liquids and disposal after treatment to bring such liquids within prescribed permissible limits.
- Turfing with grass or planting with shrubs of all exposed areas as soon as possible to reduce erosion risks.
- On site fueling area of vehicles and equipments will be located away from water bodies.
- Provision of retention areas to contain accidental spills of toxic and hazardous material.
- Construction camps shall be located away at about 1.0 km from the water bodies and no discharge shall be allowed to be disposed in to the water bodies.

c. Impact during Operation

346. Chemical contamination may take place due to use of lead based paints in the bridge. Though the magnitude is not anticipated to be high still heavy metals even in traces may harm the aquatic species.

347. Oil contamination may happen if any accident occurs on the bridge and oil spills out of the vehicles. Though the probability is very less still requires a contingency plan to be formulated.

d. Mitigation during operation

348. The mitigation measures to be taken during operation are as follows:

- Use of lead-based paints in painting bridge components shall be strictly prohibited.
- A contingency plan shall be prepared to handle accidental oil spill in rivers/ streams/ canals. Though this is a very rare phenomenon steps to tackle with it are given below:
  - *First* step shall be to stop the spill by Turning off nozzles or valves from the leaking container, if it can be done safely. Or use wooden plug, bolt, band or putty on a puncture-type hole.

- *Second,* if it cannot be stopped, a pan or container shall be used to collect the oil.
- *Third,* for the oil that has already spread, locally available sorbents shall be used like sand, straw, sawdust, wood chips or dirt from road side shall be put on the oil contaminated location and removed after a while, immediately replacing it with a fresh layer of sorbent. This step shall be repeated based on the extent of oil spillage.
- All equipment operators and local personnel of the implementing agency shall be trained in immediate response forspill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, shall be provided by the contractors
- In case the oil spill reaches the river water, Deploy floating booms immediately downstream from the release point to confine the spread.
- skimmers or sorbents like sponge or the above mentioned can be used to absorb the oil after it has been confined
- Dispose of recovered product not suitable for on-site recycling with the rest of the waste collected during the response efforts as per Hazardous Waste Management and Handling Rules.

4. Ground water

a. Impact during construction

349. Groundwater will be extracted to support for construction and in labor camp activities. About 24.7 lakh kl water will be required for construction including 70,630 Kl for labour camp for a period of 2 years @ 45 lpd per capita (**Table IV-13**). Conflict may arise, if water requirement for labors or construction activities is met from ground water resources that are primarily being used by the local community.

350. Out of 1816 hand pumps within 15m of CL only 1540 are likely to be impacted due to widening of the project roads (**Table IV-14**). Impact corridor for hand pumps is 10m from center line on both side in open/ rural areas and building line in built up areas. Most of the hand pumps release excess water directly into the road causing water logging in the road and creating nuisance for traffic. Photographs of few impacted hand pumps are given in **Fig. 106.**

351. Groundwater pollution may take place due to leaching of oil spilled during construction.

Table IV-13: Water requirement

Road stretches	Labour camp (KL)	Concrete (KL)	Curing(KL)	Sprinkling(KL)	Turfing(KL)	Granular backfilling (KL)	Misc (KL)	Total (KL)
MDR 82W (ND)	6570	7439	53900	116072	3363	112	3741	191197
MDR 81C (HA)	8213	9495	69722	181175	11819	130	4623	276964
MDR 135W (MB)	8213	11079	80869	163768	13793	222	5338	275069
MDR 66E (HK)	14783	30870	223624	310012	19409	253	10217	594385
MDR 58W (BA)	6570	7525	54192	97515	8616	256	3131	171234
ODR 24 (KN) & MDR 25E (KB)	9855	24439	177952	267142	15897	223	7883	493537

Road stretches	Labour camp (KL)	Concrete (KL)	Curing(KL)	Sprinkling(KL)	Turfing(KL)	Granular backfilling (KL)	Misc (KL)	Total (KL)
MDR 52 C (MM)	8213	11162	81050	148843	12962	301	4617	267148
MDR 45W (AS)	8213	9676	70549	108133	7513	54	4084	208222
Total	70630	111685	811858	1392660	93372	1551	43634	24,77,756

Source: DPR consultant

Table IV-14: Hand pumps/ well to be impacted

Sl. No.	Road stretches	Total hand pumps/wells (Within 15 m from the CL)	Impacted (Within 10 m from the CL/ building line)	Not Impacted	% impacted
1	MDR 82W (ND)	103	84	19	82
2	MDR 81C (HA)	198	126	72	64
3	MDR 135W (MB)	128	84	44	66
4	MDR 66E (HK)	464	395	69	85
5	MDR 58W (BA)	118	74	44	63
6	ODR 24 (KN)	207	183	24	88
	MDR 25E (KB)	302 (including 5 taps)	302 (including 5 taps)	0	100
7	MDR 52 C (MM)	153	151	2	99
8	MDR 45W (AS)	143	141	2	99
	Total	1816	1540	276	85

Source: PPTA consultant

At km 28.320 (LHS) inDadon- 6 m from CL along Nanau – Dadon road

At km 26.160 (LHS)in Atta- 7 m from CL along Nanau – Dadon road

At km 2.993 (LHS)in Khanjahanpur- 7m from CL along Muzzaffarnagar to Baraut

At km 49.995 (LHS) in Pusar – 8m from CL Along

At km 22.910 (RHS) in Ajaypur kudaila- 10m from CL

At km 25.8 (RHS) in Hathgoam – 5m from CL

Muzzaffarnagar to Baraut

At km 22.75 (LHS)- 8 m from CL along Bulandansharar to Anupshahar

At km 64.8 (LHS) in Gosaisinghpur- 5.8m from CL along Haliyapur to Kurebhar

At km 61.400 (RHS) in Soron- 8.5 m frol CL along Aligang to Sauron

along Hussainganj to Alipur Marg

At km 28.66 (LHS)- 7m from CL along Bulandansharar to Anupshahar

At km 12.180 (LHS) in Bhumihari Patti- 8m from CL along Naurangia- Kaptanganj

At km 14.5 (RHS) in Jabrella- 8m from CL along Mohanlalganj- Unnao

along Hussainganj to Alipur

At km 76.32 (LHS) IN Dostpur -3.4m from CL along Haliyapur to Kurebhar

At km 26.750 (RHS) in Patiyali- 9m from CL along Aligang to Soron

At km 0.2 (LHS) in Mohanlalganj- 6.5 m from CL along Mohanlalganj- Unnao

Fig. 106: Photographs of few hand pumps/ wells out of those to be impacted

b. Mitigation during construction

352. Community groundwater sources shall not be used for construction purpose or meeting the water requirement of labors.

353. The contractor will make his own arrangements for water required for construction and will take all precautions to minimize the wastage of water in the construction process/ operation.

354. Extraction of water from groundwater or from surface water-bodies by the Contractor for the project purposes shall comply with all statutory provisions.

355. Extraction of ground water from over exploited, critical and semi critical blocks shall be avoided but if investable then it shall be extracted only after obtaining required permission from the State Ground Water Board.

356. The hand pumps shall be enhanced with soak pit attached to the its paved platform so that no waste age of water takes place and the excess water can be used to recharge the ground water.

357. Gunny bags or ready mix concrete and admixtures, used for curing, shall be preferred to reduce water requirement at site during construction.

358. No storage or refuelling activity will take place within say 25m of a pump location (if used for drinking water)

c. Impact during Operation

359. Not much impact on ground water is anticipated. Ground water pollution can take place only if leachate from dump containing chemical substances, reaches the ground water table. Oil spill of such an extent is not anticipated.

d. Mitigation during Operation

360. Relocation of hand pumps and wells in consultation with the local people and enhancement of the relocated hand pumps by providing cemented base and soak pits so that the excess water can be diverted to recharge ground water.

5. Climate Change Impact Assessment

361. Assessment of the impacts/ risks of climate change have been dealt in two parts i.e the causing factor and the impact/ risk factors. Climate change is highly triggered by increasing emission of greenhouse gases and project road specific assessment of the same is given below.

362. Impacts of climate change are generally anticipated in the form of increase in temperature and rainfall, increase in frequency and intensity of extreme events (cyclone, flood, drought etc.). The kind of risk that the project roads may be exposed due to the above mentioned factors are damage to asphalt pavement due to increase in temperature, damage to road infrastructure due to storms or high speed wind etc. Details of climate risk assessment are dealt in the second part of this section.

a. Greenhouse Gas Emission Assessment

363. One of the main triggering factors for climate change is increase in greenhouse gas emission. Transportation sector in India contributes to around 7.5% of the total GHG emission. Out of which road transportation alone has a share of 87%[18,19].Road construction accounts for 5% of its total life cycle GHG emission whereas, operation that is traffic accounts for rest 95%. GHG emission likely to be generated from the project roads have been computed using the Transport Emissions Evaluation Model for Projects (TEEMP)[20] developed by Clean Air

[18] *. Co2 emissions from fuel combustion highlights (2012 Edition) by International Energy Agency*

[19] *Indian Network for Climate Change Assessment, MoEF, 2010*

[20] *TEEMP is an excel-based, free-of-charge spreadsheet models to evaluate emissions impacts of transport projects.*

Asia[21]was utilized to assess the CO2 gross emissions with and without the project improvements for operation stage. The model has also been used for CO2 emission assessment during construction stage. The main improvement from the projects that has been considered for the model is better surface roughness which was translated into impacts on traffic speed and hence fuel consumption. The model also allows for the inclusion of impacts related to traffic congestion with and without project through provisions for inserting data on the traffic numbers, lane width, number of lanes and volume/capacity saturation limit. Along with CO_2 this software calculates emission of NOx and PM during operation.

b. Assumptions or considerations

364. Few assumptions made in this software are:

- Fuel efficiency as reckoned in business as usual (BAU) and with project scenario (WPS) is given in **Table IV-15.** It is assumed thatthe fuel efficiency of the vehicles would increase due to improvement of the roads.
- It is assumed that there would be no or minimum number of vehicles with vintage year before 2000 using Euro –I fuel type after 20 years **(Table IV-16**). Pre Euro vehicles are assumed to be completely discarded.

Table IV-15: Fuel efficiency in km/l

Scenario	BAU		WPS	
Fuel type	**Petrol**	**Diesel**	**Petrol**	**Diesel**
2-wheeler	45		50	
3-wheeler		18		20
Car	12	15	15	20
LCV		5		8
Bus		5		8
HCV		5		8

Source- PPTA Consultant

Table IV-16: Emission Standards of Fleet (%)

Vehicle Type	Current scenario				After 20 years		
	Pre-Euro	**Euro I**	**Euro II**	**Euro III**	**Euro I**	**Euro II**	**Euro III**
2-Wheel	0%	20%	45%	35%	10%	40%	50%
3-Wheel	10%	50%	40%	0%	0%	30%	70%
Cars/ Jeeps	5%	20%	35%	45%	0%	40%	60%
LCV/HCV	0%	25%	50%	25%	2%	30%	68%
Bus	5%	20%	50%	25%	2%	30%	68%

Source- DPR Consultant

c. Input Parameters

365. The model demands information on length of road or section, lane configuration, mode wise count of AADT in vehicles, average trip length, share or local traffic, trip length of local traffic, fleet characteristics i.e. breakdown of fleet based on fuel type, percentage breakdown of vehicle- fuel type based on Euro standard. Input parameters as considered for all the project

[21]*A network of 250 organizations in 31 countries established by the Asian Development Bank, World Bank, and USAID to promote better air quality and livable cities by translating knowledge to policies and actions that reduce air pollution and greenhouse gas emissions from transport, energy and other sectors.*

roads are as given in **Table IV-17.** Design period is considered to be 20 years and volume capacity saturation limit as 1.

366. Emissions from road construction were estimated by using the emission factor for rural roads, by using ADB - Carbon footprint 4 (http://www.adb.org/documents/reports/estimating-carbon-footprints-road-projects/default.asp), which is equivalent to 109,600 kg CO2/km of road construction.

367. The main improvement from the project that was considered for the model are better surface roughness with initially 2m/km which may deteriorate over a period but not less than 3.5 m/km and widening of roads from 1.5 lane to 2.0 lane. This will also increase the fuel efficiency of the vehicles to certain extent.

Table IV-17: Input parameters for TEEMP

Sl. No.		Project roads															
		MDR 82W (ND)		MDR 135W (MB)		MDR 58W (BA)		MDR 66E (HK)		MDR 81C (HA)		ODR24 (KN) & MDR 25E (KB)		MDR 52 C (MM)		MDR 45W (AS)	
1	Length of road(km)	30		55		37		96		49		84		54		35	
2	BAU- No. of lane	1.5		1.5		2		1.5		1.5		1.5		1.5		1.5	
3	WPS- No. of lane	2		2		2		2		2		2		2		2	
4	BAU- lane width (m)	3		3		3		3		3		3		3		3	
5	WPS- lane width (m)	3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5	
6	BAU- roughness (m/km)	7		3		3		6		6		5		4		4	
7	WPS-roughness (m/km)	2.5 to 3		2.5 to 3		2.5 to 3		2.5 to 3		2.5 to 3		2.5 to 3		2.5 to 3		2.5 to 3	
8	Start of assessment year	2018		2018		2017		2017		2017		2018		2017		2019	
9	AADT in Vehicles	2018	2033	2018	2033	2017	2033	2017	2033	2017	2033	2018	2033	2017	2033	2019	2033
	2-Wheelers	1749	4420	3894	9840	6779	17130	1900	4801	2010	5079	2649	6695	2333	6457	2785	6702
	3-wheelers	10	27	53	145	212	580	49	134	11	30	381	1043	73	218	20	53
	Car	243	665	1723	4716	1822	4987	241	659	306	838	258	706	833	2493	651	1716
	LCV	197	495	1001	2610	866	2207	148	366	102	251	178	453	198	552	306	750
	Bus	140	215	315	484	176	270	49	75	47	72	50	77	119	200	46	70
	HCV	140	275	1172	2633	773	1770	116	263	67	130	192	406	289	693	181	338
	Total	2479	6097	8158	20428	10628	26944	2503	6298	2543	6400	3708	9380	3845	10613	3989	9629
*BAU-Business As Usual Scenario; WPS- With Project Scenario																	

Source- DPR Consultant

d. Emission factors

368. Emission factors given by the Automotive Research Association of India and Central Pollution Control Board based on the factors of mode, vintage year and fuel type of vehicle has been considered. Mode wise count of Annual Average Daily Traffic (AADT) as generated from primary survey was first segregated on the basis of fuel and vintage year. Fuel type and vintage year data was collected from fuel station survey. Later number of vehicles of a particular mode, vintage year and fuel type has been multiplied with the corresponding CO2 emission factor and weighted emission factor were calculated mode wise for CO2 as given in Table IV-18. Weighted emission factors of CO2 as calculated are different for BAU and WPS depending on their fleet composition. Emission factors of NOx and PM has been entered based on vintage & Euro type as given in Table IV-19. The software automatically calculates the weighted emission factor for these parameters.

Table IV-18: CO_2 Emission Factor (kg/l)

Scenario	BAU		WPS	
Fuel type	Petrol	Diesel	Petrol	Diesel
2-wheeler	1.38		1.51	
3-wheeler		3.13		2.57
Car	1.52	2.21	1.52	2.28
LCV		2.86		2.51
Bus		3.18		3.0
HCV		1.92		2.0

Source: ARAI, 2007

Table IV-19: NOx and PM Emission Factor g/km

Mode of Vehicle	Emission	PM (g/km)		NOx (g/km)	
		Petrol	Diesel		
2-wheeler	Pre-Euro	0.015		0.3	
	Euro 1	0.035		0.27	
	Euro 2	0.035		0.27	
	Euro 3	0.013		0.15	
3-wheeler	Pre-Euro		0.782		0.93
	Euro 1		0.347		0.69
	Euro 2		0.347		0.69
	Euro 3		0.091		0.51
Car	Pre-Euro	0.0195	0.145	0.654	0.45
	Euro 1	0.004	0.19	0.2	0.84
	Euro 2	0.004	0.06	0.2	0.49
	Euro 3	0.006	0.015	0.12	0.28
LCV	Pre-Euro		1.213		15.25
	Euro 1		0.795		11.5
	Euro 2		0.795		11.5
	Euro 3		0.3		6.53
Bus	Pre-Euro		0.998		2.48
	Euro 1		0.655		2.12
	Euro 2		0.655		2.12
	Euro 3		0.475		2.12
HCV	Pre-Euro		1.213		15.25
	Euro 1		0.795		11.5

Mode of Vehicle	Emission	PM (g/km)		NOx (g/km)	
	Euro 2		0.795		11.5
	Euro 3		0.3		6.53

Source: ARAI, 2007[22]

e. Estimated Emissions

369. The proposed road upgrading resulting to surface roughness and road capacity improvements have implications in CO2 emissions. Reduced roughness and widening of road generally results in higher speed and in turn lesser emissions. At the same time change in fleet composition over time and corresponding weighted emission factor may lead to increase in CO2 emission. These factors are further affected by traffic congestion once the volume/capacity saturation limit is exceeded.

370. The total emission of CO2 as estimated during BAU and WPS for all the project roads individually is less than 100,000 tons per year threshold set by ADB[23]. Therefore it is not necessary to implement options to reduce or offset CO2 emissions under the project. The project road-wise CO2 emission intensity are provided in **Table IV-20.**

371. Value as estimated in terms of tons per km and tons per year per km shows lower emission in WPS compared to BAU in case of MDR 66E (HK) and ODR 24 (KN) & MDR 25E (KB) as the roads are expected to experience significant improvement in terms of roughness i.e from 5-6 m/km to 2.5 -3 m/km. MDR 82W (ND) on the other hand despite having improvement of roughness from 7.1 m/km to 2.5 -3 m/km is showing increase of emission during WPS as the count of bus is projected to increase by 225 PCU compared to that of 75 for MDR 66E (HK) and 81 for ODR 24 (KN)& MDR 25E (KB). The count of bus here becomes significant as it is having the highest weighted emission factor.

372. Road wise emissions estimated in terms of tons/ km and tons/ km / year are given in **Fig. 107&108.** Year Wise emissions estimated for each road is given in **Fig. 109**. Emissions are showing an increasing trend both in BAU and WPS due to increase in projected traffic. Output sheets of TEEMP are given in **Appendix 30.**

373. CO2 emission from construction materials as estimated for MDR 82W (ND) is 3288 tons, MDR 135W (MB) is 6028 tons, MDR 58W (BA) is 4055 tons, MDR 66E (HK) is 10412 tons, MDR 81C (HA) is 5370 tons, ODR24 & MDR 25E (KB) is 9206 tons, MDR 52 C (MM) is 5918 tons, MDR 45W (AS) is 4773 tons.

374. Emissions of PM and NOX seems to remain unchanged except for Muzaffarnagar – Baraut most probably owing to its high count of traffic. PM and NOx are showing an increase by 1.5 times and 1.6 times respectively in terms of ton / year.

f. Mitigation Measures

375. Though the total emission does not cross the threshold of 100,000 as per SPS, ADB, few CO2 offsetting measures like the following can be taken.

- Tress to be cut will be compensated at the ratio of 1:3. Attempt shall be made to

[22] *Air Quality Monitoring Project- Indian Clean Air Program (ICAP) Draft Report on 2007 'Emission Factor Development for Indian Vehicles' CPCB & ARAI, Pune*

[23] *Environment Safeguards- A Good Practice Sourcebook Draft Working Document, 2012, ADB*

use some land in the vicinity of road for afforestation.

- Additional road side compensatory afforestation shall be done at the ratio of 1:2 for all the roads based on space availability that shall act as pollution sink.
- Local bodies of road side towns shall be perused for setting up CNG stations so as to encourage the use of clean fuel at least by the local traffic.
- The pavement roughness shall be kept at the minimum by timely and effective maintenance.

Table IV-20: Summary of Gross CO2, NOx and PM emissions

Road	MDR 82W (ND)		MDR135W (MB)		MDR 58W (BA)		MDR 81C (HA)		MDR 66E (HK)		ODR24 (KN) & MDR 25E (KB)		MDR 52 C (MM)		MDR 45W (AS)	
Parameter	CO2 (2018-2037)		CO2(2018-2037)		CO2(2017-2036)		CO2(2017-2036)		CO2(2017-2036)		CO2 (2018-2037)		CO2(2017-2036)		CO2(2019-2038)	
Scenario	BAU	WPS	BAU	WPS	BAU	WPS	BAU	WPS	BAU	WPS	BAU	WPS	BAU	WPS	BAU	WPS
tons/km	1960	2086	8776	10753	8169	8227	1074	1226	2065	1484	2347	1908	2236	2400	1076	1233
tons/year	2940	3129	24133	29570	15113	15221	2630	3003	6350	7048	7216	8013	6048	6491	1910	2189
tons/km/ year	98	104	439	538	408	411	54	61	103	74	117	95	112	120	54	62
g/pkm	43	45	87	71	69	69	50	57	65	72	64	71	60	64	75	86
g/tkm	77	82	69	51	60	61	85	98	55	61	53	59	66	71	54	61
Parameter	PM		PM		PM		PM		PM		PM		PM		PM	
tons/km	2	2	8	12	9	9	1	1	2	2	3	2	2	2	1	1
tons/year	3	3	21	33	16	16	2	2	7	7	8	8	6	6	2	2
tons/km/ year	0.11	0.11	0.38	0.60	0.44	0.44	0.05	0.05	0.12	0.08	0.14	0.10	0.11	0.11	0.06	0.06
g/pkm	0.05	0.05	0.08	0.08	0.07	0.07	0.05	0.05	0.07	0.07	0.07	0.07	0.06	0.06	0.09	0.09
g/tkm	0.09	0.09	0.06	0.06	0.06	0.06	0.08	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Parameter	NOx		NOx		NOx		NOx		NOx		NOx		NOx		NOx	
tons/km	26	26	107	174	130	130	13	13	34	22	38	28	31	31	20	20
tons/year	39	39	294	477	240	240	33	33	104	104	118	118	83	83	35	35
tons/km/ year	1	1	5	9	6	6	1	1	2	1	2	1	2	2	1	1
g/pkm	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
g/tkm	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

**BAU-Business As Usual Scenario; WPS- With Project Scenario; PM-Particulate Matter; NOx- Nitrogen Oxides*

Source: TEEMP Output (PPTA Consultant)

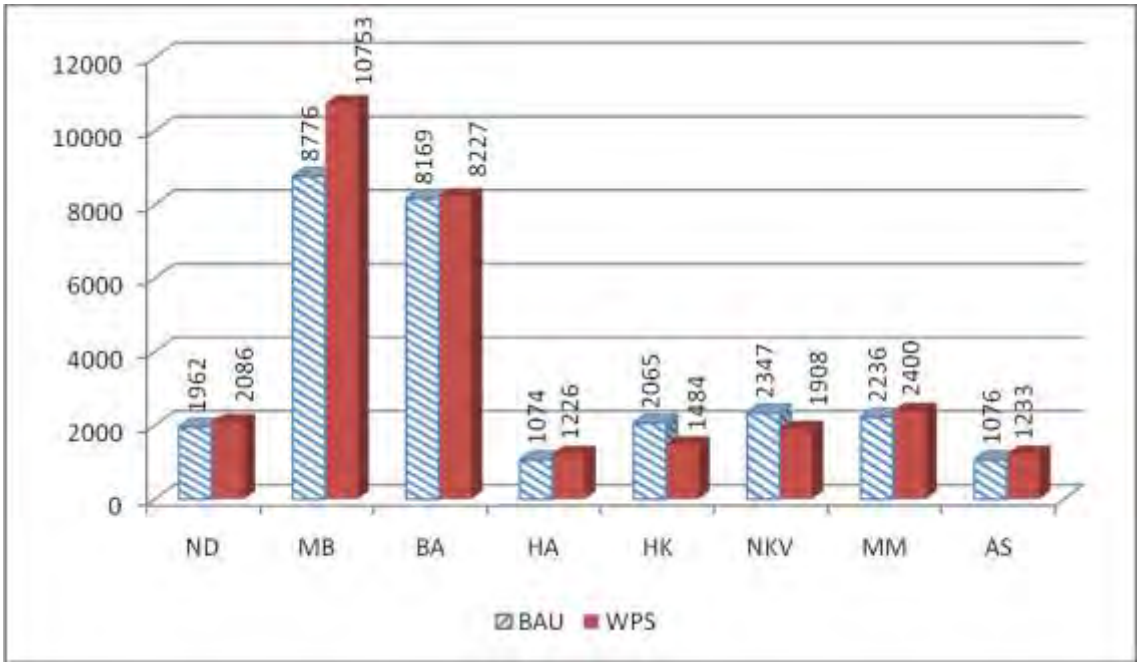


Fig. 107: Road wise CO_2 emissions in Tons/km

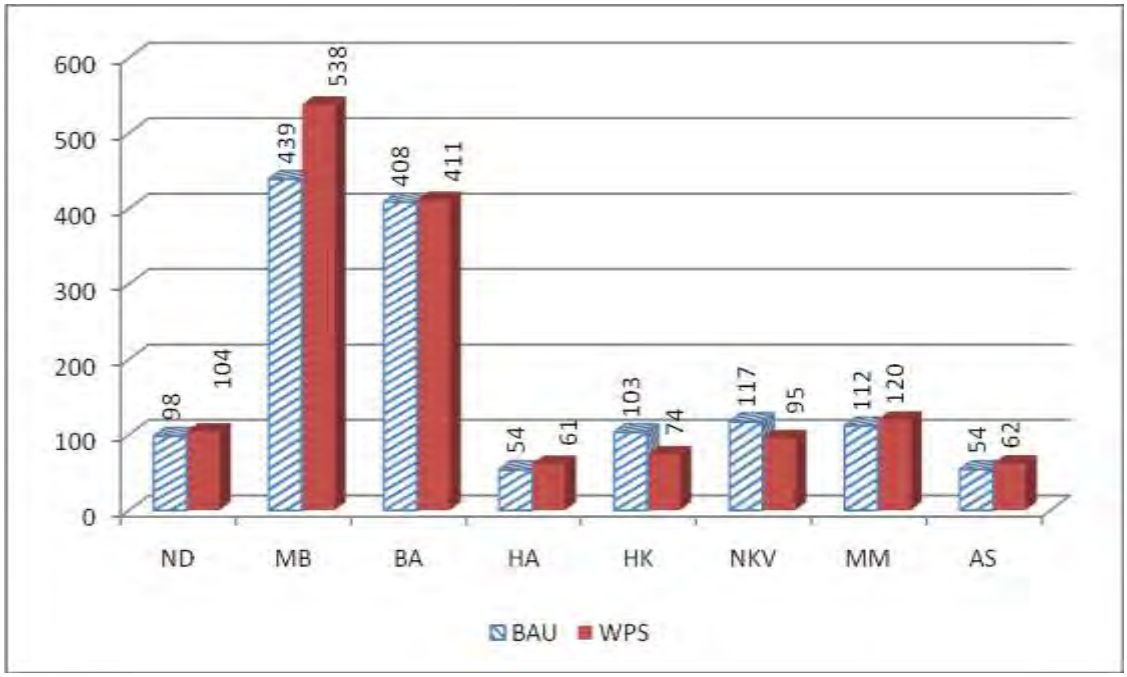
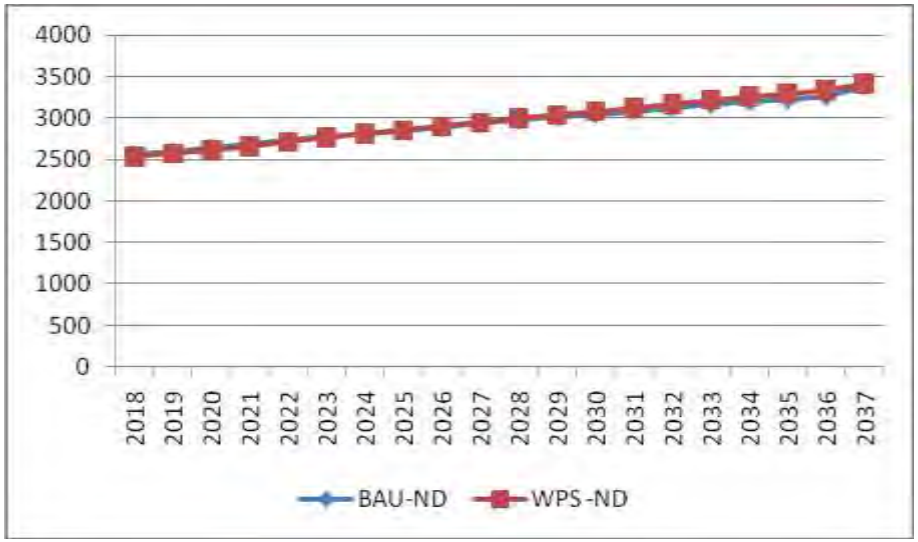


Fig. 108: Road wise CO_2 emissions in Tons/km/ year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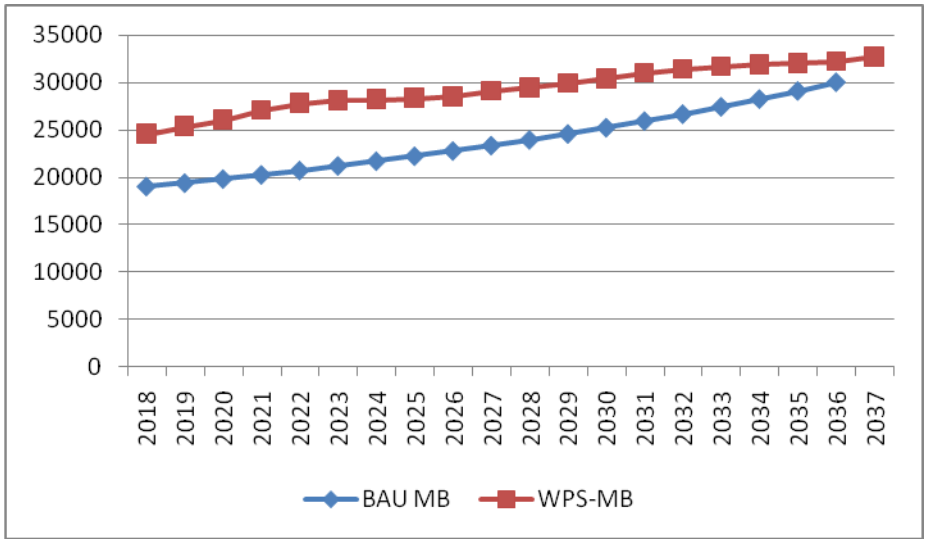
BAU-ND
WPS-ND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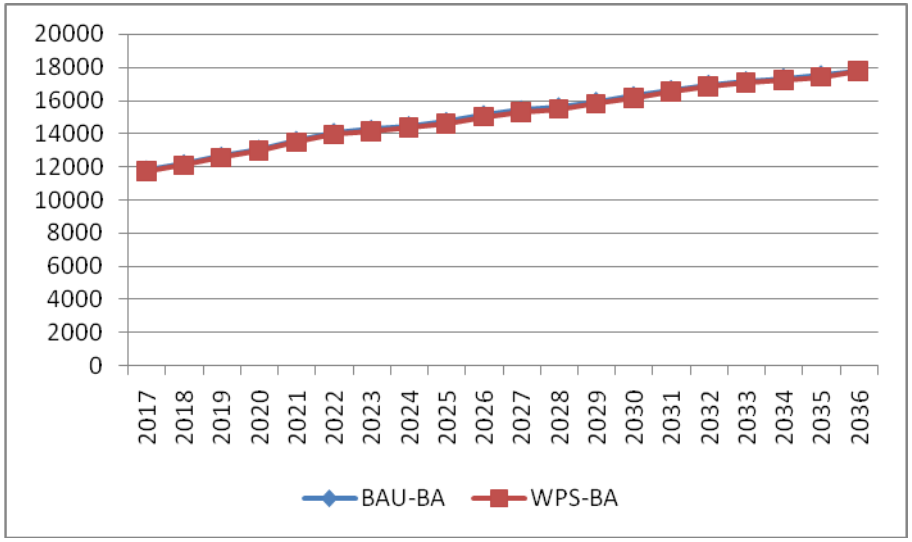
BAU MB
WPS-MB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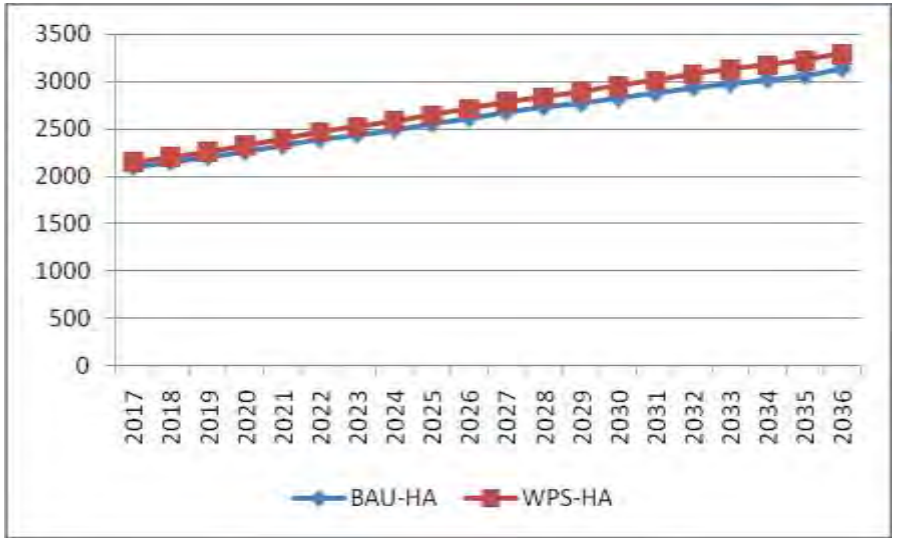
BAU-BA
WPS-BA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BAU-HA
WPS-HA

Fig. 109: Comparison of CO2 emission in BAU and WPS for all roads by year in tons

g. Climate change Risk Assessment & Adaptation

376. Sector specific climate risks screening has been done to analyze impact on road components due to likely change in climatic variables, mainly temperature and precipitation. Projection has been done for the year 2050 under the IPCC Assessment Report (AR5) and Representative Concentration Pathways (RCP8.5) scenario[24].

377. Annual mean temperature of Uttar Pradesh is ~25.350C, the lowest in January (15.60C), and the highest in June (33.330C). Annual mean temperature is projected to rise ~2.760C by 2050. Seasonally, temperature rise is projected to be lower during July-October period (<2.70C). Spatially, temperature rise is projected to increase gradually from southeast to northwest. The northwestern part of Uttar Pradesh is projected to experience a higher temperature rise (>2.80 C), and the lowest temperature rise is projected to occur within the southeastern region (<2.50 C).

378. Annual mean of total precipitation of Uttar Pradesh is about 1,011mm. Over 87% of the precipitation falls within the monsoon (June-September) period. Annual average precipitation is projected to increase 66mm (6.5%) by 2050s under the RCP8.5 scenario and the increase is projected to occur overwhelmingly during the monsoon period (86%). The highest increase (>21mm) is projected for the month of September. Spatially, increase in precipitation is projected to be less (<30mm) over the northwestern part of the state, and higher (>40mm) for the southeastern part of the state.

379. Climate change impacts affect the safety, operation, and maintenance of road transportation infrastructure and systems, and all road network users. Major climate change impacts are increased risks of flooding (increased storminess) and higher temperatures. Bridges, culverts, road embankments, road foundations, and pavements are the main components prone to flooding. Prolonged periods of higher temperatures may affect asphalt integrity particularly during the months of April, May, and June. Adaptation measures shall include raising the finished road level, slope stabilization, using heat resistant pavement material etc. Possible impacts and their intensity along with adaptation measures are as given in **Table IV-21.**

380. Adaptation measures involves improvement of 3 major bridges, improvement of 51minor bridges and new construction of 4 (parallel to existing) minor bridges and improvements of 766 culverts; construction of 268.89 km lined and 763.30 km of unlined drains; increase in height of embankment for a length of 115.92 km, turfing for a length of 316.51 km and stone pitching for a length of 14.25 km. Total cost incurred for the adaptation measure is approximately Rs.707.253 Cr. Adaptation measures and cost implications have been summarized in **Table IV-22.**

Table IV-21: Climate change risks for roads and adaptation measures

Sl. No.	Change in Climatic parameters	Impact on roads	Project roads likely to be impacted	Adaptation measures
1	**Temperature increase** by 2.76^{0}C (>40.5^{0}C in April, May, June)	Pavement buckling, rutting, softening; Thermal expansion in bridge expansion joints and pave surfaces;	All the roads	Heat resistant paving materials shall be used;

[24] *Climate Risk Screening Report, Proposed Multitranche Financing Facility, and Technical Assistance Grant India - Uttar Pradesh Major District Road Investment Program,2015,ADB*

Sl. No.	Change in Climatic parameters	Impact on roads	Project roads likely to be impacted	Adaptation measures
2	**Drought** 55% rainfall deficit in Western U.P; 43% in Eastern UP. Recurrence period is projected to be 6-8 years in E.UP & 10 years in W.UP	Impact on road stability; Unavailability of water for compaction work; Longitudinal cracks parallel to the center due to damage in road foundation; The cracks typically start near the road's outer edge because the soil alongside the pavement is exposed to the heat and lost moisture to evaporation. As the soil began to compress, it would bend the outside of the road. A series of three or four cracks are often observed as the drying progressed toward the road's center; Soil erosion on embankments;	MDR 82W(ND), MDR 135W (MB), MDR 58W (BA), MDR 66E (HK), ODR24 & MDR 25E (KB), MDR 45W (AS)	Slope stabilization measures like turfing along the road embankment and stone pitching along the embankment of bridges/culverts.
3	**Increased intensity of rainfall & Flood risk in the monsoon season**	Disruption of road network; inaccessibility; storm water drainage problem; slope failure; damage to bridges, pavement	High risk for MDR 66E (HK); ODR 24 (KN) & MDR 25E (KB); Medium risk in other roads; However, flood has not been reported during survey.	1-in-100-year return period including climate change allowance shall be considered for the designing of across drainage structures and embankment height.
4	**Cyclone** (Edies, gusts and changes in wind direction are often greatest near the ground in extreme wind episodes)	Strong winds can also cause damages to roadside infrastructure (e.g., signs, lighting fixtures and supports, etc.)	All the roads according to BMTPC Vulnerability Atlas, Uttar Pradesh is under High Damage Risk Zone.	The road infrastructure shall be designed, installed and material shall be chosen based on the factors like resistance to high wind speed etc.

Source- ADB,2015

Table IV-22: Summary of adaptation measures and cost implications

Sl. No.	Road stretch	Description	Cross Drainage			Side Drains (km)		Raised Embankment		Slope stabilization measure	
			Major bridge	Minor bridge	Culverts	Lined	Unlined	No. of Stretches	Length (km)	Turfing (length in km)	Stone pitching + filter media (length in km)
1	**MDR 82W** (ND)	Existing (No)	1	6	56	14.30	45.572	14	8.93	22.786	1.74
		Improvement (No)	1	6	48						
		Abandoned (No)	0	0	8						
		Existing length(m)	212.84		122.84						
		Proposed length(m)	237.96		135.37						
	Cost implication (Rs. Cr)	**Total (54.75)**	3.13		3.7	12.04		35.21		0.31	0.36
2	**MDR 135W** (MB)	Existing	2	4		25.067	93.140	10	9.44	46.73	2
		Improvement	2	4	108						
		Abandoned	0	0	2						
		Existing length (m)	219.96		189.90						
		Proposed length(m)	235.80		199.40						
	Cost implication (Rs. Cr)	**Total (52.346)**	1.87		7.054	16.023		26.819		0.17	0.41
3	**MDR 66E** (HK)	Existing	0	12	196	59.74	131.52	27	15.54	65.75	2.89
		Improvement	0	12	178						
		Abandoned	0	0	18						
		Existing length (m)	236.76		429.40						
		Proposed length(m)	251.70		460.85						

Sl. No.	Road stretch	Description	Cross Drainage			Side Drains (km)		Raised Embankment		Slope stabilization measure	
			Major bridge	Minor bridge	Culverts	Lined	Unlined	No. of Stretches	Length (km)	Turfing (length in km)	Stone pitching + filter media (length in km)
	Cost implication (Rs. Cr)	**Total (127.724)**	0	3.649	12.710	47.146		62.759		0.88	0.58
4	**MDR 58W** (BA)	Existing	0	8	44	13.740	48.50	12	13.92	29.190	1.1
		Improvement	0	8	41						
		Abandoned	0	0	3						
		Existing length (m)	103.20		90.80						
		Proposed length(m)	103.60		117.70						
	Cost implication (Rs. Cr)	**Total (74.849)**	0	4.641	3.782	11.57		54.266		0.39	0.2
5	**MDR 81C** (HA)	Existing	0	2	110	13.30	58.05	9	6.65	29.026	1.74
		Improvement	0	2	104						
		Abandoned	0	0	6						
		Existing length (m)	34.44		200.26						
		Proposed length(m)	34.44		219.46						
	Cost implication (Rs. Cr)	**Total (36.585)**	0	0.056	5.286	10.063		20.44		0.38	0.36
6	**ODR 24** (KN)	Existing	1	4	36	14.08	34.40	19	7.04	16.34	0.63
		Improvement	0	2	32						
		Abandoned /New	0	2 new	4						
		Existing length (m)	156.20		60.90						
		Proposed length(m)	160.50		75.20						
	MDR 25E	Existing	1	6	80	48.06	74.64	40	34.15	37.32	1.3

Sl. No.	Road stretch	Description	Cross Drainage			Side Drains (km)		Raised Embankment		Slope stabilization measure	
			Major bridge	Minor bridge	Culverts	Lined	Unlined	No. of Stretches	Length (km)	Turfing (length in km)	Stone pitching + filter media (length in km)
	(KB)	Improvement	0	6	77						
		Abandoned	0	0	3						
		Existing length (m)	88.40		196.80						
		Proposed length(m)	88.40		188.90						
	Cost implication (Rs. Cr)	**Total (238.74)**	5		10	48		174.65		0.72	0.37
7	**MDR 52 C** (MM)	Existing	0	9	109	40.4	175.66	8	10.20	43.913	1.67
		Improvement	0	9	102						
		Abandoned/ New	0	2 new	7						
		Existing length (m)	165.44		168.14						
		Proposed length(m)	169.64		209.76						
	Cost implication (Rs. Cr)	**Total (59.012)**	0	4.307	6.888	16.58		30.317		0.59	0.33
8	**MDR 45W** (AS)	Existing	0	0	84	40.2	101.82	25	10.052	25.45	1.18
		Improvement	0	0	76						
		Abandoned	0	0	8						
		Existing length (m)	-		61.80						
		Proposed length(m)	-		149.98						
	Cost implication (Rs. Cr)	**Total (63.247)**	0	0	5.405	17.112		40.14		0.34	0.25
	Total	**Total cost 707.253**	**3**	**55**	**766**	**268.89**	**763.30**	**164.00**	**115.92**	**316.51**	**14.25**

Sl. No.	Road stretch	Description	Cross Drainage			Side Drains (km)		Raised Embankment		Slope stabilization measure	
			Major bridge	Minor bridge	Culverts	Lined	Unlined	No. of Stretches	Length (km)	Turfing (length in km)	Stone pitching + filter media (length in km)
		Existing length (m)	**1217.24**		**1520.84**						
		Proposed length(m)	**1282.04**		**1756.62**						

Source- DPR Consultant

6. Air Environment

381. Air pollution sources observed are dusty roads, brick kilns, jaggery making small scale industries along the road stretches. Another source of pollution are vehicular emissions that increases due to poor road conditions, congestions etc. Out of all these the issues that can be addressed within the scope of this project are improving the pavement condition and widening of road that would help control dust from kutcha road and vehicular emission due to smooth plying of vehicles and reduced congestion.

a. Impact during construction

382. The most important pollutant during this phase will be suspended particulate matter along with gaseous pollutants like oxides of nitrogen, sulfur dioxides, and carbon monoxide & carbon dioxide (GHG). Assessment of GHG during construction has been done as given in the previous section. Such deterioration of air quality can be assigned to:

- Fugitive dust emission from construction activities like site clearance, excavation, back-filling and concreting.
- Hauling and dumping of earth & construction spoils
- Vehicular movement along unpaved roads or temporary diversions.
- Gaseous emission from construction equipment and vehicular traffic. Inadequate maintenance of vehicles and use of adulterated fuel use may increase the emission.
- Emissions from hot-mix plants.
- Impacts on air quality will be low to moderate and spatially restricted along the immediate corridor of impact.

b. Mitigation during construction

383. The negative impacts on air quality during construction will be mostly localized and limited to construction period only. These short terms impact can be mitigated by adopting the following measures.

- The hot mix plant, crushers and the batching plants shall be sited more than 1 km in the downwind direction of the nearest settlement; dust screen shall be used around the crusher trap dust at sources only.
- State SPCB guidelines for establishment of hot mix plant shall be followed
- Mitigation measures such as provision of dust screens in stockyard/construction camps, dust extraction units in the Hot Mix Plant/Batching Plant, and water sprays at the construction sites/ stock piles of construction materials /construction camp/hauls roads/quarries shall be made to reduce fugitive dust emissions.
- All vehicles, equipment and machinery including DG sets used for construction shall be regularly maintained as per CPCB norms.
- Regular monitoring of PM10, PM2.5, SOX, NOx etc. as suggest in environmental monitoring plan shall be carried out by the contractor.
- To avoid dust emissions likely to result from the spills of construction materials and borrow materials, the vehicles delivering material shall be fitted with tail boards and shall be covered with tarpaulin sheets;
- Provision of dust mask for construction workers

- Cold mix technology shall be opted wherever feasible
- The trees with high Air Pollution Tolerance Index (ATPI) shall be preferred more. Viz. ATPI for Neem or Azadirachta Indica is 12.95, for cassia fistula or Amaltas is 10.87, ficus religiosa or peepal is 10.36, dalbergia sisoo or seesam is 9.91 and Eugenia Jambolana or Jamun 9.3125.

c. Impact during Operation

384. Air quality is likely to improve in the initial years after commissioning because of saving of fuel in the vehicular traffic riding on smooth and improved roads with much less interruption.

385. Impact on air quality in the operational phase is likely to come from increased vehicular traffic flows. Also loose soils on cleared areas may be blown off during strong winds and cause fugitive dust emission, which affects the quality of the air. Air quality in terms of CO, PM and NOx emission has been modelled using CALINE4.

7. AAQ Impact Prediction Modelling of CO Using CALINE 4

386. CALINE 4 (Caltrans, 1989) is a dispersion model that predicts impacts near roadways. CALINE 4 is a simple line source Gaussian plume dispersion model.

387. **Input parameters.** Multi-Run/Worst Case Hybrid (8 hourly), Worst Case Wind Direction (1 hourly) and Standard types (1 hourly) options were used for CO, PM and NO2 modeling respectively. Wind speed is considered 1m/s for worst case scenario for CO and PM. The wind direction for NO2 assessment was taken from the outcome of PM assessment for worst case assessment. Roughness option is considered as “sub urban roughness”. Link type as at grade and link height as zero. The mixing zone width considered is 7m (pave surface) +6 m (3m on either side). Few inputs vary based on the road stretch specific conditions. The input parameters considered for all the roads are as given in **Table IV-23.**

Table IV-23: Input parameters

Project roads	Altitude (msl)	Weighted Emission factor (g/mile)[26]				Peak hourly traffic
		Year	CO	PM	NOX	
MDR 135W (MB)	180	2020	3.02	0.38	2.80	500
		2030	2.97	0.36	2.67	784
MDR 82W (ND)	180	2020	2.49	0.17	1.52	154
		2030	2.49	0.17	1.42	238
MDR 58W (BA)	120	2020	2.34	0.11	1.00	795
		2030	2.23	0.10	0.94	1205
MDR 81C (HA)	120	2020	2.34	0.11	1.0	196
		2030	2.23	0.10	0.94	296
MDR 66E (HK)	100	2020	2.74 at km16.00	0.18	1.49	259
			2.66 at km 3.00	0.19	1.35	227
			2.91 at km 1.00	0.26	1.87	203
		2030	2.7 at km16.00	0.17	1.41	378

[25] *Horaginamani et al.,2012, Air Pollution Tolerance of Selected Plant Species Considered for Urban Green Belt Development in Trichy, World Journal of Environmental Biosciences,Volume 1, Issue 1: 51-54*

[26] *Design Report and “Emission Factor development for Indian Vehicles”, ARAI, Pune*

Project roads	Altitude (msl)	Weighted Emission factor (g/mile)[26]				Peak hourly traffic
		Year	CO	PM	NOX	
			2.63 at km 43.00	0.18	1.29	332
			2.87 at km 81.00	0.25	1.80	299
ODR 24 (KN) & MDR 25E (KB)	180	2020	2.79 of ODR 24	0.23	1.59	293
			2.72 of MDR 25E at km 37	0.20	1.18	336
			2.92 MDR 25E at km 49.5	0.25	1.54	294
		2030	2.77of ODR 24	0.22	1.55	433
			2.70 of MDR 25E at km 37	0.20	1.13	506
			2.87 of MDR 25E at km 49.5	0.24	1.45	436
MDR 52 C (MM)		2020	2.56 at km 8.5	0.21	1.33	350
			2.69 at km 51.5	0.24	1.75	284
		2030	2.53 at km 8.5	0.20	1.26	553
			2.64 at km 51.5	0.23	1.67	440
MDR 45W (AS)	160	2020	2.23 at km 44	0.16	1.07	242
			2.31 at km 55	0.21	1.06	46
		2030	2.26 at km 44	0.15	1.21	382
			2.25 at km 55	0.19	1.13	74

Source- DPR Consultant

388. **Result.** The predicted CO and NOx concentrations including monitored baseline concentration level at all locations are well within the National Ambient Air Quality Standards for the projected years 2020 and 2030 (**Table IV-24**). Predicted PM level exceeds the NAAQS limits at 8 locations both in the years 2020 and 2030 which is due to higher baseline concentration in MDR81C, MDR 66E,ODR 24 (KN) and MDR 25E (KB). High base line concentration is probably because of poor road condition.

Table IV-24: Monitored and predicted GLCs for CO, PM and NOx

Project Road	Monitoring station	years	CO (NAAQS Limit-2 mg/m^3)		PM (NAAQS limit for PM 10-100μg/m^3)		NOx (NAAQS limit-80 μg/m^3)	
			Monitored baseline GLC	Predicted cumulative GLC	Monitored baseline GLC	Predicted cumulative GLC	Monitored baseline GLC	Predicted cumulative GLC
ND (MDR 82W)	AQ1	2020	1.28	1.29	75.4	76.3	20.8	22.8
		2030	1.28	1.31	75.4	77.5	20.8	19.0
	AQ2	2020	1.03	1.04	62.5	63.0	15.8	26.7
		2030	1.03	1.06	62.5	64.1	15.8	25.5
MB (MDR 135W)	AQ3	2020	1.14	1.17	65.2	69.1	21.5	34.8
		2030	1.14	1.22	65.2	76.2	21.5	61
	AQ4	2020	0.98	0.99	64.0	65.5	17.8	22.6
		2030	0.98	1.02	64.0	68.1	17.8	32.0
	AQ5	2020	0.9	0.93	51.6	55.0	15.3	26.5
		2030	0.9	0.98	51.6	61.1	15.3	48.7
AB (MDR 58W)	AQ6	2020	1.54	1.64	83.8	85.7	24.6	25.8
		2030	1.54	1.69	83.8	89.6	40.2	28.1
	AQ7	2020	1.25	1.42	62.5	64.3	22.4	23.5
		2030	1.25	1.47	62.5	68.0	37	25.7
HA (MDR 81C)	AQ8	2020	1.54	1.57	**120**	**132**	40.2	40.2
		2030	1.54	1.59	**120**	**133**	40.2	40.2
	AQ9	2020	1.25	1.27	**112**	**123.4**	37	46.4
		2030	1.25	1.28	**112**	**124.1**	37	51.3
	AQ10	2020	0.73	0.75	80.6	92.1	33	42.1
		2030	0.73	0.76	80.6	92.8	33	46.8
HK (MDR 66E)	AQ11	2020	1.16	1.16	**105.5**	**105.8**	37.2	39.2
		2030	1.16	1.18	**105.5**	**106.6**	37.2	43.4
	AQ12	2020	1.0	1.00	**131**	**131.3**	37	38.6
		2030	1.0	1.02	**131**	**131.9**	37	42.0
	AQ13	2020	1.0	1.01	98	98.4	37	39.2
		2030	1.0	1.02	98	99.2	37	43.9
	AQ14	2020	1.5	1.51	**110**	**110.5**	39	41.7
		2030	1.5	1.52	**110**	**111.5**	39	47.6
	AQ15	2020	1.0	1.01	**105**	**105.3**	39.4	41.4
		2030	1.0	1.02	**105**	**105.9**	39.4	45.8
ODR 24 (KN) & MDR 25E (KB)	AQ16	2020	1.30	1.31	**120**	**120.4**	40.2	42.6
		2030	1.30	1.32	**120**	**121.3**	40.2	47.9
	AQ17	2020	1.30	1.31	**120**	**120.4**	38	39.9
		2030	1.30	1.32	**120**	**121.3**	38	44.1
	AQ18	2020	0.8	0.81	94.3	94.6	34.9	36.4
		2030	0.8	0.82	94.3	95.2	34.9	39.2
	AQ19	2020	1.1	1.11	96	96.4	39.4	41.4
		2030	1.1	1.12	96	121.2	39.4	44.2
MM (MDR-52C)	AQ 20	2020	0.75	0.76	80.8	81.6	18.1	22.4
		2030	0.75	0.78	80.8	83	18.1	29.6
	AQ 21	2020	0.78	0.79	80.3	80.8	18.3	21.1
		2030	0.78	0.81	80.3	81.7	18.3	25.6
	AQ 22	2020	0.83	0.84	81	81.8	18.4	22.4

Project Road	Monitoring station	years	CO (NAAQS Limit- 2 mg/m^3)		PM (NAAQS limit for PM 10- 100μg/m^3)		NOx (NAAQS limit- 80 μg/m^3)	
			Monitored baseline GLC	Predicted cumulative GLC	Monitored baseline GLC	Predicted cumulative GLC	Monitored baseline GLC	Predicted cumulative GLC
		2030	0.83	0.86	81	83.1	18.4	29.2
	AQ 23	2020	0.79	0.80	76.5	77.2	19.6	23.5
		2030	0.79	0.82	76.5	78.3	19.6	30.1
AS (MDR-45W)	AQ 24	2020	0.81	0.82	79.1	79.7	18.1	21.5
		2030	0.81	0.85	79.1	81.2	18.1	30.4
	AQ 25	2020	0.84	0.85	81.1	81.4	18.6	20.6
		2030	0.84	0.86	81.1	82.3	18.6	25.8
	AQ 26	2020	0.83	0.83	79.9	80.2	20.3	21.5
		2030	0.83	0.84	79.9	80.7	20.3	24.3

Source- CALINE OUTPUT (DPR Consultant)

d. Mitigation during Operation

389. The mitigation measures to be taken during operation are as follows:

- Slopes or open areas from where vegetation has been cleared during construction shall be re-vegetated to control dust.
- Improvement in pavement condition will also reduce the dust emission in future years.
- Monitoring of air quality shall be done as suggested in the monitoring plan.
- Free and uninterrupted flow of vehicle due to pavement improvement, widening, segregation of vehicular and pedestrian traffic by provision of footpaths along settlements shall lead to lesser emission of vehicular pollutants.
- The actual concentration is likely to be lesser than that predicted due to encouraged use of cleaner fuel and clean technologies in future for instance use of Bharat stage V is proposed for the entire country in near future.

8. Noise Environment

a. Impact during construction

390. The magnitude of impact during the construction phase will depend upon the types of the equipment used, the construction methods employed and the scheduling of the work. Impacts can be estimated, however, based on the types of construction work anticipated, the types of equipment required and their associated range of noise levels. The construction activities will include the excavation for foundations and grading of the sites and the construction of structures and facilities.

391. Increase in traffic due to construction activities may lead to increase in the noise levels. Due to operation of the construction equipment, there will be a rise in noise level, though temporary in nature. Vibration may be caused due to increase temporarily because of the operations of jackhammers, vibrating rollers etc.

392. There will be some impacts on people residing along the project corridor. Impacts on

different receptors will also vary considerably during the construction stage and these impacts will be localized and limited to stretches where construction work will be under progress, near equipment / vehicle yard, plant sites. The machineries and equipments used in construction during their operation may cause significant changes in the noise level. Proper scheduling of operation of such machineries during the construction phase may to a great extent attenuate the noise level leading to lessening of the discomfort level of the affected communities. The expected noise levels from construction activities are given in **Table IV-25.**

Table IV-25: Noise levels generated from different construction sources

Clearing		**Structure Construction**	
Bulldozer	80	Crane	75-77
Front end loader	72-84	Welding generator	71-82
Jack hammer	81-98	Concrete mixer	74-88
Crane with ball	75-87	Concrete pump	81-84
		Concrete vibrator	76
Excavation & Earth Moving		Air compressor	74-87
Bulldozer	80	Pneumatic tools	81-98
Backhoe	72-93	Bulldozer	80
Front end loader	72-84	Cement and dump trucks	83-94
Dump truck	83-94	Front end loader	72-84
Jack hammer	81-98	Dump truck	83-94
Scraper	80-93	Paver	86-88
Grading and Compacting		**Landscaping and Clean-Up**	
Grader	80-93	Bulldozer	80
Roller	73-75	Backhoe	72-93
		Truck	83-94
Paving		Front end loader	72-84
Paver	86-88	Dump truck	83-94
Truck	83-94	Paver	86-88
Tamper	74-77	Dump truck	83-94

Source: Environment Protection Agency

393. **Resultant Noise Level.** The combined effect of above sources can be determined as per the following equation:

$L_{p(total)} = 10 \log(10^{(Lp1/10)} + 10^{(Lp2/10)} + 10^{(Lp3/10)} + \ldots\ldots.)\ldots\ldots\ldots\ldots(2)$

Where: L_{p1}, L_{p2} and L_{p3} are noise pressure level at a point due to different sources in dB(A).

394. The resultant maximum noise level for the above sources as calculated using equation (2) is 100.5 dB(A).

395. For an approximate estimation of dispersion of noise in the ambient air from the source point, a standard mathematical equation (3) for sound wave propagation is used. The sound pressure level generated by noise sources decrease with increasing distance from the source as given in **Fig. 110**. Assuming no barrier the noise level tends to reach 90 dB(A) (Permissible limit by CPCB for construction zone) at a distance of 10 m from the site.

$L2 = L1 + 10 * \text{Log } 10 (d1/d2)\ldots\ldots\ldots\ldots(3)$

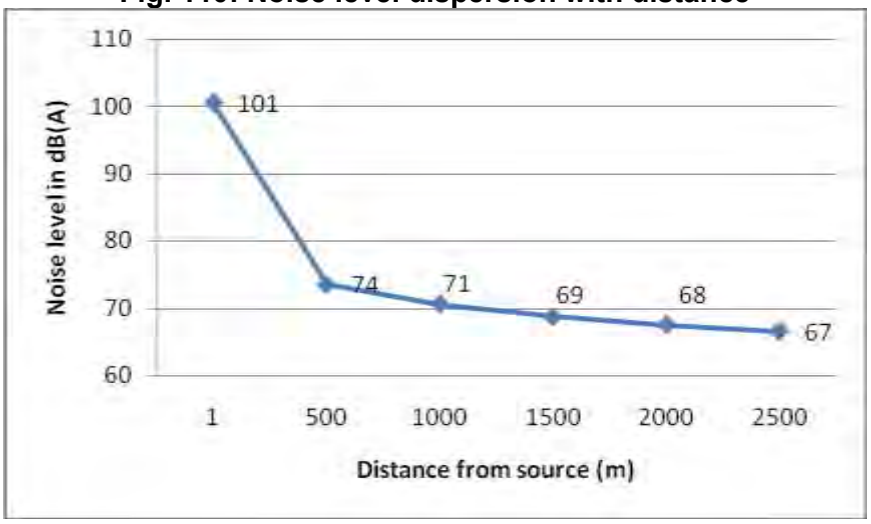
Where, L_2 is the sound level at distance d_2

L_1 is the predicted sound level at distance d_1

$d_1$is 1m from source

d_2 is distance of the boundary wall from road edge

Fig. 110: Noise level dispersion with distance



b. Mitigation during construction

396. Measures to mitigate noise impacts during the construction phase may include the following provisions:

- ***Barrier protection-*** Construction machineries shall be operated within movable acoustic barriers (such as plywood with sound absorbing materials) that can attenuate the sound pressure level by approximately 10 to 15 dB(A).
- ***Distance-*** All noisy machineries such as HMP and rock crushers shall also be located around 1km from any habituated area in the predominant downwind direction where along with barrier protection the noise level can be reduced to 55 dB(A), permissible limit for residential area.
- ***Source Controls,*** i.e., requirements that all exhaust system will be maintained in good working order; properly designed engine enclosures and other noise reducing techniques will be employed; and regular equipment and vehicles maintenance will be undertaken. Noise shall be mitigated by using low-noise equipment and observing good maintenance of machinery.
- ***Site Controls,*** i.e., requirements that stationary equipment will be placed as far away from sensitive receptors as possible; disposal sites and haul routes will be selected in such a way to minimize objectionable noise impacts on locals; and shielding mechanisms will be employed where possible.
- ***Time and activity constraints-*** operations will be scheduled to coincide with periods when people are least likely to be affected. The noisy construction operations and their duration will be scheduled in such a way to prevent nighttime activities. To protect construction workers from severe noise impacts, workers exposed to excessive noise will be given ear plugs, helmets, etc. or their working hours at noisy location shall be reduced.
- **Community Awareness**- public notification of construction operations shall incorporate noise considerations. Methods to handle complaints will be specified. Provision of appropriate signage near sensitive receptors like schools, hospitals,

etc. will help reduce noise

c. Impact during Operation

397. Noise modelling has been done for representative sections of the project roads using CoRTN model.

9. CoRTN Model

398. The CoRTN (Calculation of Road Traffic Noise) model was developed by up UK Department of Transport in 1988. It is a traffic Noise model that can be used to forecast the noise level from an uninterrupted traffic flow condition. CoRTN model software was run by using traffic forecast data of year 2030.

399. **Assumptions.** The assumptions are:

- Height of source 0.5 m above carriage level
- Model does not take background noise into account such as trains, aero plane, industry, daily activities, market activities, etc.
- Model doesn't consider the ground level absorption of the noise and absorbing source like tree, wall, etc.
- Metrological conditions are not taken
- During the pre-project scenario (Year 2014/ 2015), average speed was considered as 40 kmph, whereas after the completion of the project, design speed of 80 kmph was considered for operation phase.
- Average speed of 40 kmph was considered to predict the distance where noise level due to traffic level will meet the prescribed standards.

400. **Classification of vehicles.** In CoRTN model vehicles are classified onto two categories namely light vehicles and heavy vehicles.

401. **Approach, Methodology and Validation**. The model has been validated for Indian Conditions by CSIR Central Road Research Institute & CSIR CRRI has published the validation in 2008 in a paper titled "Validation of Noise Prediction Model for an Urban Area". The CoRTN model has been found to be more accurately predicting results in Indian conditions in comparison to other noise models. The present model used for the project is derived from the CSIR CRRI validated and modified model.

402. The outputs of the assessment are presented in **Fig. 111** and **Appendix 31.** The figure and appendix shows the noise levels that will be generated by traffic at the respective distance from the centerline of the road without mitigation and with mitigation. The "with mitigation" column assumes attenuation of noise due to: i) requirement for reduction in speed of traffic from 80km/hour to 20 km/hour in sensitive locations, ii) existing fencing walls around the sensitive structure compound if any, In accordance with the Federal Highway administration's Traffic Noise Model (FHWA's) there will be a reduction in approximately 6dB of noise when speed is reduced from 80km/hour to 20 km/hour. Literature[27]shows that noise barriers can reduce noise by 5 to 10 dB. Hence with construction of a noise barrier it has been assumed that there will be a further reduction in noise by approximately 7 dB (assuming an average reduction in noise of 7dB) in addition to 6dB reduction (from speed reduction) , hence a total reduction of approximately 13 dB of noise. Calculations made with this assumption as given in **Appendix 31**

[27] *http://www.fhwa.dot.gov/environment/noise/noise_barriers/design_construction/keepdown.cfm*

shows that noise barriers will be very effective in lowering noise levels. Infact the noise levels will remain below baseline levels even with the traffic increase expected in 2030.

403. **Projected noise levels.** The road wise projected noise levels are as follows:

- *Nanau to Dadon*- It can be seen that without mitigation measures the noise levels increase by 5-6dB. The noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 15.5 m from the road edge and that of silence zone at 20m.
- Hussainganj to Alipur- Without mitigation measures the noise levels increase by 6-7Db (A). The noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 13.5 m from the road edge and that of silence zone at 20m.
- *Muzaffarnagar to Baraut*- Without mitigation measures the noise level is predicted to increase by 6-7Db (A). Night time is already having a low intensity of noise. The noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 27.5m from the road edge.
- *Bulandshahar to Anoopshahar*- Without mitigation measures the noise level is predicted to increase by 6-7dB(A). The noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 27.5 m from the road edge.
- *Haliyapur to Khurebhar*- Without mitigation measures the noise level is predicted to increase by 6-7dB(A). Night time is already having a low intensity of noise. The noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 13.5 m from the road edge. Since there is only 1 dB(A) difference between noise level modelled at km 16, km 43 and km 81, levels of only one location (highest amongst three) has been graphed in **Fig. 111.**
- *Kaptanganj to Naurangia* - Without mitigation measures the noise level is predicted to increase by 6-7Db(A). Night time is already having a low intensity of noise. The noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 19.5 m from the road edge. Assessment has been done separately in 3 sections i.e. ODR 24 (KN). KM 37.5 of MDR25 E (KB) and km 49.5 of MDR25E (KB). Difference between the sections is by 1 & 2 dB(A). Highest noise levels are observed at km 49.5 and have been graphed in **Fig. 111**.
- *Mohanlalganj to Unnao*- Without mitigation measures the noise level is predicted to increase by 6-7dBA. Night time is already having a low intensity of noise. The increment noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 19.5m from the road edge.
- *Aliganj to Soron*- Without mitigation measures the noise level is predicted to increase by 6-7dB(A). The noise level will attain to the standards of residential i.e. 55 dB(A) at a distance of 17.5m from the road edge.

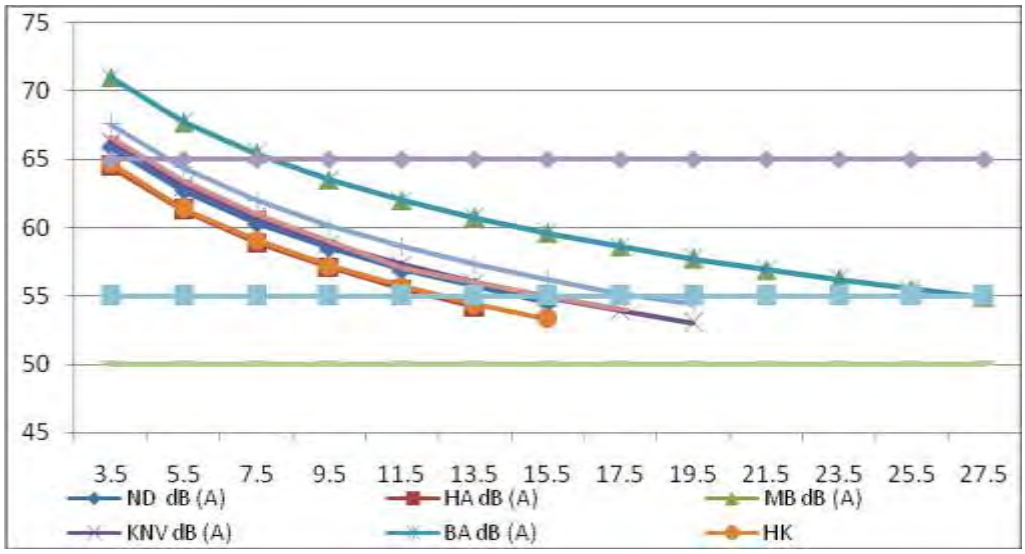
d. Mitigation during Operation

404. **On-road treatment.** On road noise attenuating measures like no horn sign posts and speed limit near sensitive receptor shall be provided to attenuate noise. Plantation along the road shall be maintained properly.

405. **Off-road treatment.** Sensitive receptors adjacent to road that is receiving excessive noise and has no intervening land use are proposed to be provided with off road building treatments. To reduce noise and vibrations, it is proposed to increase the height of compound walls to 2m. A masonry wall or hollow concrete blocks wall can be used for noise attenuation. In

case the wall is of good structural condition light concrete carpeting can be done. In case the structural condition of wall seems to be poor and cannot bear the load, it shall be reconstructed with hollow concrete blocks/ masonry wall. In case the receptor already has a boundary wall in good condition and its height is at least 2 m no barriers have been proposed for them. Also private clinics have not been considered for protection as exposure time for patients are very less, it may lead to loss of livelihood and in some cases there are not enough space in front of the dispensary or private clinic for a barrier. Cross section of the Boundary wall (Noise Barrier) and detail of sensitive receptors likely to be affected due to noise pollution is presented in **Appendix 32** along with proposed mitigation measure and a summary is given in **Table IV-26.**

406. The feasibility of extending the existing boundary wall will be checked by the contractor during construction phase. The locations identified for noise barriers are tentative and will have to be finalized by the contractor.



Source- CoRTN Output (DPR Consultant)

Fig. 111: Modelled noise levels along the project roads

Table IV-26: Summary of number of noise barrier proposed out of total sensitive locations

Sl. No.	Road stretches	Total sensitive receptor	No. of receptors exposed to high level of noise	Noise barriers proposed			Length (m)	Distance in m where Noise Levels are in limits
				Health institution	Educational institution	Total*		
1	MDR 82W (ND)	24	23	2	12	14	560	15.5
2	MDR 81C (HA)	36	20	2	18	20	882	26.0
3	MDR 135W (MB)	46	45	2	18	20	1099	69.0
4	MDR 66E (HK)	86	47	4	43	47	2082	25.0 -29.5
5	MDR 58W (BA)	26	14	1	13	14	602	26.0
6	ODR 24 (KN)	11	11	0	11	11	585	34.5
	MDR 25E (KB)	40	40	7	33	40	1051	27.5 - 32
7	MDR 52 C (MM)	41	29	8	10	18	558	29.5- 36.0

Sl. No.	Road stretches	Total sensitive receptor	No. of receptors exposed to high level of noise	Noise barriers proposed			Length (m)	Distance in m where Noise Levels are in limits
				Health institution	Educational institution	Total*		
8	MDR 45W (AS)	17	16	0	7	7	220	20 -22
	Total	327	245	26	165	191	7639	

Source: DPR Consultant

10. Ecological Environment

a. Impact during construction

407. **Flora.** Nearly **37873** trees are likely to be cut that are present within 10 m of CL or formation width out of 62988 present within the RoW **(Table IV-1)** and 78.76 ha of protected forest is to be diverted for the purpose of widening/ improvement of the project road. Common species to be cut are shagoon, bakain, semar, sesham, guava, ber, gulmohur, siris neem bargad, peepal,babul, kadam, mango etc.

408. Some trees and ground vegetation will also be affected during establishment of construction camps, worker camps, and stockyards for material storage and construction machinery and equipment camps. There would be loss of vegetation cover (shrubs and herbs) due to earth cutting, clearing and grubbing etc. Such impacts will be localized, temporary and reversible.

409. During construction the rate of accumulation of dust on leaves may increase. It affects the rate of photosynthesis as they receive less light for photosynthesis; this interferes with gas exchange between the leaf and air, and the reduction of leaf stomatal conductance influences plant biomass formation and yield i.e. plant growth and development gets affected.

410. **Fauna.** No impacts anticipated on wildlife as the road stretches are not crossing through any national park or wildlife sanctuaries. Also there is no Wildlife Sanctuary / National Park located within 15 km distance from the project road except for Mohanlanganj to Unnao Marg.

411. Nawabganj Bird Sanctuary is located approximately at a distance of 11km from the Mohanlalganj to Unnao marg road. **Fig. 112** shows the location of the sanctuary with respect to the project road marked on Google earth imagery. The sanctuary is categorized as an Important Bird and Biodiversity Areas (IBA) by Bird Life International. The bird sanctuary acts as breeding place for many resident/migratory birds during winter like Surus crane, Intermediate Egret, Asian open bill stork etc. Sarus crane, a resident species and Greater spotted Eagle clanga, a migratory species falls under vulnerable category of International Union for Conservation of Nature and Natural Resources (IUCN). A bird sanctuary has an anthropogenic boundary but bird's habitat may spread geographically beyond the boundary. Migratory birds are observed in the Baknai Badaila Jheel located 25 m RHS of the road from km 46.900 to 47.500 near village Unchagaon Killa. However, as discussed with Mr. Sanjay Srivastava, Conservator of Forest, Nawabganj, the site is not an identified site for bird protection.

412. Breeding of avifaunal species normally gets disturbed due to noise. This region falls under the indirect impact zone of the project road. However, no bird killing has been reported in this area by local people or the Forest Department.

413. The edge and the shallow water part of a pond/ marsh is the richest area. The shallow part means depth of 1 cm of water[28]. This area is preferred by most of the aquatic microorganisms. Siltation during construction may destroy their breeding place.

414. The Stretch of River Ganges has been notified as Ramsar Site from BrijGhat to Narora Bridge. Nearest point of the Ramsar site from project road is 900m. The Gangetic Dolphins has been reported near Narora Bridge , whose nearest distance from Project road is 20km .The Anupsahar-Bulandsahar (MDR 58) road is outside the wetland boundary of Ramsar site and the nearest point is junction of Aupsahar at km 39.700. Refer to **Fig. 96** in **Chapter 3** for the map. No impact is anticipated on the Ramsar site as the intervening land has the big city of Anoopshahar on it, the bank of river in this stretch is being used for burning and disposing of dead bodies, taking baths. This stretch of river is shallow and also receiving sewage from the locality. because of above factors no rich fauna is present in this stretch which has also been confirmed by the local people and Department of Forest . Only impact could be during the construction period when the labour may get engaged into fishing activities..

415. Common animals like monkeys, dogs, cattle are observed along the road that may get affected during construction and cause vehicle –animal conflicts. Two locations along Bulandshahar and Anoopshahar road (km 23.200 to km 23.400 and km 47 to km 48) where temples exist, people offer food materials as religious offerings to monkeys and this draws them in group to the road. This may lead to human-animal or animal-vehicle conflict during construction.

416. The cumulative impact of extraction from river bed is increase in turbidity due to slope collapse affecting propagation of fishes and other aquatic life mainly benthic organisms, The macro-benthic life which remains attached to the river bed material may get dislodged and carried away downstream by turbulent flow. Mining and dredging activities, poorly planned stockpiling and uncontrolled dumping of overburden, and chemical/fuel spills from equipments and machinery involved in dredging may cause reduced water quality for downstream users, and poisoning of aquatic life. However, the sand quarries identified for the project requirement have no density and diversity of benthic fauna. No fishing was observed or reported. This is mainly because all river beds are dry for most part of the year. Moreover, any extraction of river bed material is regulated by different authorities like State Environmental Impact Assessment Authority, State Pollution Control Board and State Mining Department with an objective of to conserve top soil, no impact on aquatic biodiversity, hydrological regime etc. by haphazard and unscientific mining of minor minerals. Moreover, the project will utilize river bed materials from existing licensed quarries with all stipulated conditions of above mentioned authorities.

b. Mitigation during construction

417. **Flora.** The mitigation measures for flora during construction are as follows:

- Only those trees shall be cut that directly impinge the construction work after prior permission from the forest department under relevant act. For instance, old peepal trees present just at the edge of RoW on both side of the road near km 52.00 in Talli (Fig.113) along Aliganj Soron shall not be cut. Widening shall be done meticulously within the available RoW.
- Net Present Value and other statutory payments shall be done to Compensatory Afforestation Fund Management and Planning Authority (CAMPA)
- Protected forest area shall be diverted prior to start of construction work as per

[28] *Guidance on good practice in the management and creation of small water bodies in Scotland, Department of Environment Food and Rural Affairs, Scotland*

FCA, 1980

- Compensatory afforestation shall be done as per state forest department rule at the ratio of 1:3 or as per state forest department.
- Plantation compensatory afforestation shall be done @ 1:2 at available spaces along the road. Streem plantation shall be carried out on 1 m either side of the road with the combination of long medium shrubs in consultation with forest department.
- The plantation will be carried out as per IRC Code SP: 21:2009 “Guidelines for Landscaping and Tree Plantation”.
- Plantation audit shall be done to determine survival rate as per guidelines of forest department.
- The contractor shall be responsible to prevent labours from illegal felling trees or exploiting the orchards present along the roads. Contractor shall make necessary arrangement of cooking gas/fuel to the workers.
- Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants

418. **Fauna.** The mitigation measures for fauna during construction are as follows:

- Precautionary and Educative sign boards shall be installed at least 100 m before and after the sites near the temples at km 22.9 and km 47 of Bulandshahar to Anoopshahar road during construction to aware construction workers and road users about the Do’s and Don’ts in monkey zone.
- Project laborers will be made aware of the relevant provision of the Wildlife (Protection) Act 1972 and rules made there under to prevent poaching of game birds and animals.
- The contractor will take reasonable precaution to prevent his workmen or any other persons from hunting / trapping or causing any sort of damage to the avifaunal or faunal species including fishing in any water body especially the Gangetic stretch of Ramsar site near Anoopshahar – Bulandshahar road.
- Hot mix plant/ construction camp shall not be located within 1000m of the road stretch from km 46.900 to 47.500 near village Unchagaon Killa especially during winters (November to February). Also construction activities shall not be carried out during night time. A guard shall be appointed by the contractor to ensure that avifaunal species are not disturbed due to any kind of construction activities and prevent hunting or fishing by labours. Silt fencing shall be done along the water bodies near the road in this zone if required. Precautionary & informatory sign boards shall also be displayed.
- Silt fencing shall be provided to other stagnant water bodies as has been detailed out under the heading of *Water Environment* in this chapter earlier.
- During construction, if any wild animal is found by chance, near the construction site or workers camp the contractor will immediately inform to nearest forest office (range office or divisional office) or wildlife department and will take appropriate steps/ measures in consultation with the forest/wildlife officials.

Fig.112: Location of Nawabganj Bird Sanctuary along Mohanlalganj to Unnao road

Fig. 113: Peepal tree on both side of road at km 52 in Talli village along Aliganj to Soron

c. Impact during Operation

419. **Flora.** There will be a beneficial impact during this stage. Approximately 114741 (@1:3) trees of different species will be planted as part of compensatory afforestation. Additional plantation shall also be done along the road side at the ratio of 1:2 based on availability of space. Impact shall be long term and positive.

420. **Fauna.** Buffalos and cows are observed to be tied in areas designated as cattle sheds (often no shed is present physically) immediately adjacent to the paved surface of road or within

RoW. This practice shall be discouraged as it makes the animals prone to accidents.

421. The two locations along Bulandshahar and Anoopshahar road (km 23.200 to km 23.400 and km 47 to km 48) where temples exist, people offer food materials as religious offerings to monkeys and this draws them in group to the road (**Fig. 114**). This practice has made the locations accident prone and risky for the monkeys as well.

422. Migratory birds observed near Mohanlalganj to Unnao from km 46.900 to 47.500 near village Unchagaon Killa may get impacted due to glare during night

Fig. 114: Locations where monkeys are fed openly along *Bulandshahar to Anoopshahar*

d. Mitigation during Operation

423. **Flora.** Plantation audit shall be done to determine the survival rates of trees during operation to ensure their proper growth as per guidelines of Forest Department.

424. **Fauna.** The mitigation measures for fauna during operation are as follows:

- Villagers shall be discouraged to keep their cattles at road side through consultation and putting up sign boards along the road in villages.
- To avoid glare during night along Mohanlalganj to Unnao road, road side tree plantation shall be done (based on availability of PWD land) with minimum two rows of plantation i.e. small and medium with thick foliage so that vehicle lights get obstructed. High voltage light shall also not be installed along this particular stretch of the road.
- Precautionary and Educative sign boards shall be installed at least 100 m before and after the sites near the temples at km 22.9 and km 47 of Bulandshahar to Anoopshahar road to discourage people from offering food to monkeys at road side. Precautionary board shall be display warning signs and educative board shall display the Dos and Don'ts for the road users. Samples of display that shall be written on the sign boards are as given in **Fig. 115 to 117.**
- Rumble strips shall be provided on either side of road and center of road at km 22.9 and km 47 of Bulandshahar to Anoopshahar to reduce the speed of vehicles so that monkey- vehicle conflict can be avoided.

Fig. 115: Sample of Precautionary Board

Fig. 116: Sample of Educative Board

Fig. 117: Sample of Educative Board

11. Socio- Economic & Cultural Environment

a. Impact during construction

425. 7103 persons and 809 households are likely to be impacted because of widening/ improvement of the project roads.205 community property resources are likely to be affected including 112 religious properties and 76 government properties. Total 741 private properties including residential and commercial structures are likely to be affected due to widening of the project roads. Out of it 58 structures are likely to be severely affected and physically displaced.683 structures are likely to get partially affected but will not be displaced. 45 hot spots have been identified based on criteria like congested settlement, loss of livelihood of

economically weaker section, religious place of high importance for local people, loss of too many structures etc. **(Refer Table IV-27).**

Table IV-27: Affected persons and Households and Impacted Structures

	MDR 82W (ND)	MDR 81C (HA)	MDR 135W (MB)	MDR 66E (HK)	MDR 58W (BA)	ODR 24 (KN)	MDR 25E (KB)	MDR 52 C (MM)	MDR 45W (AS)	Total
Affected persons and households										
APs	1337	727	213	1182	0	204	714	223	2503	7103
PAHs	177	130	32	170	0	30	75	33	162	809
Common Property resource										
Other community Properties	32	10	89	0	0	18	26	15	15	205
Religious properties	2	4	3	85	0	2	5	6	5	112
Governmen t properties	2	47	3	1	0	3	1	1	18	76
Total	36	61	95	86	0	23	32	22	38	393
Number of Private properties and severity of impact										
Physical Displaceme nt	0	15 (>34%)	0	0	0	0	0	3 (>20 %)	40 (>20%)	58
Partial/ moderate impact (No displaceme nt)	148 (<20 %)	105 (<33%)	32 (<20%)	156 (<20%)	0	30 (<20%)	65 (<20%)	20 (<20 %)	127 (<20%)	683
Total number	148	120	32	156	0	30	65	23	167	741
Hot spots										
Number of locations identified	4	6	5	8	1	2	5	7	7	45

Source: SIA& RP

b. Mitigation during construction

426. To save the structures in the identified hotspots various options have been suggested as given in **Table IV-28.** Out of 45 locations, 26 locations are being saved by restricting widening within the RoW. In 12 locations widening is suggested to be restricted within 10 to 12 m to minimize the impacts on structures and livelihood. Eccentric widening has been suggested in 5 locations to avoid displacement of structures of religious importance. At one location a temple is suggested to be relocated within the village.

427. Compensation for loss of livelihood and structures shall be provided as per government provisions and ADB policy i.e. The Right to Fair Compensation and Transparence in Land Acquisition, Rehabilitation and Resettlement Act, 2013, Direct Land Purchase Policy, 2015 by Government of U.P and ADB's Safeguard Policy Statement (2009).

428. Details of socio economic profile, impact, compensation, resettlement assistance and entitlement matrix are given in the Resettlement Plan prepared separately.

Table IV-28: Location identified as critical areas & Mitigation Measures

Sl. No.	Village Name	Reasons for being Hot spot	Suggested Mitigation Measures
Nanau toDadon			
1	Tikta (Km.14.900)	70 years old Mosque and Madrassa, where more than 1000 people use to gather to offer their pray daily.	Widening within available RoW
2	Chharra (Km. 20.500)	Nearly 111 residential, commercial and other structures are located along the road that shall be partially affected up to 12 meters	Widening within available RoW (9-10 m).
3	Dadau (Km. 28.500)	48 commercial and residential structures will be partially affected if widened upto 14 m	Widening up to 12 m is recommended that would affect only 33 structures
4	Adarsh Nagar (Km. 29.500)	Nearly 12 residential and commercial structures will get affected is widened upto 12 meters	Widening within available RoW (9-10 m).
Muzaffarnagar to Baraut			
5	Tawli (Km.10.000)	50 years old Mosque, where more than 1000 people gather daily for prayer	RHS Eccentric widening to save the mosque
6	Shadabbar (Km. 24.500)	17 structures will be partially affected, if widening up to 14 mtrs	Improvement within 12 meters that will save 5 structures
7	Bharal (Km. 41.070)	significant Impact on 10 structures, if widened upto 14m	Improvement within a 12 meters that will save 9 structure
8	Kanhar (Km. 45.000)	22 residential and commercial structures will get affected if widened upto 12 m	Widening within 10 m that will help to save all the structures
9	Baraut (Km. 59.320)	significant Impact on 50 structures if widened upto 14m	Improvement within a 12 meters that will save 48 structures
Bulandshahar to Anoopshahar			
10	Anibash Nagar (Km.35.820)	Famous for its 50 years old Temple, where hundreds of people gathered daily	RHS Eccentric widening to save the temple
Haliyapur to Khurebhar			
11	Dhanpatganj	10 structures will be affected in case of widening of the road upto 14 meters	Widening within 12 m
12	Kurebhar (Km. 34.800)	17 structures will be affected if widened upto 14m	Widening within 12 m that will save 14 structures
13	Bhajana	There are two temples (one of left side and one on right side) which could be affected in case of widening of the road up 14 meters.	Widening within 12 m to save both the temples.
14	Haliyapur	Temple at 5 meter from the center.	Widening within available RoW to save the Temple.
15	Birsinghpur	Nearly 33 residential, commercial and other structures will be affected if widened upto 14 m	Widening within available RoW. This will help in avoiding all the structures
16	Gosaisinghpur	24 private, community and governme nt structures will be partially affected if widened up to 14 meters	Widening of the project road within RoW
17	Dostpur	45 structures will be affected if widened upto 14 m	Widening of the project road within RoW
18	Bibiganj	More than 30 structures will be affected if widened upto 14 meters	Widening within 12 m
Hussainganj to Alipur			
19	Chhivlaha (Km.16.000 –	145 structures will be affected if widened upto 14 m	Widening within 12 m This will save 82 structures.

Sl. No.	Village Name	Reasons for being Hot spot	Suggested Mitigation Measures
	17.000)		
20	Ahinda(Km.14.000 to 15.500)	12 structures will be affected if widened upto 14 m	Widening within 12 m It will save 11 structure
21	Paliya Bujurg(Km. 18.000 to 19.000)	49 structures will be affected if widened upto 14 m	Widening within 12 m. It will save 43 structures
22	Kashranwa Mod(Km. 20.000 to 21.000)	8 structures will be affected if widened upto 12 m and 49 if widened upto 14 m	Widening within available ROW (12-14m) to minimise the impact.
23	Hanthgaon(Km. 24.500 to 27.500)	115 structures will be affected if widened upto 14 m	Widening within 12 m.It will save 95 structures
24	Prem Nagar (Km 41.000 to 42.000)	21 structures will be affected if widened upto 14 m	Widening within 12 m. It will save 19 structures
Kaptanganj-Hata-Gouribazar Road			
25.	Kaptanganj (Km.0.000)	Nearly 6 residential, commercial and other community structures are likely to be partially affected is widening is done up to 12 meters. All may lose livelihood	Widening within available ROW (9-10 m). This will help in saving all the structures and livelihood.
26	Sudama Chowk (Km. 17.480)	Old temple with banayan tree at 4.6m from CL and a pond situated on either side of the road.	Widening within available RoW to save the old temple, banyan tree .
27	Chhapuli (Km. 54.500)	Nearly 29 residential, commercial and other structures are likely to be affected upto 12 m	Widening within available ROW (9-10 m).
28	Balua (Km. 28.250)	This village is known for its two small temples which are situated just 5.50 and 5.90 meters away from the Centreline of the road and likely to be impacted	Widening within available RoW and not disturb the temples
29	Laxmipur (Km. 53.300)	Famous Hanuman temple with boundary wall within 4.00 meters away from the Centreline of the road.	Widening within available RoW and not disturb the temple
Kaptanganj-Naurangia Road			
30	Mishrouli (Km. 3.500)	Famous Durga Temple situated very close to road	LHS Eccentric widening as PWD's vacant land is available to save the temple
31	Charigarwa (Km.16.500)	10 residential structures are located along the road that shall be affected upto 14 m	Widening within 12 m to save 3 structures
Mohanlalganj to Unnao			
32	Mohanlalganj (Km.0.000)	13 structures will be affected if widened upto 12 m	Widening within available ROW (9-10 m).
33	Dhanwara (Km. 4.200)	Old bade baba temple along with a 100 years of big peepal tree. Will get affected if widened upto 12m.	RHS Eccentric widening. PWD's vacant land is available to save the temple.
34	Sishendi (Km. 9.300)	A small temple will get affected if widened upto 12m	RHS eccentric widening. PWD's vacant land is available to save the Temple.
35	Jabrella (Km. 13.000)	8 structures including a small temple will be partially affected if widened up to 14m	Widening within available ROW (9-10 m).
36	Bhawaniganj (Km. 24.000)	9 commercial, residential and a religious structures will be partially affected if widened up to 14m	Temple will be relocated within the village

Sl. No.	Village Name	Reasons for being Hot spot	Suggested Mitigation Measures
37	Sagouli (Km.26.500)	Famous temple and Madrassa at 4.5 m from CL, where more than 1000 people use to gather to offer their pray daily.	Widening within available ROW (9-10 m) to save the temple and madrasa .
38	Maurwan (Km. 31.500)	10 structures will be affected if widened up to 14m	Widening within 12 m to save 8 structures.
Aliganj to Soron			
39	Patiyali (Km.27.000)	Patiyali town is located very close to the road. 94 structures will get affected if widened upto 14 m. 50 structures falls within 12 m.	Widening within available ROW (9-10 m) to avoid all the structures & loss of livelihood
40	Gunj Dundwara (Km. 34.000)	260 structures will be fully and 130 partially affected if widened upto 14 m. 4 mosques and 11 other CPRs will also get affected.	Widening within available width to avoid all the structures and the mosques
41	Gadkha (Km. 38.000)	16 structures will be fully and 44 partially affected if widened upto 14 m	Widening upto 12m to save 5 structures
42	Sahawar (Km. 46.000)	125 structures will be fully and 88 partially affected if widened upto 14 m. 5 big mosques and 2 temples are getting severely affected	Widening within available width to avoid all the structures
43	Tali (Km. 52.000)	3 temples and 3 government structures and very old peepal tree within 12m	Left side eccentric widening
44	Yakutganj (Km.54.500)	30 structures will be fully and 29 partially affected if widened upto 14 m	Widening upto 12 m to save 16 structures
45	Soron (Km 61.00)	3 structures will be fully and 14 partially affected if widened upto 12 m	Widening upto 12m only to minimise the loss of structure and livelihood

Source: SIA & RP

12. Cumulative & Induced impact

429. According to the ADB Environment Safeguards Sourcebook cumulative impact is described as: “The combination of multiple impacts from existing projects, the proposed project, and anticipated future projects that may result in significant adverse and/or beneficial impacts that cannot be expected in the case of a stand-alone project.” The sourcebook also describes induced impacts as: “Adverse and/or beneficial impacts on areas and communities from unintended but predictable developments caused by a project, which may occur at later or at a different location.

a. Cumulative impact

430. Cumulative impacts of road transport include:

- deterioration of air quality by introducing new sources from generated and diverted traffic due to road improvement
- land conversion along the road alignment without the concomitant land use controls will attract ribbon settlement
- increase in speed and road users exacerbate road crashes

431. Combustion related emissions, which is already coming from brick kilns and jaggery making factories situated along the project roads will increase due to the project from the

increase in traffic. Although emission from the project is not expected to breach applicable national standards except for ODR 24 and MDR 25 E, cumulating Particulate Matter, sulphur dioxide, nitrogen dioxide, and carbon dioxide from other source could in the future deteriorate ambient air quality.

432. Controlling the emissions from brick kilns and jaggery factories are not in the scope of this project. However, it is suggested that the construction camps/ hot mix plants/ crusher shall be located away from such existing pollution sources, as far as possible so that the immediate cumulative impact can be avoided.

433. Improved access ushered by the project will make the areas immediately along the alignment more attractive for settlement. This will result to land conversion into built-up area and in turn create a multitude of impacts from increased risk to community safety, wildlife-transport conflict, and even congestion.

b. Induced impact

434. Economic activities supporting transport like fuel stations, automotive repair shops, lodging, and restaurants are expected to increase with increase of traffic and induced development in the project area. Increase in agro-industrial activities are also expected to take advantage of improved access to urban centers where there are higher demand and better prices for agricultural products. The improved road will provide better connectivity and result in (i) Reduction in travel time (ii) better mode and frequency of transport (iii) access to good quality health care facilities, educational and other infrastructural facilities iv) better investment climate for industries creating more employment opportunities to local people

435. Adversely it will also have a slow but significant effect of resource exploitation. Easy accessibility of the area will increase the population of the region. This means more and more exploitation of the natural resources like ground water, fuel, etc.

13. Labour health & safety

The contractor shall follow World Bank's Environment, Health and safety policy (EHS) for ensuring proper living facilities, sanitation, water supply, safety, health of the labours in construction and labours camp. The contractor shall prepare and Health and Safety managementplan (as part of CEMP) prior to start of construction detailing on minimization measures for health and safety risks in accordance with the national legislations and WB's EHS policy. Guidelines for labour and construction camp shall include but not limited to the following

a. Site selection for labour camp

436. Following measures shall be followed by the contractor:

- The living accommodation and ancillary facilities for labour shall be erected and maintained to standards and scales approved by the resident engineer.
- All sites used for camps must be adequately drained. They must not be subject to periodic flooding, nor located within 200 feet of swamps, pools, sink holes or other surface collections of water unless such water surface can be subjected to mosquito control measures.
- The camps must be located such that the drainage from and through the camps will not endanger any domestic or public water supply.
- All sites must be graded, ditched and rendered free from depressions such that water may get stagnant and become a nuisance.

b. Water supply

437. Following measures related to water supply shall be followed:

- An adequate and convenient water supply, approved by the appropriate health authority, must be provided in each camp for drinking, cooking, bathing and laundry purposes.
- The drinking water system must be monitored in accordance with the water quality parameters as prescribed by the State Pollution Control Board. The water supply system used for cooking purposes that is drained seasonally must be cleaned, flushed, and disinfected prior to use. Furthermore, a water sample of satisfactory bacteriologic quality, i.e. a sample showing not more than one coliform bacteria per 100 ml sample must be obtained before being placed into service.
- At all construction camps and other workplace, good and sufficient water supply shall be maintained to eliminate chances of waterborne/water-related/water-based diseases to ensure the health and hygiene of the workers.

c. Solid/ liquid Waste

438. 562.5 kg/ day municipal solid waste and 77 KLD sewage is likely to be generated from the labour camps. Road wise breakup of waste is given in **Table IV-29.**

- Packaged sewage treatment plants (PSTP)/ septic tank connected to soak pits shall be set up for managing sewage or liquid waste.
- Organic solid waste generated from kitchen shall be composted at site itself.
- The manure can be either supplied to farmers or used on embankments for turfing.
- Inorganic or inert waste shall be supplied to the authorized vendors / recyclers.

Table IV-29: Solid and liquid waste likely to be generated from labour camps

	Sewage (KLD)	Solid waste (kg/day)
MDR 82W (ND)	7.2	50
MDR 81C (HA)	9	62.5
MDR 135W (MB)	9	62.5
MDR 66E (HK)	16.2	112.5
MDR 58W (BA)	7.2	50
ODR24 (KN) & MDR 25E (KB)	10.8	100
MDR 52 C (MM)	9	62.5
MDR 45W (AS)	9	62.5
Total	**77**	**562.5**

Source: PPTA Consultant

d. Toilet Facilities and Hygiene

439. The following measures shall be taken:

- There shall be adequate supply of water, close to latrines and urinals.
- Toilet facilities adequate for the capacity of the camp must be provided. Each toilet room must be located so as to be accessible, without any individual passing through any sleeping room.
- A toilet room must be located within 200 feet of the door of each sleeping room.

No toilet may be closer than 100 feet to any sleeping room, lunch area or kitchen.

- Where the toilet rooms are shared, such as in multifamily shelters and in barrack type facilities, separate toilet rooms must be provided for each male and female workers. These rooms must be distinctly marked “for men” and “for women” by signs printed in English and in the native language of the persons occupying the camp, or marked with easily understood pictures or symbols. If the facilities for each sex are in the same building, they must be separated by solid walls or partitions extending from the floor to the roof or ceiling.
- Urinals must be provided on the basis of one unit or 2 linear feet of urinal trough for each 25 men. The floor from the wall and for a distance not less than 15 inches measured from the outward edge of the urinals must be constructed of materials impervious to moisture. Where water under pressure is available, urinals must be provided with an adequate water flush. Urinals troughs in privies must drain freely into the pit or vault, and the construction of this drain must be such as to exclude flies and rodents from the pit.
- The sewage system for the camp must be designed, built and operated to the satisfaction of the concerned local State Govt. Department so that no health hazard occurs and no pollution to the air, ground or adjacent watercourse takes place. Compliance with the relevant legislation must be strictly adhered to.
- Garbage bins must be provided in the camps and regularly emptied and the garbage disposed off in a hygienic manner to the satisfaction of relevant norms.
- A packaged sewage treatment plant would be preferred as it is easy to install and dismantle and takes care of the sewage by treating it within the system. The treated water can further be used for washing and flushing.
- Sprays shall be used to prevent breeding of mosquitos and thus prevent incident of malaria or dengue.
- On completion of the works, all such temporary structures shall be cleared away, all rubbish removed, trenches filled in and effectively sealed off and the outline site left clean and tidy, at the Contractor’s expense, to the entire satisfaction of the engineer.

e. Labour safety & first aid

440. The following measures related to safety and first aid shall be taken:

- Adequate precautions will be taken to prevent danger from electrical equipment. No material or any of the sites will be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights will be provided to protect the public.
- All workers employed on mixing asphaltic material, cement, lime mortars, concrete etc, will be provided with protective footwear and protective goggles and other Personal Protective Equipments. Workers, who are engaged in welding works, would be provided with welder’s protective eye-shields. The use of any toxic chemical, if any will be strictly in accordance with the manufacturer’s instructions. The Supervision consultant will be given at least 6 working days’ notice of the proposed use of any toxic chemical.
- Injuries might occur during the construction period. It is therefore pertinent to provide first aid facilities for all the construction workers. At construction camps and at all workplaces first aid equipment and nursing staff must be provided. Since many of the workplaces may be far away from regular hospitals, an indoor health unit having one bed facility every 250 workers needs to be provided.

- Adequate transport facilities for moving the injured persons to the nearest hospital must also be provided in ready to move condition.
- The first-aid units should apart from an adequate supply of sterilized dressing material should contain other necessary appliances as per the factory rules of Uttar Pradesh.
- The employer should ensure that qualified first-aid can be provided at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work · Eye-wash stations and/or emergency showers should be provided close to all workstations where immediate flushing with water is the recommended first-aid response · Where the scale of work or the type of activity being carried out so requires, dedicated and appropriately equipped firstaid room(s) should be provided. First aid stations and rooms should be equipped with gloves, gowns, and masks for protection against direct contact with blood and other body fluids · Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.
- The PPE shall be provided to the Labors in accordance with National Guidelines and World Bank EHS Guidelines.
- Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. Table IV 30 presents general examples of occupational hazards and types of PPE available for different purposes. Recommended measures for use of PPE in the workplace include: · Active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure · Identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual · Proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs for employees.

Table IV 30 Summary of Recommended Personal Protective Equipment According to Hazard

Objective	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.
Hearing protection	Noise, ultra – sound.	Hearing protectors (ear plugs or ear muffs).
Foot protection	Falling or rolling objects, pointed objects, Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and chemicals.
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.

Objective	Workplace Hazards	Suggested PPE
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors.	Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi – gas personal monitors, if available.
	Oxygen deficiency	Portable or supplied air (fixed lines). On – site rescue equipment.
Body / leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

14. Road safety

a. Safety during construction

441. Traffic management shall be done as per IRC:SP 55-2014 (Guidelines for Safety in Construction Zones).

- Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'.
- The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'.
- The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow.
- On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed.
- Restriction of construction activity to only one side of the existing road.
- The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer".
- Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.
- Temporary diversion (including scheme of temporary and acquisition) will be constructed with the approval of the CSC. Special consideration will be given in the preparation of the traffic control plan to the safety of pedestrians and workers at night.
- Temporary access and diversions shall have proper drainage facilities.
- Access to the schools, temples and other public places must be maintained when construction takes place near them.
- Fencing shall be provided along construction site wherever cattle movement is expected.

b. Safety during operation

442. Past accident data of UP, engineering studies and consultations suggest that road accident are generally caused by drivers exceeding the speed limits (over speeding); overloading; careless overtaking; reckless driving habits; unregulated movements of non-motorized vehicles; Lack of traffic safety education; and poor enforcement of traffic laws and

poor road condition (**Fig. 118 & Fig. 119).**

Fig. 118: Accident took place during site visit at Km 11.100 near village Bela along Hussainganj to Alipur Marg

Fig. 119: poor road condition from km 9 to km 11 along Hussainganj to Alipur Marg

443. Some of the deficient engineering design causes accidents are geometric deficiency, Deficient junction design, Narrow bridges in comparison to road width, Poor visibility during night in highly encroached and congested settlement portions, Lack of signals, hoardings and other precautionary measures, Slow moving vehicle without any lights etc.

444. **Safety through People's participation.** Above-mentioned causes of the accident are the major concerns of the present day road traffic management system. Changing community behaviour will be the main agenda of road safety campaigns which should be undertaken with close participation of the communities living along the corridors. The target groups for road safety education and awareness campaign will be school children, school teachers, senior citizens, roadside dwellers, shop-keepers, drivers of motorized and non-motorized vehicles, local knowledgeable persons, CBOs, NGOs, etc. These target groups will be exposed to road safety education and awareness program. Road safety awareness campaigns for road residents will be conducted by the RP implementing NGO/Consultant. This may involve:

- programs planned for raising Awareness of the Masses
- Dissemination of road safety instructions in public places
- Distribution of leaflets and posters
- Public marches along the proposed road
- Distribution of booklets and bookmarks among school children
- Organizing workshops on road safety
- Advocacy with media representatives about road safety

445. **Safety through design parameters**. Delineators and object markers are provided as per provisions of IRC: 79-1989. They are basically driving aids and not substitutes for warning signs, road markings or barriers.

446. Road markings perform the important function of guiding and controlling traffic on a highway. The location and type of marking lines, material and color has been proposed in accordance with IRC: 35-1997,"Code of Practice for Road Markings"

447. Cautionary, mandatory and informatory signs have been provided depending on the situation and function they perform in accordance with the IRC: 67-2012 guidelines for Road

Signs.

448. Kilometre stones are proposed in accordance with IRC: 8-1980 guidelines. Kilometre stones are located on the left-hand side of the road as one proceeds from the station from which the Kilometre count starts. Kilometre stones shall be fixed at right angles to the centre line of the carriageway. 200m stones and boundary stones conform to IRC: 26-1967 and IRC: 25-1967. 200m stones are located on the same side of the road as the kilometre stones

449. Metal Beam Crash Barrier is proposed at locations where the embankment height is more than 3.0m, Sharp curves and also at major bridge approaches. Metal beam rail shall be W profile corrugated sheet steel beams. Total length of crash barriers provided in the project roads is 3.049 km (**Table IV-30**).

450. Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals.

451. 1 m wide (both side) side walk ways or foot path have been proposed along the built up areas for pedestrian safety. Total length of proposed footpath in all the roads is 263.917 km both side (**Table IV-31**).

Table IV-31: Safety provisions

	Crash barrier (km)	Footpath (km)
MDR 82W (ND)	0	14.3
MDR 81C (HA)	0.872	13.33
MDR 135W (MB)	0.061	20.067
MDR 66E (HK)	1.967	59.74
MDR 58W (BA)	0.149	13.74
ODR24 (KN) & MDR 25E (KB)	0	62.14
MDR 52 C (MM)	0	40.4
MDR 45W (AS)	0	40.2
Total	**3.049**	**263.917**

Source: DPR Consultant

10. Summary of potential impact and Mitigation

452. A summary of the potential impacts and mitigation measures of all the project roads as discussed in detail in this chapter is given in **Table IV-32.**

Table IV-32: Summary of potential impacts and mitigation measures

Sl. No.	Environment component/Impacts	Mitigation
1.DESIGN STAGE		
1.1	**Proposed Widening/Improvement**	
•	• Widening may lead to land acquisition, Loss of fertile agricultural land and Loss of soft water recharging surface • Pavement roughness ranges from 6-7 m/km on the higher side that may affect the condition of vehicle plying on them continuously especially local vehicles.	• Improvement shall be done within the existing RoW to minimize the impacts • Reduction of pavement roughness is predicted to be 2.5 to 3 m/km that would lead to reduction in air and noise pollution
1.2	**Ecological Sensitivity**	
	• Loss of 78.76ha of protected forest	• Compensatory afforestation shall be done at the

Sl. No.	Environment component/Impacts	Mitigation
	cover • Loss of nearly 37873 trees	ratio of 1:3. • Additional road side CA shall be done @ 1:2 based on space availability.
1.3	**Widening of road along with drainage**	
	• Accumulation of runoff water along the roads • Over topping or flooding of road surface	• 1m wide rectangular drains cum footpath in built up areas of length 268.89 km and 1.8 m wide unlined drains of length 736.30 km in open areas has been proposed in Project Roads. • The Profile of road has been raised at 166 locations for a length of 115.86 km in all Project roads. • 3 major bridges to be retained with minor improvements. 28 minor bridges to be widened, 15 to be retained and 11 to be reconstructed out of 54 minor bridges. Out of 437 culverts, 144 are to be widened and 460 to be reconstructed.
1.4	**Planning for pre-construction activities**	
	Road side utilities like electric poles, water supply line, hand pumps, wells may get impacted	Planning shall be made to remove and relocate the utilities prior to start of construction with prior permission of the competent authority.
1.5	**Design for safety provision**	
	Road improvement may increase the speed of plying vehicles posing increasing threat of accidents	Adequate safety provisions like traffic control devices and road safety features, including retro-reflective warning sign boards near school, hospital, and religious places, sidewalks, road markings, road lighting, crash barriers and speed breakers as per relevant IRC codes and standards are incorporated in the design (IRC: 79-1989, IRC: 35-1997, IRC: 67-2012, IRC: 8-1980). Horizontal and Vertical geometry has been improved to the extent possible in line with IRC Guidelines.
2	**CONSTRUCTION & OPERATION STAGE**	
2.1	**Topography**	
	• The project areas are on plain terrain • Finished road level has been raised at 166 stretches and along a length of 115.86 km. • No significant change or impact in topography is anticipated	• No mitigation measures required
2.2	**Micro climate**	
	• Increase in temperature due to operation of machines and removal of trees	• Sprinkling of water shall be done during construction • Saplings shall be planted on vacant spaces on both sides of roads.
2.3	**Geology**	
	• Extraction of approximately 16.44 lakh cum of stone aggregate and 2.9 lakh cum of sand is required to be done from the rocky areas and river beds. • Illegal or Over extraction of sand from river banks may lead collapse of river banks, loss of adjacent and structures, increase in channel slope and erosion	• Quantity of stone aggregates required is negligible compared to the existing available quantities. • Moreover the stones will be obtained from existing quarries which have all valid permits applicable under law and are being managed in environment friendly manner.15 quarries and 8 sand mining site have been identified.

Sl. No.	Environment component/Impacts	Mitigation
		• No new quarries are proposed. Hence, no significant impacts are anticipated on the geology of the region.
2.4	**Natural Hazard- Earth quake**	
	• Out of 8 roads 3 falls in high risk zone , 4 in moderate and 1 in low risk zone • May break or cause cracks on pavement, bridge or culverts; disrupt traffic flow; damage to vehicles or life of road users.	• The pavement & cross drainage structures design shall be earthquake resistant
2.5	**Soil**	
	Construction • Loss of productive soil due to change in land use • Soil erosion along the river banks, road embankment • Soil compaction along haulage routes • Loss of top soil in borrow areas and along haulage routes • 33 borrow areas are identified. • Contamination of soil due to seepage of oil/ fuel or disposal of solid / liquid waste from camps	• Construction • Improvement Proposals shall be carried out within available ROW and no additional land acquisition is proposed • Construction / labour camp shall be opened up in barren land 1 km away from settlements. It shall not be opened on agricultural land unless inevitable. In such case the top soil shall be stripped, stored and reused • For protection from soil erosion, bank protection measures in the form of turfing/ stone pitching shall be taken; side slopes of embankment shall not be steeper than 1:2; construction work shall not be done during monsoon; stockpiling shall not be more than 2m in height and steeper than 1:2.slope protection measures shall be taken in the form of turfing/ stone pitching as necessary or as applicable under IRC:56-1974. • Side slopes of the embankment shall not be steeper than 1:2 and turfing of embankment slopes shall be done along the stretch. • Construction work shall not be done during monsoon season • Soil excavated shall be piled with height not more than 2 m and slope should not be steeper than 1:2. It shall be covered with tarpaulin • MoRTH guidelines on “Earthwork Erosion Control and Drainage” in section 300 shall be followed for selection and management of borrow pits. • Along the roadside, borrow pits should be located 5m away from the toe line. • Borrow areas along road side, if permitted by the engineer shall not be dug continuously. • In no case the depth of borrow area should exceed 2m from the existing ground level. • The depth of the pits shall be so regulated that their bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of the bank. • In case of cultivable land, top soil (15cm) should

Sl. No.	Environment component/Impacts	Mitigation
		be preserved and stockpiled. • Ridges of not less than 8m width should be left at intervals not exceeding 300m. Small drains to be cut through the ridges to facilitate drainage. • No pit shall be dug within the offset width of a minimum of 10m • Water pooling to be avoided/managed so that no disease spread due to water stagnation. • Borrow pits should be located at least 1000m away from settlements. • The contractor shall evolve site-specific redevelopment plans for each borrow area locations, which shall be implemented after the approval of the CSC. • Haulage route shall be pre identified and avoid productive land • The storage area and refueling stations shall be roofed and rainwater drained separately an oil/grease interceptor prior to final disposal
	Operation • Oil spillage from vehicles in case of accidents may contaminate the adjacent agricultural land. However, possibility of such an accident is very less.	**Operation** • A contingency plan shall be prepared to handle any such spills so as to save the agricultural land. Since most of the length of the project roads cross through agricultural land and surface water acts as source of irrigation this measure would be necessary. • First step shall be to stop the spill by Turning off nozzles or valves from the leaking container, if it can be done safely. Or use wooden plug, bolt, band or putty on a puncture-type hole. • Second, if it cannot be stopped, a pan or container shall be used to collect the oil. • Third, for the oil that has already spread, locally available sorbents shall be used like sand, straw, sawdust, wood chips or dirt from road side shall be put on the oil contaminated location and removed after a while, immediately replacing it with a fresh layer of sorbent. This step shall be repeated based on the extent of oil spillage. In case of water bodies skimmers or sorbents like sponge or the above mentioned can be used. • All equipment operators, local officials of implementing agency shall be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, shall be provided by the contractors.
2.6	**Construction Waste**	
	• Scarified bitumen are harmful for human health. It can cause irritation, redness, occasional drying and peeling of skin,	• Reuse shall be done based on suitability and approval of Environmental expert of CSC. • The sub grade of the existing pavement shall be

Sl. No.	Environment component/Impacts	Mitigation
	burning, swelling and watering of eye • Demolition waste left unattended would create nuisance	used as embankment fill material. • The existing base and sub-base material shall be recycled as sub-base of the haul road or access roads • The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc. • The Contractor will suitably dispose unutilized debris materials either through filling up of borrow areas located in wasteland or at pre-designated disposal locations, subject to the approval of the CSC. • In case of disposal of unused bitumen, Hazardous Material (Management, Handling & Transboundary Movement) rules, 2008 shall be followed. • Residual bituminous wastes, the disposal will be carried out over a 60 mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water. It shall be covered with a layer of soil and planted with small shrubs or grass so as to stabilize the soil • Dumping site identified shall not be within 1.5 km from habitation and forest areas and 500 m from ponds. • Consent from the village council has to be obtained before finalizing the location
2.7	**Drainage & Hydrology**	
	Construction • Obstruction in flow of water due to dumping of Scarified material / Construction Waste in streams.	**Construction** • No construction material shall be stored near the streams. • Construction waste shall be reused to the extent possible in the re construction, temporary traffic diversions etc and excess waste shall be disposed in the manner provided in EMP in environment friendly manner and in no case shall be disposed in streams crossing the roads. • Silt fencing/ sediment barrier shall be installed along the bank of river or streams to control the sediment. • Sites of re construction / widening of culverts, widening / construction /repair of bridges shall be immediately cleaned after the works. All Rivers crossing the project roads except river Sai and Gandhak are seasonal rivers, so work of construction / widening / repairs of bridges shall be carried out in non-monsoon season.
	Operation • The drainage channels may get sediment or filled with aquatic plants thus reducing the flow and volumetric capacity of the water channels resulting	**Operation** Cleaning of cross drainage structures and Lateral drains prior to monsoon shall be carried out so that they can accommodate the increased water flow during heavy rains

Sl. No.	Environment component/Impacts	Mitigation
	in clogging of drains and spilling of water on the road in urban area.	
2.8	**Water Environment**	
	Construction • Severely impacted ponds are 28 out of 89 • Moderately -49 ponds; low impact-8;negligible impact-4ponds • >50% reclamation of only 1 pond; 4 ponds by 25-50% & 31 ponds by < 25%. • Other impacts would be in terms of siltation and oil contamination (if accidents occur) • Increase in turbidity of river water during bridge construction can harm fishes and smother algae • 24.7 lakh KL water will be extracted from ground water for construction. May lead to conflict with local users • OOut of 1816 hand pumps within 15m of CL , 1540 will be impacted • CContamination of Ground water due to storage of Construction Material. •	**Construction** • Out of 89 ponds, retaining wall (592 m) is proposed for 20 ponds and silt fencing (637 m) shall be done around 49 ponds, intercepting ditches shall be provided along 21 ponds (in 13 ponds the ditch shall be provided along with silt fencing). 9 ponds are identified for enhancement. Silt fencing of river bank at least up to 5 m either side form the bridge; turbidity curtain & piling protector made of impermeable fabric shall be used along with cover of tarpaulins under the bridge. Immediate cleaning of debris from river bed Camps shall be located 1km away from water bodies Retention areas to contain accidental spills of toxic and hazardous material. Ready mix concrete and gunny bags / curing admixtures, shall be used to reduce water requirement at site during construction. Extraction of ground water from Critical, semi critical and over exploited blocks shall be avoided. If inevitable shall be done after taking permission from CGWA; Community GW sources shall be avoided No Storage or refueling activity shall take place within 25m of Hand Pump if being used for drinking.
	Operation • Siltation and oil spill (if accidents occur) • Heavy metals from paints may harm aquatic species	**Operation** • Lead based paints shall be prohibited strictly • Contingency plan shall be prepared to manage oil spill in water bodies as suggested in the IEE. • Relocation and enhancement of hand pumps are proposed.
2.9	**Climate change Impact Assessment- Greenhouse Gas emission estimation**	
	Construction & Operation • Assessment of GHG has been done using TEEMP. • The total emission of CO2 as estimated during BAU and WPS for all the project roads individually is less than 100,000 tons per year threshold set by ADB	**Construction & Operation** • To further off set the emissions compensatory plantations (1:3) shall be done on lands near the roads along with additional road side plantation at 1:2. • Encourage use of clean fuel by setting up CNG stations in towns along the roads. Maintain road roughness at minimum.
2.10	**Climate Change risk assessment**	
	Construction and operation • Increase on temperature by 2.76^0 C in summer may lead to pavement buckling, rutting softening. • Drought may lead to longitudinal cracks	**Construction and operation** • Heat resistant paving materials shall be used; • Adaptation measures involves reconstruction and widening of CD structures, construction of 268.89 km lined and 763.30 km of unlined

Sl. No.	Environment component/Impacts	Mitigation
	on pavement and soil destabilization • Flood may lead to damage of pavement / bridges/ culverts and drainage problem • Strong wind may lead to damage of road infrastructure	drains; increase in height of embankment for a length of 115.92 km, turfing for a length of 316.51 km and stone pitching for a length of 14.25 km. Total cost incurred for the adaptation measure is approximately Rs.707.253 Cr. • 1-in-100-year return period shall be considered for the designing of CD structures and embankment height. • The road infrastructure shall be designed, installed and material shall be chosen based on the factors like resistance to high wind speed etc.
2.11	**Air Environment**	
	Construction • Fugitive dust emission from construction activities like site clearance, excavation, back-filling and concreting, hauling and dumping of earth & construction spoils • Gaseous emission from construction equipment, hot mix plant and vehicular traffic. Inadequate maintenance of vehicles and use of adulterated fuel use may increase the emission. • Impacts on air quality will be low to moderate and spatially restricted along the immediate corridor of impact.	**Construction** • The hot mix plant, crushers and the batching plants shall be sited more than 1 km in the downwind direction of the nearest settlement; dust screen shall be used around the crusher trap dust at sources only. • State SPCB guidelines for establishment of hot mix plant shall be followed • Mitigation measures such as provision of dust screens in stockyard/construction camps, dust extraction units in the Hot Mix Plant/Batching Plant, and water sprays at the construction sites/ stock piles /construction camp/hauls roads/quarries shall be made to reduce fugitive dust emissions. • All vehicles, equipment and machinery including DG sets used for construction shall be regularly maintained as per CPCB norms. • Regular monitoring of PM10, PM2.5, SOX, NOx etc. as suggest in environmental monitoring plan shall be carried out by the contractor. • To avoid dust emissions likely to result from the spills of construction materials and borrow materials, the vehicles delivering material shall be fitted with tail boards and shall be covered with tarpaulin sheets; • Provision of dust mask for construction workers • Cold mix technology shall be opted wherever feasible • The trees with high Air Pollution Tolerance Index (ATPI) shall be preferred more. Viz. ATPI for Neem or Azadirachta Indica is 12.95, for cassia fistula or Amaltas is 10.87, ficus religiosa or peepal is 10.36, dalbergia sisoo or seesam is 9.91 and Eugenia Jambolana or Jamun 9.31
	Operation • Concentration of CO, PM and NOx has been predicted using a CALINE 4. • The predicted cumulative GLC of CO and NOx at all locations are within the NAAQS limit for the projected years	**Operation** • Slopes or open areas from where vegetation has been cleared during construction shall be re-vegetated to control dust. • Improvement in pavement condition will also reduce the dust emission in future years.

Sl. No.	Environment component/Impacts	Mitigation
	2020 and 2030 . • Predicted PM level exceeds the NAAQS limits at 8 locations both in the years 2020 and 2030 due to higher baseline concentration in MDR81C, MDR 66E, ODR 24 (KN) and MDR 25E (KB).	• Monitoring of air quality shall be done as suggested in the monitoring plan. • Free and uninterrupted flow of vehicle due to pavement improvement, widening, segregation of vehicular and pedestrian traffic by provision of footpaths along settlements shall lead to lesser emission of vehicular pollutants. • The actual concentration is likely to be lesser than that predicted due to encouraged use of cleaner fuel and clean technologies in future for instance use of Bharat stage V is proposed for the entire country in near future.
2.12	**Noise Environment**	
	Construction • The resultant maximum noise level for likely to be generated by construction machineries is 100.5 dB(A).	**Construction** • Construction machineries shall be operated within acoustic barriers (such as plywood with sound absorbing materials) that can attenuate the sound pressure level by approximately 10 to 15 dB(A). • Construction camp shall also be located around 1km downwind from any habituated area where along with barrier protection the noise level can be reduced to 55 dB(A) • Regular equipment and vehicles maintenance shall be undertaken • Stationary equipment will be placed as far away from sensitive receptors as possible; disposal sites and haul routes will be selected in such a way to minimize objectionable noise impacts on locals; and shielding mechanisms will be employed where possible. • The noisy construction operations and their duration shall be scheduled in such a way to prevent nighttime activities. • Workers exposed to excessive noise will be given ear plugs, helmets, etc. or their working hours at noisy location shall be reduced. • Public notification of construction operations shall incorporate noise considerations. Methods to handle complaints will be specified.

Sl. No.	Environment component/Impacts	Mitigation
	Operation • Noise level modelling and prediction is done using CoRTN model software. On an average all the roads are showing increase in noise level by 5-7 dB(A) without mitigation measures. It will be comparatively lesser during night.	**Operation** • On road noise attenuating measures like no horn sign posts and speed limit near sensitive receptor shall be provided to attenuate noise. • Plantation along the road shall be maintained properly. • A combination of noise barriers, along with reduction in speed and presence of boundary wall shall cumulatively reduce noise levels by 16 dB(A). • Sensitive receptors located along the road roads edge without any intervening land use are proposed to be provided with noise barriers of 2m high masonary or hollow concrete block walls. • In case the wall is of good structural condition light concrete carpeting can be done. In case the structural condition of wall seems to be poor and cannot bear the load, it shall be reconstructed. • Out of 327 sensitive receptors, noise barriers are proposed for 191 schools, colleges and hospitals.
2.13	**Ecological Environment**	
	Construction **Flora** • Some trees and ground vegetation will be affected during establishment of construction camps, worker camps, and stockyards for material storage and construction machinery and equipment camps. • During construction the rate of accumulation of dust on leaves may increase. It affects the rate of photosynthesis as they receive less light for photosynthesis; this interferes with gas exchange between the leaf and air, and the reduction of leaf stomatal conductance influences plant biomass formation and yield i.e. plant growth and development gets affected **Fauna** • Noise during construction is anticipated in the indirect impact zone between Nawabganj Bird Sanctuary and the project road of MDR 52 C. This may affect the breeding of resident and migratory avifaunal species. • No impact is anticipated on the Ramsar site no. 1574 due to MDR 58W as the intervening land has the big city of Anoopshahar on it. And the river stretch is highly polluted and shallow.	**Construction** **Flora** • Peepal trees on both side of Aliganj soron road at km 52 in Talli village shall be saved by widening the road within available space. • Avenue plantation shall be carried out as per IRC Code SP: 21:2009 “Guidelines for Landscaping and Tree Plantation” at the ratio of 1:2 as per availability of space along the road near sensitive land uses (sensitive noise receptors, water bodies etc) • No illegal tree felling will be allowed. Contractor will arrange for cooking gas/fuel. • Work on Protected Forest Land shall be started after obtaining permission under Forest Conservation Act 1980. • Sprinkling of water shall be done to suppress dust so that it does not accumulate on leaves of trees. **Fauna** • Hot mix plant/ construction camp shall not be located within 1000m of the road stretch from km 46.900 to 47.500 near village Unchagaon Killa especially during winters (November to February). Also construction activities shall not be carried out during night time. A guard shall be appointed by the contractor to ensure that avifaunal species are not disturbed due to any kind of construction activities. • Project

Sl. No.	Environment component/Impacts	Mitigation
		laborers will be made aware of the relevant provision of the Wildlife (Protection) Act 1972 and rules made there under to prevent poaching of game birds and animals. The contractor shall take reasonable precaution to prevent his workmen or any other persons from hunting / trapping or causing any sort of damage to the fauna including fishing in any water body or to the orchards. • Precautionary and Educative sign boards shall be installed at least 100 m before and after the sites near the temples at km 22.9 and km 47 of Bulandshahar to Anoopshahar road during construction to aware construction workers and road users about the Do's and Don'ts in monkey zone. • During construction, if any wild animal is found by chance, near the construction site or workers camp the contractor will immediately inform to nearest forest office (range office or divisional office) or wildlife department and will take appropriate steps/ measures in consultation with the forest/wildlife officials.
	Operation **Flora** • Approximately 114741 (@1:3) trees of different species will be planted as part of compensatory afforestation. Additional plantation shall also be done along the road side at the ratio of 1:2 based on availability of space within RoW. Impact shall be long term and positive. **Fauna** • Buffalos and cows are tied in areas designated as cattle sheds (often no shed is present physically) immediately adjacent to the paved surface of road or within RoW. This practice shall be discouraged as it makes the animals prone to accidents. • Two locations along Bulandshahar to Anoopshahar road (km 23.200 to km 23.400 & km 47.000 to km 48.000) where temples exist, people offer food materials as religious offerings to monkeys and this draws them in group to the road. This practice has made the locations accident prone and risky for the monkeys as well.	**Operation** **Flora** • Plantation audit shall be done to determine the survival rates of trees during operation to ensure their proper growth as per guidelines of Forest Department. • To avoid glare during night along MDR 52 C Screen plantation from km 45.900 to 48.500 km shall be carried out in vacant spaces within ROW with minimum two rows of plantation i.e. small and medium with thick foliage obstruct vehicle lights. High voltage light shall also not be installed along this particular stretch of the road **Fauna** • Villagers shall be discouraged to keep their cattles at road side through consultation and putting up sign boards along the road in villages. • Precautionary and Educative sign boards shall be installed at least 100 m before and after the sites near the temples at km 22.9 and km 47 of Bulandshahar to Anoopshahar road to discourage people from offering food to monkeys at road side. Precautionary board shall be display warning signs and educative board shall display the Dos and Don'ts for the road users. • Rumble strips shall be provided on either side of road and center of road at km 22.9 and km 47 of Bulandshahar to Anoopshahar to reduce the speed of vehicles so that monkey- vehicle conflict can be avoided

Sl. No.	Environment component/Impacts	Mitigation
2.14	**Socio economic Environment**	
	• 7103 persons and 809 households are likely to be impacted • 205 CPRs are likely to be affected including 112 religious properties and 76 government properties. • 58 out of 741 private structures are likely to be displaced and rest would be partially affected. • 45 hot spots have been identified based on criteria like congested settlement, loss of livelihood of economically weaker section, religious place of high importance.	• Out of 45 hot spot locations, 17 locations are being saved by restricting widening within the RoW and at 2 locations within the available width. • In 19 locations widening is suggested to be restricted within 10 to 12 m to minimize the impacts on structures and livelihood. • Eccentric widening has been suggested in 6 locations to avoid displacement of structures of religious importance. • At one location a temple is suggested to be relocated within the village. • Compensation for loss of livelihood and structures shall be provided as per government provisions and ADB policy i.e. The Right to Fair Compensation and Transparence in Land Acquisition, Rehabilitation and Resettlement Act, 2013, Direct Land Purchase Policy, 2015 by Government of U.P and ADB's Safeguard Policy Statement (2009).
2.15	**Cumulative and Induced impact**	
	• Brick kilns and jaggery making factories present along the roads; Jaggery factories operate during winter and in winter pollutants does not get dispersed due to temperature inversion increasing the level of pollution (PM, NOx, Sox,CO2) • It will induce a ribbon development along the road; Easy accessibility • Adversely it will also have a slow but significant effect of resource exploitation.	• Construction camps shall be located away from such existing pollution sources, as far as possible so that the immediate cumulative impact can be avoided. • It is not within the scope of User agency to control exploitation of resources.
2.14	**Labour Health &safety**	
	Construction • Labour may face health issues • Accidents may occur • Unhygenic condition of rooms and toilets may pose threat to their health • 562.5 kg/ day municipal solid waste and 77 KLD sewage is likely to be generated from the labour camps. • Untreated waste not disposed properly may lead to emergence of diseases • They shall be provided with safe drinking water	**Construction** • All sites used for camps must be adequately drained. They must not be subject to periodic flooding, nor located within 200 feet of swamps, pools, sink holes or other surface collections of water unless such water surface can be subjected to mosquito control measures. • All sites must be graded, ditched and rendered free from depressions such that water may get stagnant and become a nuisance • An adequate and convenient water supply, approved by the appropriate health authority, must be provided in each camp for drinking, cooking, bathing and laundry purposes. • The drinking water system must be monitored in accordance with the water quality parameters as prescribed by the State Pollution Control Board. • The water supply system used for cooking

Sl. No.	Environment component/Impacts	Mitigation
		purposes that is drained seasonally must be cleaned, flushed, and disinfected prior to use. • Furthermore, a water sample of satisfactory bacteriologic quality, i.e. a sample showing not more than one coliform bacteria per 100 ml sample must be obtained before being placed into service • Packaged sewage treatment plants (PSTP)/ septic tank connected to soak pits shall be set up for managing sewage or liquid waste. • Organic solid waste generated from kitchen etc shall be vermi composted at site itself. • The manure can be either supplied to farmers or used on embankments for turfing. • Inorganic or inert waste shall be supplied to the authorized vendors / recyclers. • A toilet room must be located within 200 feet of the door of each sleeping room. No toilet may be closer than 100 feet to any sleeping room, lunch area or kitchen. • Separate toilet rooms must be provided for each gender. These rooms must be distinctly marked “for men” and “for women” by signs printed in English and in the native language. • Urinals must be provided on the basis of one unit or 2 linear feet of urinal trough for each 25 men. • On completion of the works, all such temporary structures shall be cleared away, all rubbish removed, trenches filled in and effectively sealed off and the outline site left clean and tidy, at the Contractor’s expense, to the entire satisfaction of the engineer. • The first-aid units should apart from an adequate supply of sterilized dressing material should contain other necessary appliances as per the factory rules of Uttar Pradesh. • Adequate transport facilities for moving the injured persons to the nearest hospital must also be provided in ready to move condition
2.15	**Road safety**	
	Construction • Accidents may take place due to ignorance of people about route diversions, or excavation on road	**Construction** • Traffic management shall be done as per IRC:SP 55-2014 (Guidelines for Safety in Construction Zones). • Traffic control plans shall be prepared in line with requirements of IRC’s SP 55 document’
	Operation • Past accident data of UP, engineering studies and consultations suggest that road accident are generally caused by Drivers exceeding the speed limits (over speeding); Overloading; Careless overtaking; Reckless driving habits;	**Operation** • Delineators and object markers are provided as per IRC: 79-1989 • The location and type of marking lines, material and color as per IRC: 35-1997,“Code of Practice for Road Markings” • IRC: 67-2012 guidelines for Road Signs; IRC: 8-

Sl. No.	Environment component/Impacts	Mitigation
	Unregulated movements of non-motorized vehicles; Lack of traffic safety education; and Poor enforcement of traffic laws and poor road condition.	1980 guidelines for kilometre stones etc have been followed in design Metal Beam Crash Barrier is proposed at locations where the embankment height is more than 3.0m, Sharp curves and also at major bridge approaches. Total length of crash barriers provided in the project roads is 3.049 km. 263.917 km of 1m wide footpath for pedestrian safety are proposed All box culverts having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals Road safety awareness campaigns for road residents will be conducted by the RP implementing NGO/Consultant. This may involve: Programs planned for raising Awareness of the Masses Dissemination of road safety instructions in public places Distribution of leaflets and posters Public marches along the proposed road Distribution of booklets and bookmarks among school children Organizing workshops on road safety Advocacy with media representatives about road safety

V. PUBLIC CONSULTATIONS AND INFORMATION DISCLOSURE

A. INTRODUCTION

453. Public participation and community consultation has been taken up as an integral part of Environmental and Social Assessment processes. Consultations with various stakeholders has been carried out since the start of design stage with objective of providing sense of belongingness of the stakeholders with the project, collection of information from the people etc. The stakeholders in the project are both primary and secondary. It is extremely important to involve stakeholders in all phases of a project for two reasons: Firstly, experience shows that their involvement in the project significantly increases the chances of success by building in a self-correcting feedback loop; secondly, involving them in the project builds confidence in the project and will greatly ease its to the target audience. All the five principles of Public Consultation viz information dissemination, information solicitation, integration, co-ordination, and engagement into dialogue were incorporated in the consultation process.

B. OBJECTIVE OF PUBLIC CONSULTATION

454. TheObjective of Public Consultation is as follows,

- Creates positivity for the project among the stakeholders,
- Inculcates the sense of belongingness in the public about the project.
- Provides Platform for discussion about Project with Authorities or their representatives
- Dissemination / Sharing of Project Interventions with the Stakeholders
- Solicitation of concerns / suggestions/apprehensions of the stakeholders about the Project and its design,
- Strengthening of Design by incorporating the feasible suggestions collected during Public Consultation,
- Strengthening of mitigative measures by incorporating the local feasible solution to problems.
- Continuous two way flow of information about the project.

1. Definition of Stakeholder

455. Stakeholders are the end-users or clients, the people from whom requirements will be drawn, the people who will influence the design and, ultimately, the people who will reap the benefits of the completed project. Hence, they are an integral part of the project.

2. Categories of Stakeholders

456. ***Primary Stakeholder*****:** Mainly includes road users and project beneficiaries such as PAPs, truckers, bus drivers, cars drivers, cyclists, heads of households, women's groups, farmers, business communities, and other vulnerable Displaced Persons (DPs) like Scheduled Castes (SC), Scheduled Tribes (ST) and Below Poverty Line (BPL) people etc.

457. ***Secondary Stakeholder*****:** Mainly includes the concern Government and semi–Government agencies .Their major role is to provide required services and clearances for the proposed project such as PWD, NGOs, PRI, ULBs, Revenue Department, Forest Department, Public Health Department, etc.

458. ***Tertiary Stakeholder*****:** Mainly includes agencies or person who are having indirect stake in the proposed project such as Asian Development Bank, Consultants, Contractors and suppliers etc.

C. METHODOLOGY

459. Consultation with the stakeholders, beneficiaries, and community leaders were carried out along all project roads using standard tools like Public Meetings, questionnaires, Interview Survey etc. Public Meetings/Questionnaire survey/ discussions etc. were designed to obtain background information and details of general environmental issues that concern people in the project area. In addition, environmental issues were discussed with relevant organizations, government officials, beneficiaries, community leaders and experts. Personal discussions were also carried out with officials, on site discussion with affected stakeholders, and reconnaissance visits have been made to the project area.

460. Consultation was carried out in two stages: First level public consultation was done during initial survey and second level of consultation was done after preparation of draft design and draft IEE.

461. **First Level Consultation** was carried out prior to finalization of design and preparation of IEE and was done to get acquainted with the issues being faced by primary stakeholders in relation with the road and their suggestions on them.

462. **Second Level Consultation** was carried out at locations where Public Consultation was carried out at initial stages and other locations after preparation of draft design and draft IEE. At this level of consultation people were made aware of design provisions and measures taken for addressing the issues raised during initial Public Consultation. In case an issue could not be addressed, reason for the same was shared and their views on Draft Design and Draft IEE were obtained. This public consultation was also carried out with Focused Group like Road users which included Truck Drivers, Tempo Drivers, auto drivers, Pedestrians, Traders along the road.

1. First Level ConsultationN

463. The locations where Public Consultations were carried out are given in **Table V-1.**and List of Govt. officials Consulted are given in **Table V-2** .The suggestions / queries / issues highlighted that were recorded and incorporated in design are given in **Table V-3**. **Fig. 120**shows First Level Process of Public Consultations carried out by the DPR Consultant on Project Roads. Signed attendance sheet is given in **Appendix 33 to Appendix 40.**

Fig. 120: First Level Consultation

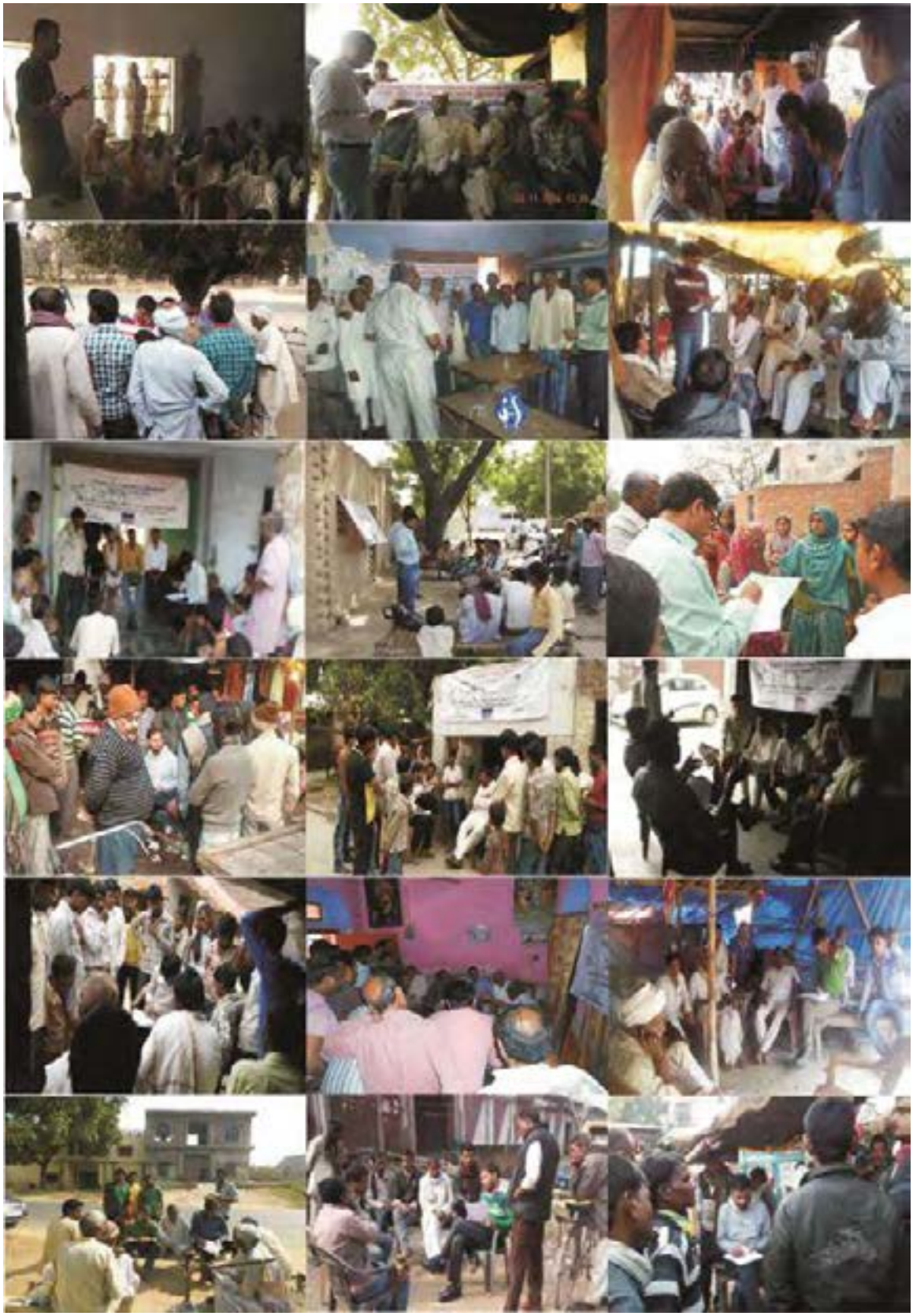


Table V-1: Locations of First Level Consultation

S. No.	Road Stretch	Date		Settlement	Location	Participants / Focused Group	Number of Participants
1.	**Nanau to Dadon (ND) (MDR 82W)**	a.	20/11/2014	Nanau	Roadside	Villagers & auto drivers	5
		b.	20/11/2014-21/11/2014	Sihawali	UP School/ Primary School	Mr. Ashok Kumar, Teacher In Charge/ Panchayat Pradhan & members, School Teachers	8
		c.	20/11/2014-21/11/2014	Pilkhana	Road side brick kiln/ Road Side Tea Stall	Brick Kiln Owner, brick buyers/ Villagers	21
		d.	21/11/2014	Sikandarpur	Panchayat Bhawan	Panchayat Pradhan, members & villagers	50
		e.	21/11/2014	Tikta	Road Side (near Mosque)	Panchayat Pradhan & Members & Teachers	28
		f.	21/11/2014	Dadon	School	Villagers	7
2.	**Bulandshehar – Anupshehar (BA) (MDR 58W)**	a	25/11/2014	Daulatnagar	Roadside Shop	Villagers & shopkeepers	9
		b	26/11/2014	Jiroli	Road Side Tea Stall	Villagers	9
		c	26/11/2014	Anupshahar Bypass	Roadside	Squatters	10
		d	27/11/2014	Debai Chauraha	Roadside Tea Stall	Villagers & shopkeepers	7
3.	**Muzaffarnagar-Baraut (MB) (MDR 135W)**	a	12/11/2014	Bijrol	Road Side	Villager and Auto Drivers	8
		b	13/11/2014	Shadabber	Road Side	Villagers	12
		c	14/11/2014	Daha	Roadside	Villagers	11
		d	15/11/2014	Sanjhak	Road Side	Villagers and Shopkeepers	15
		e	15/11/2014	Tawli	Road side tea stall	Villagers	8
4.	**Haliyapur-Kurebhar - Bilwai (HK) (MDR 66E)**	a	12/11/2014	Kurebhar	Kurebhar Chowk	Shopkeepers	10
		b	12/11/2014	Bhawanigarh	Tea-Shop	Villagers & Shopkeepers	17
		c	13/11/2014	Hadaura Market	Dhaba	Farmers, Squatters and Shopkeepers	10
		d	13/11/2014	Veersinghpur Mor	Roadside Shop	Shopkeepers	7
		e	13/11/2014	Belwai Chauraha	Roadside Shop	Shopkeepers and Farmers	7
5.	**Hussainganj-Hathgaon-Auraiya-Alipur (HA) (MDR 81C)**	a	15/12/2014	Premnagar	Roadside	Villagers & Shopkeepers	11
		b	15/12/2014	Hathgaon	Roadside Tea Stall	Villagers & Shopkeepers	14
		c	15/12/2014	Bahra Chowki	Roadside Tea Stall	Villagers & Shopkeepers	14
		d	15/12/2014	Chhiblaha	Roadside shop	Villagers & Shopkeepers	10
6A.	**Kaptainganj-**	a	13/12/2014	Mishroli	Alonside road	Squatters and Shopkeepers	16

S. No.	Road Stretch	Date		Settlement	Location	Participants / Focused Group	Number of Participants
	Naurangia (KN) (ODR 24)			Chauraha			
		b	13/12/2014	Nirvaya	Tea shop	Villagers	18
		c	13/12/2014	Chakhni Bhumyari	Alongside of the road	Villagers	13
		d	13/12/2014	Naurangiya Village	Alongside Shop	Owners of alongside road and villagers	11
6B.	**Kaptanganj-Hata-Gauri Bazar- Barhaaj Marg (KB) (MDR 25E)**	a	13/12/2014	Vakilganj	Sanitary shop	Villagers and shopkeepers	8
		b	13/12/2014	Gauribazar	Alongside road	Shopkeepers and Squatters	8
		c	13/12/2014	Indupur	Grocery Shop	Shopkeepers	11
		d	13/12/2014	Chhapauli	Pan Shop	Shopkeepers and Villagers	13
7.	**Mohanlalganj-Maurawan-Unnao Marg (MM) (MDR 52C)**	a	11/06/2015	Dhanwara	Near Temple	Local Community	15
		b	11/06/2015	Jabrela	Jabrela market	Local Community, Shop owners	17
		c	10/06/2015	Khalu Kheda	Khalu Kheda Market	Local Community, Shop owners	18
		d	08/06/2015	Maurawan	Residence of Maurawan Chairman	Local Community	15
		e	09/06/2015	Mangat Kheda	Road Side	Local Community	18
		f	12/06/2015	Taura	Residence of Taura village head	Local Community	20
8.	**Aliganj-Soron Marg (AS) (MDR 45W)**	a	14/06/2015	Sahawar	Near Tent Shop at Ward No 7	Local Community	14
		b	14/06/2015	Patyali	Sabhasad's Place	Local Community	16
		c	14/06/2015	Tali	Nearby Roadside Settlement	Local Community	20
		d	15/06/2015	Lakhmipur Gopal Singh	Nearby Roadside Settlement	Local Community	40
		e	15/06/2015	Ganjdundwara	Nagar Palika Office	Local Community, Shop Owners	10
		f	16/06/2015	Timbarpur	Nearby Roadside Settlement	Local Community	17
		g	16/06/2015	Gadka	Near Raja ki Chopal	Local Community	20

Source: DPR Consultant

Table V-2: Consultation with Government Officials

S. No.	Name of the road	Date	Location	Participants	Outcome of Consultation / Issues Discussed
i.	Nanau to Dadon (MDR 82W)	22/11/2014	Forest Office, Aligarh	Mr. DP Gupta, DFO Mr. Ashok Kumar Nimesh, RO, Aligarh AE & JE, UP PWD & Consultants	Informed that road under study is notified protected forest
ii.	Bulandshehar – Anupshehar (MDR 58W)	27/11/2014 & 14/07/2015	Divisional Forest Office, Bulandshahar	Prabhagiya Nideshak, Samajik Vaniki	Joint verification and tree enumeration, Submission of compensation has to be carried out. Project Road is not located in Ramsar Site (Upper Ganga River, Brijghat to Narora) and a dense settlement of Anoopshahar is present between the project road and the Ramsar site hence negligible impact is anticipated. Though, it is a polluted stretch because of more human interference, sewage discharge, agricultural runoff and intensive fishing, hence dolphins have not been reported in this stretch near Anoopshahar.
iii.		14/07/2015	SDO, UP Irrigation Department		Project Road is not located in Ramsar Site (Upper Ganga River, Brijghat to Narora) and a dense settlement of Anoopshahar is present between the project road and Ramsar site hence negligible impact is anticipated.
iv.	Muzaffarnagar-Baraut (MDR 135W)	14/11/2014	Forest Office, Baghpat	DFO Baghpat	Informed that the stretch from Taoli village to Budhana is notified forest area
v.	Haliyapur-Kurebhar - Bilwai (MDR 66E)		Forest Department, Sultanpur	Prabhagiya Nirdeshak	Application for Joint Inspection for tree felling need to be done
vi.	Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)	15/11/2014	Forest Office, Fatehpur	Prabhagiya Nideshak, Samajik Vaniki	Informed that RoW from Bahera Chowk at km 33.375 to Alipur Jita at km 48.675 is notified protected forest, for which application has to be made. For rest of the stretch, Joint Inspection for tree felling needs to be done.
viA.	Kaptainganj-Naurangia (ODR 24)	12/12/2014	Forest Department, Kushinagar	Prabhagiya Nideshak	Application for Joint Inspection for tree felling need to be done
viB.	Kaptanganj-Hata-Gauri Bazar- Barhaaj	12/12/2014	Forest Department,	Prabhagiya Nideshak	Application for Joint Inspection for tree felling need to be done

S. No.	Name of the road	Date	Location	Participants	Outcome of Consultation / Issues Discussed
	Marg (MDR 25E)		Deoria		
vii.	Mohanlalganj-Maurawan-Unnao Marg (MDR 52C)	11/06/2015	Forest Department, Unnao	Mr. V.K Mishra, Divisional Forest Officer (DFO) Unnao	• Informed about the presence of Notified Protected Forest in starting 0.8 km of the road. • Record of sighting of Endangered/ Migratory species in the vicinity of Project Area • Forest Map showing the alignment
		11/06/2015	Range Office, Purwa Unnao	Mr. Girdhari Lal Maurya, Range Officer, Purwa Unnao	
		23/03/2015	Regional Office, Lucknow	SDO, Lucknow	
viii.	Aliganj-Soron Marg (MDR 45W)	15/06/2015	Forest Office, Kasganj	R. Balachandran, DFO, Kasganj Forest Division	Application for Joint Inspection for tree felling need to be done

Source: DPR Consultant

Table V-3: Issue Raised and Response of Project Authorities

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td>1.</td><td>Project was welcomed.</td><td>All locations</td><td>It will be tried to improve all suggestions feasible in the design.</td></tr>
<tr><td>2.</td><td>WATER</td><td></td><td></td></tr>
<tr><td></td><td>Primarily Ground Water is being used to meet the domestic water requirement through Hand Pumps. Loss of Hand Pumps may affect the supply of water.</td><td>ND - (c,d,e,f)
BA - (a,b,c,d)
MB - (b,d,g)
HK - (a,b,c,d)
HA - (a,b)
KN- (a,c)
KB - (a,c,d,f)
MM- (a,b,c,d,e)
AS - (b,c,d,f,g)</td><td>Public Hand Pumps shall be replaced prior to dislocation of existing hand pump, so that, domestic water requirements are not disrupted. Cost of relocation of Private Hand Pumps shall be given to the owner of hand pump. The details of hand pumps and wells that will be impacted are given in Chapter 4 and the number of hand pumps/wells likely to be impacted are given below:
<table>
<tr><th>Name of Road</th><th>Hand Pumps</th><th>Wells / Bore well</th></tr>
<tr><td>ND</td><td>82</td><td>2</td></tr>
<tr><td>BA</td><td>74</td><td>-</td></tr>
<tr><td>MB</td><td>84</td><td>0</td></tr>
<tr><td>HK</td><td>383</td><td>12</td></tr>
<tr><td>HA</td><td>112</td><td>10 + 4 = 14</td></tr>
<tr><td>KN</td><td>182</td><td>1</td></tr>
<tr><td>KB</td><td>297 HP and 5 taps</td><td>-</td></tr>
<tr><td>MM</td><td>146</td><td>5</td></tr>
<tr><td>AS</td><td>141</td><td>5</td></tr>
</table></td></tr>
<tr><td></td><td>Loss of Surface Water bodies Degradation of Water body due to dumping of Waste and / or sewage in Ponds.</td><td>ND - (a,c,d,e)
MB - (b,f,g)
HK - (c,d)
HA – (b,d)
KN - (a,b,c)
KB - (a,b,c,d,e,f)
MM - (a,b,c,d,e,f)</td><td>Surface water bodies being impacted are proposed to be mitigated by increasing the depth of the pond to maintain same volume.
Ponds along the road during construction shall be provided with intercepting Channel which shall collect the surface run off and divert it to Oil Interceptor cum Settling Tank before discharging in the ponds.
Silt Fencing shall be put up along the surface body and retaining walls shall be constructed to save the ponds.
Details of surface water bodies impacted and mitigation measures impacted are given in Chapter 4.
Construction Waste shall not be dumped in the surface water bodies along the road.</td></tr>
<tr><td></td><td>Surface water body is polluted due to use of pesticides and fertilizer in agricultural fields.</td><td>AS - (c)</td><td>This is not in Scope of Project.</td></tr>
<tr><td></td><td>Water tank should be provided for supply of water.</td><td>KB – (a)</td><td>Providing Water Supply is not in scope of work.</td></tr>
<tr><td>3.</td><td>NOISE LEVELS</td><td></td><td></td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td></td><td>Noise levels seem to be higher and are continuous source of irritation.</td><td>ND - (d,f)
BA - (c,d)
MB - (a,b,d,f,g)
HK - (a,b,c,d,e)
HA – (a,b,c,d)
KN- (a,c)
KB- (a,c,d,f)
MM- (a,c,d,e)
AS - (a,b,e,g)</td><td>The road is being improved from single / Intermediate lane to two lane of 7.0 m width with paved shoulder of 1.5m and concrete pavers between concrete tied pavement and covered drain in built up area and with earthen shoulders of 2.5m width in open areas, which will augment the carrying capacity of road leading to free flow of traffic resulting in Less honking and noise emissions from vehicles.
1m wide Footpath cum drain has been proposed in urban locations for segregation of Pedestrian traffic. These measures shall help in removing bottlenecks in free flow of traffic and segregation of Slow moving traffic with fast moving traffic.
<table>
<tr><th>Name of Road</th><th>Footpath cum drain Length (km)</th></tr>
<tr><td>ND</td><td>Drain 2 x 7.150 =14.300</td></tr>
<tr><td>BA</td><td>2 x 6.870 = 13.740</td></tr>
<tr><td>MB</td><td>2 x 12.5335 = 25.067</td></tr>
<tr><td>HK</td><td>2 x 29.870=59.740</td></tr>
<tr><td>HA</td><td>2 x 6.65=13.300</td></tr>
<tr><td>KN</td><td>2 x 14.040=14.080</td></tr>
<tr><td>KB</td><td>2 x 24.030=48.060</td></tr>
<tr><td>MM</td><td>2 x 10.20=20.40</td></tr>
<tr><td>AS</td><td>2 x10.052=20.104</td></tr>
</table>
With the improvement of Road Surface Roughness smooth running of Vehicles shall be possible.
Junctions are proposed to be improved in accordance with IRC Guidelines.
Informatory signs like Silence Zone, No Honking shall be erected.
All above measures shall help in smooth uninterrupted flow of traffic resulting in less honking and less noise from running vehicles.
Noise barriers have been suggested at sensitive locations which shall be provided in consultation with Management /Owner of the sensitive receptors and details are given in Chapter IV.
<table>
<tr><th rowspan="2">Road stretches</th><th rowspan="2">Total sensitive receptor</th><th colspan="3">Noise barriers proposed</th><th rowspan="2">Length (m)</th></tr>
<tr><th>Health institution</th><th>Educational institution</th><th>Total</th></tr>
<tr><td>ND</td><td>24</td><td>2</td><td>12</td><td>14</td><td>560</td></tr>
<tr><td>BA</td><td>26</td><td>1</td><td>13</td><td>14</td><td>602</td></tr>
<tr><td>MB</td><td>46</td><td>2</td><td>18</td><td>20</td><td>1099</td></tr>
<tr><td>HKB</td><td>86</td><td>4</td><td>43</td><td>47</td><td>2082</td></tr>
<tr><td>HA</td><td>36</td><td>2</td><td>18</td><td>20</td><td>882</td></tr>
</table>
</td></tr>
</table>

S. No.	Issue Raised	Locations	Response of Project Authorities
			KN 11 0 11 11 585 KB 40 7 33 40 1051 MM 41 8 10 18 558 AS 17 0 7 7 220 **Total 327 26 165 191 7639**
4.	**AIR QUALITY**		
	Deterioration in Air quality due to more emissions from the vehicles. At most of the places Pavement does not exist resulting in dust emissions due to running of Vehicles.	ND - (a,b,c,d,e,f) BA - (c,d) MB - (a,b,d,f,g) HK - (a,c,d,e) HA – (a,b,c,d) KN- (a,b,c) KB- (a,c,d,f) MM- (a,b,c,d,e) AS - (a,b,e,g)	• The deterioration in air quality along the project is due to burning of fuel from Stationary vehicles, due to acceleration and deceleration of vehicles and frequent traffic Jams. • Either pavement does not exist on road or is of poor quality which results in emissions of Particulate Matter. The pavement is proposed to be either Reconstructed or Overlaid. • All measures suggested at S.No 2 except last shall help in uninterrupted free flow of traffic without any bottleneck which will results in fewer emissions from vehicles. • With the construction of road including Paved /earthen shoulders vehicles will not have to go down the roads during overtaking, Pot holes shall be removed resulting in very less dust emissions/ wind borne Particulate Matter from the road due to running of vehicles.
	There are many brick kilns along the roads		During Consultations Brick Kiln owners were advised to use good fuel. Plantation of Species of trees which have large leaves and are known as air purifier shall be carried out.
5.	**Odor Problem**		
	There is problem of foul odor due to the tannery industry.	AS – (e)	This is not in Scope of Work, However the concerns of community was communicated to tannery industry and brought to the notice of UPPCB.
6.	Impact on community place	HK – (d) - Semari Bazar HA – (a) - Vegetable and fruit market alongside the road	Carrying capacity of roads after widening shall increase and bottle necks shall be removed, which will facilitate the smooth flow of traffic in congested areas.
7.	**Solid waste**		
	Management of the waste - collection and disposal are very poor.	AS – (a,c)	Awareness shall be given to the local residents and Gram Panchayats for proper management of domestic waste during the Construction.
8.	**Compensation**		
	The squatters who will be affected should be properly compensated.	AS – (b)	The compensation will be paid as per entitlement matrix of the Project in line with ADB SPS 2009 adopted by the Govt. of Uttar Pradesh.
9.	**DRAINAGE**		

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td></td><td>In built up areas over flow of sewage from side drains takes place due to inadequate capacity and blockage.
Cross Drainage Structures are inadequate and Choked.</td><td>ND - (e,f)
HK - (a,c,d,e)
HA – (a,b,d)
KN- (a,b,c)
KB- (a, c,d, f)
MM- (a,b,c,d,e)
AS - (a,b,e)</td><td>Minor and Major bridge shall be widened. The number of bridges that have to be reconstructed or retained with repair, as per the requirement are:
<table>
<tr><th>Name of Road</th><th>Major Bridges</th><th>Minor Bridges</th></tr>
<tr><td>ND</td><td>1RWM[1]</td><td>5 W[2], 1 RWM</td></tr>
<tr><td>BA</td><td>Nil</td><td>Nil</td></tr>
<tr><td>MB</td><td>2 RWM</td><td>2 RE[3],2 RWM</td></tr>
<tr><td>HK</td><td>Nil</td><td>9 W, 2 RE, 4 RWM</td></tr>
<tr><td>HA</td><td>Nil</td><td>Nil</td></tr>
<tr><td>KN</td><td>1 RWM</td><td>1 RE, 1 RWM, 2 New</td></tr>
<tr><td>KB</td><td>1 RWM</td><td>2 W, 1 RE, 4 RWM, 2 New</td></tr>
<tr><td>MM</td><td>Nil</td><td>Nil</td></tr>
<tr><td>AS</td><td>Nil</td><td>Nil</td></tr>
</table>
[1]Retained with minorrepair,[2] Widening,[3]Reconstruction
Culverts Shall be widened or reconstructed, details of which are given below:
<table>
<tr><th>Name of Road</th><th>Culverts Widening</th></tr>
<tr><td>ND</td><td>15 W, 28 RE, 5 RWM</td></tr>
<tr><td>BA</td><td>15 W, 28 RE, 5 RWM</td></tr>
<tr><td>MB</td><td>8 W, 84 RE, 15 RWM</td></tr>
<tr><td>HK</td><td>9 W, 113 RE , 56 RWM</td></tr>
<tr><td>HA</td><td>31 W, 35 RE, 01 RWM</td></tr>
<tr><td>KN</td><td>1 W, 13 RE, 18 RWM</td></tr>
<tr><td>KB</td><td>34 W, 36 RE, 7 RWM</td></tr>
<tr><td>MM</td><td>3 W, 58 RE, 41 RWM</td></tr>
<tr><td>AS</td><td>6 W, 56 RE,14 RWM</td></tr>
</table>
1m wide rectangular Footpath cum drain has been proposed in built up areas. 1.8 m wide unlined rectangular drain has been proposed in rural areas
Side / Cross drains shall be cleaned once in a Month during maintenance Period.
The Vertical Profile of road has been increased to avoid overtopping of water in built up areas.</td></tr>
<tr><td>10.</td><td>ROAD SAFETY</td><td></td><td></td></tr>
<tr><td></td><td>Accidents Frequently take place on roads.</td><td>ND - (a,b,c,d,e,f)
MB - (a,b,d,f)
HK - (a,e)
HA – (a,b,d)</td><td>The road is being improved from single/ intermediate lane to Two lanes with Paved / Earthen Shoulder to augment the carriageway capacity.
In built up areas Footpath cum drain along with concrete pavers between Footpath and concrete tied shoulder shall be provided for segregating the pedestrians from moving</td></tr>
</table>

S. No.	Issue Raised	Locations	Response of Project Authorities
		KN- (a,b,c) KB- (a,b,c,d,e,f) MM- (a,b,c,d,e,f) AS - (a,b,e)	traffic. Horizontal and Vertical road geometry has been improved to the extent in accordance with IRC Guidelines. Horizontal curves with radius less than 300 m, width of pavement and roadway shall be increased.
	Signages are not present on the Road.	ND - (a,b,c,d,e,f) BA - (a,b) MB - (a,b,d,f,g) HK - (b,c,d) HA – (a,b,c,d) KN- (a,b,c) KB- (a,b,c,d,e,f) MM- (a,b,c,d,e,f) AS - (a,b,c,d,e,f,g)	All Road safety measures like Signages like Cautionary, Mandatory and informatory signs, Delineators, cat eye, Road way indicators, Hazard markers etc. shall be proposed.
	Safety of Students is serious issue as Students has to cross roads for attending school.	ND - (a,ef) BA - (a,d) MB - (b,f,g) HK - (a,b,c,d) HA – (a,b,c,d) KN- (a,b,c) KB- (a,b,c,d,e,f) MM- (a,b,c,d,e,f) AS(a,b,e)	Informatory and Cautionary Sign board shall be provided at sensitive locations.
	Requirement of Traffic management: There is no proper management of traffic.	HK – (a, e)	During Construction: Traffic management shall be done as per IRC:SP 55-2014. Sign boards for route diversion, reflective tapes along excavated areas shall be used during construction for safety in the construction site and for the convenience of moving traffic, temporary diversion will be done. During Operation: Traffic control devices and road safety features, including Traffic Signs, Road Markings, Road lighting & Crash Barriers are proposed and designed as per relevant IRC codes and standards. Segregation of pedestrian and fast moving traffic shall be done at builtup locations and concrete pavers shall act as parking areas in commercial.
11.	Loss of Property Loss of Livelihood	All Locations	Improvement of Road has been restricted within Right of way to avoid Land Acquisition. People who will be losing livelihood, their commercial structures shall be compensated

S. No.	Issue Raised	Locations	Response of Project Authorities
			in accordance with ADB's Entitlement Matrix / PWD's Basic Schedule of Rates (BSR). In built up Areas improvement of road shall be limited between building lines.
12.	Archaeological Monuments or Place of Cultural Importance	1,3,5,7	No Archaeological Monuments notified under The Ancient Monuments and Archaeological Sites and Remains Act 1958 (ACT No. 24 of 1958) is present on 500m on either side of Right of Way.
13.	Green Cover along the road Vacant Space on either side of road has been notified as Protected Forest.	i, iii, v, vii	ND – Entire length notified as PF vide Order No. 155 / XIV-331-50 dated 10.02.1960 MB – notified protected forest from chainage km 9.000 to km 31.000 vide Order No. 155 / XIV-331-50 dated 10.02.1960 HA - RoW from Bahera Chowk at km 33.375 to Alipur Jita at km 48.675 is notified as protected forest vide Notification No. 3278/14-2-43/86 dated 7th August, 1986 MM - approx.first 0.800Km of the Project Road section (Mohanlalganj-Bani Road-NH24A; falling in Lucknow District) is notified as Protected Forest Work on Project shall start after taking Permission Under Forest Conservation Act (1980) Net Present Value of the diverted forest land, cost of compensatory afforestation of 3 trees in lieu 1 tree proposed to be felled and all other Statuary demands shall be deposited in Compensatory Afforestation Fund Management and Planning Authority managed by Ministry of Environment and Forest and climate change, New Delhi.
14.	Felling of Road Side Trees	ii, iv, viA, viB	Road Side trees shall be felled after taking permission from the authorities. Trees shall be planted on Vacant Spaces in available ROW.
15.	**Health and Hygiene**		
	During Construction of Roads labor camps shall be established and labor from outside shall come which will be a Health and Hygiene Hazards.	ND - (a,b,c,d,e,f) BA - (a,b) MB - (a,b,d,f,g) HK - (b,c,d) HA – (a,b,c,d) KN- (a,b,c) KB- (a,b,c,d,e,f) MM- (a,b,c,d,e,f) AS - (a,b,c,d,e,f,g)	Labors shall be Screened Medically before employing and regular Medical Checkup shall be Carried out. Mobile Toilets / Earthen lined latrines shall be provided in camps. Water shall be Supplied to the labor camp and existing Hand Pumps being used by locals shall not be used or else new hand pumps shall be bored for meeting demand of labor camp. Labor Camp shall be located away from the settlements / water courses
16.	Employment to Local People	ND - (e,f) HK - (a,c,d,e) HA – (a,b,d) KN- (a,b,c) KB- (a, c,d, f) MM- (a,b,c,d,e) AS - (a,b,e)	Direct and indirect employment shall be generated due to the Project. Major generation of employment shall be during construction stage and preference shall be given to local people.

Source: DPR Consultant
ND – Nanau Dadon (MDR 82W), BA - Bulandshar – Anoopshar (MDR 58W), MB - Muzaffarnagar – Baraut (MDR 135W), HK - Haliyapur – Kurebhar – Bilwai (MDR 66E)
HA - Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C), KA - Kaptanganj-Naurangiya (ODR 24), KB - Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg (MDR 25E)
MM - Mohanlalganj to Maurawan Unnao Marg (MDR 52C), AS - Aliganj-Soron Marg (MDR 45W)

2. Second Level Consultation

464. The PPTA Consultant carried out extensive meaningful Second Tier of Consultation to share the design and Draft Initial Environment Examination with the Stakeholders. Consultations were carried out in groups, individual stakeholders. The Stakeholders were briefed about the Response to their issues raised in the Public Consultations carried earlier and their suggestions were again invited. Many of the suggestions raised in Second tier Consultations were similar to those raised earlier, only new issues are being presented in the table below. Details of locations of public consultation are given in **Table V-4**. List of Govt. officials and public representatives who were consulted is given in **Table V-5.** Issues raised and the suggested improvements are presented in **Table V-6.** The **Fig. 121 & Fig. 122** shows Second Tier Process of Public Consultations being done on project roads. Signed attendance sheet is given in **Appendix 41 to Appendix 48.**

Fig. 121: Photographs of Second Level Consultation

Fig. 122: Photographs of Second Level Consultation

Fig. 123: Consultation with Forest Officials

Consultation with Chief Engineer, Project Director, Staff Officer and other Staff of PWD.

Consultation with Executive Engineer on Aliganj Soron Marg

Consultation with DFO, Sultanpur, Haliyapur Kurebhar-Bilwai Road

Consultation with surveyor, Fatehpur Forest Division, Hussainganj- Alipur Marg

Consultation with surveyor at Kushinagar Forest Division

Consultation with Flying Scott Incharge & surveyor, Kasganj, Aliganj Soron

Table V-4: Locations of Second Level Consultation

S. No.	Road Stretch	Date		Time	Location	Participants / Focused Group	No. of Participants
1.	**Nanau to Dadon (ND) (MDR 82W)**	α	24/12/2014	3:00 PM	Pilakhna Chairman Office	Chairman and Panchayat Member	15
		β	25/12/2014	10:00 AM	Nanau	Auto and Truck drivers	12
		γ	25/12/2014	12:01 PM	Pilakhna	Local Residents	12
		δ	25/12/2014	1:00 PM	Sikandarpur	Local Residents	20
		ε	25/12/2014	3:00 PM	Tikta	Local Residents	10
		ζ	25/12/2014	4:30 PM	Charra Chairman Office	Chairman and Panchayat Member	10
		η	26/12/2014	11:00 AM	Charra Town	Shop owners	25
		θ	26/12/2014	2:30 PM	Naglabhod	Local Residents	15
2.	**Bulandshehar – Anupshehar (BA) (MDR 58W)**	α	27/12/2014	12:15 PM	Jatwai	Sarpanch and Panchayat Members	15
		β	28/12/2014	12:05 PM	Karanpur Kalan	Govt Employee and Local Residents	6
		γ	28/12/2014	12:30 PM	Anupshehar	Shop-owner	3
		δ	28/12/2014	4:00 PM	Amarpur	Truck Drivers	2
		ε	28/12/2014	2:00 PM	Jirauli	Farmer Group	25
		ζ	28/12/2014	12:20 PM	Daulatnagar	Villagers, Farmers and Shopkeepers	11
3.	**Muzaffarnagar-Baraut (MB) (MDR 135W)**	α	14/2/2015	3:30 PM	Shahpur Town	Truck Drivers and Local Residents	5
		β	14/2/2015	4:30 PM	Harsoli Viilage	Auto Drivers	10
		γ	14/2/2015	5:15 PM	Taoli	Auto Drivers	6
		δ	15/2/2015	9:30 AM	Budhana	Chairman and Panchayat Members	10
		ε	15/2/2015	10:30 PM	Budhana	Truck Drivers and Local Residents	15
		ζ	15/2/2015	11:30 AM	Madimpur	Local Residents	7
		η	15/2/2015	12:15 PM	Shahpur	Police, Pedestrian and Fruit sellers	10
		θ	15/2/2015	2:00 PM	Bharal	Sarpanch and Gram Sabha Members	20
		ι	16/02/2015	12:00 PM	Tawli	Local Residents	20
		κ	12/02/2015	11:00 AM	Shahdabbar	Local Residents & Shopkeepers	23
		λ	13/02/2015	4:00 PM	Daha	Shopkeepers	23
4.	**Haliyapur-Kurebhar – Bilwai (HK) (MDR 66E)**	α	26/2/2015	10:30 AM	Haliyapur	Shop Owner and Local Residents	8
		β	26/2/2015	11:30 AM	Kanhaisingh Ka Purwa	Housewives	3
		γ	26/2/2015	12:01 PM	Kanhaisingh Ka Purwa	Local Residents	10
		δ	26/2/2015	12:30 PM	Dobhiyara	Local Residents	15

S. No.	Road Stretch	Date		Time	Location	Participants / Focused Group	No. of Participants
		ε	27/2/2015	10:30 PM	Delhi Bazaar	Sarpanch and Panchayat Members	8
		ζ	27/2/2015	11:15 AM	Pirukala	Local Residents	10
		η	27/2/2015	11:30 AM	Pirusarraya	Milk Van Driver and Principal	8
		θ	28/2/2015	12:15 PM	Chaurma	Local Residents	5
		ι	28/2/2015	3:30 PM	Dharampur	Truck Drivers	15
		κ	1/3/2015	1:00 PM	Bilwai	Shop Owner	5
		λ	1/3/2015	1:30 PM	Bibiganj	Shop Owner and Local Residents	15
		μ	1/3/2015	4:00 PM	Kurebhar	Pradhan, Gram sabha members and Local Residents	30
		ν	2/3/2015	10:30 AM	Dostpur	Local Residents	25
		ξ	2/3/2015	11: 00 AM	Dostpur	Auto and Taxi drivers	20
		ο	27/02/2015	12:30 PM	Bhawanigarh	Farmers, Shopkeepers, Local residents	15
5.	**Hussainganj-Hathgaon-Auraiya-Alipur (HA) (MDR 81C)**	α	18/02/2015	3:16 PM	Afoi	Panchayat Members and Local Residents	5
		β	18/02/2015	4:02 PM	Mohmadpur Gauti	Local Residents	5
		γ	18/02/2015	4:21 PM	Chauck Sarai	Local Residents	5
		δ	18/02/2015	4:33 PM	Prem Nagar	Local Residents	10
		ε	18/02/2015	5:17 PM	Hathgaon	Chainman and Local Residents	7
		ζ	19/02/2015	11:01 PM	Hussainganj	Panchayat Members and Local Residents	10
		η	19/02/2015	01:08 PM	Bajranjapur	Panchayat Members and Local Residents	13
		θ	19/02/2015	3.08 PM	Rampur	Local Residents	5
		ι	19/02/2015	05:02 PM	Kandhai ki purwa	Panchayat Members and Local Residents	13
		κ	19/02/2015	05:08 PM	Bela	Panchayat Members and Local Residents	10
		λ	20/02/2015	11.05 PM	Laxmanpur	Panchayat Members and Local Residents	7
		μ	20/02/2015	12.30 PM	Ahinda	Panchayat Members and Local Residents	9
		ν	21/02/2015	3.30 PM	Alipur Jita, Afoi	Auto driver, truck driver	7
		ξ	21/02/2015	4.10 PM	Hathgaon, Rampur, Hasanpur	Auto driver, truck driver	10
		ο	02/03/2015,	12:30 PM,	Chhivlaha	Shopkeepers	22

S. No.	Road Stretch	Date		Time	Location	Participants / Focused Group	No. of Participants
			25/02/2015 & 28/02/2015	2:00 PM & 3:00 PM			
		π	09/06/2015	4:00 PM	Nirvaya	Farmers and local residents	12
6A.	**Kaptainganj-Naurangia (KN) (ODR 24)**	α	06/06/2015	3.30 PM	Naurangia	Shopkeepers, Auto-drivers Villagers	15
		β	06/06/2015	05.00 PM	Rambag Chauraha	Villagers	15
		γ	09/06/2015	3.00 PM	Mishrauli, Pagar Mauza	Villagers & Shopkeepers	19
		δ	09/06/2015	4:30 PM	Bandeliganj Chauraha	Villagers & Shopkeepers	15
		ε	09/06/2015	4:00 PM	Nirvaya	Farmers and local residents	12
6B.	**Kaptanganj-Hata-Gauri Bazar- Barhaaj Marg (KB) (MDR 25E)**	α	08/06/2015	3.30 PM	Chappauli	Villagers, Shopkeepars, Autodrivers	24
		β	08/06/2015	2.30 PM	Hata	Auto Drivers	7
		γ	08/06/2015	4.30 PM	Narayanpur Village	Villagers & ShopKeepars	18
		δ	08/06/2015	5.30 PM	Indupur	Villagers	1
		ε	09/06/2015	2:30 PM	Junga Bazar	Villagers & ShopKeepars	13
		ζ	10/06/2015	3:30 PM	Gauribazar	Shopkeepers and farmers	13
7.	**Mohanlalganj-Maurawan-Unnao Marg (MM) (MDR 52C)**	α	14/06/2015	3.00 PM	Unchgaon Killa	Villagers, Shopkeepars	12
		β	14/06/2015	2.30 PM	Tushraur	Villagers, Shopkeepars, Auto Drivers	13
		γ	15/06/2015	11.30 AM	Mohanlalganj	ShopKeepars & Drivers	12
		δ	15/06/2015	1.30 PM	Kalu Khera	Auto Drivers	10
		ε	16/06/2015	2:30 PM	Maurawan	Villagers & ShopKeepars	12
		ζ	16/06/2015	4.30 PM	Mohanlalganj	Truck Drivers	2
		η	04/06/2015	3:00 PM	Dhanwara	Farmers	15
		θ	04/06/2015	2:30 PM	Jabrella	Women Group	11
8.	**Aliganj-Soron Marg (AS) (MDR 45W)**	α	4/6/2015	11:30 AM	Sahavar	Shop owner and Local Residents	20
		β	5/6/2015	11:00 AM	Patiyali	Local Residents	10
		γ	5/6/2015	11:30 AM	Ganjdundwara	Local Residents	10
		δ	5/6/2015	12:01 PM	Sahavar	Truck Driver and Fruit Seller	2
		ε	5/6/2015	12:30 PM	Yakutganj	Stakeholders	15
		ζ	5/6/2015	10:00 AM	Humainyupur	Principal, Teachers and Local Residents	8
		η	5/6/2015	11:15 AM	Soron	Local Residents	10

Source: PPTA Consultant

Table V-5: Consultation with Government Agencies / Public Representatives

S. No.	Name of the road	Date	Location	Participants	Outcome of Consultation / Issues Discussed
1.	All Roads	27/12/2014	LKO	Mr. S.K Singh, Chief Engg. UP PollutionControl Board Mr. Akhlaq Hussain Chief Environment Officer Mr. Amit Chandra, Executive Engg UPPCB HQ Lucknow	The contractors shall obtain NOC from Pollution Control Board before installing and operation of hot mix and batching plants. Hot mix plants shall be sited in accordance with UPPCB guidelines. Environmental quality of the project area should not degrade during the construction period. Environment Management Plan and Environment Monitoring Plan should be implemented in true spirit.
2.	All Roads	Throughout the Project Design Stage	LKO	Mr. Surender Kumar Singh, CE UPPWD Mr. Uma Shankar SE UPPWD	Integration of Environment Mitigation measures into the design. Environment Budget for project road. Institutional set up for implementation of Environment Safeguards during project execution stage. Capacity Building in respect of implementation of environment safeguards
3.	ND, BA,MB,AS KN, KB, HK,HA	Through Out The Project Design Stage	LKO	Mr. Satish Kumar, SE, UPPWD Mr. Agarwal SE UPPWD	Permission for diversion of forest land from Forest Department under Forest Conservation Act (1980), Permission for cutting of Road side trees shall also be obtained before execution of construction work.
4.	All Roads	Through Out The Project Design Stage	LKO	Mr. Salil Yadav Executive Engineer, PWD HQ	Discussed and finalized Environment Budget. Integration of EMP into the bid documents.
5.	All Roads	5/01/2015	Department of Environment, LKO	Mr. Anurag Yadav Nodal Officer, State Expert Appraisal Committee UP	The project road does not attract EIA Notification 2006 and subsequent amendments as it is neither designated as National Highway nor State Highway. Hence prior Environment Clearance is not required under EIA Notification 2006.
6.	Nanau to Dadon (MDR 82W)	26/12/2014	Forest Office, Aligarh	Mr. D.P. Gupta, DFO, Aligarh Mr. R.P. Singh, Steno to DFO Mr. Ashok Kumar Nimesh, RO. Aligarh Mr. Rajveer Singh, RO,	Informed that complete stretch of Nanau Dadon Road is notified as PF vide notification number – 1115- 10th Feb 1960. Permission for diversion of Forest Land shall be required to be obtained from MoEF&CC under FC Act (1980).

S. No.	Name of the road	Date	Location	Participants	Outcome of Consultation / Issues Discussed
				Atrauli	
7.	Nanau to Dadon (MDR 82W)	24/12/2014	Pilakhna Chairman Office	Chairman and Panchayat Member	Reported that road condition is very bad leading to inconvenience and high accident rates. Drainage Problem is there along the road in Pilakhana due to partially damaged and choked drainage.
8.	Nanau to Dadon (MDR 82W)	25/12/2014	Charra Chairman Office	Chairman and Panchayat Member	Many structures will be impacted due to widening of road.
9.	Bulandshehar – Anupshehar (MDR 58W)	29/12/2014	Forest Office, Bulandshehar	Mr. Anuj Kumar Saxena, DFO, Bulandshehar Mr. Kamal Kishor, RO, Anupshehar Mr. Fateh Singh, Block Officer, Anupshehar	Project road is not a notified protected forest. Permission for felling of trees has to be obtained prior to start of work.
10.	Bulandshehar – Anupshehar (MDR 58W)	27/12/2014	Jatwai	Sarpanch and Panchayat Members	• Problem of monkeys near the temple areas, leading to their killing in accidents. • Surface water bodies, specially canals should not be impacted due to road construction.
11.	Muzaffarnagar-Baraut (MDR 135W)	13/12/2014	Forest Office, Muzaffarnagar	Mr. H.V. Girish, DFO, Muzaffarnagar Mr. Dev Dutt, Forester	Informed that road stretch from Taoli to Budhana Town is notified as PF vide notification number – 1115- 10th Feb 1960 Permission for diversion of Forest Land shall be required to be obtained from MoEF&CC under FC Act, 1980.
12.	Muzaffarnagar-Baraut (MDR 135W)	15/2/2015	Budhana	Chairman and Panchayat Members	Water Quality of Hindon River is very poor due to various types of wastes from villages and industries and dumping of wastes entering the river.
13.	Muzaffarnagar-Baraut (MDR 135W)	15/2/2015	Bharal	Sarpanch and Gram Sabha Members	Road safety is main issue.
14.	Haliyapur-Kurebhar - Bilwai (MDR 66E)	04/03/2015	Forest office, Sultanpur	M. D.K. Singh, DFO, Sultanpur Mr. Ramesh Kumar, S.D.O. Forest Mr. Rajendra Shrivastava, Draftsman	Informed that three ranges fall under this road stretch, which are Kurebhar, Kadipur and Musafirkhana. Permission for felling of trees has to be obtained prior to start of work. The road side plantation has been carried out by Forest Department.
15.	Haliyapur-Kurebhar - Bilwai (MDR 66E)	27/2/2015	Delhi Bazaar	Sarpanch and Panchayat Members	Poor condition of road and absence of drainage system.

S. No.	Name of the road	Date	Location	Participants	Outcome of Consultation / Issues Discussed
16.	Haliyapur-Kurebhar - Bilwai (MDR 66E)	1/3/2015	Kurebhar	Pradhan, Gram sabha members and Stakeholders	Noise, absence of drainage system and road safety.
17.	Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)	20/02/2015	Forest Division, Fatehpur	Mr. Mohan Chand Yadav, Surveyor	Informed that road stretch from km 33 to km 48 of this road (Check) is notified as PF vide notification number – 1115-10th Feb 196033 to 48 Road falls under two ranges, namely Khaga and Fatehpur. Permission for diversion of Forest Land shall be required to be obtained from MoEF&CC under FC (ACT)1980.
18.	Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)	18/02/2015	Afoi	Panchayat Members and Stakeholders	• Absence of drainage system. • Water logging problem at builtup locations. • Road safety is an issue in urban locations.
19.	Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)	18/02/2015	Hathgaon	Chainman and Stakeholders	
20.	Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)	19/02/2015	Kandhai ki purwa	Panchayat Members and Stakeholders	
21.	Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)	19/02/2015	Bela	Panchayat Members and Stakeholders	
22.	Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)	20/02/2015	Ahinda	Panchayat Members and Stakeholders	

S. No.	Name of the road	Date	Location	Participants	Outcome of Consultation / Issues Discussed
23.	Kaptainganj-Naurangia (ODR 24) & Kaptanganj-Hata-Gauri Bazar-Barhaaj Marg (MDR 25E)	10/06/2015	Forest Office, Kushinagar	Mr. R.P Singh, DFO, Kushunagar Mr. Sohan Lal, Draftsman, Kushinagar Mr. Anil Kumar Yadav, Surveyor Mr. Dilip Kumar Shrivastava, Range Officer, Khadda Mr. PC Singh, RO, Hata	There is no Forest area, no eco-sensitive area, no endangered species etc. in the area.
24.	Kaptanganj-Hata-Gauri Bazar-Barhaaj Marg (MDR 25E)	10/06/2015	Forest Office, Deoria	Mr. Ratnesh Shrivastava, DFO, Deoria Mr. D.N. Parsad, Draftsman Mr. Sachinanad, Surveyor	There is no Forest area, no eco-sensitive area, no endangered species etc. in the area.
25.	Mohanlalganj-Maurawan-Unnao Marg (MDR 52C)	18/06/15	Forest Office, Unnao	Mr. Uday Veer Singh, ACF, Unnao Mr.Girjesh Kumar Awasthi, Range Officer, Purva Range Mr. Anil Kumar Shrivastava, Draftsman Mr. Devki Nandan Yadav, Forester	Informed about the presence of Baknai / Badila Jheel, which is visited by Migratory birds in Winter who visits Nawabganj Bird Sanctuary.
26.	Mohanlalganj-Maurawan-Unnao Marg (MDR 52C)	19/06/2015	Forest Office, Awadh	Mr. S.C Yadav, DFO, Awadh Mr. K.S. Nagarpatti, Surveyor	Informed that Mohanlalganj to Bani Road is notified as PF vide notification number – 1115-10th Feb 1960
27.	Mohanlalganj-Maurawan-Unnao Marg (MDR 52C)	19/06/2015	Range Office, Mohanlalganj	Mr. C.K.P Choudhary, Range Officer	Confirmed about the presence of PF along Mohanlalganj to Bani Road.
28.	Aliganj-Soron Marg (MDR 45W)	06/06/2015	Forest Office, Kasganj	Mr. R. Balachandran, DFO, Kasganj M. Sudesh Bharti, Flying Scott Incharge Mr. A.K. Singh, RO,	There is no Forest area, no eco-sensitive area, no endangered species etc. in the area

S. No.	Name of the road	Date	Location	Participants	Outcome of Consultation / Issues Discussed
				Kasganj Mr. Bharat Singh, Steno to DFO	

Source: PPTA Consultant

Table V-6: Responses of Project Authorities/ PPTA Consultant

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td>1.</td><td>Project was welcomed.</td><td>All locations</td><td>It will be tried to improve all suggestions feasible in the design.</td></tr>
<tr><td>2.</td><td>Water Quality</td><td></td><td></td></tr>
<tr><td></td><td>Ground water quality is not good.</td><td>MB – (δ,ε,κ,λ)
HA – (ε, o)
KN – (α,β,γ)
KB – (α)
MM – (γ,ε,η) 1</td><td>Ground Water Quality is not deteriorated due to the project through leaching of chemicals, oil & grease, pollutants etc. Mitigative measures like provision of Oil interceptors, cemented platform at places of re-fuelling stations, provision of mobile toilets/ lined pit latterines etc. have been outlined in EMP.</td></tr>
<tr><td></td><td>Surface Water:
Runoff from roads also enters the ponds at some locations.</td><td>HA – (γ,ε,ι,κ,λ,μ,ν)
KN – (α,γ,ε)
KB – (α,β,γ,ε)
MM – (δ,ε)
HK – (δ,ν,ξ)</td><td>The boundary of Ponds along the road during Construction Period shall be provided with Silt Fencing. Details of Which are as under:
<table>
<tr><th>Road stretches</th><th>Retaining wall (m)</th><th>Intercepting ditch & sedimentation pit (no.)</th><th>Silt fencing during construction (maximum in m)</th></tr>
<tr><td>ND</td><td>0</td><td>0</td><td>74</td></tr>
<tr><td>BA</td><td>54</td><td>0</td><td>39</td></tr>
<tr><td>MB</td><td>140</td><td>1</td><td>161</td></tr>
<tr><td>HK</td><td>112</td><td>2</td><td>79</td></tr>
<tr><td>HA</td><td>170</td><td>3</td><td>44</td></tr>
<tr><td>KN</td><td>0</td><td>1</td><td>100</td></tr>
<tr><td>KB</td><td>0</td><td>3</td><td>70</td></tr>
<tr><td>MM</td><td>116</td><td>11</td><td>Maximum length 150 m</td></tr>
<tr><td>AS</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Total</td><td>592</td><td>21</td><td>717</td></tr>
</table>
Road Side drainage shall be constructed which will have outfall in the nearest Cross Drainage structure. Cross Drainage Structures shall be widened where ever required to accommodate the flow of water. This will help in arresting the flow of water into ponds and shall also save water in ponds from getting polluted.</td></tr>
<tr><td></td><td>Pisciculture is done in pond adjacent to Mohanlalganj Morawan Marg. During</td><td>MM(δ)</td><td>Very large Pond is adjacent to the Project Road and Fish breeding is done on large scale in the Pond. To offset or mitigate the adverse impact on Pond, the following measures has been outlined in EMP:</td></tr>
</table>

S. No.	Issue Raised	Locations	Response of Project Authorities
	construction of road, water quality of pond may be impacted in terms of degradation of water quality due to sub surface run off laden with silt particles, oil and grease. The increase in Turbidity of Pond water may interfere with the Process of Photosynthesis and other activities as sunlight shall be obstructed and respiratory system may also got impacted due to increase silt in the water.		• Intercepting Channel shall be constructed along the circumference of pond along the road. The surface run off shall be intercepted by the channel diverted to Oil cum Sedimentation Chamber before discharging it. • Silt Fencing shall be placed along the circumference of the pond facing the road etc. • Water Quality of pond shall be tested prior to start of pre-construction activities and thereafter regular monitoring of water quality shall be done and if at any stage Water Quality shall be found to deteriorate immediate measures shall be taken to restore water quality.
	Rivers / Canals are crossing the roads and may be impacted during construction activities.	ND – (α,δ,ε,ζ) MB – (α,γ,δ,θ,λ) HK – (ε,η,μ,ν,ξ) HA – (ε,κ,λ,μ,ν) AS – (δ) MM- (δ) KN-(β , ε) KB (γ, δ, ε)	Rivers Sai in Mohanlalganj Morwan Road and River Gandhak in Kaptanganj Naurangia Road are the only two Perennial rivers crossing the roads , River Ganges is near to Nanau – Dadon and Bulandshar Anoopshar Road The nearest distance is of river Ganges, is 900m from our Bulandshar Anoopshar Road . During Construction of Project Road Rivers / canals may be impacted, measures has been outlined in EMP which include: • Construction Materials should not be stored near the streams during construction. • Silt Fencing shall be erected on the banks near the construction site as specified in EMP. • Construction / Widening of Cross Drainage Structures shall be carried out in dry season and streams shall be cleaned off debris, etc. after completion of work.
	Hindon River is polluted due to discharge of effluent from Leather industries located in upstream.	MB – (c) 12	Message of the Community has been communicated to the Pollution Control Board Officials about Pollution in River Hindon.
3.	**Air Quality**		
	Air quality is not good due dust from movement of traffic. Due to sugarcane transportation during winter season, the air problem becomes more severe.	ND – (α,β,γ,δ,ε,ζ,η) BA – (γ) MB – (α,γ,δ,ε,η,θ,ι,κ,λ) HK – (α,γ,ε,κ,λ,μ,ν,ξ) HA – (δ,ε,ζ,ν,ξ) KN – (β,γ,ε)	Through construction of new road, air quality will improve. Presently roads are not adequate to carry the traffic. Carrying capacity of roads after widening shall increase and bottle necks shall be removed, which will facilitate the smooth flow of traffic and vehicular emissions will be reduced because of which, air quality along the Project roads shall improve during operational phase of the Project.

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td></td><td></td><td>KB – (γ,ζ)
MM – (γ,ε,ζ)
AS – (α,β,γ,δ,ε,ζ,η) 1</td><td></td></tr>
<tr><td></td><td>Establishment of Construction Yard, Hotmix and Batching Plants</td><td>1</td><td>Contractor shall select the site of hot mix plants in accordance with guidelines of UP Pollution Control Board away from settlements and also brick kilns to avoid the commutative impact of emissions. Contractor shall obtain Consent To Establish and Operate before establishing and operating the plant. Contractor shall comply with the conditions stipulated in consents and also provisions of the Air (Prevention and Control of Pollution) Act, 1981.
Construction yards / batching plants shall be sited away from streams, settlements and shall not be located on Agricultural land.</td></tr>
<tr><td></td><td>The Condition of Pavement is not good resulting in generation of dust, more vehicular emissions due to acceleration and de acceleration of vehicles.</td><td>ND – (All Locations)
HA – (All locations)
HK - (All locations)
MB - (κ,λ)</td><td>The Condition of Pavement is not good especially in entire Stretch of Nanau – Dadon , Hussainganj – Alipur Road, Haliyapur – Kurebhar- Bilwai , Kaptanganj – Hata-Gauribazar – Rudrapur Barhaaj Marg and few stretches of other roads resulting in generation of dust from pot holes, Vehicles going on berms due to big pot holes. Vehicle Emissions from Vehicles due to acceleration and de acceleration of Vehicles while travelling on road due to Pot holes.
All Roads Except Bulandshar-Anoopshar and Muzaffarnagar – Baraut Roads are single / Intermediate lane. During overtaking vehicles has to travel on earthern shoulders whose conditions are not good resulting in generation of dust.
In built up area there is conflict of Pedestrian Traffic, Moving Traffic, and Parking Vehicles. In built up Area Pedestrian traffic has been segregated by providing Footpath cum drain, Concrete Pavers shall be provided in space between Concrete tied Pavement and Drains which shall be used for Parking of Vehicles. The road shall be widened /Improved to Two lane with Paved Shoulder.
The Profile of Road shall be raised in urban stretches where overtopping has been reported. 1m wide lined drains cum footpath shall be constructed in urban Stretches.
Rigid pavements shall be constructed in urban areas. This will prevent the problem of water accumulation on road and damage to pavement due to the water accumulation on roads.
The length of Section where rigid pavements shall be constructed for different project roads are given below:
<table>
<tr><th>S. No</th><th>Name of Road</th><th>Length (km)</th></tr>
<tr><td>1.</td><td>ND</td><td>7.150</td></tr>
<tr><td>2.</td><td>BA</td><td>6.870</td></tr>
<tr><td>3.</td><td>MB</td><td>9.444</td></tr>
<tr><td>4.</td><td>HK</td><td>29.870</td></tr>
<tr><td>5.</td><td>HA</td><td>6.650</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>6.</td><td>KN</td><td>7.040</td></tr>
<tr><td>7.</td><td>KB</td><td>24.030</td></tr>
<tr><td>8.</td><td>MM</td><td>10.200</td></tr>
<tr><td>9.</td><td>AS</td><td>10.052</td></tr>
</table>
All these measures shall result in uninterrupted free flow of traffic resulting in less generation of dust and less Vehicular emissions.</td></tr>
<tr><td>4.</td><td>Drainage</td><td></td><td></td></tr>
<tr><td></td><td>At some locations, flooding of Water takes place on road during Rainy Season</td><td>ND – (α,β,γ,ε,ζ,η)
MB – (α,δ, ε,ζ,θ,κ)
HK – (ε,κ,λ μ,ν,ξ)
HA – (δ,ε)
KN – (α,β,γ,δ,ε)
KB – (γ,θ)
MM – (α,β,γ,δ,ε,ζ)
AS – (α,β,γ,δ,ε,η)</td><td>The Profile of the road has been raised where overtopping / flooding has been reported in urban Stretches.</td></tr>
<tr><td></td><td>Proper concrete drainage system should be provided in urban stretches</td><td>ND – (ε,ζ)
MB – (α,δ,ζ,θ,κ)
HK – (ε,λ,μ,ν)
HA – (δ,ε)
KN – (α,β,γ,δ,ε)
KB – (α,β,γ,ε)
MM – (α,β,γ,δ,ε,ζ)
AS – (α,β,γ,δ,ε,η)
7, 15, 16. 18, 19, 20, 21, 22</td><td>1m wide rectangular lined drains shall be constructed in urban Stretches and 1.8m wide unlined drains shall be constructed in rural areas.
<table>
<tr><th>Name of Road</th><th>Lined Drain (km)</th><th>Unlined Drain (Km)</th><th>Total Length (km)</th></tr>
<tr><td>ND</td><td>14.300</td><td>45.572</td><td>59.872</td></tr>
<tr><td>BA</td><td>13.740</td><td>58.500</td><td>72.24</td></tr>
<tr><td>MB</td><td>25.067</td><td>93.140</td><td>118.207</td></tr>
<tr><td>HK</td><td>59.740</td><td>131.516</td><td>191.256</td></tr>
<tr><td>HA</td><td>13.300</td><td>58.050</td><td>71.35</td></tr>
<tr><td>KN</td><td>14.080</td><td>34.400</td><td>48.48</td></tr>
<tr><td>KB</td><td>48.060</td><td>74.640</td><td>122.7</td></tr>
<tr><td>MM</td><td>20.400</td><td>87.830</td><td>108.23</td></tr>
<tr><td>AS</td><td>20.104</td><td>50.906</td><td>71.01</td></tr>
</table></td></tr>
<tr><td>5.</td><td>Road Safety</td><td></td><td></td></tr>
<tr><td></td><td>Accidents near colleges and schools are caused by the speeding vehicles.
Drivers of local public transport like Auto’s, Magic want smooth running of vehicles and road safety features along the road.</td><td>ND – (α,β,γ,δ)
MB – (α,β,γ,δ,ε,θ)
HK – (α,η,ι,μ,ξ)
HA – (δ,ε,μ,ν,ο,π)
KN – (α,β,γ,δ)
KB – (β,γ,δ,ε)
MM – (α,δ,ε,θ)
AS – (β,γ)</td><td>Rumble Strips shall be provided near Schools, colleges, hospitals, Settlements etc.
Required road safety measures like zebra crossing, general signage, warning / informative board etc. Shall be installed.</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td></td><td></td><td>13, 16, 18, 19, 20, 21, 22</td><td></td></tr>
<tr><td></td><td>Most of Settlements along the road serves as Market Place for nearby areas, people coming to market areas park their vehicles especially bikes in market area in haphazard manner leading to traffic jams and accidents.</td><td>ND – (ζ,η)
BA – (γ)
MB – (α,γ,δ,θ,κ,λ)
HA – (δ,ε,κ,λ,ο)
AS – (α,β,γ,δ)</td><td>In Urban areas where rigid pavement shall be constructed additional space between the tied concrete paved shoulder and 1m wide lined drain shall be filled with concrete pavers which shall acts as Parking areas.</td></tr>
<tr><td></td><td>Footpath to be provided for pedestrians in urban areas</td><td>ND – (ζ)
MB – (α,δ,ε,η,θ)
HK – (ε,μ)
HA – (δ,ε,ζ,ο)
KN – (α,β)
KB – (α,β,ζ)
MM – (γ,ζ)
AS – (α,β,γ,δ)</td><td>1m wide Footpath cum lined drain has been proposed in urban locations for segregation of Pedestrian traffic. Profile of road has been raised at overtopping locations.</td></tr>
<tr><td></td><td>Street lights to be provided.</td><td>ND – (ζ)
MB – (δ)</td><td>Street lighting shall be provided in urban areas.</td></tr>
<tr><td>6.</td><td>Road Amenities</td><td></td><td></td></tr>
<tr><td></td><td>Bus Shelters has not been provided in the DPR. Make Provisions for same in the design</td><td>ND – (α,ζ,η)
BA – (γ)
MB – (α,δ,ε,θ)
HK – (λ,μ)
HA – (δ,ε,κ,λ)
KN – (α,δ)
KB – (α,β,ζ)
MM – (β,γ,ε,ζ)
AS – (α,β,γ,δ,ε,ζ,η)</td><td>Bus shelters shall be provided in all roads at built up sections, number of Bus Stops provided on different sections are given below:
<table>
<tr><th>S. No</th><th>Name of Road</th><th>Nos.</th></tr>
<tr><td>1.</td><td>ND</td><td>LHS 08, RHS 08</td></tr>
<tr><td>2.</td><td>BA</td><td>LHS 09, RHS 09</td></tr>
<tr><td>3.</td><td>MB</td><td>LHS 24, RHS 24</td></tr>
<tr><td>4.</td><td>HK</td><td>LHS 31, RHS 31</td></tr>
<tr><td>5.</td><td>HA</td><td>LHS 21, RHS 21</td></tr>
<tr><td>6.</td><td>KN</td><td>LHS 12, RHS 12</td></tr>
<tr><td>7.</td><td>KB</td><td>LHS 26, RHS 26</td></tr>
<tr><td>8.</td><td>MM</td><td>LHS 25,RHS 25</td></tr>
<tr><td>9.</td><td>AS</td><td>LHS 16, RHS 16</td></tr>
</table></td></tr>
<tr><td>7.</td><td>FLORA</td><td></td><td></td></tr>
<tr><td></td><td>Roadside Trees will be cut for the project.</td><td>Almost all locations, 3, 5, 6, 9, 14, 17, 23, 24, 25, 26, 27, 28</td><td>Nearly 37873 trees are likely to be cut out of 62988 that will be compensated at the ratio of 1:3. Two very old Peepal trees have been saved at km 52.000 in Village Tali of Aliganj Soran Road. Additional compensatory afforestation shall be done @ 1:2 at available spaces along the road. Only those trees shall be felled which will directly impinge on work.</td></tr>
</table>

S. No.	Issue Raised	Locations	Response of Project Authorities
	Trees to be preserved as in some area plantation is very dense and it should be preserved Growth of Trees along the sides of road is not good and in cases trees are also suffering from diseases.	ND – (α,γ) MB – (β,γ,λ) HK - (ε,θ,μ,ν,ο) KN – (ε) KB – (γ,δ) MM – (η AS – (ζ,η)	It has been observed during the visits, the conditions of road is very poor and there is generation of dust due to running of vehicles which settles on leaves of trees and interferes with the process of Photosynthesis. This has retarded the growth of trees and diseases in plants. With the improvement of roads, dust generation due to plying of vehicle shall decrease and impacts shall reduce.
	Orchards are Present along the roads and needs to be Protected during Construction Phase.	MB – (γ) HK – (δ,ε,η,ν,ξ) HA – (ε) AS – (γ)	Orchards are Present along the road and may be impacted during construction due to construction activities or felling of trees /cutting of branches by the labors. Conditions like Supply of Fuels to labor and orientation of labours with regard to Orchards shall be done.
8.	**FAUNA**		
	Presence of Monkeys along the road near the temples.	BA 10	Monkeys were spotted on road near the temples. With the intention of saving the accident on road, specific conditions have been included in EMP like cautionary and educative boards shall be put up on both sides of such spots. Speed Limits boards shall also be put up. Rumble strips to be provided on both sides of the spots where monkeys have been spotted and recorded.
	Migratory birds are spotted in ponds near Mohanlalganj-Unnao Marg road during winters.	MM – (α) 25	Ponds along the Mohanlalganj-Unnao Marg road are habitat to Migratory Birds during winter season. Pin Tail, Gaidwal, Gargniteel, Commonteel, Common Coat, Red Crested Co-chard, Common Co-chard, Mailard, Asian Open wild Storch, Comm Duck, Purple moorhen, Common moorhen, Indian moorhen, Spot willduck, Black Headed, Ibis, Purple Hearon, Grey Hearon, Kingfisher, Saras Crain, Sobler, Little Greve, Branze Winged jacana, Black Necked Starck, Wigeon species have been noted to visit the pond. None of the species are Endangered Species only two species Sarus crane, a resident species and Greater spotted Eagle clanga, a migratory species fall under Vulnerable category of International Union for Conservation of Nature and Natural Resources (IUCN). With the intention to protect the Migratory Birds, following conditions have been included in the EMP: 1. During winters from December to February, no construction work on the road upto 1km on either side of the pond shall be carried out. 2. During construction period from December to February a guard shall be posted along the pond. 3. No high voltage light shall be erected during construction period upto 1km on either side of the pond to avoid disturbance to Migratory birds. 4. Workers shall be educated about dos and don'ts in such areas 5. Dense Plantation of Medium and long trees along the edge of Ponds and Right of way

<table>
<tr><th>S. No.</th><th>Issue Raised</th><th>Locations</th><th>Response of Project Authorities</th></tr>
<tr><td></td><td></td><td></td><td>shall be carried out to act as screen barrier.and will save the birds from glaring of light of Vehicles travelling on road.
6. Al these measures shall result in Enhancement of Wild Life with the Project Development</td></tr>
<tr><td></td><td>River Ganga is very close to Bulandshar-Anoopshar Road near Anoopshehar, labors can do Fishing activities. The Gangetic Dolphins are found near the Narora Bridge. No other important aquatic Fauna has been reported in the area.</td><td>BA – (γ)</td><td>The Stretch of River Ganges has been notified as Ramsar Site from Brij-Ghat to Narora Bridge. The Gangetic Dolphins has been reported near Narora Bridge. The Bulandshahar-Anoopshahar- (MDR 58W) road is outside the wetland boundary of Ramsar site and the nearest point is junction of Anoopshahar at km 39.700 which is 900m away from the wetland boundary. This Stretch is not very rich in aquatic fauna because of large human interference as big Anoopshar Urban Locality is located between the road and river Ganges, bank of river in this stretch is being used for burning and disposing of dead bodies. The Stretch of river is also receiving sewage from the locality and depth of water is also less here because of spread of River. Hence, because of above factors and as confirmed by the local people and Department of Forest. No rich fauna is present in the area close to Project Road.</td></tr>
<tr><td>9.</td><td>Religious Property</td><td></td><td></td></tr>
<tr><td></td><td>Many religious structures are present along the road</td><td>AS – (c,f) – Temple in the settlement</td><td>Design modification has been done to save the religious structure to the extent possible. Religious Structures shall be relocated after consultation
<table>
<tr><th>Road Name</th><th>Number of Religious Structures Saved</th><th>Type of Religious Structure</th></tr>
<tr><td>ND</td><td>02</td><td>1 Mosque, 1Madrasa School at Tikta Village</td></tr>
<tr><td>BA</td><td>01</td><td>1 Temple at Avinashnagar Village</td></tr>
<tr><td>MB</td><td>01</td><td>1 Mosque at Tawli Village</td></tr>
<tr><td>KN</td><td>01</td><td>1 Temple at Mishrouli</td></tr>
<tr><td>KB</td><td>01</td><td>1 temple at Sudama Chowk</td></tr>
<tr><td>MM</td><td>04</td><td>3 Temples at Dhanwara, Sisandi and Sagauli
1 Mazar at Sagauli</td></tr>
<tr><td>AS</td><td>05</td><td>1 mazar at Patiyali (Km. 27.000), 1 mosque in Gunj Dundwara (Km. 35.000), 1 mosque & temple in Sahawar (Km.48.000) and 1 temple in Tali (Km. 52.300) temple</td></tr>
</table></td></tr>
<tr><td>10.</td><td colspan="3">ENHANCEMENT MEASURES</td></tr>
<tr><td></td><td>Ponds and hand pumps along the road should be enhanced.</td><td>ND – (ζ,η)
MB – (θ,κ,λ)
HK – (ν,ξ)
HA – (κ,μ,ο)</td><td>Enhancement of ponds:
Detailed provisions shall be decided by the contractor and approved by the CSC/ PWD based on specific site conditions. However, few suggested provisions are as mentioned:
• The pond shall be provided with earthen embankment along with stone pitching on the</td></tr>
</table>

S. No.	Issue Raised	Locations	Response of Project Authorities
		KN – () KB – () MM – () AS – (γ,ε)	inner slope and turfing on the outer slope. • In case the inner slope is gentler than 1:2 multiple rows of plantation shall be done. • Seating arrangement like benches shall be provided. • Provision of solar lighting. Enhancement of Hand Pumps To avoid loss of surplus water withdrawn from hand pump during community use, a soak pit shall be provided.

Source: PPTA Consultant

ND – Nanau Dadon (MDR 82W)
MB - Muzaffarnagar – Baraut (MDR 135W)
HA - Hussainganj-Hathgaon-Auraiya-Alipur (MDR 81C)
KB - Kaptanganj-Hata- Gauri Bazar- Barhaaj Marg (MDR 25E)
AS - Aliganj-Soron Marg (MDR 45W)
BA - Bulandshar – Anoopshar (MDR 58W)
HK - Haliyapur – Kurebhar – Bilwai (MDR 66E)
KA - Kaptanganj-Naurangiya (ODR 24)
MM - Mohanlalganj to Maurawan Unnao Marg (MDR 52C)

WOMEN CONSULTATION		
TABLE V.7 ISSUE RAISED BY WOMEN DURING PUBLIC CONSULTATION		
S.No	**ISSUE RAISED**	**RESPONSE OF PROJECT AUTHORITY**
1.	Safety of Children going to School	Zebra Crossings, Rumble Strips shall be provided on both sides of Settelements and School to Calm the Vehicles.
2.	Safety in Market Areas as women are accompanied by Children	Footpath cum Covered Drains shall be provided in the urban areas, which shall seprate the Pedesterians from Slow Moving Traffic and enhance the safety of Women and Children.
3.	Ponds which are being used for Domestic Purpose Should be Protected from being Polluted	Such Ponds Shall be protected by Providing Silt Fencing, Ditches etc and Stringent Monitoring Shall be carried out during construction Phase. Volume of such ponds shall be maintained.
4.	Drainage and Disposal of Sewage from House Hold	Sewage is being discharged in the drains which are unlined and small

D. INFORMATION DISCLOSURE

465. Environmental assessment reports for ADB projects are intended to be accessible to interested parties and the general public. The SPS 2009 outlines requirements on the required types of environmental reports for disclosure.

VI. ENVIRONMENTAL MANAGEMENT PLAN

A. Objective

470. Objective of the Environmental Management Plan (EMP) is to ensure that the environmental quality of the zone under impact does not deteriorate beyond the expected level due to construction and operation of the project and that appropriate mitigation measures are defined against the anticipated impacts.

471. The EMP comprises a set of measures to be taken in different stages like the design, construction and operation to eliminate, offset or reduce adverse environmental impacts to acceptable levels. Elimination/prevention is possible through elimination of impacts or by avoiding the action or by providing preventive measures. This can also be achieved by reducing the scale of action. Remediation is repairing or restoring particular features of the environment adversely affected by the activity. Offsetting actions means compensating for impacts by providing additions to or substitutes for the affected environment. Apart from prevention and mitigation the EMP also deals with enhancement measures to improve the environmental condition in the immediate surroundings of the project area which shall also be treated as a corporate social responsibility.

472. The Environmental Management Plan (EMP) needs to be implemented right from the conception and should continue till the end. The Plan can be divided into three phases - (a) Design phase (b) Construction phase and (c) Operational phase.

B. Environmental Management Plan (EMP) Matrix

473. The Environmental Management Plan is meant for mitigation/management /avoidance of the negative impacts and the enhancement of the various environmental components along the project roads. For each mitigation measure to be taken, its location, timeframe, implementation and overseeing/supervising responsibilities are lighted in the EMP matrix.A standalone EMPs for all contract packages of the project roads for preconstruction stage, construction stage and operation stage is given in **Appendix 49A to Appendix 58A**.

C. Environment Monitoring Programme

474. The significant physical, biological and social components affected at critical locations serve as wider/overall Performance Indicators. However, the following specific environmental parameters can be quantitatively/qualitatively measured and compared over a period of time and are, therefore, selected as Performance Indicators (PIs) for monitoring because these parameters are critical in assessment of the performance of mitigation measures proposed and evaluation of adequacy / efficacy of the IEE. These are ambient air quality, water quality, noise levels, soil erosion, drainage- cross and lateral, borrow areas, haul roads, construction & labour camps, dumping sites, tree plantation, road accident and worker accidents and animal kill.

475. The Environmental Monitoring Program has been devised for monitoring of vital environmental parameters during construction and operation phases of the project roads and it includes Performance Indicators, parameters, locations of monitoring, protocols used for monitoring, frequency and duration, standards, cost and implementation and supervision agency.

1. Ambient Air Quality

476. The Air Quality parameters viz PM10, PM2.5, SOx, NOx, and CO shall be regularly monitored at locations as given in **Appendix 49B-58B** -Environmental Monitoring Plan. This will help in evaluating the effectiveness of implementation of mitigation measures suggested to control the deterioration of Air Quality in the project area due to construction activities viz sprinkling of water for dust suppression, working of filter bags in hot mix plants, pollution control certificates of vehicles engaged in construction etc. The National Ambient Air Quality Standards, 2009 are given in **Appendix 59.**

2. Water Quality

477. In all the project roads, total 88 ponds are present within 25 m on either side of CL out of which 49 ponds are present at a distance of 0 to 10 m, 5 ponds within 10m to 12m, 17 ponds within 12 m-15 m and 17 ponds beyond 15 m from CL. Out of these, the ponds which are severely affected (based on reclamation and usage of ponds) are very important indicator for checking the effectiveness of EMP for water pollution. The surface water quality shall be tested at these water bodies for parameters specified by CPCB for surface water and class water body shall be classified for use as A, B, C, D, E as given in **Appendix 60**. The class of water body during construction shall be compared with its class prior to start of work given in IEE. If any deterioration is observed remedial measure shall be immediately taken.

478. Ground water quality may be impacted due to oil spills and subsequently due to leaching and is very important P.I. The ground water quality shall be monitored as given in **Appendix 49B-58B** - Environment Monitoring Plan. The Indian Standard Drinking Water Specifications IS:10500 2012 presented in **Appendix 61.**

3. Noise Levels

479. The Noise Levels (Leq, Leq (day), Leq (Night) shall be monitored at locations as given in **Appendix 49B-58B** - Environmental Monitoring Plan. The National Ambient Noise Quality Standards prescribed by CPCB are placed at **Appendix 62.** This performance indicator will help in analyzing the adequacy of mitigation measures, suggested in EMP for noise pollution.

4. Soil Erosion

480. Soil erosion may impact the water quality of ponds, streams, nallah. The deterioration in water quality shall impact the aquatic life and also the human life as ponds along the road are used by communities for bathing and washing purpose. Erosion in the high embankment and approaches to the bridge may endanger the life of road users.

481. Due to above reasons, soil erosion is important P.I. and shall be monitored as given in **Appendix 49B-58B** Environment Monitoring Plan.

5. Drainage

482. The clogging of drains, appendages in nallahs and streams may lead to water clogging resulting in flooding of road in urban sections etc. Cross drains and lateral drains shall be monitored for cleaning before monsoon as given in **Appendix 49B-58B** Environment Monitoring Plan.

6. Borrow Areas

483. Earth is required for construction of road. Opening, operation and closure of borrow areas is inevitable and is among one of the major activity in road development that may affect the components of valued Ecosystem. The borrow areas opening; operation and closure shall be monitored as specified in **Appendix 49B-58B** Environment Monitoring Plan.

7. Haulage Road Network

484. The Haulage roads shall be used by vehicles for bringing construction material and needs to be maintained as bad condition of haulage road may deteriorate the environment and is very important P.I. as given in **Appendix 49B-58B** Environment Monitoring Plan.

8. Construction & Labor Camps

485. The condition of construction camp is very important performance indicator about implementation of EMP like land use of construction camp, soil pollution by way of spills etc. in the camp. The monitoring parameters and frequency are given in **Appendix 49B-58B** Environment Monitoring Plan.

486. The sanitation and overall management of labor camps is a very important performance indicator about implementation of EMP like disposal of wastewater, disposal of domestic waste etc. which may directly affect health of workers in the camp. The monitoring parameters and frequency are given in **Appendix 49B-58B** Environment Monitoring Plan.

9. Dumping of Construction and Allied Waste

487. Dumping of non-usable construction waste in non-environment friendly manner may deteriorate the soil, air quality and water quality of the area. This P.I. shall be monitored as given in **Appendix 49B-58B** Environment Monitoring Plan.

10. Tree Plantation

488. Green belt along the road helps in purification of air and shade along the highways. It provides economic benefits to the village communities by tree produce, harvesting of trees and improved aesthetic to the road users.

489. Out of 62988 trees, nearly 37873 trees are likely to be felled for widening and improvement of project roads. In lieu of these trees are proposed to be planted as Compensatory Afforestation in the ration 1:3 and additional Compensatory Afforestation shall be done @ 1:2 at available spaces along the road to be finalized by Environment expert of CSC in accordance with IRC:SP:21. The survival rate of plants shall be monitored in accordance with Uttar Pradesh State Forest Department Guidelines. The monitoring parameters and frequency are given in **Appendix 49B-58B** Environment Monitoring Plan.

11. Roads Accident & Workers' Accident

490. All traffic control and safety measures as per IRC guidelines like provision of signs, barricades, pavement markings, lights and flagmen along with a traffic diversion plan reduce the risk of roads accident during construction phase which serve as a very important performance indicator for checking the effectiveness of EMP.

491. Safety of workers undertaking various operations during construction has to be ensured

by providing helmets, masks, safety goggles, etc. which aid in preventing any mishap at work place and act as an important performance indicator for measuring the adequacy of EMP.

492. The monitoring parameters and frequency w.r.t above are given in **Appendix 49B-58B** Environment Monitoring Plan.

12. Animal Kill

493. Two locations along Bulandshahar and Anoopshahar road (km 23.200 to km 23.400 & km 47 to km 48) are monkey menace locations where temples exist as people offer food materials as religious offerings to monkeys. This practice has made the locations accident prone and risky for the monkeys. Warning sign boards, Big Information sign boards and Rumble strips shall be provided to avoid these accidents and act as an important performance indicator for checking the effectiveness of EMP. The details of monitoring are given in **Appendix 49B-58B** Environment Monitoring Plan.

13. Poaching of Avifauna

494. Migratory birds are found in Baknai Badaila Jheel near Mohanlalganj-Maurawan Unnao roadfrom km 46.900 to km 47.500. Cautionary boards and informatory sign boards shall be provided during construction to prevent workmen from poaching of avifauna which will act as an important indicator of EMP performance.The monitoring parameters are given in **Appendix 49B-58B** Environment Monitoring Plan.

D. Environment Enhancement measures

1. Enhancement of ponds

495. 89 ponds are present along the eight project roads out which 9 ponds are selected for enhancement. Number of ponds to be enhanced along each project road is given in **Table VI-1.** The criteria of selection and various enhancement measures are detailed in section below.

Table VI-1: Enhancement of ponds along project roads

Sl. No.	Road stretches	Total ponds	No. to be enhanced
1	MDR 82W (ND)	5	1
2	MDR 58W (BA)	2	1
3	MDR 135W (MB)	6	1
4	MDR 81C (HA)	18	2
5	MDR 66E (HK)	18	0
6A	ODR 24 (KN)	5	0
6B	MDR 25E (KB)	8	2
7	MDR 52 C (MM)	27	2
8	MDR 45W (AS)	0	0
	Total	**89**	**9**

Source: PPTA Primary Survey

a. Inclusion criteria

- Ponds which are too shallow to retain water as the water gets lost due to evaporation
- Ponds which are getting clogged with aquatic floral species

- The ponds which are not used for waste dumping
- Ponds which are used by the community regularly
- Ponds which are getting directly affected

b. Design

496. Detailed provisions shall be decided by the contractor and approved by the supervision consultant/ PWD based on specific site conditions. However, few suggested provisions are as given below:

- The pond shall be provided with earthen embankment along with stone pitching on the inner slope and turfing on the outer slope
- In case the inner slope is gentler than 1:2 multiple rows of plantation shall be done
- Seating arrangement like benches shall be provided
- Provision of solar lighting

497. A schematic layout of pond depicting proposed enhancement measures is shown in Fig. 1.

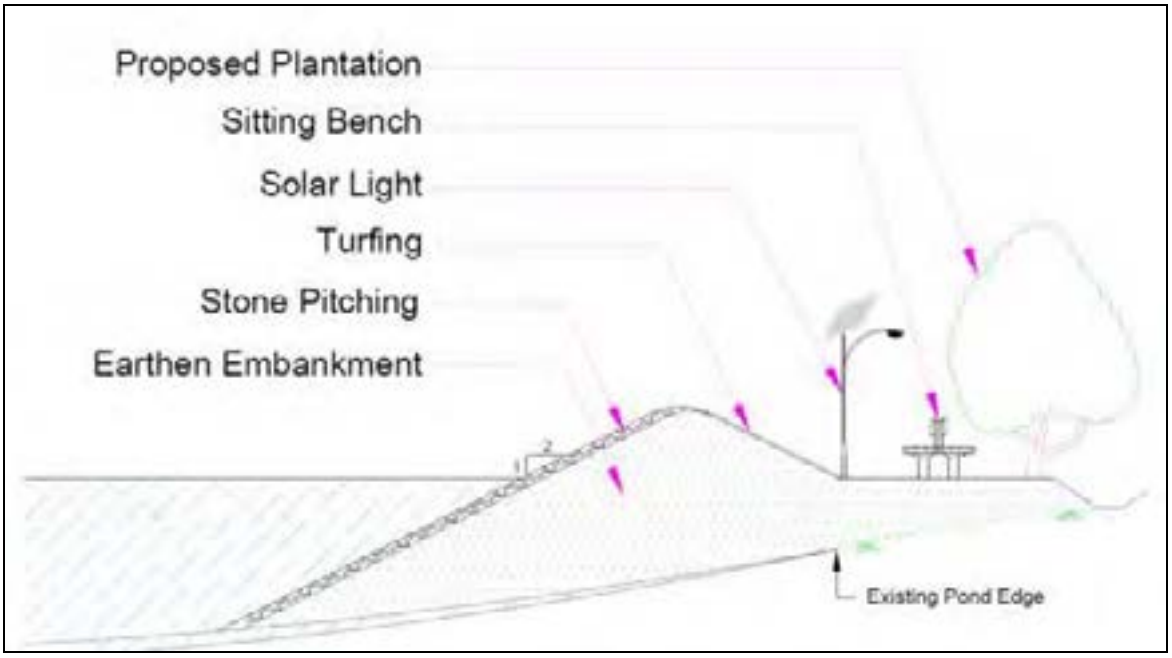


Fig. V.1: Schematic layout of enhancement measures proposed for Pond

2. Enhancement of Hand pumps

498. To avoid loss of surplus water withdrawn from hand pump during community use, a soak pit shall be built adjacent to these hand pumps. The hand pumps identified for enhancement are given in **Table VI-2** and detailed list is given in **Appendix 12** and **14** to **20** of **Chapter III.**

Table VI-2: Enhancement of Hand pumps along Project Roads

Sl. No.	Road stretches	Total hand pumps	No. to be enhanced
1	MDR 82W (ND)	104	72
2	MDR 58W (BA)	121	76
3	MDR 135W (MB)	129	69
4	MDR 81C (HA)	215	134
5	MDR 66E (HK)	466	371
6A	ODR 24 (KN)	207	173
6B	MDR 25E (KB)	302	291
7	MDR 52 C (MM)	153	141
8	MDR 45W (AS)	143	122
	Total	**1840**	**1449**

Source: PPTA Primary Survey

a. Criteria for inclusion

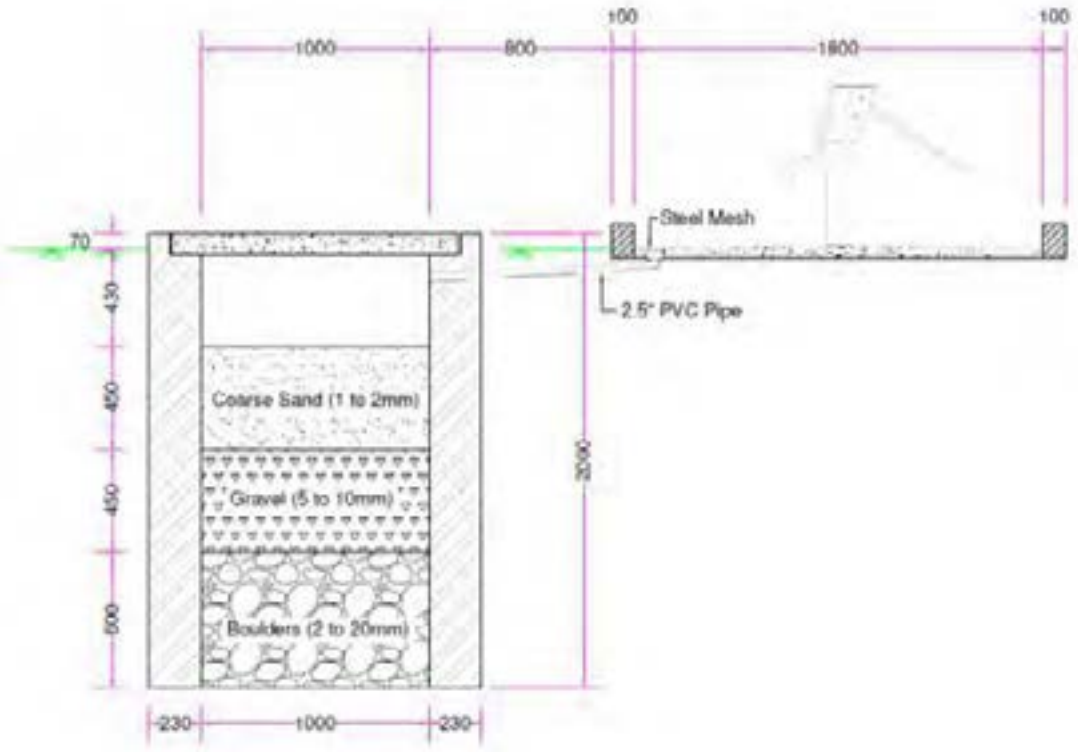
499. The hand pumps to be relocated or falling within 10 m from the center line in open areas and within building line in built up areas and not abandoned have been identified to be enhanced after relocation or insitu.

b. Design details

500. The water collected in the cemented platform will pass through a steel mesh and will be directed to the soak pit by a 2.5” diameter PVC pipe. The soak pit is designed to be 2.0 m deep and have 1.0 m radius.

501. The filter bed consists of 0.45 m thick coarse gravel (1mm to 2mm) underlain by 0.45 m thick gravel layer (5 mm to 10 mm). The lowermost layer is 0.6 m thick layer of boulders (2 mm to 20 mm). The pit will be covered with a 0.07 m thick concrete removable slab. This combination would achieve a percolation rate of 5 m/day and a collection area of 0.43 cum at the top of filter bed (**Fig. 2).**

Fig 2: TCS of Soak pit for Hand pumps



E. Organizational set- up of implementing agency

502. Public Works Department of the Government of Uttar Pradesh is the implementing agency for the proposed project. The Project Implementation Unit (PIU) at HQ level under the domain of the Public Works Department, Government of Uttar Pradesh has been mandated with execution of the Project. Presently the Engineering and technical wing of the UPPWD is headed by the Engineer in Chief at head quarter level supported by the Superintendent Engineer and Executive Engineer at Circle and Division level respectively. Currently the UPPWD does not have in house Environmental expert to supervise the environmental safeguard during execution of the road construction work.

1. Proposed Institutional Arrangement

503. UPPWD, as the Project Executing Agency, shall be responsible for overall implementation of the project, and shall perform its obligations as set forth herein and the Project Agreement through Government of Uttar Pradesh. A dedicated safeguards team for implementation of safeguards for all sub-projects under UPPWD shall be appointed. The team will be headed by the Executive Engineer at the concerned Project Implementation Unit (PIU) at field level. A construction supervision consultant (CSC) firm shall be recruited to supervise and administer civil works contracts and to ensure the works are executed in accordance with the technical specifications and contract conditions including implementation of Environmental Management Plan. The CSC team will include Environmental specialist and R&R specialist. Roles and responsibilities of ADB, UPPWD, CSC and Contractor involved in implementation of EMP have been outlined in **Table VI-3.**

Table VI-3: Roles and Responsibilities

S. No.	Agency	Responsibility
1	**UPPWD Responsibilities**	• Ensure that the project complies with the ADB's SPS, 2009 and Government of India/ Government of Uttar Pradesh Laws and regulations applicable for the project. • Ensure that contract documents include all relevant parts of the IEE, EMP and project agreements. • Ensure that sufficient funds are available to properly implement all agreed environmental safeguards measures for the project. • Obtain all statutory clearances, permissions and NOCs applicable for the Project. • Review and approve the Contractor's implementation Plan with recommendation of Supervision Consultant for the environmental measures, as suggested in the EMP. • Review the environmental performance of the project through an assessment of the annual environmental monitoring reports submitted by the PWD • Overall project coordination and management through PIU and CSC • Submit Annual Safeguards monitoring reports to ADB and its closure • Ensure updating of the EMP if any new or unanticipated environmental impacts occur during project implementation due to change in design. • Interact with the Environmental Expert of the Supervision Consultant on the state of the environment and mitigation and enhancement measures adopted; • Ensure that sufficient funds and resources are available for implementation of environment safeguards
2	**CSC Responsibilities**	• Review and update the Environmental Management Plan prior to Start of Work. • Development of Site Specific Checklist for Environment Safeguards • Supervision of implementation of environmental safeguards • Completion of monitoring checklists monthly. • Close coordination and communication with the contractor to facilitate implementation of all mitigation measures identified in EMP. • Review of Monthly Compliance Report Submitted by Contractor and also preparing Environment Safeguard Compliance Report independently after Six Month. • Provide technical support and advise for addressing complaints and grievances • Conducting Training for Engineers of UPPWD, Supervision Consultant and Contractors • Provide technical advice and on the job training to the contractors as necessary • Preparation of annual monitoring reports based on the

S. No.	Agency	Responsibility
		monitoring checklists, monitoring report and submission to UPPWD for further submission to ADB • Review and approve updated/revised contract specific EMP's if an new or unanticipated environmental impacts occur during project implementation due to design change or other reasons. • Closely coordinate and communicate with the contractor to facilitate implementation of all mitigation measures identified in EMP • Conduct training and awareness programs on implementation of environment safeguards for UPPWD, PIU and the contractors during the pre-construction stage and further organize on the job or subject specific training for the contractor during project implementation as necessary • Facilitate effective implementation of the Grievance Redress Mechanism in accordance with the steps given in Figure 4 to address affected people's concerns and complaints, promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people; • Verifying the Monthly Environment Safeguards Reports submitted by the Contractor. • Preparing Semi-Annual monitoring reports independently for all sub-projects on the implementation of EMPs for submission to PIU and UPPWD and further submission to ADB for disclosure on the ADB website.
3	**Contractor's Responsibilities**	• Responsible for the physical implementation of the mitigation measures proposed in the Environmental Management Plans (EMP) associated with the construction activities at the construction site. • Responsible for implementation of the Environmental Monitoring Program (EMOP) on collection of environmental quality data. Prepare contract package specific (EMOP) for approval by the CSC and/or PIU before the start of physical works. • Contractor Shall nominate one Person responsible for implementation of Environment Safeguards and ensure that daily inspections are carried out for Compliance of Environment Safeguards. • Ensure that adequate budget provisions are made for implementing all mitigation measures specified in the EMP and EMOP • Participate in induction training on EMP provisions and requirements delivered by the PIU • Obtain necessary consent to operate for Hot Mix Plant, Batching Plant, WMM Plant , Applicable permits for projects and other relevant permissions from relevant agencies for associated facilities for project road works, quarries, hot-mix plant etc. prior to commencement of civil works contracts • Implement all mitigation measures in the EMP • Ensure that all workers, site agents, including site supervisors

S. No.	Agency	Responsibility
		and management participate in training sessions delivered by CSC. • Contract • Ensure compliance with contractual obligations • Collect the baseline data on environmental quality before the start of physical works and continue collection of environmental quality data as given in the Environmental Monitoring Plan during construction phase. • Participate in resolving issues as a member of the GRC • Respond promptly to grievances raised by the local community or and implement corrective actions.
4	**ADB's Responsibilities**	• Review Rapid Environmental Assessment (REA) checklist and endorse or modify the project classification proposed by the UPPWD; • Review IEE reports, including this environmental assessment and review framework, and disclose draft and final reports through ADB's website as required; • Issue subproject's approval based on the respective IEE reports; • Monitor implementation of environment safeguard requirements under the project through due diligence missions; • Provide assistance to UPPWD, if required, in carrying out its responsibilities for implementing environment safeguards and for building capacity for safeguard compliance; • Review and approve annual environmental monitoring reports submitted by UPPWD and disclose them on the ADB website • Monitor UPPWD's commitments under EARF

2. Monitoring and Reporting System

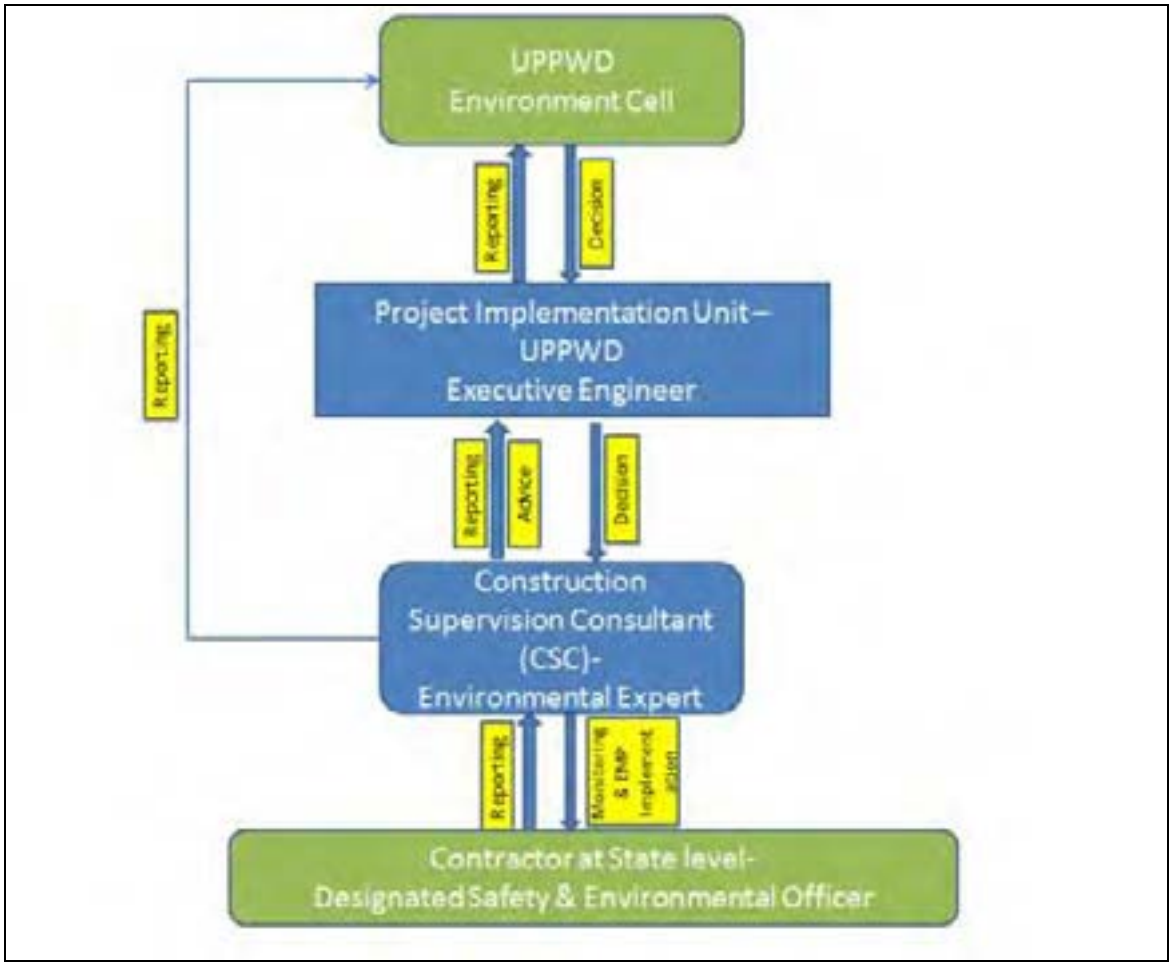
504. For effective implementation of Environment Safeguards, one engineer shall be designated as environment safeguard specialist at PIU HQ level , who will be monitoring the compliance of Environment Safeguards for the Projects and shall be assisted by the Environment Expert of CSC. At Field level - PIU, One Assistant Engineer shall be designated as EHS Officer , who along with environment specialist of CSC shall discharge the duties / responsibility as outlined in the EMP and EMOP and shall help the Engineer in approving various plans like location and lay out of Labor camps, Construction Yard , Haulage road network in line with IEE and EMP.

505. Contractor shall designate One Engineer as EHS officer who will be responsible for implementation of EMP's and EMOP's.

506. Contractor shall submit the Self certified Monitoring Report every month to CSC, who shall verify the Compliances of Environment Safeguards in Monitoring Report and advice / direct the contractor for preventive or remedial actions if required. The CSC shall submit the monitoring report verified by him to the Executive Engineer at PIU Field level for review. In addition to this CSC shall carry out Independent monitoring of compliance of Environment Safeguards every six month and submit the report to Executive Engineer of PIU Field level. PIU Field Level and CSC shall compile the Monitoring Reports every six month and shall send to PIU HQ level for review. The PIU HQ level shall sent Annual Monitoring Report to ADB

annually.

Fig. 3: Flowchart showing Institutional Setup for Implementation of EMP



F. Institutional Capacity Building

507. The existing limited implementation capacity can affect environmental outcomes despite safeguard provisions. The dearth in capacity will be addressed through enhanced technical assistance and training. Training programmes in Environmental Safeguard have been suggested at Headquarter level & Project Road Execution level for Engineers of PWD, Construction Supervision Consultant & Contractors and on-site training for workers directly involved in construction to improve environmental awareness, construction practices, legislative compliance requirements, EMP & EMoP implementation requirements and roles and responsibilities. The training and awareness programme is planned and is given in **Table VI-4.**

Table VI-4: Training and Awareness Programme

Sl. No.	Training Recipients	Mode of Training	Environmental Aspects to be covered in training modules	Training Conducting Agency
Module for Orientation Training				
SESSION-I				
Module-I	PWD engineers at HQ and Project Road Execution level, Construction Supervision Consultant's (CSC) Engineers, Contractor's Engineers & Environment Specialists and Select NGOs.	Lecture, Presentation &Interaction Session	Environmental Overview: Environmental Regulations & Project related provisions of various Acts/ Guidelines, & ADB's Safeguards Policy Statement 2009	ADB/ Environment Expert of Construction Supervision Consultant (CSC)
Module-II	PWD Engineers at HQ & Project Road Execution level, CSC's Engineers and Contractor's Engineers & Environment Specialists	Lecture Sessions, Workshops & Seminar	Environmental Impact Assessment: Road Projects & Environmental Issues EIA Process and Methodology	ADB/ Environment Expert of CSC
Module-III	PWD Engineers at HQ & Project Road Execution level, CSC's Engineers and Contractor's Engineers & Environment Specialists	Lecture Sessions, Workshops & Presentation	Environmental Management Plan for Road Projects with Special emphasis on Contract Clauses Viz a Viz EMP	ADB/ Environment Expert of CSC
SESSION –II				
Module-IV	PWD Engineers at HQ & Project Road Execution level, CSC's Engineers and Contractor's Engineers & Environment Specialists	Lectures; Group Discussions	Environmental Issues in the Project	Environment Expert of CSC
Module-V	PWD Engineers at HQ & Project Road Execution level, CSC's Engineers and Contractor's Engineers & Environment Specialists	Lectures; Demonstration sessions; Group Discussions	Environmentally Sound Construction Practices and International Best Practices& Environmentally Sustainable operations of Roads	Environment Expert of CSC
Module-VI	PWD Engineers at HQ & Project Road Execution level, CSC's Engineers and Contractor's Engineers & Environment Specialists	Lectures; Group Discussions	Environmental Monitoring Including Environmental Monitoring Plan, Parameters for Monitoring, Frequency and filling up of Reports	Environment Expert of CSC
Module for Training during Construction				
Module-I	PWD Engineers at Project Road Execution level, CSC's Engineers and Contractor's Engineers & Environment Specialists	Lectures, Presentation, Group Discussions, Workshop	Implementation of Environment Management Plan, and Corrective Actions required	Environment Expert of CSC
Module-II	PWD Engineers at Project Road Execution level, CSC's Engineers, Contractor's Engineers & Environment Specialists and Workers	Lecture Sessions, Workshops & Practical on site	Environmental Friendly Construction Methodology and Workers Safety during Construction	Environment Expert of CSC
Module-III	Local Public/ Contractor's	Workshops &	Awareness programmes on	Environment

Sl. No.	Training Recipients	Mode of Training	Environmental Aspects to be covered in training modules	Training Conducting Agency
	Workers	Practical on site	Environmental protection and enhancement measures being implemented by UPPWD and their role in sustaining the measures taken for noise pollution, air pollution, safety, soil conservation and agricultural productivity enhancement.	Expert of CSC
Module for Training before Contractor Demobilization				
Module-I	PWD engineers involved in construction, Staff of CSC, Engineering staff of Contractor	Lecture Sessions, Workshops & Presentation at site	Restoration of Sites viz. Borrow areas, Construction Camps, Crushing units, HMP etc.	Environment Expert of CSC
Module-II	PWD engineers involved in construction, Staff of CSC, Engineering staff of Contractor	Lecture Sessions, Workshops & Presentation	Reporting Formats/Procedure for Restoration	Environment Expert of CSC

Source: PPTA Consultant

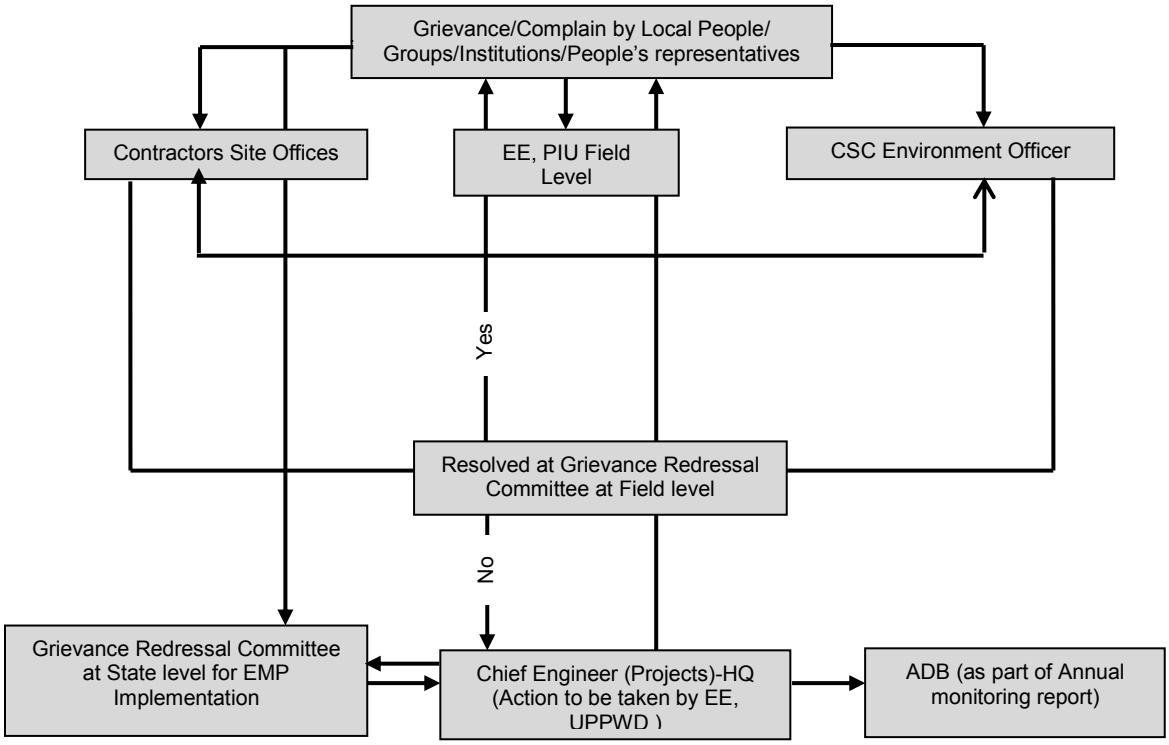
G. Grievance Redressal Mechanism

508. The project specific grievance redress mechanism (GRM) will be established to receive, and facilitate the resolution of displaced people's concerns, complaints and grievances about the social and environmental performance at the project level. The GRM will aim to provide a time bound and transparent mechanism to voice and resolve social and environmental concerns linked with the project. The project specific GRM is not intended to bypass the government's own redress process, rather it is intended to address project affected people's concerns and complaints promptly, making it readily accessible to all segments of affected persons and is scaled to the risks and impacts of the project. Hence, depending on the nature and significance of the grievances or complaints, the GRM will comprise procedures to address grievances at the project site level and UPPWD level. More serious complaints which cannot be addressed at the UPPWD level will be forwarded to the respective Grievance Redress Committee (GRC).

509. The project-specific GRM is not intended to bypass the government's own redress process. The GRM will consist of 2 levels, a Field-level GRC and a State-level GRC. Field level GRC will comprise of the: i) Executive Engineer, PIU; ii) Focal Safeguards Person, PIU; iii) Environment Expert from the CSC; iv) Expert from the CSC; v) A representative from AP community. The State level GRC will comprise of the: i) Executive Engineer, UPPWD; ii) Safeguards Project Officer, UPPWD Central; iii) Resettlement Consultant to UPPWD; iv) Environment Expert from the CSC; v) Resettlement Expert from the CSC.

510. Resolutions of grievances or the decision to elevate to the state –level will be completed no later than 30 calendar days from receipt and in another 30-calendar days for final resolution.

Fig. 4: Flow Diagram Showing Grievance Redress Mechanism



H. Environmental Management Budget

511. Environmental budget of INR 401.79 millions has been drawn up for all the project roads which are given in **Table VI-5**. This provides for compensatory plantation, enhancement of sites, and cost of monitoring. This amount has been integrated into the budget. The detailed budget for each project road is provided in **Appendix 63.**

Table VI-5: Environment Budget of the Project Roads

Sl. No.	Road stretches	Environment Budget (INR in Millions)
1.	Nanao to Dadao (MDR 82W)	66.94
2.	Bulandansharar to Anupshahar (MDR 58W)	20.74
3.	Muzzaffarnagar to Baraut (MDR 135W)	62.30
4.	Hussainganj to Alipur Marg (MDR 81C)	48.52
5.	Haliyapur to Kurebhar to Bilwai (MDR 66E)-Pkg I	28.59
6.	Haliyapur to Kurebhar to Bilwai (MDR 66E)-Pkg II	44.97
7.	Kaptanganj to Naurangiya (ODR 24)	29.63
8.	Kaptanganj to Rudrapur (MDR 25E)	47.40
9.	Mohanlaganj to Maurawan Unnao Marg (MDR 52C)	43.52
10.	Aliganj-Soron Marg (MDR 45W)	37.76
	Total (INR in Millions)	**401.79**

Source: PPTA Consultant

VII. CONCLUSION AND RECOMMENDATIONS

512. Potential impacts of the sub project roads are not found to be significant as improvement and widening has been restricted within RoW and the alignments are not passing through any ecologically sensitive areas.

513. Findings of the IEE states that improvement and widening of the project roads shall have long term positive impact on road safety, environmental and socio economic conditions. For instance reduction in air and noise pollution due to reduced pavement roughness, protection and enhancement of water bodies, improved mobility & accessibility to health / educational institutions, agricultural markets and work places that would lead to socio economic upliftment and opening up of new investment opportunities.

514. Nature of adverse impacts on valued environmental components (VECs) was majorly found to be short term, localized and reversible for example air, noise and water pollution, soil compaction, erosion and contamination anticipated during construction due to limited construction activity. GHG emission estimated from construction activities and vehicular operations were found to be within the threshold of 100,000 tons of CO2 per year as set by ADB. Impacts that are identified as irreversible are at the same time mitigable for example compensatory afforestation and avenue plantation based on availability of space shall be done as reparation for trees to be felled. Also reclaimed areas of stagnant water bodies shall be compensated by deepening the ponds and increasing their volumetric capacity. EMP has been prepared for offsetting / mitigating the negative impacts to acceptable level. Further, Environment Monitoring Programme (EMoP) has been developed to check adequacy of IEE and effectiveness of implementation of EMP.

515. It is recommended that if sub-projects are implemented complying the ADB's Safeguard Policy 2009 and EMP & EMoP are implemented in true spirit effectively, then project shall have vast more positive impacts which will be long term with enhanced road safety, increased tree cover and overall improvement of environment quality which will further act as catalyst for economic and social development of backward areas of State of Uttar Pradesh.

APPENDIX 1: RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Table 1: REA Checklist for Nanau-Dadon - MDR 82W

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	No cultural heritage in or nearby the project road
Protected Area	X		No National Park or Wildlife Sanctuary. However, existing ROW declared as road side protected forest
Wetland	√		The Upper Ganga River (Brijghat to Narora Stretch) is that Ramsar Site located in Uttar Pradesh. The Bulandshahar- Anoopshahar- (MDR 58W) road is outside the wetland boundary of Ramsar site and the nearest point is junction of Anoopshahar at km 39.700 which is 900m away from the wetland boundary
Mangrove		X	No mangrove areas
Estuarine		X	No estuarine system
Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 10 km radius
Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause…			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?	X		No encroachment on historical /cultural areas. Some religious structures that have encroached on the existing ROW may be removed Since road widening will be confined to existing RoW, no change in landscape is expected. The topography of project road is mainly plain. Filling materials shall be procured from nearby already approved queries only. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve in around the project road.
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		X	Project road cross the Kali Nadi at 6.910 km. However, no alternation in hydrology of Kali Nadi is expected due to project. A temporary soil bund will be provided around the construction site to avoid any sedimentation in nearby streams during rainfall.

Screening Question	Yes	No	Remark
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of Septic Tank with soak pit will be provided in construction camps.
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limted for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimise the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction.
Dislocation or involuntary resettlement of people		X	No new land acquisition involved as the proposed widening shall be within the EROW. Some squatters may have to be resettled as per the prevailing policies of ADB & governments.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission upto negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of septic tank with soak pit shall be kept in labor camp areas. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Widening of the road shall be limited for existing ROW only. Road side squatters will be compensated as per ADB SPS.
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, speed breakers will be constructed close to sensitive locations such as schools, temples or hospitals.
Increased noise and air pollution resulting from traffic volume?	X		Speed control and Noise barriers shall be provided in sensitive areas and settlements. Green-tunnel along the road will also be provided.

Screening Question	Yes	No	Remark
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	X		Provision of both side drains will reduce the risk of surface water pollution due to fuel spills on the road.

Table 2: REA Checklist for Bulandshahar-Anupshahar - MDR 58W

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	No cultural heritage in or nearby the project road
Protected Area		X	No National Park or Wildlife Sanctuary.
Wetland		X	No wetland in project road
Mangrove		X	No mangrove areas
Estuarine		X	No estuarine system
Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 10 km radius
Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		X	No encroachment on historical /cultural areas. Some religious structures that have encroached on the EROW may be removed Since road widening will be confined to available ROW, no change in landscape is expected. The topography of project road is mainly plain. Filling materials shall be procured from nearby already approved queries only. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve in around the project road.
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		X	Project road cross the irrigation Nallahs at many places. However, no alternation in hydrology is expected due to project. A temporary soil bund will be provided around the construction site to avoid any sedimentation in nearby streams during rainfall.
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of Septic Tank with soak pit will be provided in construction camps.

Screening Question	Yes	No	Remark
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limited for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimise the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction. But blasting work shall not be involved.
Dislocation or involuntary resettlement of people		X	No new land acquisition involved as the proposed widening shall be within the EROW. Some squatters may have to be resettled as per the prevailing policies of ADB & governments.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission up to negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of septic tank with soak pit shall be kept in labour camp areas. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Widening of the road shall be limited for existing ROW only. Road side squatters will be compensated as per ADB & Government policies.
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, speed barriers, crash barriers will be constructed close to sensitive locations such as schools, temples or hospitals.
Increased noise and air pollution resulting from traffic volume?	X		Speed control and Noise barriers shall be provided in sensitive areas and settlements. Green-tunnel along the road will also be provided.
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	X		Provision of both side drains will reduce the risk of surface water pollution due to fuel spills on the road.

Table 3: REA Checklist for Muzaffarnagar-Baraut Section of MDR 135W

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	No cultural heritage in or nearby the project road
Protected Area	X		No National Park or Wildlife Sanctuary. However, existing ROW declared as road side protected forest
Wetland		X	No wetland in project road
Mangrove		X	No mangrove areas
Estuarine		X	No estuarine system
Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 10 km radius
Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause…			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?	X		No encroachment on historical /cultural areas. Some religious structures that have encroached on the existing ROW may be removed. Since road widening will be confined to existing RoW, no major change in landscape is expected. The topography of project road is mainly plain. Filling materials shall be procured from nearby already approved queries only. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve in around the project road.
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		X	Though, project road cross the Hindon and Krishna River at Chainage No. 30.100 and 51.700 km but no alternation in hydrology is proposed due to project. Silt fencing will be provided around the construction site to avoid any sedimentation in nearby streams during rainfall.

Screening Question	Yes	No	Remark
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of STP / Mobile Disposal facility in construction camps.
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limited for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimise the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction.
Dislocation or involuntary resettlement of people		X	No new land acquisition involved as the proposed widening shall be within the Existing ROW. Some squatters may have to be resettled as per the prevailing policies of ADB & governments.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission upto negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of STP / Mobile disposal facility shall be kept in labor camp areas. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Widening of the road shall be limited for existing ROW only. Road side squatters will be compensated as per ADB SPS.
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, speed breakers, etc. will be constructed close to sensitive locations such as schools, temples or hospitals.
Increased noise and air pollution resulting from traffic volume?	X		Speed control and Noise barriers shall be provided in sensitive areas and settlements. Green-tunnel along the road will also be provided.

Screening Question	Yes	No	Remark
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	X		Provision of drain will reduce the risk of surface water pollution due to fuel spills on the road.

Table 4: REA Checklist for Haliyapur-Kurebhar-Bilwai - MDR 66E

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	No cultural heritage in or nearby the project road
Protected Area		X	No National Park or Wildlife Sanctuary.
Wetland		X	No wetland in project road
Mangrove		X	No mangrove areas
Estuarine		X	No estuarine system
Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 10 km radius
Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		X	No encroachment on historical /cultural areas. Some religious structures that have encroached on the EROW may be removed Since road widening will be confined to available ROW, no change in landscape is expected. The topography of project road is mainly plain. Filling materials shall be procured from nearby already approved queries only. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve in around the project road.
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		X	No alteration of streams is expected in the course of irrigation nallah, crossed by the road. A temporary soil bund will be provided around the construction site to avoid any sedimentation in nearby streams during rainfall.
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of Septic Tank with soak pit will be provided in construction camps.

Screening Question	Yes	No	Remark
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limited for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimise the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction. No blasting is involved in proposed development work.
Dislocation or involuntary resettlement of people		X	No new land acquisition involved as the proposed widening shall be within the Existing RoW. Some squatters may have to be resettled as per the prevailing policies of ADB & Law of lands.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission up to negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of septic tank with soak pit shall be kept in labour camp areas. Solid waste management plan will take place during construction phase. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Widening of the road shall be limited for existing ROW only. Road side squatters will be compensated as per ADB & Government policies.
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, speed barriers, etc. will be constructed close to sensitive locations such as schools, temples or hospitals.
Increased noise and air pollution resulting from traffic volume?	X		Speed limit signage and Noise barriers shall be provided in sensitive areas and settlements.
Increased risk of water pollution from oil, grease and fuel spills, and other	X		Provision of both side drains will reduce the risk of surface water pollution due to

Screening Question	Yes	No	Remark
materials from vehicles using the road?			fuel spills on the road.

Table 5: REA Checklist for Hussainganj to Alipur - MDR 81C

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		X	No cultural heritage in or nearby the project road
▪ Protected Area		X	No National Park or Wildlife Sanctuary. However, existing ROW declared as roadside protected forest
▪ Wetland		X	No wetland in project road
▪ Mangrove		X	No mangrove areas
▪ Estuarine		X	No estuarine system
▪ Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 10 km radius
▪ Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		X	No encroachment on historical /cultural areas. Some religious structures that have encroached on the EROW may be removed Since road widening will be confined to available ROW, no change in landscape is expected. The topography of project road is mainly plain. Filling materials shall be procured from nearby already approved queries only. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve in around the project road.
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		X	Project road cross the irrigation Nallahs at many places. However, no alternation in hydrology is expected due to project. A temporary soil bund will be provided around the construction site to avoid any sedimentation in nearby streams during rainfall.

Screening Question	Yes	No	Remark
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of Septic Tank with soak pit will be provided in construction camps.
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limited for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimise the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction. But blasting work shall not be involved.
Dislocation or involuntary resettlement of people		X	No new land acquisition involved as the proposed widening shall be within the EROW. Some squatters may have to be resettled as per the prevailing policies of ADB & governments.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission up to negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of septic tank with soak pit shall be kept in labour camp areas. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Widening of the road shall be limited for existing ROW only. Road side squatters will be compensated as per ADB & Government policies.
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, speed barriers, crash barriers will be constructed close to sensitive locations such as schools, temples or hospitals.

Screening Question	Yes	No	Remark
Increased noise and air pollution resulting from traffic volume?	X		Speed control and Noise barriers shall be provided in sensitive areas and settlements. Green-tunnel along the road will also be provided.
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	X		Provision of both side drains will reduce the risk of surface water pollution due to fuel spills on the road.

Table 6: REA Checklist for Kaptanganj to Naurangia (ODR 24) and Kaptanganj to Rudrapur (MDR 25E)

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	No cultural heritage in or nearby the project road
Protected Area		X	No National Park or Wildlife Sanctuary.
Wetland		X	No wetland in project road
Mangrove		X	No mangrove areas
Estuarine		X	No estuarine system
Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 1.0 km from project road
Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		X	No encroachment on historical /cultural areas. Some religious structures that have encroached on the Existing RoW may be removed Since road widening will be confined to available ROW, no change in landscape is expected. The topography of project road is mainly plain. Filling materials shall be procured from nearby already approved queries only. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve within 1.0 km from the project road.

Screening Question	Yes	No	Remark
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		X	No alteration of streams is expected in the course of irrigation nallah, croosed by the road. A temporary soil bund will be provided around the construction site to avoid any sedimentation in nearby streams during rainfall.
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of Septic Tank with soak pit will be provided in construction camps.
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limited for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimise the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction. No blasting is involved in proposed development work.
Dislocation or involuntary resettlement of people		X	No new land acquisition involved as the proposed widening shall be within the EROW. Some squatters may have to be resettled as per the prevailing policies of ADB and Law of lands.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission up to negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of septic tank with soak pit shall be kept in labour camp areas. Solid waste management plan will take place during construction phase. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Widening of the road shall be limited for existing ROW only. Road side squatters will be compensated as per ADB policies and Law of Lands.

Screening Question	Yes	No	Remark
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, speed barriers will be constructed close to sensitive locations such as schools, temples or hospitals.
Increased noise and air pollution resulting from traffic volume?	X		Speed control and Noise barriers shall be provided in sensitive areas and settlements.
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	X		Provision of both side drains will reduce the risk of surface water pollution due to fuel spills on the road.

Table 7: REA Checklist for Mohanlalganj to MaurawanUnnao Marg – MDR 52C

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	No cultural heritage in or nearby the project road
Protected Area		X	No National Park or Wildlife Sanctuary.
Wetland		X	No wetland in project road
Mangrove		X	No mangrove areas
Estuarine		X	No estuarine system
Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 1 km radius
Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		X	No encroachment on historical /cultural areas. Some religious structures that have encroached on the Existing ROW may be removed Since road widening will be confined to available ROW, no change in landscape is expected. The topography of project road is mainly plain. Filling materials shall be procured from nearby already approved queries only. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve in and around the project road.
Alteration of surface water hydrology of waterways crossed by roads, resulting		X	No alteration of streams is expected due to proposed development activities.

Screening Question	Yes	No	Remark
in increased sediment in streams affected by increased soil erosion at construction site?			A temporary soil bund will be provided around the construction site to avoid any sedimentation in nearby streams during rainfall.
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of Septic Tank with soak pit will be provided in construction camps.
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limited for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimise the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction. No blasting is involved in proposed development work.
Dislocation or involuntary resettlement of people		X	No new land acquisition involved as the proposed widening shall be within the Existing RoW. Some squatters may have to be resettled as per the prevailing policies of ADB & Law of lands.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission up to negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of septic tank with soak pit shall be kept in labour camp areas. Solid waste management plan will take place during construction phase. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Widening of the road shall be limited for existing ROW only. Road side squatters will be compensated as per ADB & Government policies.

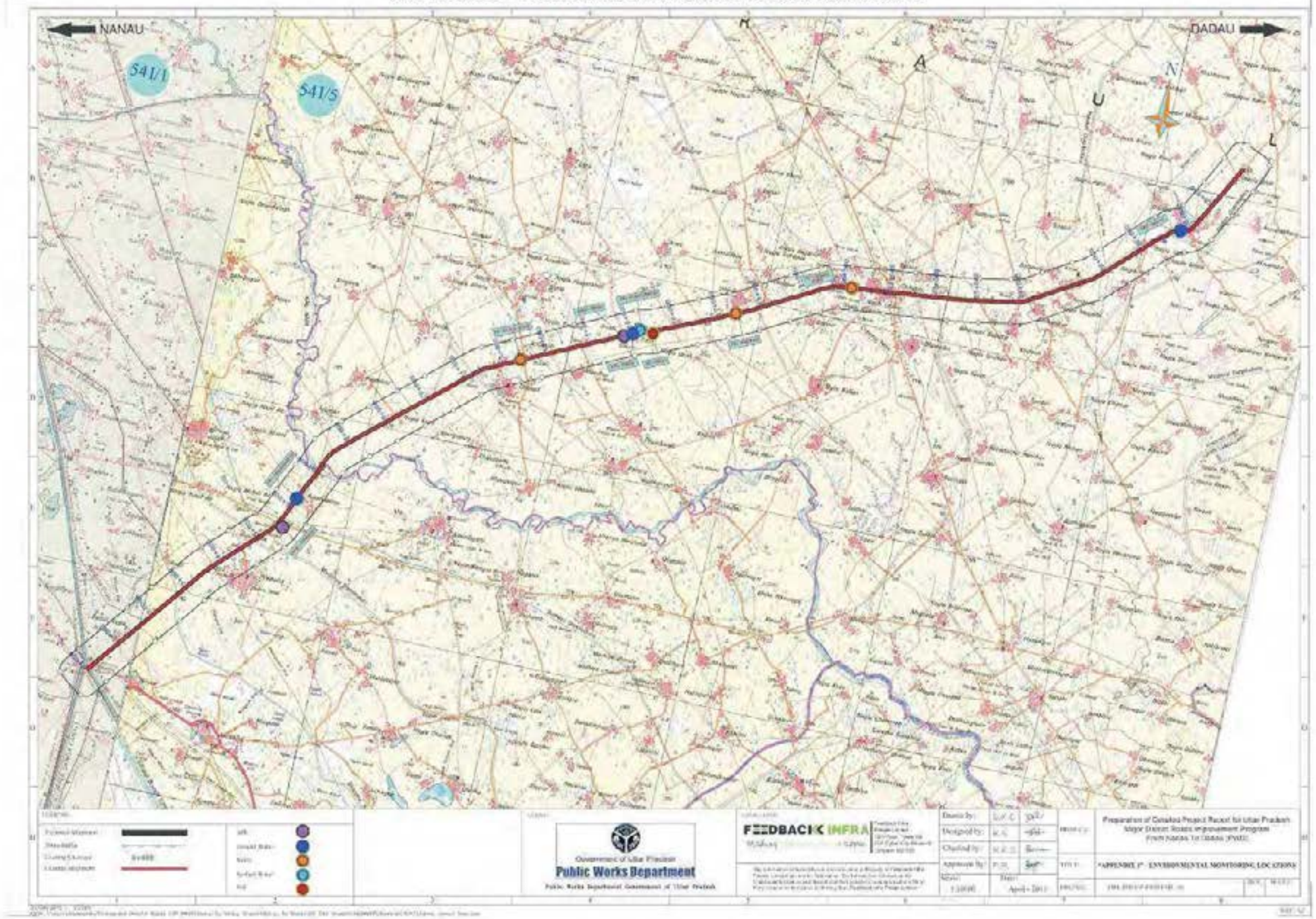
Screening Question	Yes	No	Remark
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, rumble strip, etc. will be constructed close to sensitive locations such as schools, temples or hospitals.
Increased noise and air pollution resulting from traffic volume?	X		Speed limit signage and Noise barriers shall be provided in sensitive areas and settlements.
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	X		Provision of both side drains will reduce the risk of surface water pollution due to fuel spills on the road.

Table 8: REA Checklist for Aliganj-SoronMarg – MDR 45W

Screening Question	Yes	No	Remark
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		X	No cultural heritage in or nearby the project road
Protected Area	X		No National Park or Wildlife Sanctuary.
Wetland		X	No wetland in project road
Mangrove		X	No mangrove areas
Estuarine		X	No estuarine system
Buffer zone of protected area		X	No National Park or Wildlife Sanctuary in 10 km radius
Special area for protecting biodiversity		X	No such areas
B. Potential Environmental Impacts			
Will the Project cause…			
Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?	X		No encroachment on historical /cultural areas. Some religious structures that have encroached on the existing ROW may be removed. No change in landscape is expected. The topography of project road is mainly plain. Opening of new quarries is not envisaged. Only operational and licensed quarry will be used for road construction. Earth material will be sourced from pre identified borrow areas and with the consent of landowners and all will be suitably rehabilitated.
Encroachment on precious ecology (e.g. sensitive or protected areas)?		X	There is no National Park, Wildlife Sanctuary and Bio-sphere reserve in around the project road.
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		X	No major surface water hydrology is being crossed / altered by the proposed development project. A temporary soil bund will be provided around the construction site to avoid any sedimentation in nearby small streams / ponds during rainfall.

Screening Question	Yes	No	Remark
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	X		Provision of Septic Tank with soak pit will be provided in construction camps.
Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	X		Fugitive emission is likely to take place due to construction activities. This fugitive emission shall be localized and limited for construction site during construction period only. Suppression measures like spraying of water on unpaved vehicle movement areas are proposed to minimize the dust generation.
Noise and vibration due to blasting and other civil works?	X		Noise generation during construction activities is likely. Vehicle & machineries confirming noise standards shall be used during construction.
Dislocation or involuntary resettlement of people		X	Some squatters may have to be resettled as per the prevailing policies of ADB & UP Govt.
Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		X	Regular water sprinkling to reduce the dust emission upto negligible standard. Noise barriers at sensitive receptors and community place will be provided to avoid any stress.
Hazardous driving conditions where construction interferes with pre-existing roads?	X		Construction sign will be marked at junction points.
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		X	Provision of septic tank with soak pit shall be kept in labor camp areas. Drinking water facility and regular health check-up facility shall be provided at construction site.
Creation of temporary breeding habitats for mosquito vectors of disease?		X	No such condition expected. Borrow areas shall be fully rehabilitated.
Dislocation and compulsory resettlement of people living in right-of-way?		X	Road side squatters will be compensated as per ADB SPs.
Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	X		Measures, like signage, rumble strip, etc. will be constructed close to sensitive locations such as schools, temples or hospitals.
Increased noise and air pollution resulting from traffic volume?	X		Speed control and Noise barriers shall be provided in sensitive areas and settlements. Green-tunnel along the road will also be provided.
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	X		Provision of both side drains will reduce the risk of surface water pollution due to fuel spills on the road.

APPENDIX 2 - ENVIRONMENTAL MONITORING LOCATIONS



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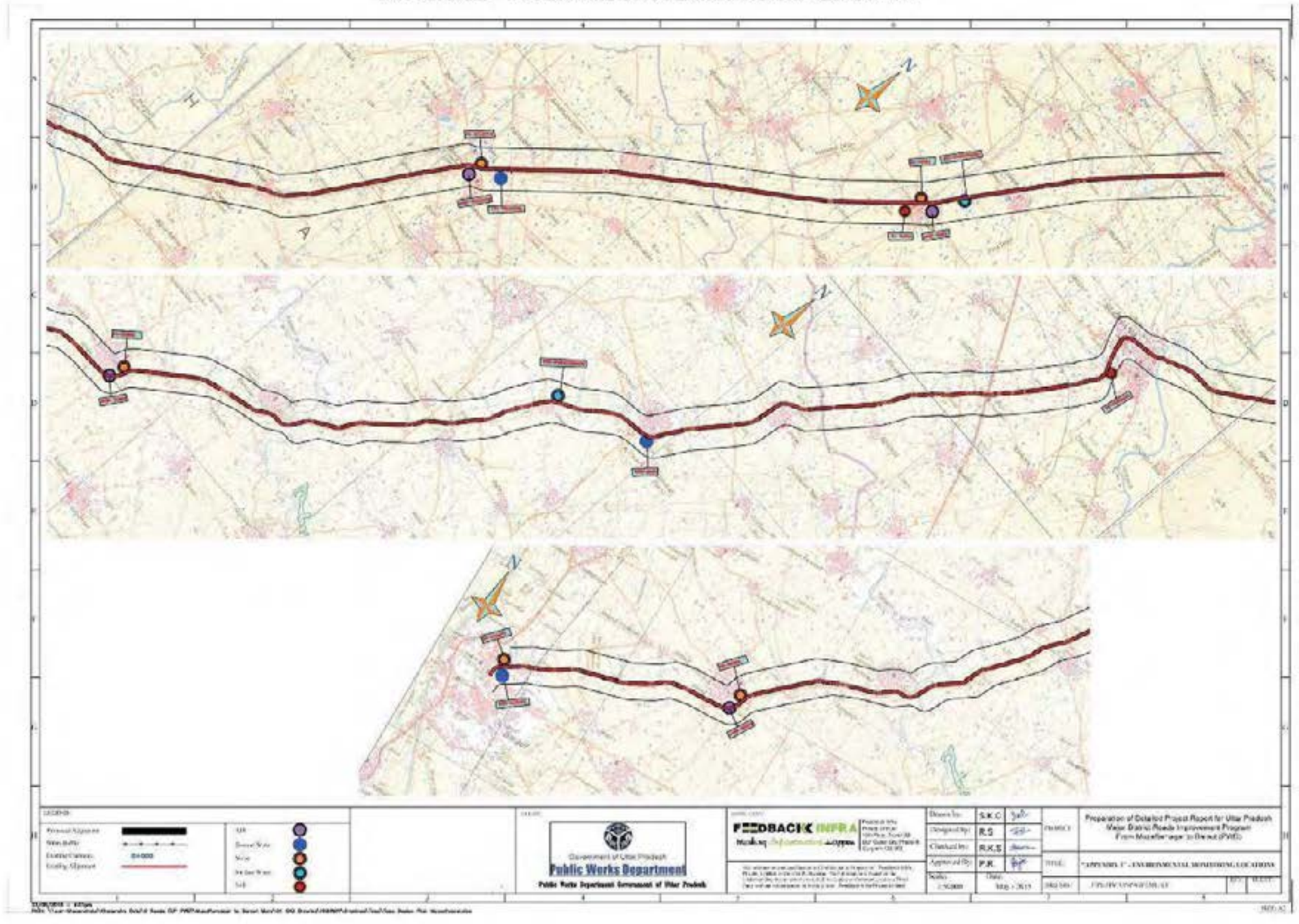

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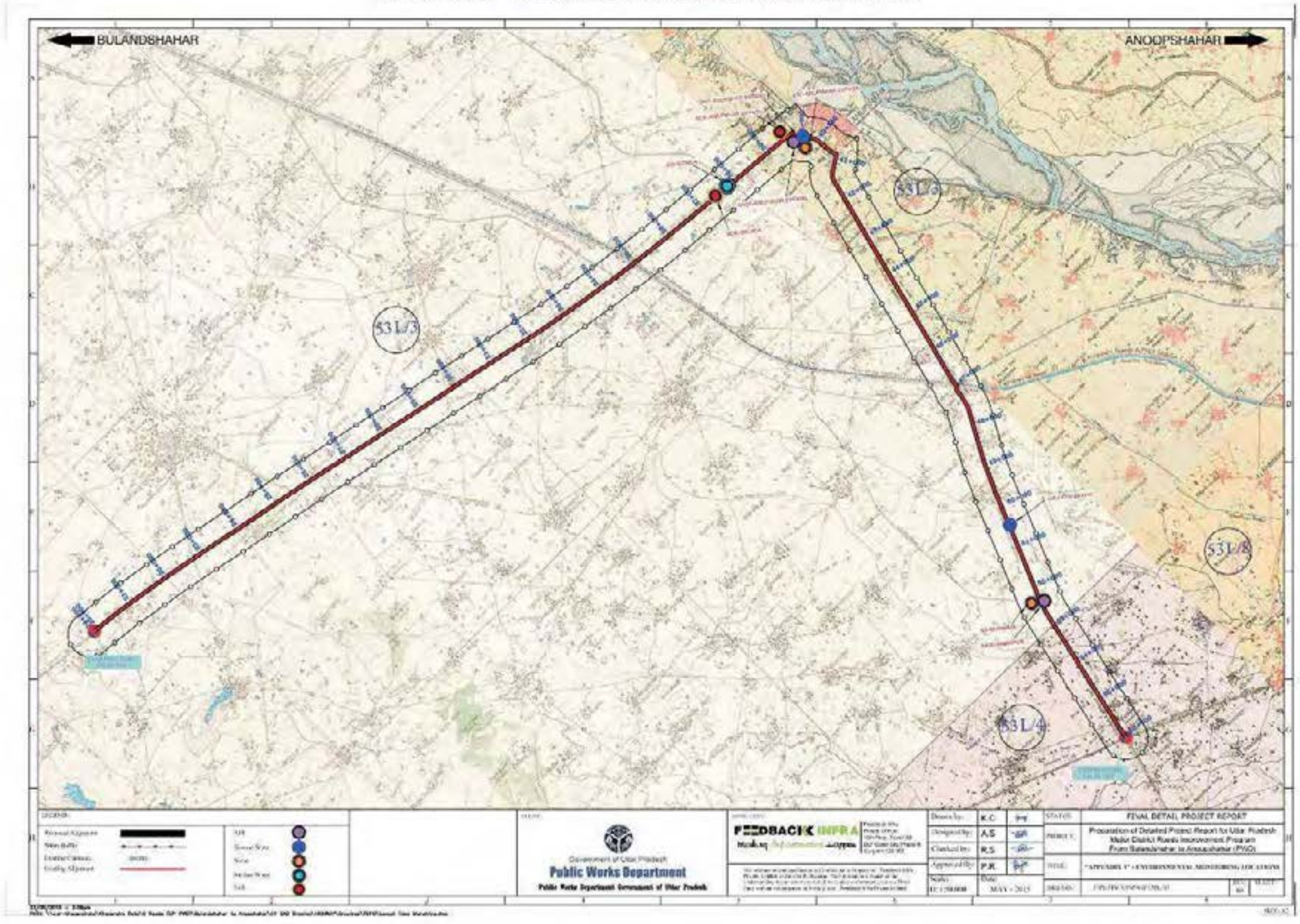

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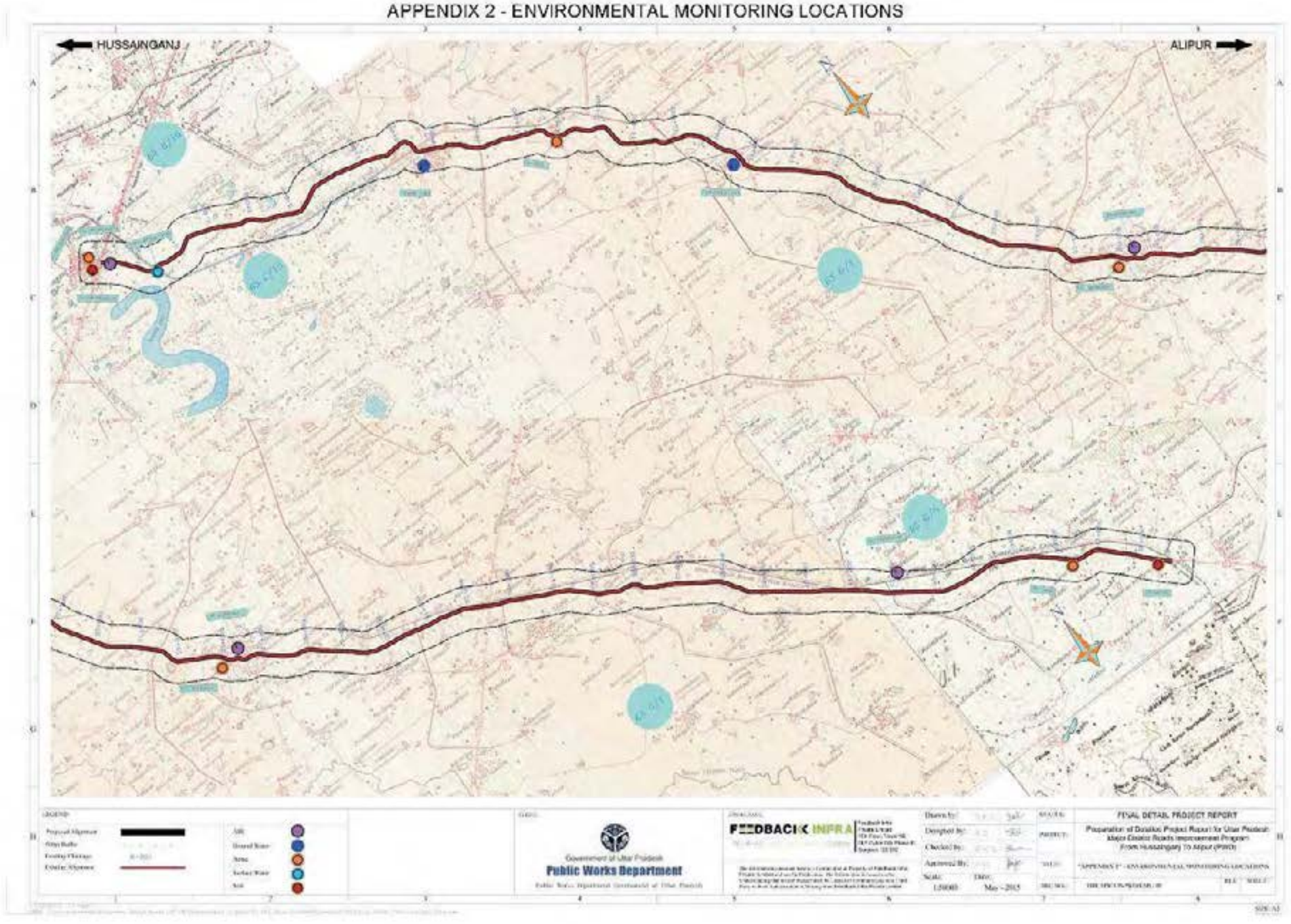

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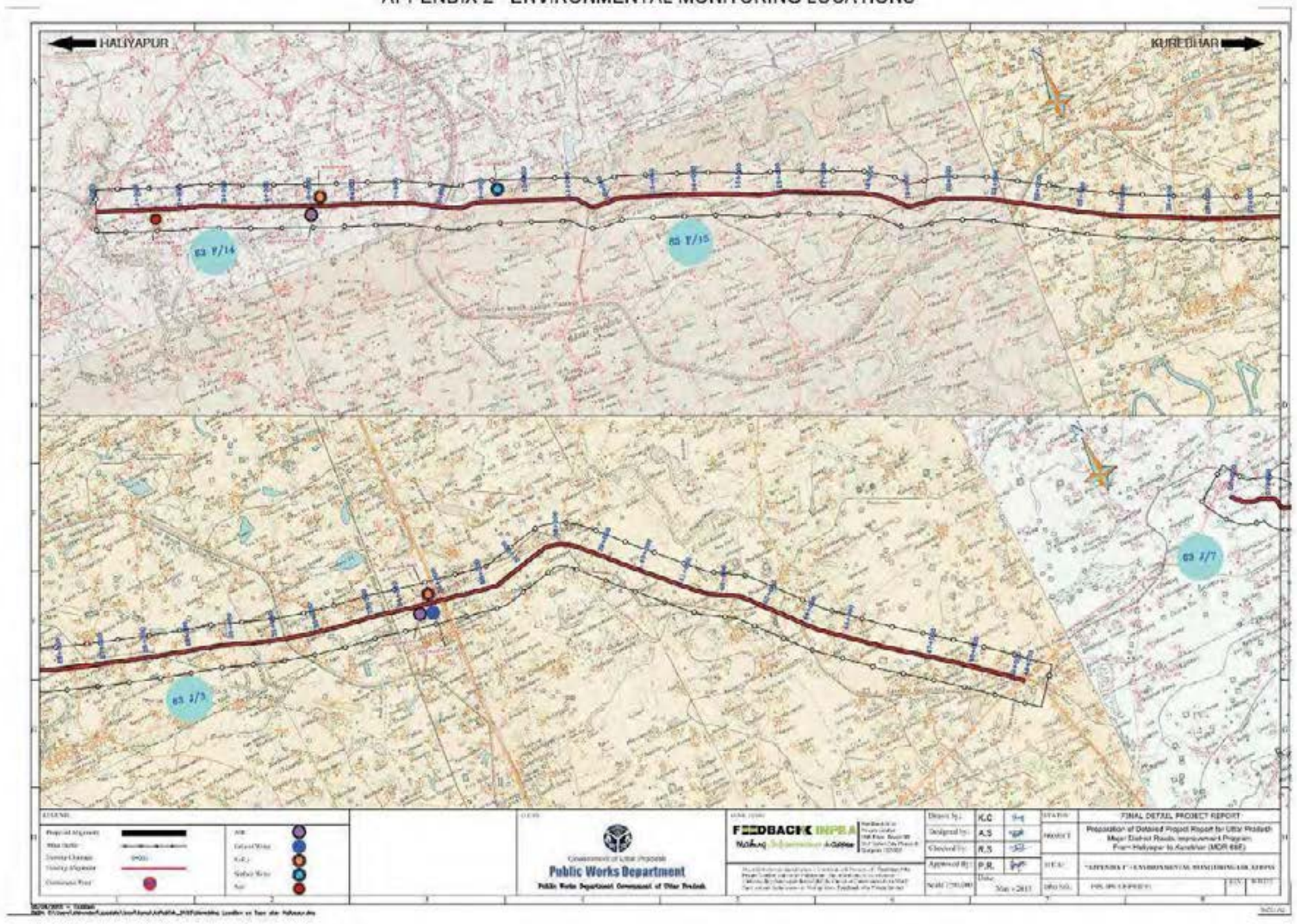

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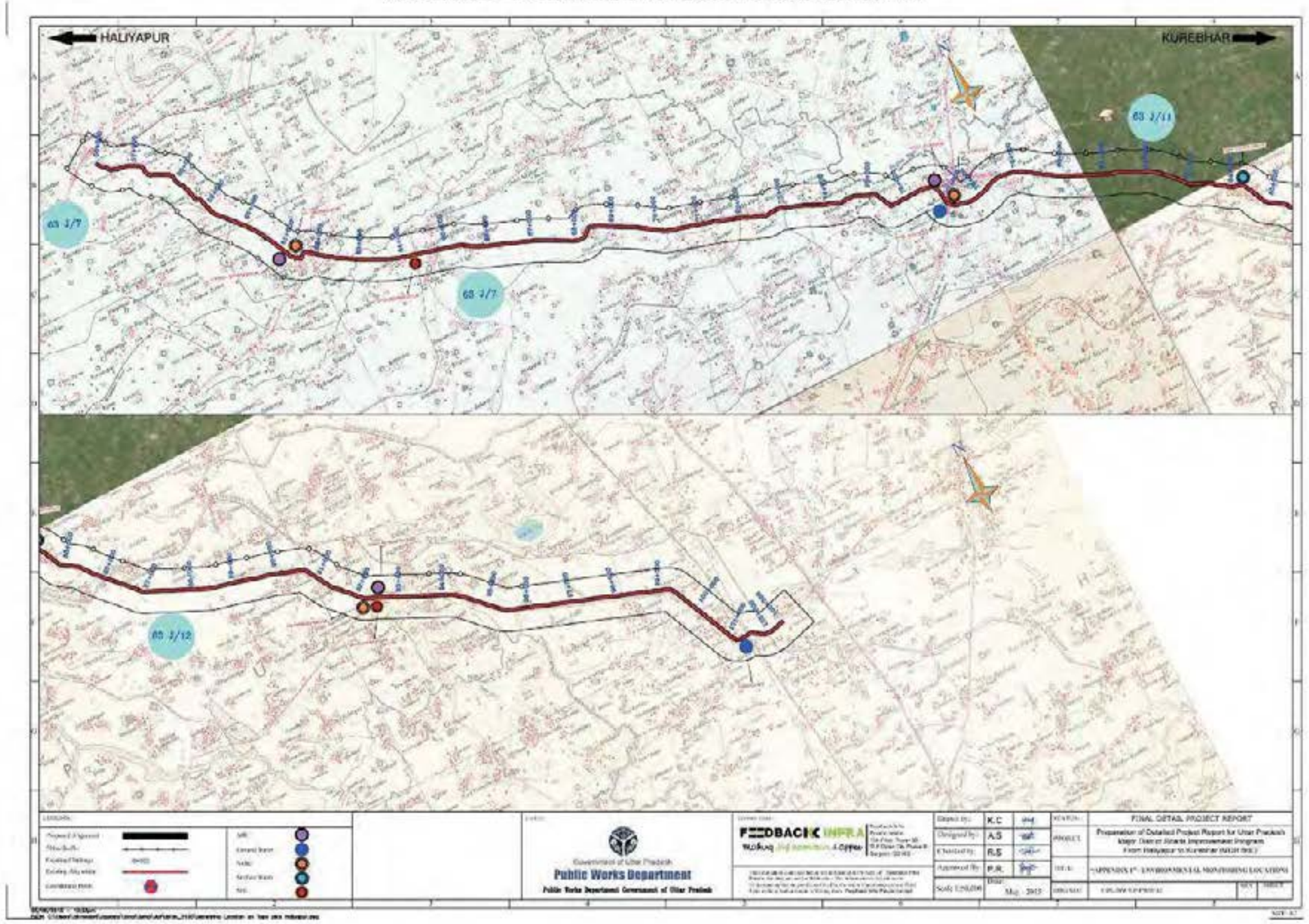

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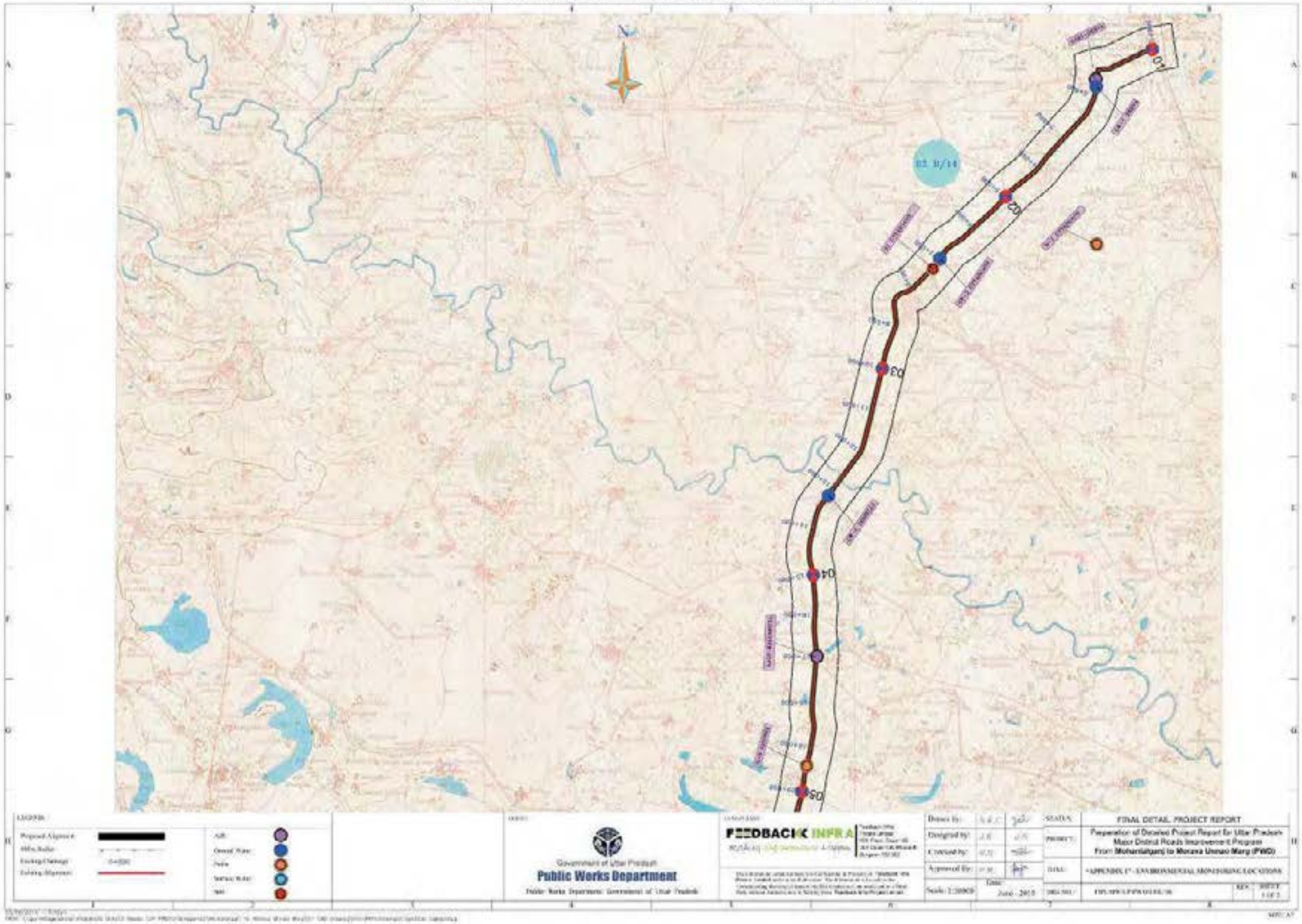

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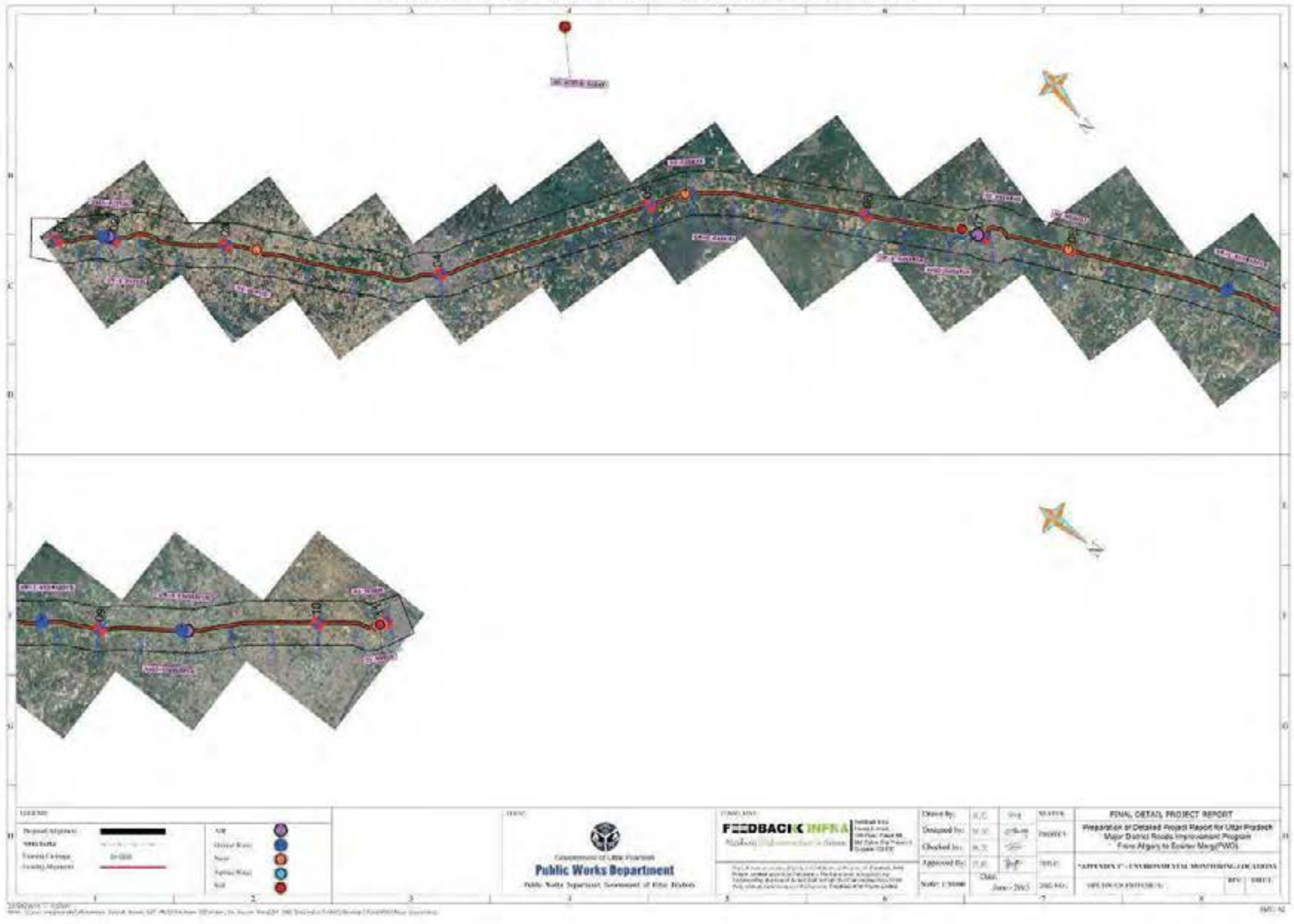


Government of Uttar Pradesh
Public Works Department
Public Works Department, Government of Uttar Pradesh

FEEDBACK INFRA

FINAL DETAIL PROJECT REPORT

Preparation of Detailed Project Report for Uttar Pradesh Major District Roads Improvement Program
From Aligarh to Etawah Marg(PWD)

APPENDIX 3: SOIL QUALITY MONITORING RESULTS OF UPMDR

Sl. No.	Parameter	Unit	MDR 82W	MDR 135W		MDR 58W		MDR 81C		MDR 66E	
			SQ1*	SQ2*	SQ3*	SQ4*	SQ5*	SQ6*	SQ7*	SQ8*	SQ9*
1	pH	-	8.1	8.1	8.3	7.7	7.9	6.45	6.25	6.6	6.2
2	Elec.Conductivity	µ mhos/cm	312	234	261	230	197	108	120	140	180
3	Nitrogen (as N)	kg/ha	151	147	225	132	165	182.0	190	168	162.0
								Nitrogen Av.(mg/kg)			
4	Phosphorous (as P)	kg/ha	43	54	61	58	52	70	74	64	69
								Phosphorous Av. (mg P2O5 / kg)			
5	Potassium (as K)	kg/ha	215	195	176	172	161	158	164	160	172
								Potassium Av. (mg/kg)			
6	Calcium	mg/kg	312	159	181	132	114	260	399	422	339
7	Magnesium	mg/kg	153	93	85	103	96	220	188	208	202
8	Organic Carbon	%	0.71	0.79	0.85	0.75	0.72	8	7	10.5	11.0
9	Iron	mg/kg	-	-	-	-	-	79.5	78.5	84.0	78.0
10	Natural Moisture Content	%	7.63	4.98	3.17	5.8	4.3	20	21.5	20.5	18.5
11	Bulk density	gm/cc	1.43	1.5	1.47	1.48	1.52	1.7	1.8	1.8	1.8
12	Moisture Retention Capacity		-	-	-	-	-	7.5	7.5	7.6	7.9
13	Grain size distribution										
a	Texture class	-	Loam	Clay Loam	Clay Loam	Clay Loam	Sandy Clay Loam	Sandy Clay	Sandy clay	-	-
b	Sand	%	40	44	42	44	47	52.5	53	-	-
c	Silt	%	38	25	22	18	22	12.5	13	-	-
d	Clay	%	22	31	36	38	31	35	34	-	-
14	Infiltration rate	cm/hr	1.53	1.64	1.73	1.55	1.49	0.2	0.21	21.0	22.0
15	Organic matter	%	1.23	1.37	1.46	1.30	1.24	14.5	12.5	14.5	15.0
16	Colour	-	Yellowish Brown	Brownish	Brownish Grey	Dark Brown	Brownish Grey	-	-	-	-
17	Salinity	PPT	0.51	0.57	0.49	0.56	0.62	-	-	-	-
18	Sodium as Na	mg/kg	49.7	56.3	47.1	42.3	45.2	-	-	-	-
19	Chloride	-	68.5	72.8	68.7	67.4	62.5	-	-	-	-
20	Porosity	V/v	-	-	-	-	-	0.45	0.48	0.38	0.42
21	Lead	mg/kg	-	-	-	-	-	0.01	0.12	-	-

Source: DPR Consultant

Note*: **SQ1**:Tikta village, Nanau-Dadau Road, **SQ2**:Agricultural land at Tawli village at km 10.200, Muzaffarnagar to Baraut Road, **SQ3**:Agricultural land at Budhana village at km 32.400, Muzaffarnagar to Baraut Road, **SQ4**:Bichada Village, Bulandshahar to Anoopshahar Road, **SQ5**:Anoopshahar Bypass, Bulandshahar to Anoopshahar Road, **SQ6**:Hussainganj Agricultural land, Hussainganj to Alipur Marg, **SQ7**: Alipur Agricultural land, Hussainganj to Alipur Marg, **SQ8**:Dhobhiyara, Haliyapur to Kurebhar; **SQ9:**Gosaisinghpur, Haliyapur to Kurebhar;

Soil Quality Monitoring Results of UPMDR

Sl. No.	Parameter	Unit	MDR 66E	ODR 24 & MDR 25E		MDR 52 C			MDR 45W		
			SQ10*	SQ11*	SQ12*	SQ13*	SQ14*	SQ15*	SQ16*	SQ17*	SQ18*
1	pH	-	6.4	6.9	6.5	7.21	7.45	7.34	7.28	7.41	7.12
2	Elec. Conductivity	µ mhos/cm	110.0	100	125	342.00	386.00	334	280	304.0	382
3	Nitrogen Av. (as N)	mg/kg	178.0	160	172	1252.0	1425.0	1225.0	1365	1265	1172
4	Phosphorous Av. (as P_2O_5)	mg/kg	72.0	65.0	68.0	67.45	78.16	61.74	75.80	70.42	63.9
5	Potassium Av. (as K)	mg/kg	160.0	180.0	156.0	173.04	187.0	178.0	182.0	192.7	178.2
6	Calcium	mg/kg	439	392	390	-	-	-	-	-	-
7	Magnesium	mg/kg	249	265	220	-	-	-	-	-	-
8	Organic Carbon	%	8.5	10.5	9.5	-	-	-	-	-	-
9	Iron	mg/kg	82.0	80.0	76.0	-	-	-	-	-	-
10	Natural Moisture Content	%	21.0	18	20	-	-	-	-	-	-
11	Bulk density	gm/cc	1.65	1.8	1.78	1.28	1.32	1.27	1.32	1.29	1.26
12	Moisture Retention Capacity	%	8.0	7.5	7.5	32.41	38.16	33.58	30.32	32.60	33.80
13	Grain size distribution										
a	Texture class	-	-	Silt Clay	Silt Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
b	Sand	%	-	52	53	43.58	48.25	50.04	38.67	39.65	41.64
c	Silt	%	-	14	13	21.38	15.34	17.55	18.66	21.23	20.13
d	Clay	%	-	34	34	35.04	36.41	32.41	42.87	39.12	38.23
14	Infiltration rate	inch/hr	18.0	0.20	0.18	292.00 mm/hr	292.00 mm/hr	273.0 mm/hr	320 mm/hr	298 mm/hr	268 mm/hr
15	Organic matter	%	16.5	-	-	0.96	1.05	0.89	1.09	0.98	0.88
16	Porosity	V/v	0.43	0.42	0.50	36.24%	39.12%	36.41%	33.27%	35.12%	33.25%
17	Lead	mg/kg	-	0.014	0.012	-	-	-	-	-	-
18	Sulphate	mg/kg	-	-	-	83.0	96.41	83.74	98.0	112.8	103.7
19	Sodium sulphate	% by mass	-	-	-	0.019	0.027	0.035	0.034	0.039	0.021

Source: DPR Consultant

Note*: **SQ10**:Akhand Nagar, Haliyapur to Kurebhar; **SQ11**: Nirvaya Village, Naurangiya-Kaptanganj-Rudrapur; **SQ12**: Rudrapur, Naurangiya-Kaptanganj-Rudrapur; **SQ13**: Dhobhiyara, Mohanlaganj to Maurawan Unnao Marg; **SQ14**: Gosaisinghpur, Mohanlaganj to Maurawan Unnao Marg; **SQ15**: Akhand Nagar, Mohanlaganj to Maurawan Unnao Marg; **SQ16**:Soron, Aliganj to Soron MArg; **SQ17**:Sahawar, Aliganj to Soron MArg; **SQ18**:Alipur Dadar, Aliganj to Soron MArg;

APPENDIX 4: SURFACE WATER RESOURCES ALONG NANAU-DADON ROAD

Sl. No.	Chainage (km)	Type	Side	Distance from Center line(m)	Use	Settlement	Depth (m)	Intervening Land use
1	0.730	Pond	LHS	5	Waste Water disposal	Nanau	2	Nil
2	0.800	Pond	LHS	10	Waste Water disposal	Nanau	3	Grassed Open space
3	1.500	Nallah	Crosses	0	Waste water disposal	Pilakna	-	Nil
4	2.650	Canal	Crosses	0	Irrigation	Pilakna	-	Nil
5	3.780	Pond	LHS	9	Irrigation	Pilakna	1.5	Open space
6	4.850	Canal	Crosses	0	irrigation	Pilakna	-	Nil
7	5.500	Canal	Crosses	0	irrigation	Pilakna	-	Nil
8	6.910	Kali River	Crosses	0	irrigation	Sikandarpur	-	Nil
9	11.090	Canal	Crosses	0	irrigation		-	Nil
9	11.100	Pond	RHS	8	Waste Water Pond	Datawali	1	Open space
10	14.650	Canal	Crosses	-	irrigation	Tikta	-	Nil
11	15.180	Pond	LHS	16	irrigation	Tikta	2.5	Open space
12	17.750	Canal	Crosses	-	Irrigation	Sihawali	-	Nill
12	21.950	Canal	Crosses	-	irrigation	Charra	-	Nil
13	24.100	Canal	Crosses	-	irrigation	Bhamani	-	Nil
14	25.570	Canal	Crosses	-	Abandon-ed	Salgawan	-	Nil

Source: PPTA Consultant

APPENDIX 5: SURFACE WATER QUALITY MONITORING RESULTS OF UPMDR

Sl. No.	Parameter	Unit	Permissible Limit (Class C)	MDR 82W	MDR 135W		MDR 58W	MDR 81C	MDR 66E	
				SW1*	SW2*	SW3*	SW4*	SW5*	SW6*	SW7*
1	pH	-	6.0 to 9.0	7.5	7.8	7.5	7.68	6.9	7.4	7.2
2	Colour	Hazen units	< 50	45	32	20	< 5	< 5	< 5	< 5
3	Turbidity	NTU	-	80.3	12.4	10.2	24.3	-	-	-
4	Electrical Conductivity	µmhos/cm	< 2000	834.6	654.1	594.1	358.6	204	260.0	290.0
5	DO	mg/l	>=4	4.2	4.5	5.2	5.2	13.1	13.9	6.9
6	TSS	mg/l	< 50	-	-	-	-	12	14.0	10.0
7	TDS	mg/l	-	490	395	384	204	188	150.0	208.0
8	BOD (27°C 3 days)	mg/l	< 3	3.5	23.1	15.7	7.2	BDL	BDL	BDL
9	COD	mg/l	-	33.4	42.2	34.8	14.5	5.0	8.0	5.5
10	Nitrate as NO3	mg/l	< 50	2.5	1.8	1.5	3.6	BDL	6.0	2.5
11	Flouride as F	mg/l	-	1.02	1.42	0.63	0.32	0.21	0.20	0.22
12	Chloride as Cl	mg/l	< 300	75.8	63.2	68.1	28.5	14.5	14.0	18.5
13	Sulphate as SO4	mg/l	< 250	43.6	48.1	43.4	12.3	14.5	20.0	26.0
14	Sodium as Na	mg/l	-	62	28	35	10	8.0	11.0	16.0
15	Potassium as K	mg/l	-	12	12	11	5	2.0	1.5	1.8
16	Pb	mg/l	< 0.05	BDL	BDL	BDL	BDL	0.1	BDL	BDL
17	Chromium as Cr^{+6}	mg/l	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18	Fe	mg/l	< 0.5	0.9	3.1	1.9	0.45	0.008	0.006	0.018
19	Total Coliform	MPN/100 ml	< 5000	4600	5300	2600	380	500	BDL	BDL

Source: DPR Consultant

Note:* **SW1**:Pond at Tikta village(Ch. 15.160 LHS), Nanau-Dadau Road, **SW2**:Pond at Tawli Village (Ch. 10.000), Muzaffarnagar to Baraut Road, **SW3**:Pond at Kanhar Village (Ch. 45.400), Muzaffarnagar to Baraut Road, **SW4**:Canal at Bichda village (Ch. 37.800), Bulandshahar to Annopshahar road, **SW5**:Ganga Canal at Hussainganj, Hussainganj to Alipur Marg, **SW6**:Pond at Govindpur, Haliyapur to Kurebhar Road; **SW7**:Pond at Loknathpur, Haliyapur to Kurebhar Road

SURFACE WATER QUALITY MONITORING RESULTS OF UPMDR

Sl. No.	Parameter	Unit	Permissible Limit (Class C)	O 24 & MDR 25E		MDR 52C		MDR 45W	
				SW8*	SW9*	SW10*	SW11*	SW12*	SW13*
1	pH	-	6.0 to 9.0	7.6	7.5	8.53	8.15	8.38	8.32
2	Colour	Hazen units	< 50	<5.0	<5.0	-	-	-	-
3	Odour	-	< 10	Agreeable	Agreeable	-	-	-	-

Sl. No.	Parameter	Unit	Permissible Limit (Class C)	O 24 & MDR 25E		MDR 52C		MDR 45W	
				SW8*	SW9*	SW10*	SW11*	SW12*	SW13*
4	Electrical Conductivity	µmhos/cm	< 2000	210.0	212.0	288	284	346	320
5	DO	mg/l	>=4	9.4	6.2	5.80	5.90	5.2	5.5
6	TSS	mg/l	< 50	12.0	8.0	5.4	3.9	10.8	6.5
7	TDS	mg/l	-	120.0	183.0	184	182.0	220	204
8	BOD (27°C 3 days)	mg/l	< 3	BDL	BDL	5.4	3.8	5.1	4.2
9	COD	mg/l	-	6.0	BDL	18.63	17.62	22.80	20.65
10	Nitrate as NO3	mg/l	< 50	5.5	BDL	6.32	6.05	14.80	14.80
11	Flouride as F	mg/l	-	0.18	0.18	0.36	0.31	0.91	0.82
12	Chloride as Cl	mg/l	< 300	12.0	16.0	23.43	5.33	4.80	3.09
13	Sulphate as SO4	mg/l	< 250	18.0	12.0	88.50	52.40	38.6	34.8
14	Sodium as Na	mg/l	-	10.0	12.0	23.4	21.8	28.3	26.8
15	Potassium as K	mg/l	-	1.8	1.6	3.10	2.70	3.10	2.60
16	Pb	mg/l	< 0.05	BDL	BDL	BDL	BDL	BDL	BDL
17	Total Chromium	mg/l	< 0.05	BDL	BDL	BDL	BDL	BDL	BDL
18	Fe	mg/l	< 0.5	0.01	0.008	0.20	0.24	0.72	0.67
19	Total Coliform	MPN/100 ml	< 5000	BDL	BDL	$1.70x10^3$	$1.50x10^3$	2.8×10^3	3.4×10^3

Source: DPR Consultant

Note*: **SW8**: Gandhak river, Naurangiya-Kaptanganj-Rudrapur; **SW9:** Pond at Rudrapur**,** Naurangiya-Kaptanganj-Rudrapur; **SW10**:Pond in Unchhagaon, Mohanlaganj to Maurawan Unnao Marg; **SW11**: Pond in Uttargaon, Mohanlaganj to Maurawan Unnao Marg; **SW12**: Pond in Kunwarpur, Aliganj-Soron Marg; **SW13**: Pond in Sahawar, Aliganj-Soron Marg

APPENDIX 6: SURFACE WATER
(Anupshahar-Bulandshahar)

S.no	Chainage	Type	Side	Settelment/ Village	Uses	Distance from Center line(m)
1	20.850	Pond	LHS	Jatvai	Irrigation/ fishing/ rainwater storage	16
2	26.890	Canal	Crosses	Bhaipur	Irrigation	-
3	32.700	Canal	Crosses	Birauli	Irrigation	-
4	34.390	Canal	Crosses	Aniwas	Irrigation	-
5	34.900	Canal	Crosses	Aniwas	Irrigation	-
6	34.920	Canal	Crosses	Aniwas	Irrigation	-
7	37.750	Canal	Crosses	Karanpur Kalan	Irrigation	-
8	40.220	Nallah	Crosses	Anupshehar	Waste water	-
9	44.000	Canal	Crosses	Telai Nagla	Irrigation	-
10	45.970	Nallah	Crosses	Rajaur	Waste water	-
11	47.750	Canal	Crosses	Rajaur	Irrigation	-
12	47.760	Canal	Crosses	Rajaur	Irrigation	-
13	47.800	Canal	Crosses	Rajaur	Irrigation	-
14	47.830	Canal	Crosses	Rajaur	Irrigation	-
15	48.050	Pond	RHS	Virpur	Irrigation/ fishing/ rainwater storage	5
16	49.450	Canal	Crosses	Virpur	Irrigation	-
17	54.100	Canal	Crosses	Devi Ka nagla	Irrigation	-
18	54.900	Canal	Crosses	Kutubpur	Irrigation	-
19	56.150	Canal	Crosses	Kutubpur	Irrigation	-

Source: DPR Consultant

Appendix 7: Surface Water Source along the Project Muzaffarnagar-Baraut

S. No.	Chainage		Type	Side	Distance from Center line(m)	Village/ Settelment	Details of Sources								
	From	To					Embankment/ height	Formation (Natural or Manmade)	Intervening land use type	Depth (m)	Dimension (LXB)m	Uses bathing/ irrigation/ washing/ animals/ abandoned	Discharge of pollutant , if any- source/ nature of pollutant	Ownership private/ panchayat	% cover of aquatic plants
1	4.040	4.045	Canal	Crosses	0	Khanjahanpur	Earthern/ ground level	Man Made		1.2		Irrigation	None	Irrigation Department	0
2	5.800	5.885	Nallah	Crosses	0	Khanjahanpur	Earthern with shrubs/ ground level	Man Made		1.5		Waste Disposal	Yes	Panchayat	100%
3	9.970	10.035	Pond	RHS	10	Taoli	Absent	Natural	Open garbage dump	9	45x 76	domestic use	Domestic solid waste along boundary	Panchayat	2-4%
4	10.230	10.280	Pond	RHS	12	Taoli	Absent	Natural	Open garbage dump	1.2	50 x40	Waste Disposal/ Eutrophied	domestic solis and liquid waste	Panchayat	100%
5	11.150	11.160	Minor Canal	Crosses	0	Taoli	Stone Pitched/ ground level	Man Made		1.5		Irrigation	None	Irrigation Department	0
6	16.770	16.880	Pond	RHS	6	Kakda	Absent	Natural	Open	4.5	150x416	Waste Disposal/ Eutrophied	domestic solis and liquid waste	Panchayat	100
7	19.450	19.465	Dry Nallah	Crosses	0	Shahpur	Earthern with shrubs/ ground level	Man Made		1.2		Abandoned	domestic solid waste	Panchayat	0
8	21.520	21.525	Canal	Crosses	0	Shahpur	Earthern/ ground level	Man Made		1.2		Irrigation	None	Irrigation Department	0
9	22.550	22.555	Canal	Crosses	0	Shahpur	Stone Pitched & Earthern Both/ ground level	Man Made		1.5		Irrigation	domestic solid waste	Irrigation Department	0
10	25.490	25.550	Pond	RHS	7	Shahdabar	Absent	Natural	Open garbage dump	4.5	50 x 75	domestic use	Domestic solid waste along boundary	Panchayat	0
11	30.110	30.160	Hindan River	Crosses	0	Budhana	Earthern/ ground level	Natural		15		Waste Disposal	domestic solis and liquid waste		2-5%
12	32.930	32.937	Dry Canal	Crosses	0	Budhana	Earthern/ ground level	Man Made		1.5		Abandoned	None	Irrigation Department	0
13	41.710	41.725	Dry Nallah	Crosses	0	Bharal	Stone Pitched/ ground level	Man Made		1.5		Abandoned	None		0
14	44.395	44.400	Dry Canal	crosses	0	Daha	Earthern/ ground level	Man Made		1.5		Abandoned	None	Irrigation Department	0
15	45.400	45.450	Pond	RHS	8	Kannad	Absent	Natural	Open garbage dump	2	50 x 130	Domestic use/ eutrophied	Domestic solid waste along boundary	Panchayat	25%
16	47.115	47.120	Dry Canal	Crosses	0	Kannad	Stoned near road otherwise Earthern/ ground level	Man Made		1.5		Abandoned	None	Irrigation Department	
17	51.650	51.680	River Krishna	Crosses	0	Pusar	Earthern/ ground level	Natural		1.5		Waste Disposal	domestic solis and liquid waste		2-5%
18	54.850	54.858	Canal	Crosses	0	Bamnauli	Earthern/ ground level	Man Made		0.8		Irrigation	None	Irrigation Department	0
19	56.600	56.605	Nallah	Crosses	0	Bijhaul	Earthern/ ground level	Man Made		1.8		Waste Disposal	Yes, Villages all Waste		10-15%
20	58.350	58.355	Dry		0	Bijhaul	Earthern/	Man Made		0.9		Abandoned	None	Irrigation	

S. No.	Chainage		Type	Side	Distance from Center line(m)	Village/ Settelment	Details of Sources								
	From	To					Embankment/ height	Formation (Natural or Manmade)	Intervening land use type	Depth (m)	Dimension (LXB)m	Uses bathing/ irrigation/ washing/ animals/ abandoned	Discharge of pollutant , if any- source/ nature of pollutant	Ownership private/ panchayat	% cover of aquatic plants
			Canal				ground level							Department	
21	60.600	60.608	Canal	Crosses	0	Baraut	Earthern/ ground level	Man Made		1.2		Irrigation	None	Irrigation Department	5-10%
22	61.550	61.650	Pond	LHS	7	Baraut	Absent	Natural	Open garbage dump	1.2		Domestic use	Domestic solid waste along boundary	Panchayat	3-5%
23	61.800	61.810	Canal	Crosses	0	Baraut	Earthern/ **ground level**	Man Made		1.2		Irrigation	None	Irrigation Department	0

Source: PPTA Consultant

Appendix 8: Surface Water Hussainganj

S. No.	Chainage	Side	Type of Sources	Distance from Center line(m)	Village\ Settelmet	Condition of Bank- Broke/ Fine/ Height/ Erathen/ stone pitched	Formation (Natural/ Manmade)	Intervening land use type	Depth of water (m)	Total Depth (m)	Uses	Discharge of pollutant, if any source / nature of pollutant	Ownership Private/ Panchayat/ Govt.	% cover of aquatic plant	Distance from Metteled Road
1	13.500	RHS	Pond	6.5	Gossain Ki Sarai	Absent	Natural	Open	2	5	Storage of Rainwater/ Eutrophied	Runoff from agricultural land causing eutrophication	Panchyat	10.0	3.0
2	13.600	LHS	Pond	5.0	Gossain Ki Sarai	Absent	Natural	Open	2	3	Storage of Rainwater/ Eutrophied	Runoff from agricultural land causing eutrophication	Panchyat	90.0	2.0
3	14.900	LHS	Pond	3.5	Luxmanpur	Absent	Natural	Open	3	8	Storage of Rainwater/ Eutrophied	Runoff from agricultural land & domestic wastes causing eutrophication	Panchyat	100.0	2.0
4	14.950	crossin g	Ganga Canal	2.5	Luxmanpur	Fine	Manmade	NIL	1	6	Irrigation	NIL	State Government	5.0	0.0
5	16.350	LHS	Pond	4.5	Ahinda	Absent	Natural	Open	2	3	Storage of Rainwater/ Eutrophied	Runoff from agricultural land & domestic wastes causing eutrophication	Panchyat	95.0	3.0
6	16.600	crossin g	Nallah	0.0	Ahinda	Fine	Manmade	NIL	1	6	Irrigation	NIL	State Government	5.0	0.0
7	18.600	LHS	Pond	4.0	Baliya	Absent	Natural	Open	3	8	Domestic uses/ Eutrophied	Domestic wastes causing eutrophication	Panchyat	100.0	2.5
8	19.000	LHS	Pond	6.0	Baliya	Absent	Manmade	Open	1	3	Storage of Rainwater	NIL	Panchyat	0.0	2.0
9	19.400	LHS	Pond	20.0	Baliya	Absent	Natural	Open	1	3	Storage of Rainwater	NIL	Panchyat	0.0	18.0
10	21.050	RHS	Pond	10.0	Simara Manapur	Absent	Natural	Open	2	6	Domestic uses/ Eutrophied	Eytropication due to domestic waste	Panchyat	40.0	8.0
11	23.500	RHS	Pond	9.0	Ajaypur Kudaila	Absent	Natural	Open	3	6	Storage of Rainwater/ Eutrophied	Runoff from agricultural land & domestic wastes causing eutrophication	Panchyat	90.0	7.5
12	23.500	RHS	Pond	12.0	Ajaypur Kudaila	Absent	Natural	Open	1	2.5	Storage of Rainwater	NIL	Panchyat	0.0	10.0
13	24.100	RHS	Pond	15.0	Ajaypur Kudaila	Broken	Manmade	Open	3	6	Domestic uses	NIL	Panchyat	0.0	13.0

S. No.	Chainage	Side	Type of Sources	Distance from Center line(m)	Village\ Settelmet	Condition of Bank- Broke/ Fine/ Height/ Erathen/ stone pitched	Formation (Natural/ Manmade)	Intervening land use type	Depth of water (m)	Total Depth (m)	Uses	Discharge of pollutant, if any source / nature of pollutant	Ownership Private/ Panchayat/ Govt.	% cover of aquatic plant	Distance from Metteled Road
14	28.500	RHS	Pond	4.5	Hathgoam	Absent	Natural	Open	2	6	domestic use	NIL	Panchyat	10.0	2.5
15	33.300	crossing	Nallah	2.5	Ayrahan	fine	Manmade	NIL	1	6	Irrigation	NIL	State Government	20.0	0.0
16	35.800	LHS	Pond	8.0	Benchi ki purba	Absent	Natural	open	2	3	Storage of Rainwater	NIL	Panchyat	60.0	6.0
17	36.700	LHS	Pond	18.0	Chaube ki Sarai	Absent	Manmade	concrete structure	2	4	Storage of Rainwater	NIL	Panchyat	30.0	16.0
18	36.800	LHS	Pond	12.0	Chaube ki Sarai	Absent	Manmade	Open	1	2	Storage of Rainwater	NIL	Panchyat	0.0	10.0
19	39.100	LHS	Pond	20.0	Paharpur	Absent	Manmade	open	3	6	Storage of Rainwater	NIL	Panchyat	20.0	18.0
20	42.400	crossing	Nallah	2.5	PremNagar	Fine	Manmade	NIL	0.5	5	Irrigation	NIL	State Government	20.0	0.0
21	46.600	RHS	Pond	13.0	Afoi	Fine	Manmade	Open	2	3	Storage of Rainwater	NIL	Panchyat	20.0	11.0
22	47.600	LHS	Pond	15.0	Afoi	Absent	Manmade	Open	1.5	2	Storage of Rainwater/ Eutrophied	NIL	Panchyat	30.0	13.0

Source: PPTA Consultant

Appendix 9: Surface Water Source along the Project
Haliyapur-Kurebhar

S.no	Chainage		Type	Side	Distance from Center line(m)	Village/ Settelment	Details of Sources								
	From	To					Condition of bank – broken/ fine/ height/ earthen/ stone pitched	Formation (Natural or Manmade)	Intervening land use type	Depth (m)	Approximate Dimension (Width × Length)	Uses bathing/ irrigation/ washing/ animals/ abandoned	Discharge of pollutant , if any- source/ nature of pollutant	Ownership private/ panchayat	% cover of aquatic plants
1	1.600	1.630	Pond	LHS	7	Kandhaisingh Purva	No Bank	Natural	Open/ Cowdung/Waste	1.5	90 × 30	Waste Water Pond	Domestic solid waste along boundary	Panchayat	0
2	2.500	550.000	Pond	RHS	20	Dobhiyara	Earthern	Man Made	Open	9	40× 50	Fishing	None	Panchayat	0
3	3.670	3.700	Pond	RHS	8	Churihar ke Purwa	No Bank	Natural	Open	3	35 × 30	Domestic use	None	Panchayat	0
4	6.250	6.260	Dry Canal	Crosses	0	Loniya ke Purwa	Earthern	Man Made		1		Abandoned	None	Irrigation Department	
5	7.790	7.805	Major Canal	Crosses	0	Harbhansh Ke Purwa	Earthern	Man Made		5		Irrigation	None	Irrigation Department	0
6	7.810	7.825	Major Canal	Crosses	0	Harbhansh Ke Purwa	Earthern	Man Made		5		Irrigation	None	Irrigation Department	0
7	11.015	11.030	Nallah	Crosses	0	Sanjhava	Earthern	Man Made		1		Waste	Domestic solid and liquid waste	Panchayat	80
8	11.830	11.840	Canal	Crosses	0	Sanjhava	Earthern	Man Made		2		Irrigation	None	Irrigation Department	0
9	14.450	14.490	Pond	LHS	15	Bhulaiaehar ka Purwa	No Bank	Natural	Open/Sherbs	1.5	80 × 40	Waste Water Pond	Domestic solid and liquid waste	Panchayat	15%
10	16.900	16.905	Canal	Crosses		Delhi Bazaar	Earthern	Man Made		1.5		Irrigation	None	Irrigation Department	0
11	19.025	19.050	Pond	LHS	6.5	Pirusrraya	No Bank	Natural	Open	3	25 × 50	Waste Water Pond	Domestic solid and liquid waste	Panchayat	100
12	19.405	19.410	Minor Canal	Crosses		Pirusrraya	Earthern	Man Made		1.5		Irrigation	None	Irrigation Department	0
13	20.100	20.110	Dry Nallah	Crosses		Radhepandit Purwa	Earthern	Man Made				waste	Domestic solid and liquid waste	Panchayat	
14	20.410	20.460	Pond	RHS	15	Radhepandit Purwa	Earthern	Natural	Open/Sherbs/ Cowdung	1.5	50 × 60	domestic use	solid waste along boundary	Panchayat	0
15	21.700	21.715	Canal	Crosses		Haroda Bazaar	Earthern	Man Made		5			None	Irrigation Department	
16	21.720	21.735	Canal	Crosses		Haroda Bazaar	Earthern	Man Made		5		Irrigation	None	Irrigation Department	
17	24.080	24.085	Nallah	Crosses		Kutta Dharamganj	No Bank	Man Made		0.6		Waste	Domestic solid and liquid waste	Panchayat	
18	30.300	30.310	Nallah	Crosses		Sanjay Nagar	Earthern	Man Made		1		Waste	Domestic solid and liquid waste	Panchayat	
19	31.175	31.190	Major Canal	Crosses		Ainpur	Earthern	Man Made		5		Irrigation	None	Irrigation Department	
20	31.200	31.215	Major Canal	Crosses		Ainpur	Earthern	Man Made		5		Irrigation	None	Irrigation Department	
21	34.390	34.400	Minor Canal	Crosses		Kurebhar	Earthern	Man Made		0.6		Irrigation	None	Irrigation Department	

S.no	Chainage		Type	Side	Distance from Center line(m)	Village/ Settelment	Details of Sources								
	From	To					Condition of bank – broken/ fine/ height/ earthen/ stone pitched	Formation (Natural or Manmade)	Intervening land use type	Depth (m)	Approximate Dimension (Width × Length)	Uses bathing/ irrigation/ washing/ animals/ abandoned	Discharge of pollutant , if any- source/ nature of pollutant	Ownership private/ panchayat	% cover of aquatic plants
22	37.260	37.310	Pond	LHS	7	Erul	No Bank	Natural	open	1	50 × 60	Waste Water Pond	Domestic solid and liquid waste	Panchayat	95
23	37.900	37.910	Minor Canal	Crosses		Raghavpur	Earthern	Man Made		0.5		Irrigation	None	Irrigation Department	0
24	40.280	40.320	Pond	RHS	20	Malampur	No Bank	Natural	Open/Shrub/Road	1.5	50 × 60	Fishing	Runoff from agricultural land	Panchayat	10
25	41.050	41.055	Dry Canal	Crosses		Barola	Earthern	Man Made				None	None	Irrigation Department	
26	43.040	43.045	Dry Canal	Crosses		Phulauna	Earthern	Man Made				None	None	Irrigation Department	
27	46.710	46.715	Canal	Crosses		Dhudhu	Earthern	Man Made				Irrigation	None	Irrigation Department	
28	47.090	47.115	Pond	LHS	6	Bhajna	No Bank	Natural	Open	1.5	25 × 20	Waste Water Pond	Domestic solid and liquid waste	Panchayat	95
29	48.240	48.255	Pond	RHS	6	Nagaipur	No Bank	Natural	Open	1.5	25 ×30	Waste Water Pond	Domestic solid and liquid waste	Panchayat	100
30	58.280	58.320	Pond	On Both Sides of the Road	5	Chaurma	No Bank	Natural	Open/Shrubs	1.3		Waste Water Pond	Domestic solid and liquid waste	Panchayat	100
31	61.730	61.800	Pond	LHS	6.5	Birsinghpur	No Bank	Natural	Open/Shrubs	1.5	70 ×30	Waste Water Pond	Domestic solid and liquid waste	Panchayat	0
32	62.320	62.360	Pond	RHS	8	Birsinghpur	No Bank	Natural	Open/Shrubs	3	40 ×50	Fishing/irrigation	Runoff from agricultural land	Panchayat	0
33	62.740	62.760	Nallah	Crosses		Birsinghpur	Earthern	Man Made		3		Waste	Domestic solid and liquid waste		80
34	64.175	64.180	Minor Canal	Crosses		Chaure	Earthern	Man Made		1.5		Irrigation	None	Irrigation Department	0
35	68.250	68.320	Pond	LHS	18	Tadipur	No Bank	Natural	Open/Cow dung/Shrubs	3	70×70	domestic use	Domestic solid and liquid waste	Panchayat	15
36	71.450	71.460	Dry Canal	Crosses		Chittepatti	Earthern	Man Made				Irrigation	None	Irrigation Department	
37	72.800	72.810	Dry Canal	Crosses		Chittepatti	Earthern	Man Made		1		Waste	Domestic solid and liquid waste	Panchayat	
38	76.500	76.560	Pond	RHS	18	Dostpur	No Bank	Man Made	open	2	50×300	Domestic use /Fishing	None	Panchayat	0
39	77.000	77.040	Pond	RHS	5	Dostpur	No Bank	Natural	open	1.2	40×50	Waste Water Pond	Domestic solid and liquid waste	Panchayat	100
40	78.610	78.615	Minor Canal	Crosses		Dostpur	Earthern	Man Made		1		Irrigation	None	Irrigation Department	0
41	83.710	83.715	Minor Canal	Crosses		Loknath Purwa	Earthern	Man Made		1.5		Irrigation	None	Irrigation Department	0

S.no	Chainage		Type	Side	Distance from Center line(m)	Village/ Settelment	Details of Sources								
	From	To					Condition of bank – broken/ fine/ height/ earthen/ stone pitched	Formation (Natural or Manmade)	Intervening land use type	Depth (m)	Approximate Dimension (Width × Length)	Uses bathing/ irrigation/ washing/ animals/ abandoned	Discharge of pollutant , if any- source/ nature of pollutant	Ownership private/ panchayat	% cover of aquatic plants
42	85.720	85.730	Canal	Crosses		Rahul Nagar	Earthern	Man Made		1		Irrigation	None	Irrigation Department	o
43	90.050	90.080	Pond	LHS	7	Bacharia	Earthern	Natural	open	3	30×60	Domestic use/ fishing/ irrigation	Nil	Panchayat	10
44	91.400	91.480	Pond	Both Sides	8	Akhandnagar	Earthern	Natural	Open/Shrubs	2.5	80×60	Domestic use/Fishing	None	Panchayat	0
45	92.680	92.685	Nallah	Crosses		Akhandnagar	Earthern	Man Made				Waste	Domestic solid and liquid waste	Panchayat	
46	101.790	101.800	Canal	Crosses		Bilwai	Earthern	Man Made				Irrigation	None	Irrigation Department	

Source: PPTA Consultant

Appendix 10A: Surface Water (Kaptanganj - Naurangia)

S. No.	Chainage	Side	Type of Sources	Distance from Center line(m)	Village\ Settelmet	Condition of Bank-Broke/Fine/Height/ Erathen/stone pitched	Formation (Natural/ Manmade)	Intervening land use type	Depth of water (m)	Total Depth (m)	Dimension (Width × Length)m	Uses	Discharge of pollutant, if any source/ nature of pollutant	ownership Private/ Panchayat/ Govt.	% cover of aquatic plant
1	0.200 to 0.300	Both Side	Choti Gandak River	crossing	Kaptainganj	Broken	Natural	NIL	-	-	100 m (width)× Linear Formation	Waste	Pollutantants of Town	Government	0.0
2	6+700	both side	pond	crossing		-	Natural	NIL			2414 (length)x 140 (width)	Rainwater storage	Nil	Government	40.0
3	11.790	crossing	Canal	crossing	Bhumihaari Patti	Earthen	Manmade	NIL	-	-	10 (width)× Linear Formation	Irrigation	NIL	State Government	0.0
4	12.400	LHS	Pond	10.0	Bhumihaari Patti	earthen	Manmade	Open	-	1.5	30(width)×30 (Length)	Storage of Rainwater	NIL	Panchyat	0.0
5	12.450	LHS	Shallow Depth	10.0	Bhumihaari Patti	earthen	Manmade	Grassy	-	0.5	20(width)× 48 (Length)	Storage of Rainwater	NIL	Panchyat	0.0
5	14.700 to 14.760	crossing	Canal	crossing	Kahnu Chappra	earthen	Manmade	Open	-	-	50m (width)× Linear Formation	Irrigation	NIL	Panchyat	0.0
6	15.900	LHS	Shallow Depth	14.0	Pagdiyaar Bazar	Broken	Natural	Open	-	3	12(width)× 18 (Length)	Storage of Rainwater	NIL	Panchyat	100.0
7	16.600	Both Side	Pond	2.5	Chargharwa	Broken	Manmade	Open	2	4	35 (width)× 40 (Legth)	storage of Rainwater	NIL	Panchyat	0.0
8	16.700	LHS	Pond	10.0	Chargharwa	Broken	Natural	Open	-	3	40(width)× 50 (Length)	storage of Rainwater	NIL	Panchyat	0.0
9	17.400	crossing	water channel	25.0	Chargharwa	Broken	Natural	Open	0.5	1	30m (width) xlinear formation	Storage of Rainwater	NIL	Panchyat	0.0
10	18.000	crossing	Canal	crossing	Khairatia Colony	Fine	Manmade	Open	-	-	35 (width)× Linear formation	Irrigation	NIL	Panchyat	0.0
11	19.600	RHS	Pond	15.0	Kalwari Patti	Broken	Manmade	Open	2	3	10 (width)× 10 (Length)	Storage of Rainwater	NIL	Panchyat	0.0
12	21.700	crossing	Canal	crossing	Sirasia	Fine	Manmade	Open	-	-	20 (width)× Linear formation	Irrigation	NIL	Panchyat	10.0
13	22.400	crossing	Canal	crossing	Naurangia Kotawa More	Fine	Manmade	Open	-	-	10 (width)× Linear formation	Irrigation	NIL	Panchyat	90.0
14	23.100	crossing	Canal	crossing	Naurangia	Fine	Manmade	Open	-	-	10 (width)× Linear formation	Irrigation	NIL	Panchyat	100.0

Source: PPTA Consultant

Appendix 10B: Surface water_Kaptainganj-Hata-Gauribazar-Rudrapur

S. No.	Chainage	Side	Type of Sources	Distance from Center line(m)	Village\ Settelmet	Condition of Bank-Broke/Fine/Height/ Erathen/stone pitched	Formation (Natural/ Manmade)	Depth of water (m)	Total Depth (m)	Dimension (Width × Length)m	Uses	Discharge of pollutant, if any source/nature of pollutant	ownership Private/ Panchayat/ Govt.	% cover of aquatic plant	Distance from Metteled Road
1	3.200	Both Side	Choti Gandak Tributory	crossing	Semara Village	Broken	Natural	-		15 (width) X linear	Irrigation	NIL	State Government	35.0	0.0
2	3.600	crossing	Canal	crossing	Semara Village	Earthen	Manmade	-		15 (width) X linear	Irrigation	NIL	State Government	50.0	0.0
3	12.400	crossing	Canal	crossing	Pakadi Madaraha	Earthen	Manmade	-		20 (width) X linear	Irrigation	NIL	State Government	100.0	-
4	13.450	crossing	Canal	crossing	Pakadi Madaraha	Earthen	Manmade	-		10 (width) X linear	Irrigation	NIL	State Government	-	-
5	15.500	crossing	Mawan Nallah	crossing	Harpur Barawan	Earthen	Natural	-		40m (width)× Linear Formation	Irrigation	NIL	State Government	-	0.0
6	17.700	LHS	Pond	10.0	Janga Bazar	Fine	Manmade	-	2	80(width)× 100 (Length)	Storage of Rainwater	NIL	Panchyat	100.0	0.0
7	18.300	crossing	Canal	crossing	Janga Bazar	Fine	Manmade	-	3.5	40 (width)× Linear formation	Irrigation	NIL	State Government	-	0.0
8	19.500	RHS	Pond	25.0	Janga Bazar	Fine	Manmade	-	1.5	50(width)× 50 (Length)	storage of Rainwater	NIL	Panchyat	10.0	0.0
9	24.100	RHS	Pond	15.0	Hata	Earthen	Manmade	-	2.5	40(width)× 40 (Length)	Storage of Rainwater	NIL	Panchyat	100.0	0.0
10	24.300	crossing	Canal	crossing	Hata	Fine	Manmade	-	5	20 (width)× Linear formation	Storage of Rainwater	NIL	State Government	0.0	0.0
11	25.450	crossing	Canal	crossing	Paragpur	Fine	Manmade	-	1.5	5 (width)× Linear formation	Irrigation	NIL	State Government	0.0	0.0
12	27.100	crossing	Canal	crossing	Madaraha	Fine	Manmade	-	-	10 (width)× 10 (Length)	Irrigation	NIL	State Government	5.0	0.0
13	29.800	crossing	Canal	crossing	Balua	Fine	Manmade	-	2	20 (width)× Linear formation	Irrigation	NIL	State Government	10.0	0.0
14	32.100	LHS	Pond	10.0	Wakilganj	Earthen	Manmade	-	2	50 (width)× 60 (Length)	Storage of Rainwater	NIL	Panchyat	100.0	0.0
15	34.900	RHS	Pond	25.000	Bakhara	Earthen	Manmade	-	3	50 (width)× 60 (Length)	Storage of Rainwater	NIL	Panchyat	100.000	0.000
16	36.100	crossing	Canal	crossing	Bisunpura	Earthen	Manmade		1.5	10 (width)× Linear formation	Irrigation	NIL	State Government	-	-
17	38.100	crossing	Canal	crossing	Rampur	Fine	Manmade	-	2	20 (width)× Linear formation	Irrigation	NIL	State Government		
18	39.000	crossing	Canal	crossing	Damar Biswa	Fine	Manmade	-	3	20 (width)× Linear formation	Irrigation	NIL	State Government		
19	39.500	RHS	Canal	crossing	Damar Biswa	Fine	Manmade	-	1.5	20 (width)× Linear formation	Irrigation	NIL	State Government		
20	45.900	RHS	Pond	15.000	Indupur	Earthen	Manmade	-	-	150 (Width) X 25 (Length)	Storage of Rainwater	NIL	Panchyat		
21	55.700	RHS	Pond	15.000	Chappauli	Earthen	Manmade	-	2.000	60 (Width) X 50 (Length)	Storage of Rainwater	NIL	Panchyat		
22	56.400	crossing	Pond	crossing	Chappauli	Earthen	Manmade	-	3.000	Uneven	Storage of Rainwater	NIL	Panchyat		
23	58.500	RHS	Pond	30.000	Rudrapur	Earthen	Natural	-	3.000	100 (Width) X 80 (Length)	Storage of Rainwater	Solid Waste	Panchyat		
24	59.700	LHS	Pond	20.000	Rudrapur Bypass	Earthen	Manmade	-	3.000	30 (Width) X 15 (Length)	Storage of Rainwater	NIL	Panchyat		

Source: PPTA Consultant

Appendix 11: Surface water (Mohanlalganj-Maurawan-Unnao Marg)

S. No.	Chainage	Side	Type of Sources	Distance from Center line(m)	Village\ Settelmet	Condition of Bank-Broke/Fine/ Height/ Erathen/ stone pitched	Formation (Natural/ Manmade)	Depth of water (m)	Total Depth (m)	Dimension (Width × Length)m	Uses	Discharge of pollutant, if any source/nature of pollutant	ownership Private/ Panchayat/ Govt.	% cover of aquatic plant
1	0.280	LHS	Pond	9.000	Mohanlalganj	Earthen	Manmade	-	2	22 (width) X 35 (Length)	waste disposal	Solid waste dump & domestic dischages	Panchyat	100.0
2	1.100	crossing	Nallaha	crossing	Mohanlalganj	Earthen	Manmade	-		15 (width) X linear	Irrigation	City sewrage disposal	State Government	-
3	2.48.	LHS	Pond	11.0	Mohanlalganj	Earthen	Manmade	-	1.5	22 (width) X30(Length)	-	Solid waste dump & domestic dischages	Panchyat	10.0
4	5.000	crossing	Canal	crossing	Bhasanda	Earthen	Manmade	-	-	10 (width) X linear	Irrigation	NIL	State Government	-
5	6.800	crossing	water logging area	crossing	Bhasanda	Earthen	Manmade	-	2.5	10m (width)× Linear Formation	-	NIL	Panchyat	100.0
6	7.400	RHS	Adarsh Jalasaya	25.0	Uttargaon	Earthen	Manmade	-	7	100(width)× 80 (Length)	Fishing	NIL	State Government	-
7	7.540	crossing	Canal	crossing	Uttargaon	Earthen	Manmade	-	-	10 (width)× Linear formation	Irrigation	NIL	State Government	-
8	7.800	RHS	Pond	10.0	Uttargaon	Earthen	Manmade	-	2	50(width)× 50 (Length)	Dry	Solid waste dump & domestic dischages	Panchyat	-
9	7.850	LHS	Pond	10.0	Uttargaon	Earthen	Manmade	-	2	100(width)× 40 (Length)	Storage of Rainwater	Solid waste dump & domestic dischages	Panchyat	-
10	8.000	RHS	Pond	5.0	Sesandi	Earthen	Manmade	-	1.5	50(width)× 20 (Length)	Storage of Rainwater	Solid waste dump & domestic dischages	Panchyat	0.0
11	8.050	Both side	Pond	7.0	Sesandi	Earthen	Manmade	-	2	40(width)× 25 (Length)	Irrigation	Solid waste dump & domestic dischages	Panchyat	100.0
12	8.300	LHS	Pond	8.0	Sesandi	Earthen	Manmade	-	2	50 (width)× 50 (Length)	Storage of Rainwater	Solid waste dump & domestic dischages	Panchyat	100.0
13	8.300	RHS	Pond	8.0	Sesandi	Earthen	Manmade	-	2.5	30 (width)× 15 (Length)	Irrigation	Solid waste dump & domestic dischages	Panchyat	-
14	8.600	LHS	Pond	8.0	Sesandi	Earthen	Manmade	-	3	20(width)× 15 (Length)	Storage of Rainwater	NIL	Panchyat	20.0
15	12.300	LHS	Adarsh Jalasaya	50.000	Sesandi	Fine	Manmade	-	1.500	50 (width)× 50 (Length)	Fishing	NIL	State Government	70.000
16	13.100	crossing	Sai River	crossing	Jabrella	Earthen	Natural	-		100 (width)× Linear formation	Multi uses	NIL	State Government	-
17	15.200	LHS	Pond	12.000	Petna Kheda	Earthen	Manmade	-	1.000	10 (width)× Linear formation	Storage of Rainwater	NIL	Panchyat	
18	15.600	crossing	Canal	crossing	Petna Kheda	Earthen	Manmade	-	3.000	10 (width)× Linear formation	Irrigation	NIL	Panchyat	
19	17.200	RHS	Pond	15.000	Kalu Kheda	Earthen	Manmade	-	3.000	25 (width)× 30 (Length)	Irrigation	NIL	State Government	
20	17.650	crossing	Nallaha	crossing	Kalu Kheda	Earthen	Manmade	-		10 (Width) X Linear Formation	Irrigation	NIL	State Government	
21	17.800	RHS	Pond	15.000	Kalu Kheda	Earthen	Manmade	-	2.000	20 (Width) X 20 (Length)	Storage of Rainwater	NIL	Panchyat	
22	18.500	RHS	Pond	15.000	Kalu Kheda (KanchanPur)	Earthen	Manmade	-	2.500	30 (Width) X 40 (Length)	abandoned	NIL	Panchyat	
23	18.670	LHS	Pond	15.000	Kalu Kheda (KanchanPur)	Earthen	Manmade	-	1.500	35(Width) X 40 (Length)	abandoned	NIL	Panchyat	
24	19.920	LHS	Pond	15.000	Kalu Kheda (KanchanPur)	Earthen	Manmade	-	2.000	20 (Width) X 50 (Length)	Storage of Rainwater	Solid waste dump & domestic dischages	Panchyat	100.000
25	20.200	crossing	Canal	crossing	Sandauli	Earthen	Manmade	-	1.500	20 (Width) X Linear Formation	Irrigation	NIL	State Government	
26	24.000	RHS	Pond	20	Bhawaniganj	Earthen	Manmade	-	2.5	30 (Width) X 40 (Length)	Storage of Rainwater	Solid waste dump & domestic dischages	Panchyat	
27	24.700	crossing	Canal	crossing	Bhawaniganj	Earthen	Manmade	-		30 (Width) X Linear Formation	Irrigation	NIL	State Government	

S. No.	Chainage	Side	Type of Sources	Distance from Center line(m)	Village\ Settelmet	Condition of Bank-Broke/Fine/ Height/ Erathen/ stone pitched	Formation (Natural/ Manmade)	Depth of water (m)	Total Depth (m)	Dimension (Width × Length)m	Uses	Discharge of pollutant, if any source/nature of pollutant	ownership Private/ Panchayat/ Govt.	% cover of aquatic plant
28	28.300	crossing	Canal	crossing	Mohanlal Kheda	Earthen	Manmade	-		5 (Width) X Linear Formation	Irrigation	NIL	State Government	
29	28.300	LHS	Pond	10	Mohanlal Kheda	Earthen	Manmade	-	2.5	10(Width) X 10 (Length)	Storage of Rainwater	NIL	Panchyat	
30	31.200	LHS	Pond	8	Maurawan	Earthen	Manmade	-	2	20(Width) X 20 (Length)	Storage of Rainwater	NIL	Panchyat	
31	32.300	LHS	Pond	10	Maurawan	Earthen	Manmade	-	2	30(Width) X 40 (Length)	waste disposal	Solid waste dump & domestic dischages	Panchyat	
32	32.900	RHS	Pond	7	Maurawan	Earthen	Manmade	-	3	30(Width) X30 (Length)	waste disposal	NIL	Panchyat	
33	33.700	crossing	water logging area	crossing	Maurawan (Basaha Tiraha)	Earthen	Manmade	-	1.5	20(Width) X40 (Length)	waste disposal	NIL	Panchyat	
34	34.100	crossing	Canal	crossing	Basaha Tiraha	Earthen	Manmade	-		10 (Width) X Linear Formation	Irrigation	NIL	State Government	
35	37.800	crossing	Canal	crossing	Banigaon	Earthen	Manmade	-		10 (Width) X Linear Formation	Irrigation	NIL	State Government	
36	41.700	crossing	Purwa Raj Baha	crossing	Purwa Raj	Earthen	Manmade	-		15 (Width) X Linear Formation	Irrigation	NIL	State Government	
37	44.800	RHS	water logging area	12	Purwa Raj	Earthen	Manmade	-	1.5	20(Width) X20 (Length)	waste disposal	Solid waste dump & domestic dischages	Panchyat	
38	45.000	RHS	Pond	15	Katra	Earthen	Manmade	-	1.5	40(Width) X30 (Length)	Domestic Uses	NIL	Panchyat	-
39	45.500	crossing	Canal	crossing	Katra	Earthen	Manmade	-		45 (Width) X Linear Formation	Irrigation	NIL	State Government	
40	47.100	crossing	Canal	crossing	Taran Kheda	Earthen	Manmade	-		15 (Width) X Linear Formation	Irrigation	NIL	State Government	
41	48.400	RHS	Baknai Badaila Jheel	25	Unchagaon Killa	Earthen	Natural	-	6	Jheel	Fishing/irigation	NIL	State Government	100
42	49.000	LHS	Pond	15	Lungarpur	Earthen	Manmade	-	2	15(Width) X 40(Length)	Storage of Rainwater	NIL	Panchyat	
43	49.200	RHS	Pond	15	Lungarpur	Earthen	Manmade	-	6	60(Width) X 120 (Length)	Fishing	NIL	State Government	100
44	50.200	crossing	Canal	crossing	Lungarpur	Earthen	Manmade	-		10 (Width) X Linear Formation	Irrigation	NIL	State Government	
45	51.100	crossing	Canal	crossing	Lungarpur	Earthen	Manmade	-		5 (Width) X Linear Formation	Irrigation	NIL	State Government	
46	54.800	crossing	Canal	crossing	Taura Bichia	Earthen	Manmade	-		5 (Width) X Linear Formation	Irrigation	NIL	State Government	

Source: PPTA Consultant

APPENDIX 12: GROUND WATER SOURCE ALONG THE PROJECT- NANAO TO DADAO

Sl. No.	Chainage (km)	Type of Sources	Side	Settlement	Distance from CL (m)	Uses	Impacted (Y/N)
1	0.025	Hand Pump	RHS	Nanau	6.5	Drinking	Y
2	3.210	Well	RHS	Pilakhna	7	Abandoned	Y
3	3.510	Hand Pump	RHS	Pilakhna	5	Drinking	Y
4	3.810	Hand Pump	LHS	Pilakhna	8	Drinking	Y
5	4.075	Hand Pump	LHS	Pilakhna	7	Drinking	Y
6	4.200	Hand Pump	LHS	Pilakhna	10	Drinking	Y
7	4.240	Hand Pump	LHS	Pilakhna	9	Drinking	Y
8	4.400	Hand Pump	LHS	Pilakhna	10	Drinking	Y
9	4.450	Hand Pump	RHS	Pilakhna	7	Drinking	Y
10	4.480	Hand Pump	LHS	Pilakhna	12	Drinking	N
11	4.530	Hand Pump	LHS	Pilakhna	10	Drinking	Y
12	5.090	Hand Pump	RHS	Pilakhna	15	Drinking	N
13	5.180	Hand Pump	RHS	Pilakhna	15	Drinking	N
14	5.230	Hand Pump	RHS	Pilakhna	7	Drinking	Y
15	5.380	Hand Pump	RHS	Pilakhna	9	Drinking	Y
16	5.410	Hand Pump	RHS	Pilakhna	7	Abandoned	Y
17	5.650	Hand Pump	RHS	Sikandpur	7	Drinking	Y
18	5.790	Hand Pump	RHS	Sikandpur	6	Drinking	Y
19	6.000	Hand Pump	RHS	Sikandpur	7	Drinking	Y
20	6.230	Hand Pump	RHS	Sikandpur	10	Drinking	Y
21	6.320	Hand Pump	RHS	Sikandpur	5	Drinking	Y
22	6.450	Hand Pump	RHS	Sikandpur	8	Drinking	Y
23	6.560	Hand Pump	LHS	Sikandpur	8	Drinking	Y
24	6.560	Hand Pump	RHS	Sikandpur	10	Drinking	Y
25	6.570	Hand Pump	RHS	Sikandpur	9	Drinking	Y
26	6.570	Hand Pump	LHS	Sikandpur	13	Drinking	N
27	6.590	Hand Pump	LHS	Sikandpur	14	Drinking	N
28	6.600	Hand Pump	LHS	Sikandpur	13	Drinking	N
29	6.650	Hand Pump	LHS	Sikandpur	10	Drinking	Y
30	7.400	Well	LHS	Sikandpur	10	Abandoned	Y
31	7.530	Hand Pump	RHS	Sikandpur	8	Drinking	Y
32	8.090	Hand Pump	RHS	Sikandpur	12	Drinking	N
33	8.730	Hand Pump	RHS	Sikandpur	12	Drinking	N
34	9.010	Hand Pump	LHS	Sikandpur	14	Drinking	N
35	9.100	Hand Pump	RHS	Paharipur	10	Drinking	Y
36	9.110	Hand Pump	RHS	Paharipur	11	Drinking	N
37	10.700	Hand Pump	LHS	Paharipur	9	Washing and Drinking Both	Y
38	11.100	Hand Pump	LHS	Nausa	8	Drinking	Y
39	11.780	Hand Pump	RHS	Datawali	7	Drinking	Y
40	12.070	Hand Pump	RHS	Datawali	9	Abandoned	Y
41	12.080	Hand Pump	RHS	Datawali	8	Drinking	Y
42	12.200	Hand Pump	RHS	Datawali	14	Abandoned	N
43	12.260	Hand Pump	LHS	Datawali	5	Drinking	Y
44	12.410	Hand Pump	LHS	Datawali	5	Drinking	Y
45	12.580	Hand Pump	LHS	Datawali	7	washing and Drinking Both	Y
46	12.720	Hand Pump	LHS	Datawali	13	Abandoned	N
47	12.900	Hand Pump	RHS	Datawali	15	Drinking	N
48	13.680	Hand Pump	LHS	Barla	4	Drinking	Y
49	14.080	Hand Pump	RHS	Tikta	8	Abandoned	Y
50	14.950	Hand Pump	RHS	Tikta	7	Drinking	Y
51	15.090	Hand Pump	RHS	Tikta	9	Drinking	Y
52	17.100	Hand Pump	RHS	Shiwali	15	Drinking	N
53	17.280	Hand Pump	RHS	Shiwali	6	Drinking	Y
54	17.610	Hand Pump	LHS	Shiwali	8	Drinking	Y
55	17.800	Hand Pump	LHS	Shiwali	6	Drinking	Y
56	18.510	Hand Pump	LHS	Shiwali	16	Drinking	N
57	18.530	Hand Pump	RHS	Shiwali	9	Drinking	Y

Sl. No.	Chainage (km)	Type of Sources	Side	Settlement	Distance from CL (m)	Uses	Impacted (Y/N)
58	19.430	Hand Pump	RHS	Shiwali	8	Drinking	Y
59	19.580	Hand Pump	LHS	Shiwali	12	Drinking	N
60	19.710	Hand Pump	LHS	Charra	7	Drinking	Y
61	20.020	Hand Pump	LHS	Charra	4	Drinking	Y
62	20.070	Hand Pump	RHS	Charra	7	Drinking	Y
63	20.070	Hand Pump	RHS	Charra	10	Drinking	Y
64	20.150	Hand Pump	LHS	Charra	5	Drinking	Y
65	20.180	Hand Pump	RHS	Charra	5		Y
66	20.280	Hand Pump	RHS	Charra	5	Drinking	Y
67	20.320	Hand Pump	LHS	Charra	5	Drinking	Y
68	20.410	Hand Pump	LHS	Charra	6	Drinking	Y
69	20.560	Hand Pump	LHS	Charra	6	Drinking	Y
70	20.820	Hand Pump	RHS	Charra	8	Drinking	Y
71	21.220	Hand Pump	RHS	Charra	10	Drinking	Y
72	21.530	Hand Pump	LHS	Charra	8	Drinking	Y
73	21.600	Hand Pump	RHS	Charra	5	Drinking	Y
74	22.580	Hand Pump	RHS	Bhamani	7	Abandoned	Y
75	23.800	Hand Pump	RHS	Bhamani	11	Drinking	Y
76	24.200	Hand Pump	LHS	Bhamani	9	Drinking	Y
77	24.580	Hand Pump	LHS	Salgawan	12	Drinking	Y
78	24.680	Hand Pump	LHS	Salgawan	7	Abandoned	Y
79	25.270	Hand Pump	RHS	Salgawan	8	Drinking	Y
80	26.160	Hand Pump	LHS	Atta	7	Drinking	Y
81	26.700	Hand Pump	RHS	Dadau	9	Drinking	Y
82	27.010	Hand Pump	RHS	Dadau	8	Drinking	Y
83	27.170	Hand Pump	RHS	Dadau	7	Drinking	Y
84	27.270	Hand Pump	LHS	Dadau	10	Drinking	Y
85	27.550	Hand Pump	LHS	Dadau	10	Abandoned	Y
86	27.600	Hand Pump	LHS	Dadau	13	Abandoned	N
87	27.660	Hand Pump	RHS	Dadau	11	Washing and Drinking Both	y
88	27.720	Hand Pump	LHS	Dadau	12	Drinking	y
89	27.820	Hand Pump	RHS	Dadau	7	Abandoned	y
90	27.900	Hand Pump	LHS	Dadau	10	Drinking	y
91	28.030	Hand Pump	LHS	Dadau	10	Abandoned	y
92	28.150	Hand Pump	RHS	Dadau	8	Drinking	y
93	28.180	Hand Pump	RHS	Dadau	5	Abandoned	y
94	28.210	Hand Pump	RHS	Dadau	7	Drinking	y
95	28.320	Hand Pump	LHS	Dadau	6	Drinking	y
96	28.420	Hand Pump	LHS	Dadau	9	Drinking	y
97	28.600	Hand Pump	RHS	Dadau	15	Drinking	N
98	28.700	Hand Pump	LHS	Dadau	6	Drinking	Y
99	28.850	Hand Pump	RHS	dadau	7	Drinking	Y
100	28.730	Hand Pump	RHS	Dadau	9	Drinking	Y
101	29.370	Hand Pump	LHS	Nagla Bhore	6	Drinking	Y
102	29.750	Hand Pump	LHS	Nagla Bhore	8	Drinking	N
103	29.850	Hand Pump	RHS	Nagla Bhore	8	Abandoned	Y
104	29.920	Hand Pump	RHS	Nagla Bhore	13	Drinking	N

Source: PPTA Consultant

APPENDIX 13: GROUND WATER QUALITY MONITORING RESULTS OF UPMDR

Sl. No.	Parameter	Unit	Indian Standards as per IS 10500:2012		MDR 82W			MDR 135W			MDR 58W		MDR 81C	
			Desirable	Permissible	GW1*	GW2*	GW3*	GW4*	GW5*	GW6*	GW7*	GW8*	GW9*	GW10*
1	Colour	Hazen Units	5.00	15.00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2	Alkalinity as CaCo3	(mg/l)	200	600	213.5	183.4	209.1	176.3	145.6	182.5	171.4	142.7	168.0	326.0
3	Conductivity	µS/cm	-	-	645.3	689.1	821.5	584.2	548.4	629.4	618.4	568.4	-	-
4	Turbidity	NTU	1.00	5.00	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
5	pH	-	6.5-8.5	No relaxation	7.5	7.7	7.2	7.3	7.1	7.6	7.3	7.1	7.67	7.28
6	Total Hardness as CaCO3	mg/l	200.00	600.00	239.5	243.1	313.8	189.6	152.5	202.6	209.3	196.7	196.0	344.0
7	Calcium as Ca	mg/l	75.00	200.00	67.3	76.5	93.6	54.2	37.2	62.4	65.4	58.4	40.0	49.6
8	Magnesium as Mg	mg/l	30.00	100.00	17.4	12.7	19.5	13.2	14.5	11.4	11.2	12.4	23.32	53.46
9	TDS	mg/l	500	2000	390	410	495	354	312	396	379	332	242.0	779.0
10	Copper as Cu	mg/l	0.05	1.50	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11	Iron as Fe	mg/l	0.30	No relaxation	0.21	0.23	0.27	0.23	0.19	0.21	0.23	0.19	0.03	0.06
12	Manganese as Mn	mg/l	0.10	0.30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13	Chlorides as Cl	mg/l	250.00	1000.00	51.2	77.3	94.7	51.1	45.2	61.9	63.5	59.7	28.0	76.0
14	Sulphate as SO4	mg/l	200.00	400.00	23.6	31.7	53.1	13.2	10.5	15.3	28.5	22.7	11.8	131.0
15	Nitrate as NO3	mg/l	45.00	No relaxation	2.5	3.4	3.7	2.3	3.7	3.9	4.7	3.7	12.25	2.33
16	Fluoride as F	mg/l	1.00	1.50	0.61	0.53	0.72	0.64	0.56	0.73	0.28	0.19	0.67	1.36
17	Arsenic as As	mg/l	0.01	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18	Lead as Pb	mg/l	0.01	No relaxation	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19	Zinc as Zn	mg/l	5.00	15.00	1.9	2.1	2.5	2.1	1.8	2.4	1.3	1.8	0.24	0.22
20	Chromium as Cr^{+6}	mg/l	0.05	No relaxation	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21	Sodium	mg/l	-	-	10	15	13	15	19	21	22	12	-	-
22	Potassium	mg/l	-	-	5	9	7	6	8	5	7	5	-	-
23	Bicarbonate	mg/l	-	-	213.5	183.4	209.1	176.3	145.6	182.5	171.4	142.7	-	-
24	Phenolic compound as C6H5OH	-	0.001	0.002	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-
25	Cyanide	mg/l	0.05	No relaxation	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-
26	Aluminium	mg/l	0.03	0.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-
27	Cadmium	mg/l	0.003	No relaxation	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-
28	Mercury	mg/l	0.001	No relaxation	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-	-

Source: DPR Consultant

Note*- GW1: Handpump at Sikandarpur at km 6.3, Nanao-Dadao Road

GW2: Handpump at Tikta at km 14.8, Nanao-Dadao Road

GW3: Handpump at Dadon at km 28.0, Nanao-Dadao Road

GW4: Handpump at Shahpur at km 21.400, Muzaffarnagar to Baraut Road

GW5: Handpump at Daha at km 42.900, Muzaffarnagar to Baraut Road

GW6: Handpump at Baraut at km 61.000, Muzaffarnagar to Baraut Road

GW7: Handpump at Anoopshahar Bypass at km 40.000, Bulandshahar to Anoopshahar Road

GW8: Handpump at Chhiblaha at km 50.500, Bulandshahar to Anoopshahar Road

GW9: Handpump at Mawai at km 8.5, Hussainganj to Alipur Marg

GW10: Handpump at Chhiblaha at km 17.1, Hussainganj to Alipur Marg

GROUND WATER QUALITY MONITORING RESULTS OF UPMDR

Sl. No.	Parameter	Unit	Indian Standards as per IS 10500:2012		ODR 24 & MDR 25E		MDR 66E			MDR 52C				MDR 45W		
			Desirable	Permissible	GW11*	GW12*	GW13*	GW14*	GW15*	GW16*	GW17*	GW18*	GW19*	GW20*	GW21*	GW22*
1	Colour	Hazen Units	5.00	15.00	<5.0	<5.0	<5.0	<5.0	<5.0	-	-	-	-	-	-	-
2	Alkalinity as CaCo3	(mg/l)	200	600	136.0	332.0	220.0	440.0	310.0	431.2	443.5	125.1	512.0	175.6	265.3	295.35
3	Conductivity	µS/cm	-	-			-	-	-	673	691	194	2800	431	413	460
4	Turbidity	NTU	1.00	5.00	0.2	BDL	0.50	0.25	BDL	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5	pH	-	6.5-8.5	NR	7.44	6.94	7.30	6.94	7.28	7.91	8.02	8.08	8.04	8.27	8.06	7.54
6	Total Hardness as CaCO3	mg/l	200.00	600.00	148	336.0	232.0	448.0	316.0	380	248	160	476	174.0	180	192
7	Calcium as Ca	mg/l	75.00	200.00	40.0	89.6	32.0	99.2	57.6	139.48	80.16	44.89	187.57	36.0	41.68	51.30
8	Magnesium as Mg	mg/l	30.00	100.00	11.7	27.2	36.93	48.60	47.79	7.61	11.66	11.66	1.72	20.41	18.47	15.0
9	TDS	mg/l	500	2000	168.0	420.0	254.0	620.0	370.0	-	-	-	-	275	264.0	294
10	Copper as Cu	mg/l	0.05	1.50	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11	Iron as Fe	mg/l	0.30	NR	0.03	3.82	5.96	1.88	0.54	0.17	0.10	0.08	0.34	0.134	0.098	0.132
12	Manganese as Mn	mg/l	0.10	0.30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13	Chlorides as Cl	mg/l	250.00	1000.00	10.0	42.0	8.0	136.0	8.0	4.26	6.39	23.43	6.39	8.52	3.20	5.33
14	Sulphate as SO4	mg/l	200.00	400.00	25.0	22.0	3.0	18.6	1.37	148.0	76.20	65.23	130.0	26.9	23.7	26.4
15	Nitrate as NO3	mg/l	45.00	NR	0.1	2.6	0.39	2.19	0.27	12.58	8.36	3.26	16.05	6.90	6.10	8.32
16	Fluoride as F	mg/l	1.00	1.50	0.25	0.19	0.40	0.33	0.46	0.86	0.54	0.23	0.92	0.56	0.42	0.49
17	Arsenic as As	mg/l	0.01	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18	Lead as Pb	mg/l	0.01	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19	Zinc as Zn	mg/l	5.00	15.00	0.22	0.25	0.32	0.28	0.21	0.13	0.196	0.098	0.61	0.18	0.21	0.34
20	Total Chromium	mg/l	0.05	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21	Sodium	mg/l	-	-	-	-	-	-	-	46.2	56.3	16.5	168.0	22.9	21.6	24.8
22	Potassium	mg/l	-	-	-	-	-	-	-	2.80	1.80	1.10	5.20	1.80	1.40	2.5
23	Bicarbonate	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	Phenolic compound as C6H5OH	-	0.001	0.002	-	-	-	-	-	-	-	-	-	-	-	-
25	Cyanide	mg/l	0.05	NR	-	-	-	-	-	-	-	-	-	-	-	-
26	Aluminium	mg/l	0.03	0.2	-	-	-	-	-	-	-	-	-	-	-	-
27	Cadmium	mg/l	0.003	NR	-	-	-	-	-	-	-	-	-	-	-	-
28	Mercury	mg/l	0.0001	NR	-	-	-	-	-	-	-	-	-	-	-	-

Source: DPR Consultant

Note: GW11: Handpump at Kaptanganj, Naurangiya to Kaptanganj to Varhaaj Marg
GW12: Handpump at Rudrapur, Naurangiya to Kaptanganj to Varhaaj Marg
GW13: Handpump at Kurebhar at km 34.500, Haliyapur to Kurebhar Road
GW14: Handpump at Dostpur at km 77.200, Haliyapur to Kurebhar Road
GW15: Handpump at Bilwai at km 102.000, Haliyapur to Kurebhar Road
GW16: Handpump at Dehwa at km 0.300, Mohanlaganj to Maurawan Unnao Marg
GW17: Handpump at Jabrella at km 13.400, Mohanlaganj to Maurawan Unnao Marg
GW18: Handpump at Maurawan at km 30.800, Mohanlaganj to Maurawan Unnao Marg
GW19: Handpump at Mangat Khera at km 51.200, Mohanlaganj to Maurawan Unnao Marg
GW20: Handpump at Patiyali at km 27.200, Aliganj to Soron Marg
GW21: Handpump at Garkha at km 41.400, Aliganj to Soron Marg
GW22: Handpump at Timberpur at km 56.800, Aliganj to Soron Marg

Appendix 14: Ground Water Source along the Project
(Anupshahar-Bulandshahar)

S. No.	Chainage	Type of Sources	Side	Distance from Center line (m)	Platform type	Impacted(Y/N)
1	22.750	Hand Pump	LHS	8	nil	Y
2	22.950	Hand Pump	LHS	8	cemented	N
3	23.410	Hand Pump	LHS	11	brick/ cement	N
4	23.750	Hand Pump	RHS	12	cemented	N
5	24.250	Hand Pump	RHS	12	cemented	N
6	24.760	Hand Pump	RHS	8	cemented	Y
7	25.080	Hand Pump	RHS	11	cemented	N
8	25.260	Hand Pump	LHS	8	cemented	N
9	25.380	Hand Pump	LHS	9	cemented	Y
10	25.410	Hand Pump	LHS	12	cemented	N
11	25.530	Hand Pump	LHS	11	nil	N
12	25.700	Hand Pump	RHS	11	cemented	N
13	26.400	Hand Pump	RHS	13	cemented	N
14	27.500	Hand Pump	LHS	5	cemented	Y
15	27.650	Hand Pump	RHS	7	cemented	Y
16	27.800	Hand Pump	LHS	9	cemented/ broken	Y
17	28.020	Hand Pump	RHS	13	cemented	N
18	28.660	Hand Pump	LHS	7	cemented	Y
19	28.760	Hand Pump	RHS	9	cemented	Y
20	30.030	Hand Pump	RHS	7	cemented	Y
21	31.670	Hand Pump	RHS	9	cemented	Y
22	31.710	Hand Pump	RHS	11	cemented	N
23	31.780	Hand Pump	RHS	12	cemented	N
24	31.850	Hand Pump	RHS	13	cemented	N
25	31.970	Hand Pump	RHS	11	cemented	N
26	32.030	Hand Pump	RHS	9	cemented	Y
27	32.100	Hand Pump	RHS	11	cemented	N
28	32.230	Hand Pump	LHS	7	cemented	Y
29	32.770	Hand Pump	RHS	13	cemented	N
30	33.300	Hand Pump	LHS	13	cemented	N
31	33.850	Hand Pump	LHS	8	nil	Y
32	34.000	Hand Pump	RHS	8	cemented	Y
33	34.700	Hand Pump	LHS	13	cemented	N
34	34.820	Hand Pump	RHS	11	nil	N
35	34.840	Hand Pump	RHS	16	cemented	N
36	34.880	Hand Pump	RHS	12	cemented	N
37	34.970	Hand Pump	RHS	13	cemented	N
38	35.020	Hand Pump	LHS	13	nil	N
39	35.050	Hand Pump	RHS	14	cemented	N
40	36.430	Hand Pump	LHS	10	cemented	Y
41	36.670	Hand Pump	LHS	11	cemented	N
42	37.010	Hand Pump	LHS	16	cemented	N

S. No.	Chainage	Type of Sources	Side	Distance from Center line (m)	Platform type	Impacted(Y/N)
43	38.780	Hand Pump	RHS	9	cemented	Y
44	39.050	Hand Pump	LHS	13	nil	N
45	39.050	Hand Pump	RHS	11	cemented	N
46	39.060	Hand Pump	RHS	12	nil	N
47	39.080	Hand Pump	LHS	11	cemented	N
48	39.180	Hand Pump	RHS	11	cemented	N
49	39.240	Hand Pump	RHS	8	cemented	Y
50	39.300	Hand Pump	RHS	8	cemented	Y
51	39.380	Hand Pump	LHS	10	cemented	Y
52	39.430	Hand Pump	LHS	10	cemented	Y
53	39.750	Hand Pump	RHS	7	cemented	Y
54	39.850	Hand Pump	RHS	6	cemented	Y
55	39.900	Hand Pump	LHS	12	nil	N
56	39.970	Hand Pump	RHS	10	cemented	Y
57	40.110	Hand Pump	RHS	6	cemented	Y
58	40.220	Hand Pump	RHS	7	cemented	Y
59	40.300	Hand Pump	RHS	10	cemented	Y
60	40.450	Hand Pump	LHS	9	cemented	Y
61	40.850	Hand Pump	RHS	9	cemented	Y
62	40.870	Hand Pump	LHS	11	cemented	N
63	40.950	Hand Pump	RHS	13	cemented	N
64	42.030	Hand Pump	RHS	9	nil	Y
65	42.080	Hand Pump	RHS	7	cemented	Y
66	42.410	Hand Pump	RHS	10	cemented/ broken	Y
67	42.520	Hand Pump	LHS	13	cemented	N
68	42.650	Hand Pump	RHS	11	nil	N
69	43.250	Hand Pump	LHS	16	nil	N
70	43.550	Hand Pump	RHS	9	cemented	Y
71	44.950	Hand Pump	RHS	8	cemented	Y
72	45.380	Hand Pump	LHS	7	cemented	Y
73	46.670	Hand Pump	LHS	11	nil	N
74	46.700	Hand Pump	LHS	9	cemented/ broken	Y
75	46.770	Hand Pump	RHS	8	cemented	Y
76	47.000	Hand Pump	LHS	10	nil	Y
77	47.300	Hand Pump	LHS	10	cemented	Y
78	47.870	Hand Pump	RHS	7	cemented	Y
79	47.970	Hand Pump	RHS	6	cemented	Y
80	48.450	Hand Pump	RHS	13	brick/broken	N
81	49.150	Hand Pump	LHS	9	cemented	Y
82	49.330	Hand Pump	LHS	8	cemented	Y
83	49.480	Hand Pump	RHS	7	cemented	Y
84	49.500	Hand Pump	RHS	10	nil	Y
85	49.700	Hand Pump	RHS	9	brick/ broken	Y

S. No.	Chainage	Type of Sources	Side	Distance from Center line (m)	Platform type	Impacted(Y/N)
86	49.800	Hand Pump	RHS	13	cemented	N
87	49.850	Hand Pump	LHS	15	cemented	N
88	50.300	Hand Pump	RHS	11	cemented	N
89	50.410	Hand Pump	RHS	12	cemented	N
90	50.470	Hand Pump	LHS	6	cemented	Y
91	50.660	Hand Pump	LHS	8	cemented	Y
92	50.670	Hand Pump	RHS	10	cemented	Y
93	51.500	Hand Pump	RHS	9	cemented	Y
94	52.200	Hand Pump	LHS	7	cemented	Y
95	52.910	Hand Pump	LHS	9	cemented/ broken	Y
96	52.950	Hand Pump	LHS	9	cemented/ broken	Y
97	52.980	Hand Pump	LHS	6	cemented	Y
98	53.050	Hand Pump	LHS	8	cemented/ broken	Y
99	53.120	Hand Pump	RHS	11	cemented/ broken	N
100	53.820	Hand Pump	RHS	8	cemented	Y
101	54.200	Hand Pump	LHS	7	nil	Y
102	54.500	Hand Pump	RHS	8	cemented/ broken	Y
103	54.530	Hand Pump	RHS	7	nil	Y
104	54.590	Hand Pump	LHS	10	cemented	Y
105	54.600	Hand Pump	RHS	9	cemented	Y
106	54.610	Hand Pump	LHS	9	cemented	Y
107	54.670	Hand Pump	LHS	9	cemented	Y
108	54.790	Hand Pump	LHS	8	cemented	Y
109	55.030	Hand Pump	RHS	7	cemented	Y
110	55.100	Hand Pump	RHS	11	cemented	N
111	56.120	Hand Pump	LHS	7	cemented	Y
112	56.200	Hand Pump	RHS	8	brick/ broken	Y
113	56.200	Hand Pump	RHS	7	brick/ broken	Y
114	56.270	Hand Pump	LHS	8	cemented	Y
115	56.300	Hand Pump	LHS	9	cemented	Y
116	56.350	Hand Pump	LHS	7	cemented	Y
117	56.410	Hand Pump	LHS	10	cemented/ broken	Y
118	56.470	Hand Pump	LHS	8	cemented	Y
119	56.490	Hand Pump	LHS	10	cemented	Y
120	56.620	Hand Pump	LHS	12	cemented	N
121	56.700	Hand Pump	LHS	8	nil	Y

Source: PPTA Consultant

Appendix 15: Ground Water Source along the Project (Muzaffarnagar Baraut)

S. No.	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (m)	Uses for Drinking/ washing/ Abanoned	Platform & Radius	Impact
1	2.993	Hand Pump	LHS	Khanjahanpur	7	76	Drinking	Cemented / 0.5m	Y
2	3.300	Hand Pump	RHS	Khanjahanpur	7	76	Drinking	Cemented / 0.9m	Y
3	3.350	Hand Pump	RHS	Khanjahanpur	12	76	Drinking	Cemented / 0.5m	N
4	4.050	Hand Pump	RHS	Khanjahanpur	11	76	Drinking	Cemented / 0.6m	N
5	4.600	Hand Pump	RHS	Khanjahanpur	11	76	Drinking	Cemented / 0.5m	N
6	4.700	Hand Pump	LHS	Khanjahanpur	13	76	Drinking	Cemented / 0.5m	N
7	5.800	Hand Pump	RHS	Khanjahanpur	15	76	Drinking	Cemented / 0.5m	N
8	6.450	Hand Pump	RHS	Khanjahanpur	11	76	Drinking	Cemented / 0.9m	N
9	6.500	Hand Pump	LHS	Khanjahanpur	11	76	Drinking	Cemented / 0.5 m	N
10	7.300	Hand Pump	RHS	Sanjhak	15	20	Abandoned	NO	N
11	7.550	Hand Pump	RHS	Sanjhak	8	76	Drinking	Cemented / 0.5m	Y
12	7.780	Hand Pump	RHS	Sanjhak	11	76	Drinking	No	N
13	7.800	Hand Pump	LHS	Sanjhak	11	76	Drinking	Cemented / 0.6m	N
14	7.820	Hand Pump	RHS	Sanjhak	8	20	Abandoned	NO	Y
15	7.850	Hand Pump	RHS	Sanjhak	8	76	Drinking	Cemented / 0.5m	Y
16	7.870	Hand Pump	LHS	Sanjhak	9	76	Abandoned	Cemented / 0.6m	Y
17	7.910	Hand Pump	RHS	Sanjhak	8	20	Drinking	NO	Y
18	7.910	Hand Pump	RHS	Sanjhak	10	76	Drinking	Cemented / 0.6m	Y
19	7.960	Hand Pump	RHS	Sanjhak	14	76	Drinking	Cemented / 0.5m	N
20	9.400	Hand Pump	RHS	Taoli	11	76	Drinking	NO	N
21	9.580	Hand Pump	RHS	Taoli	9	76	Drinking	Cemented / 0.6m	Y
22	9.690	Hand Pump	LHS	Taoli	7	21	Drinking	Cemented / 0.6m	Y
23	9.710	Hand Pump	LHS	Taoli	8	76	Abandoned	Cemented / 0.5m	Y
24	9.750	Hand Pump	LHS	Taoli	8	76	Drinking	Cemented / 0.5m	Y
25	9.770	Hand Pump	RHS	Taoli	9	75	Drinking	Cemented / 0.5m	Y
26	9.780	Hand Pump	LHS	Taoli	9	21	Drinking	NO	Y
27	9.800	Hand Pump	LHS	Taoli	9	75	Drinking	Cemented / 0.5m	Y
28	9.950	Hand Pump	RHS	Taoli	7	75	Drinking	Cemented / 0.5m	Y
29	9.970	Hand Pump	LHS	Taoli	7	75	Drinking	Cemented / 0.5m	Y
30	10.010	Hand Pump	LHS	Taoli	8	75	Abandoned	Cemented / 0.5m	Y

S. No.	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (m)	Uses for Drinking/ washing/ Abanoned	Platform & Radius	Impact
31	10.025	Hand Pump	LHS	Taoli	9	75	Drinking	Cemented / 0.5m	Y
32	10.050	Hand Pump	LHS	Taoli	8	75	Drinking	Cemented / 0.5m	Y
33	10.080	Hand Pump	RHS	Taoli	8	75	Drinking	Cemented / 0.6m	Y
34	10.130	Hand Pump	LHS	Taoli	7	25	Drinking	Cemented / 0.5m	Y
35	10.150	Hand Pump	LHS	Taoli	7	75	Drinking	Cemented / 0.5m	Y
36	10.220	Hand Pump	LHS	Taoli	8	75	Drinking	Cemented / 0.5m	Y
37	10.300	Hand Pump	LHS	Taoli	7	75	Drinking	Cemented / 0.5m	Y
38	10.340	Hand Pump	RHS	Taoli	9	75	Drinking	Cemented / 0.5m	Y
39	10.370	Hand Pump	RHS	Taoli	8	65	Drinking	Cemented / 0.4m	Y
40	10.400	Hand Pump	LHS	Taoli	8	25	Abandoned	NO	Y
41	10.470	Hand Pump	LHS	Taoli	8.5	75	Drinking	Cemented / 0.5m	Y
42	10.650	Hand Pump	RHS	Taoli	11	75	Abandoned	Cemented / 0.5m	N
43	10.810	Hand Pump	RHS	Taoli	10	75	Drinking	Cemented / 0.5m	Y
44	12.480	Hand Pump	RHS	Hassoli	12	75	Drinking	Cemented / 0.5m	N
45	12.700	Hand Pump	RHS	Hassoli	10	75	Drinking	Cemented / 0.4m	Y
46	12.910	Hand Pump	RHS	Hassoli	11	75	Abandoned	Cemented / 0.5m	N
47	12.930	Hand Pump	LHS	Hassoli	12	75	Drinking	Cemented / 0.5m	N
48	13.750	Hand Pump	RHS	Hassoli	15	75	Drinking	Cemented / 0.5m	N
49	13.950	Hand Pump	LHS	Hassoli	12	75	Abandoned	Cemented / 0.6m	N
50	16.300	Hand Pump	RHS	Kakda	14	75	Drinking	Cemented / 0.5m	N
51	16.320	Hand Pump	LHS	Kakda	14	75	Drinking	Cemented / 0.8m	N
52	16.400	Hand Pump	LHS	Kakda	13	75	Drinking	Cemented / 0.5m	N
53	16.510	Hand Pump	RHS	Kakda	7	75	Drinking	Cemented / 0.5m	Y
54	16.600	Hand Pump	LHS	Kakda	25	75	Drinking	Cemented / 0.5m	N
55	16.650	Hand Pump	LHS	Kakda	8	75	Drinking	Cemented / 0.5m	Y
56	16.660	Hand Pump	RHS	Kakda	9	75	Drinking	Cemented / 0.5m	Y
57	16.700	Hand Pump	LHS	Kakda	11	75	Drinking	Cemented / 0.5m	N
58	16.720	Hand Pump	RHS	Kakda	10	75	Drinking	Cemented / 0.5m	Y
59	16.780	Hand Pump	LHS	Kakda	9	75	Drinking	Cemented / 0.5m	Y
60	16.820	Hand Pump	LHS	Kakda	12	75	Drinking	Cemented / 0.5m	N
61	16.860	Hand Pump	LHS	Kakda	12	75	Drinking	Cemented / 0.5m	N
62	20.210	Hand Pump	LHS	Shahpura	7	75	Abandoned	Cemented / 0.5m	Y
63	21.020	Hand Pump	LHS	Shahpura	12	75	Drinking	Cemented / 0.5m	N

S. No.	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (m)	Uses for Drinking/ washing/ Abanoned	Platform & Radius	Impact
64	21.530	Hand Pump	LHS	Shahpura	14	75	Drinking	Cemented / 0.5m	N
65	21.810	Hand Pump	LHS	Shahpura	13	75	Drinking	Cemented / 0.5m	N
66	22.450	Hand Pump	LHS	Shahpura	10	75	Abandoned	NO	Y
67	23.180	Hand Pump	LHS	Umarpur	12	75	Drinking	Cemented / 0.5m	N
68	23.780	Hand Pump	RHS	Umarpur	11	20	Drinking	NO	N
69	23.950	Hand Pump	LHS	Umarpur	13	75	Drinking	NO	N
70	23.950	Hand Pump	RHS	Umarpur	13	75	Abandoned	NO	N
71	24.050	Hand Pump	LHS	Umarpur	10	70	Drinking	NO	Y
72	24.350	Hand Pump	LHS	Umarpur	12	70	Drinking	NO	N
73	24.500	Hand Pump	LHS	Shahdabar	10	75	Drinking	NO	Y
74	24.750	Hand Pump	LHS	Shahdabar	11	75	Abandoned	Cemented / 0.5m	N
75	24.900	Hand Pump	LHS	Shahdabar	9	75	Drinking	Cemented / 0.6m	Y
76	25.050	Hand Pump	LHS	Shahdabar	7	75	Drinking	Cemented / 0.5m	Y
77	25.160	Hand Pump	RHS	Shahdabar	7	75	Drinking	Cemented / 0.5m	Y
78	25.450	Hand Pump	RHS	Shahdabar	7.5	75	Abandoned	Cemented / 0.8m	Y
79	25.490	Hand Pump	RHS	Shahdabar	12	75	Drinking	Cemented / 0.5m	N
80	25.570	Hand Pump	RHS	Shahdabar	11	75	Drinking	Cemented / 0.6m	N
81	26.230	Hand Pump	RHS	Madinpur	10	75	Drinking and Washing	Cemented / 0.5m	Y
82	26.290	Hand Pump	LHS	Madinpur	8	75	Drinking	Cemented / 0.6m	Y
83	26.310	Hand Pump	LHS	Madinpur	8	75	Drinking	Cemented / 0.5m	Y
84	26.440	Hand Pump	LHS	Madinpur	7	75	Drinking	Cemented / 0.6m	Y
85	26.510	Hand Pump	LHS	Madinpur	7	75	Abandoned	Cemented / 0.5m	Y
86	26.900	Hand Pump	RHS	Madinpur	11	75	Abandoned	Cemented / 0.6m	N
87	27.840	Hand Pump	RHS	Bhasana	11	75	Washing and Drinking Both	Cemented / 0.5m	N
88	27.950	Hand Pump	RHS	Bhasana	11	75	Drinking	Cemented / 0.5m	N
89	28.320	Hand Pump	LHS	Bhasana	10	75	Abandoned	Cemented / 0.5m	Y
90	31.300	Hand Pump	RHS	Budhana	7.5	75	Drinking	NO	Y
91	31.600	Hand Pump	LHS	Budhana	7	75	Abandoned	Cemented / 0.5m	Y
92	32.150	Hand Pump	RHS	Budhana	7.5	75	Drinking	Cemented / 0.5m	Y
93	40.310	Hand Pump	LHS	Bharal	12	75	Abandoned	Cemented / 0.5m	N
94	41.070	Hand Pump	RHS	Bharal	6	75	Drinking	Cemented / 0.6m	Y

S. No.	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (m)	Uses for Drinking/ washing/ Abanoned	Platform & Radius	Impact
95	42.110	Hand Pump	RHS	Daha	9	75	Drinking	Cemented / 0.5m	Y
96	42.250	Hand Pump	RHS	Daha	8	75	Drinking	NO	Y
97	42.610	Hand Pump	RHS	Daha	7	75	Drinking	Cemented / 0.5m	Y
98	43.080	Hand Pump	RHS	Daha	7.5	75	Drinking	Cemented / 0.5m	Y
99	43.180	Hand Pump	RHS	Daha	6	75	Drinking	NO	Y
100	43.300	Hand Pump	RHS	Daha	7	75	Drinking	Cemented / 0.5m	Y
101	44.910	Hand Pump	LHS	Daha	12	75	Drinking	Cemented / 0.6m	N
102	45.450	Hand Pump	LHS	Kannad	6	75	Drinking	Cemented / 0.8m	Y
103	45.550	Hand Pump	LHS	Kannad	5	75	Abandoned	Cemented / 0.5m	Y
104	45.650	Hand Pump	LHS	Kannad	6	75	Drinking	Cemented / 0.5m	Y
105	45.700	Hand Pump	RHS	Kannad	6	75	Drinking	Cemented / 0.5m	Y
106	46.050	Hand Pump	LHS	Kannad	10	75	Drinking	Cemented / 0.7m	Y
107	46.950	Hand Pump	RHS	Kannad	7.5	75	Drinking	Cemented / 0.6m	Y
108	47.960	Hand Pump	LHS	pusar	7	75	Drinking	Cemented / 0.6m	Y
109	48.160	Hand Pump	RHS	pusar	7.5	75	Drinking	Cemented / 0.6m	Y
110	48.240	Hand Pump	RHS	pusar	7.5	75	Drinking	Cemented / 0.6m	Y
111	48.300	Hand Pump	LHS	pusar	6.5	75	Drinking	Cemented / 0.6m	Y
112	49.995	Hand Pump	RHS	pusar	8	75	Drinking	Cemented / 0.6m	Y
113	52.100	Hand Pump	LHS	pusar	8.5	75	Drinking	Cemented / 0.5m	Y
114	52.450	Hand Pump	RHS	Bamnauli	9	75	Abandoned	Cemented / 0.5m	Y
115	52.700	Hand Pump	RHS	Bamnauli	8	75	Drinking	Cemented / 0.6m	Y
116	54.700	Hand Pump	RHS	Bamnauli	5	75	Drinking	Cemented / 0.5m	Y
117	56.100	Hand Pump	LHS	Bijhaul	10	75	Drinking	Cemented / 0.5m	Y
118	56.780	Hand Pump	RHS	Bijhaul	7	75	Drinking	Cemented / 0.6m	Y
119	56.900	Hand Pump	RHS	Bijhaul	7	75	Drinking	Cemented / 0.5m	Y
120	57.100	Hand Pump	LHS	Bijhaul	7	75	Abandoned	Cemented / 0.5m	Y
121	57.110	Hand Pump	RHS	Bijhaul	12	75	Drinking	Cemented / 0.5m	N
122	57.200	Hand Pump	RHS	Bijhaul	9	75	Abandoned	Cemented / 0.5m	Y
123	57.510	Hand Pump	RHS	Bijhaul	7	75	Drinking	Cemented / 0.5m	Y
124	58.400	Hand Pump	RHS	Baraut	11	75	Drinking	Cemented / 0.5m	N
125	59.320	Hand Pump	RHS	Baraut	7	75	Drinking	Cemented / 0.5m	Y
126	59.510	Hand Pump	RHS	Baraut	7	75	Drinking	Cemented / 0.5m	Y
127	60.800	Hand Pump	RHS	Baraut	12	21	Drinking	Cemented / 0.5m	N

S. No.	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (m)	Uses for Drinking/ washing/ Abanoned	Platform & Radius	Impact
128	61.180	Hand Pump	RHS	Baraut	13	75	Drinking	Cemented / 0.6m	N
129	62.100	Hand Pump	LHS	Baraut	4	75	Drinking	Cemented / 0.45m	Y

Source: PPTA Consultant

Appendix 16: Ground Water Source along the Project-(Hussainganj- Alipur Jita Road MDR 81C)

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
1	13.700	LHS	Hand Pump	9.9	Bargadiyapur	15	using for drinking water	Concrete platform	6.4	y
2	13.750	RHS	Hand Pump	7.8	Bargadiyapur	15	using for drinking water	Concrete platform	4.3	y
3	13.800	LHS	Hand Pump	9.7	Bargadiyapur	15	using for drinking water	Concrete platform	6.2	y
4	13.825	RHS	Hand Pump	10.4	Gosain ki Sarai	18	using for drinking water	Concrete platform	6.9	N
5	13.850	LHS	Hand Pump	20.9	Gosain ki Sarai	18	using for drinking water	Concrete platform	17.4	N
6	13.875	LHS	Hand Pump	11.5	Gosain ki Sarai	18	using for drinking water	Brick based platform	8.0	N
7	13.900	RHS	Well	9.5	Gosain ki Sarai	15	using for domestic purposes	Concrete platform	6.0	y
8	13.900	LHS	Hand Pump	5.5	Gosain ki Sarai	40	using for drinking water	Concrete platform	2.0	y
9	13.925	LHS	Bore well	11.5	Gosain ki Sarai	20	using for drinking water	Concrete platform	8.0	N
10	13.950	RHS	Hand Pump	7.5	Gosain ki Sarai	15	using for drinking water	Concrete platform	4.0	y
11	13.975	RHS	Hand Pump	5.5	Gosain ki Sarai	38	using for drinking water	Concrete platform	2.0	y
12	14.000	RHS	Hand Pump	11.5	Gosain ki Sarai	11	using for drinking water	Brick based platform	8.0	N
13	14.010	RHS	Hand Pump	8.2	Gosain ki Sarai	40	using for drinking water	Concrete platform	4.7	y
14	14.020	LHS	well	11.0	Gosain ki Sarai	11	using for drinking water	Concrete platform	7.6	N
15	14.020	RHS	Hand Pump	10.9	Gosain ki Sarai	20	using for drinking water	Concrete platform	7.4	N
16	14.000	LHS	Hand Pump	7.5	Gosain ki Sarai	20	using for drinking water	Concrete platform	4.0	y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
17	14.010	LHS	Hand Pump	7.5	Gosain ki Sarai	20	using for drinking water	Concrete platform	4.0	y
18	14.100	LHS	Hand Pump	15.0	Gosain ki Sarai	20	using for drinking water	Concrete platform	11.5	N
19	14.125	LHS	Hand Pump	14.5	Gosain ki Sarai	20	using for drinking water	Drinking	11.0	N
20	14.150	LHS	Hand Pump	7.1	Gosain ki Sarai	13	using for drinking water	Concrete platform	5.6	y
21	14.175	LHS	Hand Pump	10.7	Gosain ki Sarai	13	using for drinking water	Concrete platform	9.2	N
22	14.225	LHS	Hand Pump	7.0	Gosain ki Sarai	13	using for drinking water	Concrete platform	4.5	y
23	14.230	LHS	Hand Pump	5.5	Gosain ki Sarai	13	abondoned	Brick based platform	4.0	y
24	14.250	LHS	Hand Pump	6.4	Gosain ki Sarai	13	using for drinking water	Concrete platform	4.9	y
25	14.250	RHS	Hand Pump	9.8	Gosain ki Sarai	13	using for drinking water	Earthen platform	8.3	y
26	14.260	RHS	Hand Pump	10.0	Gosain ki Sarai	13	using for drinking water	Concrete platform	8.5	y
27	14.265	LHS	Hand Pump	10.7	Gosain ki Sarai	13	using for drinking water	Concrete platform	9.2	N
28	14.275	RHS	Hand Pump	7.5	Gosain ki Sarai	15	using for drinking water	Brick based platform	6.0	y
29	14.300	RHS	Hand Pump	9.5	Gosain ki Sarai	13	using for drinking water	Concrete platform	8.0	y
30	14.325	RHS	Hand Pump	9.8	Gosain ki Sarai	13	using for drinking water	Concrete platform	8.3	y
31	14.400	RHS	Hand Pump	18.7	Gosain ki Sarai	15	using for drinking water	Concrete platform	17.2	N
32	14.400	LHS	Hand Pump	9.5	Gosain ki Sarai	15	using for drinking water	Concrete platform	8.0	y
33	14.450	RHS	Hand Pump	14.7	Gosain ki Sarai	15	using for drinking water	Brick based platform	13.2	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
34	14.450	LHS	Hand Pump	10.2	Gosain ki Sarai	15	using for drinking water	Concrete platform	8.7	N
35	14.475	LHS	Hand Pump	12.5	Gosain ki Sarai	15	using for drinking water	Concrete platform	11.0	N
36	14.480	LHS	Hand Pump	12.5	Gosain ki Sarai	13	using for drinking water	Concrete platform	11.0	N
37	14.500	LHS	Hand Pump	10.6	Gosain ki Sarai	13	using for drinking water	Concrete platform	8.9	N
38	14.600	RHS	Hand Pump	8.3	Gosain ki Sarai	14	using for drinking water	Brick based platform	6.8	y
39	14.625	RHS	Hand Pump	12.2	Gosain ki Sarai	14	using for drinking water	Concrete platform	10.7	N
40	14.700	RHS	Hand Pump	10.8	Luxmanpur	14	using for drinking water	Concrete platform	9.3	N
41	14.750	RHS	Well	14.3	Luxmanpur	15	using for drinking water	Concrete platform	12.8	N
42	14.800	LHS	Hand Pump	5.5	Luxmanpur	40	using for drinking water	Concrete platform	4.0	y
43	14.950	RHS	Hand Pump	10.2	Luxmanpur	13	using for drinking water	Concrete platform	8.7	N
44	14.980	LHS	Bore well	17.5	Ahinda	15	Agricultural Use	Earthen platform	16.0	N
45	14.990	LHS	Hand Pump	13.7	Ahinda	40	using for drinking water	Concrete platform	12.2	N
46	14.990	RHS	Hand Pump	11.2	Ahinda	15	using for drinking water	Concrete platform	9.7	N
47	14.980	RHS	Hand Pump	12.5	Ahinda	15	using for drinking water	Brick based platform	11.0	N
48	15.250	RHS	Hand Pump	17.9	Ahinda	15	using for drinking water	Brick based platform	16.4	N
49	15.270	LHS	Well	6.8	Ahinda	15	using for drinking water	Concrete platform	5.3	y
50	15.300	RHS	Bore well	25.0	Ahinda	15	Agricultural Use	Earthen platform	23.5	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
51	15.400	RHS	Hand Pump	8.9	Ahinda	15	using for drinking water	Concrete platform	7.4	y
52	15.410	RHS	Hand Pump	11.9	Ahinda	10	using for drinking water	Concrete platform	10.4	N
53	15.435	RHS	Well	5.5	Ahinda	15	using for drinking water	Concrete platform	4.0	y
54	15.435	RHS	Hand Pump	9.2	Ahinda	40	using for drinking water	Concrete platform	4.7	y
55	15.550	RHS	Hand Pump	8.8	Ahinda	15	using for drinking water	Concrete platform	7.3	y
56	15.600	RHS	Hand Pump	9.0	Ahinda	15	using for drinking water	Concrete platform	7.5	y
57	15.630	LHS	Hand Pump	9.8	Ahinda	15	using for drinking water	Concrete platform	8.3	y
58	15.700	RHS	Hand Pump	13.5	Ahinda	15	using for drinking water	Concrete platform	12.0	N
59	15.750	RHS	Hand Pump	18.5	Ahinda	10	using for drinking water	Brick based platform	17.0	N
60	15.800	RHS	Hand Pump	14.5	Ahinda	10	using for drinking water	Concrete platform	13.0	N
61	16.250	LHS	Hand Pump	6.9	Chhiwaha	10	using for drinking water	Concrete platform	5.4	y
62	16.275	RHS	Hand Pump	10.0	Chhiwaha	10	using for drinking water	Concrete platform	8.5	y
63	16.350	LHS	Hand Pump	8.9	Chhiwaha	20	using for drinking water	Concrete platform	6.4	y
64	16.400	RHS	Hand Pump	9.3	Chhiwaha	20	using for drinking water	Concrete platform	7.8	y
65	16.450	RHS	Well	16.5	Chhiwaha	10	abondoned	Concrete platform	15.0	N
66	16.575	RHS	Well	11.5	Ahinda	10	abondoned	Concrete platform	10.0	N
67	16.600	LHS	Hand Pump	3.5	Ahinda	15	using for drinking water	Concrete platform	2.0	y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
68	16.650	LHS	Hand Pump	4.0	Chhiwaha	10	using for drinking water	Concrete platform	2.5	y
69	16.860	LHS	Hand Pump	5.0	Chhiwaha	10	using for drinking water	Concrete platform	3.5	N
70	16.875	RHS	Hand Pump	7.0	Chhiwaha	15	using for drinking water	Concrete platform	4.5	N
71	16.900	RHS	Hand Pump	6.0	Chhiwaha	15	using for drinking water	Concrete platform	3.5	N
72	16.910	RHS	Hand Pump	6.0	Chhiwaha	15	using for drinking water	Concrete platform	3.5	N
73	16.920	LHS	Hand Pump	5.0	Chhiwaha	15	using for drinking water	Concrete platform	2.5	y
74	17.100	RHS	Well	5.5	Chhiwaha	15	abondoned	Concrete platform	3.0	N
75	17.200	LHS	Hand Pump	5.5	Chhiwaha	40	using for drinking water	Concrete platform	3.0	y
76	17.300	LHS	Hand Pump	5.0	Chhiwaha	15	using for drinking water	Concrete platform	2.5	y
77	17.400	RHS	Hand Pump	6.0	Chhiwaha	15	using for drinking water	Concrete platform	3.5	y
78	17.410	LHS	Hand Pump	6.0	Chhiwaha	40	using for drinking water	Concrete platform	4.5	y
79	17.500	LHS	Hand Pump	6.5	Chhiwaha	40	using for drinking water	Concrete platform	3.5	y
80	17.600	RHS	Hand Pump	9.5	Chhiwaha	40	using for drinking water	Concrete platform	7.0	N
81	17.650	LHS	Hand Pump	7.5	Chhiwaha	40	using for drinking water	Concrete platform	5.0	y
82	17.700	LHS	Hand Pump	7.5	Chhiwaha	40	using for drinking water	Concrete platform	5.0	y
83	18.400	LHS	Hand Pump	13.3	Chhiwaha	40	using for drinking water	Concrete platform	12.8	N
84	18.500	RHS	Well	22.5	Baliya	20	using for drinking water	Concrete platform	21.0	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
85	18.600	LHS	Hand Pump	16.5	Baliya	20	using for drinking water	Concrete platform	15.0	N
86	18.700	LHS	Hand Pump	5.0	Baliya	20	using for drinking water	Concrete platform	3.5	y
87	18.750	RHS	Hand Pump	11.5	Baliya	20	abondoned	Concrete platform	10.0	N
88	18.800	RHS	Hand Pump	5.0	Baliya	20	using for drinking water	Concrete platform	3.5	y
89	18.825	RHS	Hand Pump	7.5	Baliya	20	using for drinking water	Concrete platform	6.0	y
90	18.850	RHS	Hand Pump	15.0	Baliya	20	using for drinking water	Concrete platform	13.5	N
91	18.875	RHS	Hand Pump	15.0	Baliya	20	using for drinking water	Concrete platform	14.0	N
92	19.150	LHS	Hand Pump	7.5	Baliya	20	abondoned	Earthen platform	6.0	y
93	19.200	RHS	Hand Pump	15.0	Baliya	20	abondoned	Earthen platform	13.5	N
94	19.250	LHS	Hand Pump	11.5	Baliya	20	using for drinking water	Concrete platform	10.0	N
95	19.300	RHS	Hand Pump	15.0	Baliya	20	using for drinking water	Concrete platform	13.5	N
96	19.350	RHS	Hand Pump	11.0	Baliya	20	using for drinking water	Concrete platform	9.5	N
97	19.400	LHS	Hand Pump	11.0	Baliya	20	using for drinking water	Concrete platform	9.0	N
98	19.500	LHS	Hand Pump	23.0	Baliya	20	using for drinking water	Concrete platform	21.5	N
99	19.800	RHS	Bore well	7.0	Baliya	40	using for drinking water	Concrete platform	5.5	y
100	19.920	RHS	Hand Pump	8.0	Baliya	20	using for drinking water	Concrete platform	5.5	y
101	20.100	RHS	Hand Pump	7.0	Baliya	10	using for drinking water	Concrete platform	5.5	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
102	20.500	RHS	Hand Pump	12.0	Kasramod Chauraha	10	using for drinking water	Concrete platform	10.5	N
103	20.600	LHS	Hand Pump	7.0	Kasramod Chauraha	20	using for drinking water	Concrete platform	5.5	y
104	21.000	RHS	Hand Pump	13.0	Simara Manapore	20	using for drinking water	Concrete platform	11.4	N
105	21.050	RHS	Hand Pump	9.8	Simara Manapore	20	using for drinking water	Concrete platform	6.3	y
106	21.150	RHS	Well	8.8	Simara Manapore	20	using for drinking water	Concrete platform	5.3	y
107	21.100	LHS	Well	18.0	Simara Manapore	20	using for drinking water	Concrete platform	16.5	N
108	21.450	LHS	Hand Pump	4.5	Simara Manapore	40	using for drinking water	Concrete platform	3.0	y
109	21.950	LHS	Bore well	13.4	Simara Manapore	40	Agricultural Use	Earthen platform	8.5	N
110	22.200	LHS	Bore well	13.5	Simara Manapore	40	Agricultural Use	Earthen platform	12.0	N
111	22.800	RHS	Hand Pump	11.0	Ajaypur Kudaila	20	abondoned	Concrete platform	9.5	N
112	22.900	LHS	Bore well	14.0	Ajaypur Kudaila	40	Agricultural Use	Concrete platform	12.5	N
113	22.910	RHS	Bore well	10.0	Ajaypur Kudaila	40	Agricultural Use	Concrete platform	8.5	y
114	23.100	LHS	Bore well	15.0	Ajaypur Kudaila	40	Agricultural Use	Concrete platform	13.5	N
115	23.800	LHS	Hand Pump	8.0	Ajaypur Kudaila	20	using for drinking water	Concrete platform	6.5	y
116	24.900	RHS	Bore well	18.0	Ajaypur Kudaila	40	Agricultural Use	Concrete platform	16.5	N
117	25.100	RHS	Hand Pump	16.5	Hathgoam	40	using for drinking water	Concrete platform	15.0	N
118	25.300	RHS	Hand Pump	6.5	Hathgoam	40	using for drinking water	Concrete platform	5.0	y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
119	25.600	LHS	Hand Pump	8.5	Hathgoam	40	using for drinking water	Concrete platform	7.0	y
120	25.600	RHS	Hand Pump	12.5	Hathgoam	30	abondoned	Concrete platform	11.0	N
121	25.800	RHS	Hand Pump	5.0	Hathgoam	30	using for drinking water	Concrete platform	3.5	y
122	26.200	LHS	Hand Pump	17.0	Hathgoam	30	using for drinking water	Concrete platform	15.5	N
123	26.300	LHS	Hand Pump	4.0	Hathgoam	30	using for drinking water	Concrete platform	2.5	y
124	26.400	RHS	Well	14.5	Hathgoam	10	abondoned	Concrete platform	13.0	N
125	26.400	LHS	Hand Pump	3.5	Hathgoam	40	using for drinking water	Concrete platform	1.5	y
126	26.500	RHS	Hand Pump	10.8	Hathgoam	40	using for drinking water	Concrete platform	8.3	N
127	26.500	RHS	Hand Pump	3.5	Hathgoam	40	abondoned	Concrete platform	2.0	y
128	26.500	LHS	Hand Pump	6.7	Hathgoam	40	using for drinking water	Concrete platform	4.2	N
129	26.600	RHS	Hand Pump	5.5	Hathgoam	40	using for drinking water	Concrete platform	3.5	y
130	26.650	LHS	Hand Pump	7.0	Hathgoam	40	using for drinking water	Concrete platform	5.0	y
131	26.700	LHS	Hand Pump	4.0	Hathgoam	40	using for drinking water	Concrete platform	2.0	y
132	26.700	RHS	Well	4.0	Hathgoam	15	abondoned	Concrete platform	2.0	y
133	26.800	LHS	Hand Pump	6.0	Hathgoam	40	using for drinking water	Concrete platform	4.0	y
134	26.810	LHS	Hand Pump	6.2	Hathgoam	40	using for drinking water	Concrete platform	4.2	y
135	26.900	RHS	Hand Pump	7.6	Hathgoam	40	using for drinking water	Concrete platform	5.6	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
136	26.920	RHS	Hand Pump	3.0	Hathgoam	40	using for drinking water	Concrete platform	1.0	y
137	26.990	RHS	Hand Pump	4.0	Hathgoam	40	using for drinking water	Concrete platform	2.0	y
138	27.080	LHS	Hand Pump	4.5	Hathgoam	40	using for drinking water	Concrete platform	2.5	y
139	27.100	RHS	Hand Pump	7.5	Hathgoam	40	using for drinking water	Concrete platform	5.5	y
140	27.150	LHS	Hand Pump	7.2	Hathgoam	40	using for drinking water	Concrete platform	5.2	y
141	27.200	RHS	Hand Pump	9.2	Hathgoam	40	using for drinking water	Concrete platform	7.2	y
142	27.200	LHS	Hand Pump	7.5	Hathgoam	40	abondoned	Concrete platform	5.5	y
143	27.250	LHS	Hand Pump	9.0	Hathgoam	40	using for drinking water	Concrete platform	7.5	y
144	27.280	LHS	Hand Pump	9.3	Hathgoam	40	using for drinking water	Concrete platform	7.3	y
145	27.320	LHS	Hand Pump	8.0	Hathgoam	40	using for drinking water	Concrete platform	6.0	y
146	27.400	LHS	Hand Pump	5.5	Hathgoam	40	using for drinking water	Concrete platform	3.5	y
147	27.450	RHS	Hand Pump	15.0	Hathgoam	40	using for drinking water	Concrete platform	13.5	N
148	27.500	RHS	Hand Pump	4.9	Hathgoam	40	using for drinking water	Concrete platform	6.9	y
149	27.600	LHS	Hand Pump	8.0	Hathgoam	40	using for drinking water	Concrete platform	6.0	y
150	27.700	RHS	Hand Pump	10.0	Hathgoam	40	using for drinking water	Concrete platform	8.0	N
151	27.700	RHS	Hand Pump	10.0	Hathgoam	40	using for drinking water	Concrete platform	8.0	y
152	27.800	LHS	Hand Pump	10.0	Hathgoam	40	using for drinking water	Concrete platform	8.0	y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
153	27.850	RHS	Hand Pump	8.8	Hathgoam	40	using for drinking water	Concrete platform	6.8	y
154	27.900	RHS	Hand Pump	7.5	Hathgoam	40	using for drinking water	Concrete platform	9.5	y
155	28.200	RHS	Hand Pump	15.0	Hathgoam	40	using for drinking water	Concrete platform	17.0	N
156	28.400	RHS	Hand Pump	8.5	Hathgoam	40	using for drinking water	Concrete platform	7.0	N
157	28.900	LHS	Hand Pump	10.7	Hathgoam	40	using for drinking water	Concrete platform	9.2	N
158	29.100	LHS	Bore well	9.2	Aramasin Chauraha	50	Agricultural Use	Concrete platform	7.7	y
159	29.600	LHS	Hand Pump	12.0	Aramasin Chauraha	40	Agricultural Use	Earthen platform	10.0	N
160	29.610	LHS	Hand Pump	12.0	Jalaipur	40	using for drinking water	Earthen platform	10.0	N
161	29.700	RHS	Hand Pump	20.0	Shahpur Rahibasti	40	using for drinking water	Earthen platform	18.4	N
162	29.900	LHS	Hand Pump	7.9	Shahpur Rahibasti	40	using for drinking water	Concrete platform	6.4	y
163	30.100	LHS	Hand Pump	12.0	Shahpur Rahibasti	40	using for drinking water	Brick based platform	10.5	y
164	30.800	LHS	Hand Pump	13.5	Shahpur Rahibasti	40	using for drinking water	Brick based platform	12.5	N
165	31.100	RHS	Hand Pump	10.0	Shahpur Rahibasti	40	using for drinking water	Concrete platform	8.5	y
166	31.400	RHS	Bore well	20.0	Bahera chowki	60	Agricultural Use	Earthen platform	18.5	N
167	33.000	RHS	Hand Pump	5.4	Bahera chowki	40	using for drinking water	Concrete platform	3.9	y
168	33.800	LHS	Well	9.0	Ayrahan	15	abondoned	Concrete platform	7.5	y
169	33.810	RHS	Hand Pump	14.3	Ayrahan	40	using for drinking water	Concrete platform	12.8	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
170	34.880	RHS	Hand Pump	4.3	Bhikampore More	40	using for drinking water	Concrete platform	2.8	y
171	36.000	RHS	Hand Pump	6.4	Benchi ki purba	40	using for drinking water	Concrete platform	4.9	y
172	36.500	RHS	Hand Pump	9.5	Chaube ki Sarai	40	using for drinking water	Concrete platform	8.0	y
173	36.600	LHS	Well	13.3	Chaube ki Sarai	30	abondoned	Concrete platform	11.8	N
174	36.650	LHS	Hand Pump	8.9	Chaube ki Sarai	40	using for drinking water	Concrete platform	7.4	y
175	36.700	RHS	Hand Pump	4.3	Chaube ki Sarai	40	using for drinking water	Concrete platform	2.8	y
176	36.750	RHS	Well	6.5	Chaube ki Sarai	10	using for domestic purposes	Concrete platform	5.0	y
177	36.800	RHS	Well	5.7	Chaube ki Sarai	10	abondoned	Concrete platform	4.2	y
178	36.850	RHS	Hand Pump	5.3	Chaube ki Sarai	40	using for drinking water	Concrete platform	4.8	y
179	36.980	RHS	Hand Pump	5.1	Usrahar Purba	35	using for drinking water	Concrete platform	4.6	y
180	37.080	LHS	Hand Pump	5.2	Usrahar Purba	30	abondoned	Concrete platform	3.7	y
181	37.200	LHS	Hand Pump	7.7	Usrahar Purba	40	using for drinking water	Concrete platform	6.2	y
182	37.600	RHS	Hand Pump	5.5	Sultanpur Ghos	40	using for drinking water	Concrete platform	4.0	y
183	37.700	LHS	Hand Pump	9.1	Sultanpur Ghos	30	abondoned	Concrete platform	7.6	N
184	37.800	LHS	Hand Pump	10.3	Sultanpur Ghos	50	using for drinking water	Concrete platform	8.8	N
185	37.850	RHS	Hand Pump	9.2	Sultanpur Ghos	40	using for drinking water	Concrete platform	7.7	y
186	38.400	LHS	Hand Pump	8.8	Paharpur	40	using for drinking water	Concrete platform	7.3	y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
187	39.500	RHS	Bore well	9.0	Paharpur	40	using for drinking water	Earthen platform	7.0	y
188	40.800	LHS	Hand Pump	7.5	Rampur Basai	40	using for drinking water	Concrete platform	6.0	y
189	41.500	LHS	Bore well	10.7	Rampur Basai	40	using for drinking water	Earthen platform	9.2	N
190	41.600	RHS	Hand Pump	5.8	PremNagar	40	using for drinking water	Concrete platform	3.3	y
191	41.700	RHS	Hand Pump	4.5	PremNagar	40	using for drinking water	Concrete platform	3.0	y
192	41.800	RHS	Hand Pump	4.5	PremNagar	40	using for drinking water	Concrete platform	3.0	y
193	41.850	RHS	Hand Pump	3.5	PremNagar	40	using for drinking water	Concrete platform	2.0	y
194	41.900	RHS	Hand Pump	3.5	PremNagar	40	abondoned	Concrete platform	2.0	y
195	41.920	RHS	Hand Pump	7.2	PremNagar	40	using for drinking water	Concrete platform	5.7	y
196	42.100	RHS	Hand Pump	6.0	PremNagar	40	using for drinking water	Concrete platform	4.5	y
197	42.400	LHS	Hand Pump	6.4	PremNagar	40	using for drinking water	Concrete platform	4.9	N
198	42.550	RHS	Hand Pump	5.9	Davantpur More	40	using for drinking water	Concrete platform	4.4	y
199	43.600	LHS	Hand Pump	7.5	Neya Purva	40	using for drinking water	Concrete platform	6.0	y
200	43.650	RHS	Hand Pump	9.3	Neya Purva	40	using for drinking water	Concrete platform	7.8	N
201	43.720	LHS	Hand Pump	7.5	Neya Purva	40	using for drinking water	Concrete platform	6.0	y
202	43.800	RHS	Hand Pump	6.5	Neya Purva	40	using for drinking water	Concrete platform	5.0	y
203	44.900	RHS	Bore well	19.5	Neya Purva	50	Agricultural Use	Earthen platform	18.0	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (m)	Uses	Platform Type	Distance from mettled road	Impact
204	45.000	RHS	Hand Pump	8.5	Mohamad Gouti	30	using for drinking water	Concrete platform	7.0	y
205	46.800	RHS	Hand Pump	6.5	Afoi	40	using for drinking water	Concrete platform	5.0	y
206	46.900	RHS	Hand Pump	12.2	Afoi	40	using for drinking water	Concrete platform	11.7	N
207	47.200	RHS	Hand Pump	9.0	Afoi	40	using for drinking water	Concrete platform	7.5	y
208	47.250	LHS	Hand Pump	7.5	Afoi	40	using for drinking water	Concrete platform	6.0	y
209	47.300	RHS	Well	5.5	Afoi	15	abondoned	Concrete platform	4.0	y
210	47.400	RHS	Hand Pump	5.3	Afoi	20	using for drinking water	Concrete platform	3.0	y
211	47.500	RHS	Hand Pump	9.0	Afoi	25	using for drinking water	Concrete platform	7.5	N
212	47.550	RHS	Hand Pump	8.0	Afoi	40	using for drinking water	Concrete platform	6.5	y
213	47.575	RHS	Hand Pump	9.5	Afoi	40	using for drinking water	Concrete platform	8.0	y
214	48.100	LHS	Well	6.0	Alipur Jita	5	abondoned	Concrete platform	4.5	y
215	48.450	LHS	Hand Pump	13.5	Alipur Jita	25	using for drinking water	Concrete platform	12.0	N

Source: PPTA Consultant

Appendix 17: Ground Water Source along the Project Haliyapur to Kurebhar

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
1	0.450	Hand Pump	RHS	Kashirampurwa	9.5	42	Drinking	Concrete platform	Y
2	0.500	Hand Pump	RHS	Kashirampurwa	9	42	Drinking	Concrete platform	Y
3	0.600	Hand Pump	LHS	Kashirampurwa	7.5	42	Drinking	Concrete platform	Y
4	0.600	Hand Pump	RHS	Kashirampurwa	13	42	Drinking	Earthern Platform	N
5	1.400	Hand Pump	LHS	Kandhaisingh Ka Purwa	11.5	20	Drinking	Earthern Platform	N
6	1.480	Hand Pump	RHS	Kandhaisingh Ka Purwa	10	42	Drinking	Concrete platform	N
7	1.490	Hand Pump	LHS	Kandhaisingh Ka Purwa	7	42	Drinking	Concrete platform	Y
8	1.550	Well	RHS	Kandhaisingh Ka Purwa	7	9	Abandoned	Concrete platform	Y
9	1.900	Hand Pump	RHS	Kandhaisingh Ka Purwa	7.5	42	Drinking	Concrete platform	Y
10	1.950	Hand Pump	RHS	Kandhaisingh Ka Purwa	7	42	Drinking	Concrete platform	Y
11	2.080	Hand Pump	LHS	Dobhariya	7.5	42	Drinking	Concrete platform	Y
12	2.180	Hand Pump	RHS	Dobhariya	7.5	42	Drinking	Concrete platform	Y
13	2.280	Hand Pump	RHS	Dobhariya	8	20	Drinking	Concrete platform	Y
14	2.450	Hand Pump	RHS	Dobhariya	5	20	Drinking	Concrete platform	Y
15	2.580	Hand Pump	LHS	Dobhariya	9	42	Drinking	Concrete platform	Y
16	3.220	Hand Pump	RHS	Purebeni Tiwari Purwa	7	42	Drinking	Concrete platform	Y
17	3.480	Hand Pump	LHS	Purebeni Tiwari Purwa	7	42	Drinking	Concrete platform	Y
18	3.550	Hand Pump	RHS	Purebeni Tiwari Purwa	9.5	20	Drinking	Concrete platform	Y
19	3.710	Well	RHS	Chrairaon Purwa	15	10	Abandoned	Concrete platform	N
20	3.730	Hand Pump	RHS	Chrairaon Purwa	7	42	Drinking	Concrete platform	Y
21	4.050	Hand Pump	RHS	Mukundpur	11	42	Drinking	Concrete platform	N
22	4.100	Hand Pump	RHS	Mukundpur	11	20	Drinking	Concrete platform	N

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
23	4.300	Hand Pump	RHS	Mukundpur	12	20	Drinking	Concrete platform	N
24	4.700	Hand Pump	RHS	Bhawanigarh	9	20	Drinking	Concrete platform	Y
25	4.720	Hand Pump	RHS	Bhawanigarh	8	20	Drinking	Brick Based Platform	Y
26	4.900	Hand Pump	RHS	Bhawanigarh	10	20	Drinking	Concrete platform	Y
27	5.100	Hand Pump	LHS	Bhawanigarh	11	20	Drinking	Concrete platform	N
28	5.150	Hand Pump	RHS	Bhawanigarh	6.5	20	Abandoned	Concrete platform	Y
29	5.500	Hand Pump	RHS	Bhawanigarh	7	20	Drinking	Brick Based Platform	Y
30	5.620	Hand Pump	RHS	Bhawanigarh	10	20	Drinking	Concrete platform	Y
31	5.700	Hand Pump	RHS	Bhawanigarh	7	20	Drinking	Concrete platform	Y
32	6.500	Hand Pump	RHS	Loniya Ka Purwa	7.5	20	Drinking	Brick Based Platform	Y
33	7.050	Hand Pump	LHS	Loniya Ka Purwa	6	20	Drinking	Concrete platform	Y
34	7.100	Hand Pump	RHS	Loniya Ka Purwa	7	20	Drinking	Concrete platform	Y
35	7.120	Hand Pump	LHS	Loniya Ka Purwa	7	20	Drinking	Concrete platform	Y
36	7.510	Hand Pump	LHS	Harbhansh Ka Purwa	9	20	Drinking	Concrete platform	Y
37	7.850	Hand Pump	RHS	Harbhansh Ka Purwa	7	42	Drinking	Concrete platform	Y
38	8.200	Hand Pump	RHS	Harbhansh Ka Purwa	6	42	Drinking	Concrete platform	Y
39	8.310	Hand Pump	LHS	Sukul Ke Purwa	6	42	Drinking	Concrete platform	Y
40	8.710	Hand Pump	LHS	Govindpur	6	42	Drinking	Earthern Platform	Y
41	8.740	Hand Pump	RHS	Govindpur	6	20	Drinking	Concrete platform	Y
42	8.740	Well	LHS	Govindpur	8.5	9	Drinking	Concrete platform	Y
43	8.750	Hand Pump	LHS	Govindpur	9	20	Drinking	Concrete platform	Y
44	8.800	Well	LHS	Govindpur	10	9	Abandoned	Concrete platform	Y
45	8.830	Hand Pump	LHS	Govindpur	8	20	Drinking	Concrete platform	Y
46	8.900	Hand Pump	RHS	Govindpur	6	20	Drinking	Concrete platform	Y
47	9.270	Hand Pump	RHS	Govindpur	8	42	Drinking	Concrete platform	Y
48	9.430	Hand Pump	LHS	Govindpur	8	20	Drinking	Concrete platform	Y
49	9.450	Hand Pump	LHS	Govindpur	8.5	42	Drinking	Concrete platform	Y
50	9.850	Hand Pump	LHS	Makdumpur	7	20	Drinking	Concrete platform	Y
51	10.440	Hand Pump	LHS	Singhni	10	20	Drinking	Concrete platform	Y
52	10.550	Hand Pump	LHS	Singhni	9.5	20	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
53	11.410	Hand Pump	RHS	Sanjhava	5	20	Drinking	Concrete platform	Y
54	11.490	Hand Pump	LHS	Sanjhava	7.5	42	Drinking	Concrete platform	Y
55	11.500	Hand Pump	RHS	Sanjhava	7	20	Drinking	Earthern Platform	Y
56	11.550	Hand Pump	RHS	Sanjhava	6	42	Drinking	Concrete platform	Y
57	12.210	Hand Pump	RHS	Bahunawa	11	42	Drinking	Concrete platform	N
58	12.450	Hand Pump	RHS	Bahunawa	6	42	Drinking	Concrete platform	Y
59	12.670	Well	RHS	Bahunawa	17	20	Drinking	Concrete platform	N
60	12.750	Hand Pump	LHS	Bahunawa	8	42	Abandoned	Concrete platform	Y
61	12.800	Hand Pump	RHS	Bahunawa	8.5	20	Drinking	Concrete platform	Y
62	12.830	Hand Pump	LHS	Bahunawa	7	20	Drinking	Concrete platform	Y
63	12.960	Hand Pump	LHS	Bahunawa	8.5	20	Drinking	Concrete platform	Y
64	12.970	Hand Pump	RHS	Bahunawa	6	20	Drinking	Concrete platform	Y
65	13.080	Hand Pump	LHS	Bahunawa	7.5	20	Drinking	Concrete platform	Y
66	13.150	Hand Pump	RHS	Bahunawa	7	42	Abandoned	Concrete platform	Y
67	13.220	Hand Pump	LHS	Bahunawa	6.5	20	Drinking	Brick Based Platform	Y
68	13.230	Hand Pump	RHS	Bahunawa	7	20	Drinking	Concrete platform	Y
69	13.300	Hand Pump	RHS	Bahunawa	8.5	20	Drinking	Concrete platform	Y
70	13.320	Hand Pump	RHS	Bahunawa	8.5	20	Drinking	Concrete platform	Y
71	13.390	Hand Pump	LHS	Bahunawa	9	20	Drinking	Brick Based Platform	Y
72	13.500	Hand Pump	RHS	Bahunawa	7	42	Drinking	Concrete platform	Y
73	13.600	Hand Pump	RHS	Bahunawa	9	42	Drinking	Concrete platform	Y
74	15.900	Hand Pump	RHS	Delhi Bazaar	7	20	Drinking	Concrete platform	Y
75	16.100	Hand Pump	RHS	Delhi Bazaar	7	20	Drinking	Concrete platform	Y
76	16.200	Hand Pump	RHS	Delhi Bazaar	8	20	Drinking	Concrete platform	Y
77	16.230	Hand Pump	LHS	Delhi Bazaar	11	20	Drinking	Concrete platform	N
78	16.320	Hand Pump	LHS	Delhi Bazaar	11	20	Drinking	Brick Based Platform	N
79	16.390	Hand Pump	LHS	Delhi Bazaar	11	42	Drinking	Concrete platform	N
80	16.500	Hand Pump	RHS	Delhi Bazaar	6	40	Abandoned	Concrete platform	Y
81	16.500	Hand Pump	RHS	Delhi Bazaar	8	20	Drinking	Concrete platform	Y
82	16.650	Hand Pump	RHS	Delhi Bazaar	10	20	Drinking	Concrete platform	Y
83	17.090	Hand Pump	LHS	Delhi Bazaar	7.5	20	Drinking	Concrete platform	Y
84	17.410	Hand Pump	LHS	Delhi Bazaar	9	20	Drinking	Brick Based Platform	Y
85	17.500	Hand Pump	LHS	Delhi Bazaar	10.5	20	Abandoned	No Platform	N

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
86	17.650	Hand Pump	RHS	Pirusarayya	10	20	Drinking	No Platform	Y
87	17.700	Hand Pump	RHS	Pirusarayya	13	20	Drinking	Brick Based Platform	N
88	17.800	Hand Pump	RHS	Pirusarayya	7	42	Drinking	Concrete platform	Y
89	17.810	Hand Pump	LHS	Pirusarayya	7	20	Drinking	Brick Based Platform	Y
90	18.200	Hand Pump	RHS	Pirusarayya	5	20	Drinking	Concrete platform	Y
91	18.300	Hand Pump	LHS	Pirusarayya	7.7	20	Drinking	Concrete platform	Y
92	18.650	Hand Pump	RHS	Pirusarayya	16.2	42	Drinking	Concrete platform	N
93	18.760	Hand Pump	RHS	Pirusarayya	14.3	42	Drinking	Concrete platform	N
94	18.760	Hand Pump	LHS	Pirusarayya	10	42	Drinking	Concrete platform	Y
95	18.860	Hand Pump	LHS	Pirusarayya	10.5	42	Drinking	Concrete platform	N
96	18.890	Hand Pump	LHS	Pirusarayya	11	20	Drinking	Brick Based Platform	N
97	18.910	Hand Pump	LHS	Pirusarayya	6.5	20	Drinking	Brick Based Platform	Y
98	18.925	Hand Pump	LHS	Pirusarayya	10.3	42	Drinking	Concrete platform	N
99	18.950	Hand Pump	RHS	Pirusarayya	10.5	42	Drinking	Concrete platform	N
100	19.010	Hand Pump	LHS	Pirusarayya	8	20	Drinking	Brick Based Platform	Y
101	19.100	Hand Pump	LHS	Pirusarayya	12	42	Drinking	Concrete platform	N
102	19.110	Hand Pump	RHS	Pirusarayya	14.7	42	Drinking	Concrete platform	N
103	19.250	Hand Pump	RHS	Pirusarayya	9.5	20	Drinking	Earthern Platform	Y
104	19.400	Hand Pump	LHS	Pirusarayya	10	42	Abandoned	Concrete platform	Y
105	19.500	Hand Pump	LHS	Pirusarayya	8	20	Drinking	Concrete platform	Y
106	19.560	Hand Pump	LHS	Pirusarayya	10.5	20	Abandoned	Earthern Platform	N
107	19.565	Hand Pump	RHS	Pirusarayya	10	20	Drinking	Concrete platform	Y
108	19.570	Hand Pump	LHS	Pirusarayya	10.5	20	Drinking	Concrete platform	N
109	19.575	Hand Pump	LHS	Pirusarayya	10	20	Drinking	Concrete platform	Y
110	19.585	Hand Pump	LHS	Pirusarayya	7	20	Drinking	Concrete platform	Y
111	19.590	Hand Pump	LHS	Pirusarayya	9.2	20	Drinking	Brick Based Platform	Y
112	19.650	Hand Pump	RHS	Pirusarayya	10.5	20	Drinking	Concrete platform	N
113	19.670	Hand Pump	RHS	Pirusarayya	10	20	Drinking	Concrete platform	Y
114	20.550	Hand Pump	RHS	Radhe Pandit Purwa	7	42	Drinking	Concrete platform	Y
115	21.070	Hand Pump	LHS	RD	9.2	20	Drinking	Concrete platform	Y
116	21.100	Hand Pump	LHS	RD	9.4	20	Drinking	Concrete platform	Y
117	21.240	Hand Pump	LHS	Haroda Bazaar	5.6	42	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
118	21.270	Hand Pump	RHS	Haroda Bazaar	8.3	20	Drinking	Earthern Platform	Y
119	21.300	Hand Pump	RHS	Haroda Bazaar	7.3	42	Drinking	Concrete platform	Y
120	21.350	Hand Pump	RHS	Haroda Bazaar	7	42	Drinking	Concrete platform	Y
121	21.370	Hand Pump	LHS	Haroda Bazaar	8.8	20	Drinking	Concrete platform	Y
122	21.430	Hand Pump	RHS	Haroda Bazaar	5	20	Drinking	Concrete platform	N
123	21.580	Hand Pump	LHS	Haroda Bazaar	6	20	Drinking	Concrete platform	Y
124	21.610	Hand Pump	LHS	Haroda Bazaar	7.5	20	Drinking	Concrete platform	N
125	21.630	Hand Pump	LHS	Haroda Bazaar	6	20	Drinking	Brick Based Platform	Y
126	21.800	Hand Pump	LHS	Haroda Bazaar	6.5	20	Drinking	Concrete platform	Y
127	21.810	Hand Pump	RHS	Haroda Bazaar	7	20	Drinking	Concrete platform	Y
128	21.830	Hand Pump	RHS	Haroda Bazaar	7	20	Drinking	Concrete platform	N
129	21.910	Hand Pump	RHS	Haroda Bazaar	10	20	Drinking	Concrete platform	Y
130	21.940	Hand Pump	LHS	Haroda Bazaar	8	20	Drinking	Concrete platform	Y
131	22.040	Hand Pump	RHS	Haroda Bazaar	7.2	42	Washing and Drinking	Concrete platform	Y
132	22.070	Hand Pump	RHS	Haroda Bazaar	5	42	Drinking	Concrete platform	Y
133	22.250	Hand Pump	LHS	Haroda Bazaar	9	42	Drinking	Concrete platform	Y
134	22.710	Hand Pump	RHS	Bhandasara	9	20	Drinking	Concrete platform	Y
135	22.800	Hand Pump	LHS	Bhandasara	6	20	Drinking	Earthern Platform	Y
136	22.910	Hand Pump	RHS	Kutta Dharamganj	9.5	42	Drinking	Earthern Platform	Y
137	23.050	Hand Pump	RHS	Kutta Dharamganj	7.5	20	Drinking	Concrete platform	Y
138	23.110	Hand Pump	RHS	Kutta Dharamganj	7	42	Drinking	Concrete platform	Y
139	23.200	Hand Pump	RHS	Kutta Dharamganj	8	42	Drinking	Concrete platform	Y
140	23.270	Hand Pump	RHS	Kutta Dharamganj	7.3	42	Drinking	Concrete platform	Y
141	23.550	Hand Pump	RHS	Kutta Dharamganj	12.2	20	Drinking	Earthern Platform	N
142	23.570	Hand Pump	LHS	Kutta Dharamganj	7.5	20	Drinking	Concrete platform	Y
143	23.650	Hand Pump	LHS	Kutta Dharamganj	8.2	42	Drinking	Concrete platform	Y
144	23.700	Hand Pump	RHS	Kutta Dharamganj	10.2	20	Drinking	Brick Based Platform	N
145	23.720	Hand Pump	RHS	Kutta Dharamganj	9.4	42	Drinking	Concrete platform	Y
146	23.870	Hand Pump	RHS	Kutta Dharamganj	7.3	42	Abandoned	Concrete platform	Y
147	23.920	Hand Pump	LHS	Kutta Dharamganj	9.4	42	Drinking	Concrete platform	Y
148	23.990	Hand Pump	RHS	Kutta Dharamganj	6.8	42	Drinking	Concrete platform	Y
149	24.110	Hand Pump	LHS	Kutta Dharamganj	6	20	Drinking	Concrete platform	Y
150	24.130	Hand Pump	RHS	Kutta Dharamganj	7.5	42	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
151	24.300	Hand Pump	RHS	Kutta Dharamganj	9.5	42	Drinking	Concrete platform	Y
152	24.410	Hand Pump	RHS	Kutta Dharamganj	8.6	42	Drinking	Concrete platform	Y
153	24.500	Hand Pump	RHS	Kutta Dharamganj	10	42	Drinking	Concrete platform	Y
154	24.650	Hand Pump	LHS	Dhanpatganj	10	42	Drinking	Concrete platform	Y
155	25.000	Hand Pump	LHS	Dhanpatganj	7.6	20	Drinking	Concrete platform	Y
156	25.100	Hand Pump	LHS	Dhanpatganj	8.2	20	Abandoned	Earthern Platform	Y
157	25.220	Hand Pump	RHS	Dhanpatganj	9	42	Bathing & Drinking	Concrete platform	Y
158	25.310	Hand Pump	RHS	Dhanpatganj	6.7	42	Drinking	Concrete platform	Y
159	26.410	Hand Pump	LHS	Dhanpatganj	4.4	42	Drinking	Concrete platform	Y
160	26.470	Hand Pump	LHS	Dhanpatganj	6.4	20	Drinking	Concrete platform	Y
161	26.500	Hand Pump	LHS	Dhanpatganj	6.4	42	Drinking	Concrete platform	Y
162	26.550	Hand Pump	LHS	Dhanpatganj	5.8	42	Drinking	Concrete platform	Y
163	26.960	Hand Pump	LHS	Dhanpatganj	7	20	Drinking	Concrete platform	Y
164	26.990	Hand Pump	RHS	Dhanpatganj	8	20	Drinking	Concrete platform	Y
165	27.450	Hand Pump	RHS	Sirsa	9	42	Drinking	Concrete platform	Y
166	27.550	Hand Pump	LHS	Sirsa	8.7	20	Drinking	Earthern Platform	Y
167	27.610	Hand Pump	RHS	Sirsa	9	42	Drinking	Concrete platform	Y
168	27.650	Hand Pump	RHS	Sirsa	9	42	Drinking	Concrete platform	Y
169	27.670	Hand Pump	RHS	Sirsa	8.5	42	Drinking	Concrete platform	Y
170	27.710	Hand Pump	LHS	Sirsa	5.6	20	Drinking	Concrete platform	Y
171	28.600	Hand Pump	LHS	Bhikarpur	7.5	20	Drinking	Concrete platform	Y
172	28.650	Hand Pump	RHS	Bhikarpur	6.5	20	Drinking	Brick Based Platform	Y
173	28.800	Hand Pump	LHS	Bhikarpur	6	42	Drinking	Concrete platform	Y
174	28.970	Hand Pump	LHS	Bhikarpur	14	42	Drinking	Concrete platform	N
175	29.600	Hand Pump	RHS	Sanjaynagar	9.3	20	Drinking	Concrete platform	Y
176	29.880	Hand Pump	RHS	Sanjaynagar	7	42	Drinking	Brick Based Platform	Y
177	29.900	Hand Pump	RHS	Sanjaynagar	11	20	Drinking	Brick Based Platform	N
178	31.100	Hand Pump	LHS	Sanjaynagar	10	42	Drinking	Concrete platform	Y
179	30.300	Hand Pump	RHS	Sanjaynagar	6	20	Drinking	Concrete platform	Y
180	30.400	Hand Pump	LHS	Sanjaynagar	9	20	Drinking	Concrete platform	Y
181	30.550	Hand Pump	LHS	Ainpur	6.8	42	Drinking	Concrete platform	Y
182	30.670	Hand Pump	RHS	Ainpur	8.3	42	Drinking	Concrete platform	Y
183	30.780	Hand Pump	LHS	Ainpur	5.7	20	Drinking	Earthern Platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
184	30.800	Hand Pump	RHS	Ainpur	6	42	Drinking	Concrete platform	Y
185	31.300	Hand Pump	LHS	Ainpur	6.7	20	Drinking	Concrete platform	Y
186	31.400	Hand Pump	LHS	Ainpur	9.3	42	Drinking	Concrete platform	Y
187	31.450	Hand Pump	LHS	Ainpur	7	42	Abandoned	Earthern Platform	Y
188	31.770	Hand Pump	LHS	Ainpur	10.5	42	Drinking	Concrete platform	N
189	31.800	Hand Pump	LHS	Babhakangaon	10.8	42	Drinking	Concrete platform	N
190	31.810	Well	LHS	Babhakangaon	11	10	Abandoned	Concrete platform	N
191	31.890	Hand Pump	LHS	Dhaurhara	6.5	20	Drinking	Brick Based Platform	Y
192	31.900	Hand Pump	RHS	Dhaurhara	10.7	42	Drinking	Concrete platform	N
193	32.100	Hand Pump	LHS	Dhaurhara	8.9	42	Drinking	Concrete platform	Y
194	33.200	Hand Pump	RHS	Phulpur	6	42	Drinking	Concrete platform	Y
195	33.380	Hand Pump	LHS	Phulpur	7.8	42	Drinking	Concrete platform	Y
196	33.800	Hand Pump	RHS	Phulpur	8.6	42	Drinking	Concrete platform	Y
197	33.920	Hand Pump	RHS	Phulpur	9.5	20	Drinking	Brick Based Platform	Y
198	33.950	Hand Pump	LHS	Phulpur	9	20	Drinking	Concrete platform	Y
199	34.200	Hand Pump	LHS	Kurebhar	6.6	42	Drinking	Concrete platform	Y
200	35.300	Hand Pump	LHS	Kurebhar	6	42	Drinking	Concrete platform	Y
201	35.600	Hand Pump	RHS	Kurebhar	6	42	Drinking	Concrete platform	Y
202	35.650	Hand Pump	LHS	Kurebhar	9	42	Drinking	Concrete platform	Y
203	35.870	Hand Pump	RHS	Kurebhar	10.5	42	Drinking	Concrete platform	N
204	35.950	Hand Pump	RHS	Galibha	8	20	Drinking	Concrete platform	Y
205	36.010	Hand Pump	RHS	Galibha	11	42	Drinking	Concrete platform	N
206	36.300	Hand Pump	RHS	Galibha	14.1	42	Drinking	Concrete platform	N
207	36.500	Hand Pump	RHS	Galibha	8.8	42	Drinking	Concrete platform	Y
208	36.600	Hand Pump	RHS	Galibha	13.4	42	Drinking	Earthern Platform	N
209	36.650	Hand Pump	RHS	Galibha	10.7	20	Drinking	Concrete platform	N
210	36.700	Hand Pump	RHS	Galibha	8.5	42	Drinking	Concrete platform	Y
211	36.850	Hand Pump	LHS	Galibha	7.6	42	Drinking	Concrete platform	Y
212	36.900	Hand Pump	RHS	Galibha	8	42	Drinking	Concrete platform	Y
213	36.900	Hand Pump	LHS	Galibha	11.6	20	Drinking	Concrete platform	N
214	36.930	Hand Pump	RHS	Galibha	7	42	Abandoned	Concrete platform	Y
215	36.970	Hand Pump	LHS	Galibha	6.6	20	Drinking	Concrete platform	Y
216	35.650	Hand Pump	LHS	Galibha	9	42	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
217	37.330	Hand Pump	LHS	Erul	8	42	Drinking	Concrete platform	Y
218	37.370	Hand Pump	LHS	Erul	9.8	20	Drinking	Concrete platform	Y
219	37.510	Hand Pump	LHS	Erul	8.5	20	Drinking	Concrete platform	Y
220	37.600	Hand Pump	RHS	Erul	10.7	42	Drinking	Concrete platform	N
221	37.790	Hand Pump	RHS	Raghavpur	1.6	42	Drinking	Earthern Platform	Y
222	37.870	Hand Pump	LHS	Raghavpur	8.9	20	Drinking	Earthern Platform	Y
223	37.880	Hand Pump	RHS	Raghavpur	7.2	20	Drinking	Concrete platform	Y
224	38.050	Hand Pump	RHS	Raghavpur	7.8	42	Drinking	Concrete platform	Y
225	38.090	Hand Pump	RHS	Raghavpur	10	20	Drinking	Concrete platform	Y
226	38.330	Hand Pump	RHS	Salimpur	9	42	Drinking	Concrete platform	Y
227	39.000	Hand Pump	RHS	Bandraha	7.5	42	Drinking	Concrete platform	Y
228	39.900	Hand Pump	RHS	Malampur	6.7	20	Drinking	Brick Based Platform	Y
229	40.070	Hand Pump	RHS	Malampur	8.5	20	Drinking	Concrete platform	Y
230	40.090	Hand Pump	LHS	Malampur	6.7	20	Drinking	Brick Based Platform	Y
231	40.550	Hand Pump	RHS	Baraula	8	42	Drinking	Concrete platform	Y
232	40.590	Hand Pump	RHS	Baraula	9.3	42	Drinking	Concrete platform	Y
233	40.750	Hand Pump	RHS	Baraula	9.2	42	Drinking	Concrete platform	Y
234	41.000	Hand Pump	RHS	Baraula	10.8	42	Drinking	Concrete platform	N
235	41.020	Hand Pump	LHS	Baraula	8.5	42	Drinking	Concrete platform	Y
236	41.130	Hand Pump	RHS	Baraula	8	42	Drinking	Concrete platform	Y
237	41.160	Hand Pump	LHS	Baraula	8.5	42	Drinking	Concrete platform	Y
238	41.500	Hand Pump	LHS	Baraula	6	42	Drinking	Concrete platform	Y
239	41.530	Hand Pump	RHS	Baraula	8.3	42	Drinking	Concrete platform	Y
240	41.620	Well	LHS	Baraula	9.4	12	Abandoned	Concrete platform	Y
241	41.625	Hand Pump	LHS	Baraula	9.4	42	Drinking	Concrete platform	Y
242	41.640	Hand Pump	RHS	Baraula	8	12	Abandoned	Concrete platform	Y
243	41.730	Hand Pump	LHS	Baraula	6.7	42	Drinking	Concrete platform	Y
244	41.760	Well	LHS	Baraula	10	12	Abandoned	Concrete platform	Y
245	42.680	Hand Pump	LHS	Phulauna	11.4	42	Drinking	Concrete platform	N
246	42.750	Hand Pump	LHS	Phulauna	7	42	Drinking	Concrete platform	Y
247	42.900	Hand Pump	LHS	Phulauna	6.5	42	Drinking	Concrete platform	Y
248	43.050	Hand Pump	LHS	Phulauna	6.9	42	Drinking	Concrete platform	Y
249	43.050	Hand Pump	RHS	Phulauna	9.6	42	Drinking	Earthern Platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
250	43.320	Hand Pump	LHS	Phulauna	10	20	Drinking	Concrete platform	Y
251	43.330	Hand Pump	LHS	Phulauna	10.5	20	Abandoned	Brick Based Platform	N
252	43.390	Hand Pump	RHS	Phulauna	7	20	Drinking	Concrete platform	Y
253	43.430	Hand Pump	LHS	Phulauna	8	20	Drinking	No Platform	Y
254	43.950	Hand Pump	LHS	Phulauna	9.8	20	Drinking	Brick Based Platform	Y
255	44.150	Hand Pump	LHS	Phulauna	7	20	Drinking	Brick Based Platform	Y
256	44.400	Hand Pump	LHS	Phulauna	11	20	Washing and Drinking	Brick Based Platform	N
257	44.600	Hand Pump	LHS	Akhori	6.5	42	Drinking	Concrete platform	Y
258	44.600	Hand Pump	RHS	Akhori	5	20	Drinking	Concrete platform	Y
259	44.650	Hand Pump	RHS	Akhori	7	20	Drinking	Brick Based Platform	Y
260	44.710	Hand Pump	RHS	Akhori	6.5	20	Drinking	Concrete platform	Y
261	44.750	Hand Pump	RHS	Akhori	7.2	20	Drinking	Concrete platform	Y
262	44.820	Hand Pump	LHS	Akhori	7.3	20	Drinking	Concrete platform	Y
263	44.850	Hand Pump	LHS	Akhori	7	20	Drinking	Brick Based Platform	Y
264	44.950	Hand Pump	LHS	Akhori	11	20	Drinking	Brick Based Platform	N
265	44.950	Hand Pump	RHS	Akhori	8.5	20	Washing and Drinking	Concrete platform	Y
266	45.500	Hand Pump	RHS	Dhudhu	11	20	Drinking	Brick Based Platform	N
267	45.550	Hand Pump	LHS	Dhudhu	7.5	20	Drinking	Concrete platform	Y
268	45.600	Hand Pump	LHS	Dhudhu	12.8	20	Drinking	Earthern Platform	N
269	46.300	Hand Pump	LHS	Dhudhu	11.6	42	Drinking	Concrete platform	N
270	47.150	Hand Pump	RHS	Bajhna	8.4	42	Abandoned	Earthern Platform	Y
271	47.160	Hand Pump	LHS	Bajhna	7	20	Washing and Drinking	Concrete platform	Y
272	47.400	Hand Pump	RHS	Bajhna	7.5	20	Drinking	Concrete platform	Y
273	47.400	Hand Pump	LHS	Bajhna	9	20	Drinking	Earthern Platform	Y
274	47.450	Hand Pump	LHS	Bajhna	11.7	42	Drinking	Brick Based Platform	N
275	47.600	Hand Pump	RHS	Bajhna	15	12	Abandoned	Brick Based Platform	N
276	47.780	Hand Pump	RHS	Bajhna	12	20	Drinking	Brick Based Platform	N
277	47.800	Hand Pump	RHS	Bajhna	10.2	20	Drinking	Concrete platform	N
278	48.100	Hand Pump	RHS	Nagaipur	13	42	Drinking	Concrete platform	N
279	48.150	Hand Pump	RHS	Nagaipur	8.4	20	Drinking	Brick Based Platform	Y
280	48.700	Hand Pump	RHS	Nagaipur	7.2	20	Drinking	Concrete platform	Y
281	49.100	Well	LHS	Nagaipur	9.5	12	Abandoned	Concrete platform	Y
282	49.100	Hand Pump	LHS	Nagaipur	8.5	20	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
283	49.100	Hand Pump	RHS	Nagaipur	6.5	20	Drinking	Concrete platform	Y
284	56.200	Hand Pump	LHS	Samari Bazar	7	20	Drinking	Concrete platform	Y
285	56.400	Hand Pump	LHS	Samari Bazar	8.2	20	Drinking	Concrete platform	Y
286	56.610	Hand Pump	RHS	Samari Bazar	6.3	20	Drinking	Concrete platform	Y
287	56.630	Hand Pump	RHS	Samari Bazar	5	20	Drinking	Concrete platform	Y
288	56.650	Hand Pump	RHS	Samari Bazar	9.4	42	Drinking	Concrete platform	Y
289	57.500	Hand Pump	RHS	Chaurma	8.5	20	Drinking	Concrete platform	Y
290	57.650	Hand Pump	RHS	Chaurma	6.5	20	Drinking	Concrete platform	Y
291	57.980	Hand Pump	RHS	Chaurma	8.8	20	Drinking	Brick Based Platform	Y
292	58.000	Hand Pump	RHS	Chaurma	8	20	Drinking	Concrete platform	Y
293	58.140	Hand Pump	RHS	Chaurma	6.7	20	Drinking	Concrete platform	Y
294	58.230	Hand Pump	RHS	Chaurma	6	20	Drinking	Concrete platform	Y
295	58.430	Hand Pump	RHS	Chaurma	7.6	20	Drinking	Concrete platform	Y
296	58.520	Well	LHS	Chaurma	3.2	12	Abandoned	Concrete platform	Y
297	58.910	Hand Pump	RHS	Chaurma	5.8	20	Drinking	Concrete platform	Y
298	59.100	Hand Pump	RHS	Chaurma	10.6	42	Drinking	No Platform	N
299	59.190	Hand Pump	RHS	Chaurma	7.5	20	Drinking	Concrete platform	Y
300	59.220	Hand Pump	RHS	Chaurma	5.5	20	Drinking	Concrete platform	Y
301	59.250	Hand Pump	LHS	Chaurma	7.8	20	Drinking	Concrete platform	Y
302	59.450	Hand Pump	RHS	Chaurma	6.7	20	Drinking	Concrete platform	Y
303	59.500	Hand Pump	LHS	Chaurma	10.7	42	Drinking	Brick Based Platform	N
304	59.720	Hand Pump	LHS	Chaurma	9.5	20	Drinking	Brick Based Platform	Y
305	61.210	Hand Pump	RHS	Birsinghpur	10	20	Washing and Drinking	Concrete platform	N
306	61.230	Hand Pump	RHS	Birsinghpur	10	20	Drinking	Concrete platform	N
307	61.330	Hand Pump	RHS	Birsinghpur	4.2	20	Drinking	Concrete platform	Y
308	61.340	Hand Pump	RHS	Birsinghpur	4.6	20	Drinking	Brick Based Platform	Y
309	61.360	Hand Pump	LHS	Birsinghpur	4.6	20	Drinking	Brick Based Platform	Y
310	61.390	Hand Pump	LHS	Birsinghpur	4.4	20	Drinking	Brick Based Platform	Y
311	61.450	Hand Pump	LHS	Birsinghpur	6.5	42	Drinking	Earthern Platform	Y
312	61.550	Hand Pump	RHS	Birsinghpur	5.7	42	Drinking	Concrete platform	Y
313	61.730	Hand Pump	RHS	Birsinghpur	5	42	Drinking	Concrete platform	Y
314	63.300	Hand Pump	LHS	Choure	6.6	42	Drinking	Concrete platform	Y
315	63.350	Hand Pump	RHS	Choure	5.8	20	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
316	63.390	Hand Pump	RHS	Choure	6.6	20	Drinking	Concrete platform	Y
317	63.410	Hand Pump	RHS	Choure	5.7	20	Drinking	Concrete platform	Y
318	63.470	Hand Pump	LHS	Choure	7.3	20	Drinking	Concrete platform	Y
319	63.510	Hand Pump	RHS	Choure	7.5	42	Drinking	Concrete platform	Y
320	63.550	Hand Pump	LHS	Choure	9.8	20	Drinking	Brick Based Platform	Y
321	63.570	Hand Pump	LHS	Choure	9	20	Drinking	Concrete platform	Y
322	63.600	Hand Pump	LHS	Choure	8.4	20	Drinking	Earthern Platform	Y
323	63.670	Hand Pump	LHS	Choure	10	20	Washing and Drinking	Concrete platform	Y
324	63.690	Hand Pump	LHS	Choure	7	20	Drinking	Concrete platform	Y
325	63.930	Hand Pump	LHS	Choure	8.8	20	Drinking	Brick Based Platform	Y
326	64.250	Hand Pump	LHS	Gosaisinghpur	6.3	20	Drinking	Brick Based Platform	Y
327	64.450	Hand Pump	RHS	Gosaisinghpur	5.8	42	Drinking	Concrete platform	Y
328	64.550	Hand Pump	RHS	Gosaisinghpur	5.4	42	Drinking	Concrete platform	Y
329	64.600	Hand Pump	RHS	Gosaisinghpur	7	20	Drinking	Concrete platform	Y
330	64.700	Hand Pump	RHS	Gosaisinghpur	5.5	42	Drinking	Concrete platform	Y
331	64.750	Hand Pump	RHS	Gosaisinghpur	5.5	42	Drinking	Concrete platform	Y
332	64.780	Hand Pump	RHS	Gosaisinghpur	5.5	42	Drinking	Concrete platform	Y
333	64.800	Well	LHS	Gosaisinghpur	5.8	10	Abandoned	Concrete platform	Y
334	64.860	Hand Pump	LHS	Gosaisinghpur	5.8	20	Drinking	Concrete platform	Y
335	64.880	Hand Pump	RHS	Gosaisinghpur	6.2	20	Drinking	Concrete platform	Y
336	64.890	Hand Pump	RHS	Gosaisinghpur	6	20	Drinking	Concrete platform	Y
337	65.350	Hand Pump	RHS	Gosaisinghpur	6.8	42	Drinking	Concrete platform	Y
338	65.450	Hand Pump	RHS	Dharampur	12	42	Drinking	Concrete platform	N
339	65.460	Hand Pump	RHS	Dharampur	13	20	Drinking	Brick Based Platform	N
340	65.560	Hand Pump	LHS	Dharampur	7.7	42	Drinking	Concrete platform	Y
341	68.130	Hand Pump	RHS	Tadipur	12.2	42	Drinking	Concrete platform	N
342	68.210	Well	RHS	Tadipur	3.5	12	Abandoned	Concrete platform	Y
343	68.220	Hand Pump	LHS	Tadipur	8.3	20	Drinking	Brick Based Platform	Y
344	68.550	Hand Pump	RHS	Tadipur	9.4	20	Drinking	Concrete platform	Y
345	68.590	Hand Pump	RHS	Tadipur	6	20	Drinking	Concrete platform	Y
346	68.850	Hand Pump	LHS	Tadipur	10	42	Drinking	Concrete platform	Y
347	68.900	Hand Pump	LHS	Tadipur	9.6	42	Drinking	Concrete platform	Y
348	68.900	Hand Pump	RHS	Tadipur	7	20	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
349	69.090	Hand Pump	LHS	Tadipur	7.6	20	Drinking	Brick Based Platform	Y
350	69.120	Hand Pump	RHS	Tadipur	9	20	Drinking	Concrete platform	Y
351	69.160	Hand Pump	LHS	Tadipur	8.5	20	Drinking	Concrete platform	Y
352	69.700	Hand Pump	RHS	Tadipur	5.6	20	Drinking	Brick Based Platform	Y
353	69.750	Hand Pump	RHS	Tadipur	7	20	Drinking	Concrete platform	Y
354	69.790	Hand Pump	RHS	Tadipur	8.8	20	Drinking	Concrete platform	Y
355	69.850	Hand Pump	LHS	Tadipur	6.8	20	Drinking	Concrete platform	Y
356	70.500	Hand Pump	RHS	Tadipur	8	20	Drinking	Concrete platform	Y
357	70.970	Hand Pump	LHS	Chitte Patti	7.5	20	Drinking	Concrete platform	Y
358	71.030	Hand Pump	RHS	Chitte Patti	8.4	20	Drinking	Concrete platform	Y
359	71.060	Hand Pump	RHS	Chitte Patti	6	20	Drinking	Concrete platform	Y
360	71.980	Hand Pump	RHS	Bikhipur	11.5	20	Drinking	Concrete platform	N
361	72.000	Hand Pump	LHS	Bikhipur	7.6	42	Drinking	Concrete platform	Y
362	72.100	Hand Pump	LHS	Bikhipur	8.5	20	Drinking	Concrete platform	Y
363	72.310	Hand Pump	RHS	Bikhipur	7.6	42	Drinking	Concrete platform	Y
364	72.310	Hand Pump	LHS	Bikhipur	8.6	20	Drinking	Concrete platform	Y
365	72.350	Hand Pump	RHS	Bikhipur	7.6	20	Drinking	Concrete platform	Y
366	72.530	Hand Pump	RHS	Baretha	8	42	Drinking	Concrete platform	Y
367	72.550	Hand Pump	RHS	Baretha	9.2	20	Drinking	Concrete platform	Y
368	73.450	Hand Pump	RHS	Babhan Ganwan	9.8	20	Drinking	Concrete platform	Y
369	73.500	Hand Pump	RHS	Babhan Ganwan	7	20	Drinking	Concrete platform	Y
370	73.550	Hand Pump	RHS	Babhan Ganwan	13	42	Drinking	Concrete platform	N
371	73.560	Hand Pump	LHS	Babhan Ganwan	9.2	20	Drinking	Concrete platform	Y
372	74.250	Hand Pump	RHS	Khalispur Dingur	5	42	Drinking	Concrete platform	Y
373	74.400	Hand Pump	RHS	Khalispur Dingur	5	20	Drinking	Concrete platform	Y
374	74.410	Hand Pump	RHS	Khalispur Dingur	8	20	Drinking	Concrete platform	Y
375	74.440	Hand Pump	RHS	Khalispur Dingur	6.3	42	Drinking	Concrete platform	Y
376	74.480	Well	RHS	Khalispur Dingur	5.4	12	Abandoned	Concrete platform	Y
377	74.480	Hand Pump	RHS	Khalispur Dingur	6.5	42	Drinking	Concrete platform	Y
378	74.490	Hand Pump	RHS	Khalispur Dingur	6.4	42	Drinking	Concrete platform	Y
379	74.500	Hand Pump	LHS	Khalispur Dingur	6.5	20	Drinking	Concrete platform	Y
380	76.250	Hand Pump	LHS	Dostpur	7.2	42	Drinking	Concrete platform	Y
381	76.250	Hand Pump	RHS	Dostpur	5	20	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
382	76.320	Hand Pump	LHS	Dostpur	3.4	20	Drinking	Concrete platform	Y
383	76.390	Hand Pump	RHS	Dostpur	3.5	20	Drinking	Concrete platform	N
384	76.400	Hand Pump	RHS	Dostpur	3.5	42	Drinking	Concrete platform	N
385	77.050	Hand Pump	RHS	Dostpur	6.5	20	Drinking	Concrete platform	Y
386	77.070	Hand Pump	RHS	Dostpur	5	20	Drinking	Concrete platform	Y
387	77.200	Hand Pump	RHS	Dostpur	12	42	Drinking	Concrete platform	N
388	77.300	Hand Pump	LHS	Dostpur	7.9	42	Drinking	Concrete platform	Y
389	77.410	Hand Pump	LHS	Dostpur	8.6	42	Drinking	Brick Based Platform	Y
390	77.800	Hand Pump	LHS	Dostpur	9.5	20	Drinking	Concrete platform	Y
391	77.900	Hand Pump	RHS	Dostpur	9.5	20	Drinking	Concrete platform	Y
392	78.050	Hand Pump	LHS	Dostpur	6.4	42	Drinking	Concrete platform	Y
393	78.160	Hand Pump	RHS	Dostpur	8.5	42	Drinking	Concrete platform	Y
394	78.190	Hand Pump	RHS	Dostpur	7.5	42	Drinking	Concrete platform	Y
395	79.080	Hand Pump	LHS	Badhauli	6.3	20	Drinking	Concrete platform	Y
396	79.110	Hand Pump	LHS	Badhauli	6.2	20	Drinking	Concrete platform	Y
397	79.150	Hand Pump	LHS	Badhauli	9.5	20	Drinking	Concrete platform	Y
398	79.400	Hand Pump	RHS	Badhauli	8.8	20	Drinking	Concrete platform	Y
399	79.450	Hand Pump	RHS	Badhauli	9.7		Drinking	Concrete platform	Y
400	79.490	Hand Pump	RHS	Badhauli	6.4	20	Drinking	Concrete platform	Y
401	79.520	Hand Pump	LHS	Badhauli	6.2	42	Drinking	Concrete platform	Y
402	79.600	Hand Pump	RHS	Badhauli	6.5	42	Drinking	Concrete platform	Y
403	79.650	Hand Pump	RHS	Badhauli	6.5	20	Drinking	Concrete platform	Y
404	79.890	Hand Pump	RHS	Badhauli	10.1	42	Drinking	Concrete platform	N
405	80.400	Hand Pump	LHS	Kohra	7	20	Drinking	Concrete platform	Y
406	80.650	Hand Pump	RHS	Kohra	6	20	Drinking	Concrete platform	Y
407	81.480	Hand Pump	RHS	Kaithi Jalapur	6.9	20	Drinking	Concrete platform	Y
408	81.500	Hand Pump	RHS	Kaithi Jalapur	5.8	42	Drinking	Concrete platform	Y
409	81.530	Hand Pump	RHS	Kaithi Jalapur	6.2	20	Drinking	Concrete platform	Y
410	81.600	Hand Pump	RHS	Kaithi Jalapur	7	20	Drinking	Concrete platform	Y
411	81.650	Hand Pump	LHS	Kaithi Jalapur	9.3	42	Drinking	Concrete platform	Y
412	83.600	Hand Pump	RHS	Golhanpara	6.7	20	Drinking	Concrete platform	Y
413	83.910	Hand Pump	RHS	Loknath Purwa	6	20	Drinking	Concrete platform	Y
414	84.060	Hand Pump	RHS	Loknath Purwa	7	42	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
415	84.330	Hand Pump	LHS	Loknath Purwa	7	42	Drinking	Concrete platform	Y
416	84.400	Hand Pump	LHS	Loknath Purwa	7.5	42	Drinking	Concrete platform	Y
417	85.500	Hand Pump	LHS	Rahul Nagar	5	20	Drinking	Concrete platform	Y
418	85.580	Hand Pump	LHS	Rahul Nagar	7.2	42	Drinking	Concrete platform	Y
419	85.600	Hand Pump	RHS	Rahul Nagar	7.5	20	Drinking	Concrete platform	Y
420	85.800	Hand Pump	LHS	Rahul Nagar	8.2	20	Drinking	Concrete platform	Y
421	85.980	Hand Pump	RHS	Rahul Nagar	5.7	20	Drinking	Concrete platform	Y
422	86.030	Hand Pump	RHS	Rahul Nagar	6.5	20	Drinking	Concrete platform	Y
423	87.700	Well	LHS	Bacharia	7.1	15	Abandoned	Concrete platform	Y
424	90.030	Hand Pump	LHS	Bacharia	5.5	20	Drinking	Brick Based Platform	Y
425	90.100	Hand Pump	RHS	Bacharia	6	20	Drinking	Earthern Platform	Y
426	90.130	Hand Pump	RHS	Bacharia	6.5	20	Drinking	Earthern Platform	Y
427	90.160	Hand Pump	LHS	Bacharia	7.6	20	Drinking	Brick Based Platform	Y
428	90.200	Hand Pump	LHS	Bacharia	8.4	20	Drinking	Brick Based Platform	Y
429	90.250	Hand Pump	LHS	Bacharia	7.4	20	Drinking	Brick Based Platform	Y
430	90.300	Hand Pump	RHS	Bacharia	6.2	20	Drinking	Brick Based Platform	Y
431	90.410	Hand Pump	RHS	Bacharia	6.3	20	Drinking	Concrete platform	Y
432	90.430	Hand Pump	RHS	Bacharia	5.3	20	Drinking	Concrete platform	Y
433	92.010	Hand Pump	RHS	Akhand Nagar	7.6	42	Drinking	Concrete platform	Y
434	92.080	Hand Pump	LHS	Akhand Nagar	6.7	42	Drinking	Concrete platform	Y
435	92.100	Hand Pump	RHS	Akhand Nagar	6.7	20	Drinking	Concrete platform	Y
436	92.120	Hand Pump	LHS	Akhand Nagar	7.9	42	Drinking	Concrete platform	Y
437	92.300	Hand Pump	RHS	Akhand Nagar	5.7	42	Abandoned	No Platform	Y
438	92.500	Hand Pump	LHS	Akhand Nagar	5.8	20	Drinking	Concrete platform	Y
439	92.510	Hand Pump	LHS	Akhand Nagar	6.3	20	Drinking	Concrete platform	Y
440	92.670	Hand Pump	RHS	Akhand Nagar	6.2	20	Drinking	Concrete platform	Y
441	92.700	Hand Pump	RHS	Akhand Nagar	7.7	42	Drinking	Earthern Platform	Y
442	92.750	Hand Pump	LHS	Akhand Nagar	6.8	20	Drinking	Concrete platform	Y
443	93.100	Hand Pump	RHS	Akhand Nagar	5.7	20	Drinking	Earthern Platform	Y
444	93.500	Hand Pump	RHS	Alauddinpur	6.2	20	Drinking	Concrete platform	Y
445	94.200	Hand Pump	LHS	Alauddinpur	7.8	20	Drinking	Concrete platform	Y
446	94.500	Hand Pump	LHS	Ayodhyanagar	5.7	20	Drinking	Concrete platform	Y
447	94.500	Hand Pump	RHS	Ayodhyanagar	7	42	Drinking	Concrete platform	Y

S. No.	Chainage	Type of Sources	Side	Village\Settelmet	Distance from Center line(m)	Depth (mbgl)	Uses for Drinking/ washing/Abanoned	Platform Type	Impacted (Y/N)
448	94.530	Hand Pump	LHS	Ayodhyanagar	5.5	20	Drinking	Concrete platform	Y
449	94.560	Hand Pump	LHS	Ayodhyanagar	6.2	20	Drinking	Concrete platform	Y
450	96.100	Hand Pump	RHS	Khushamadpur	7	42	Drinking	Concrete platform	Y
451	96.300	Hand Pump	LHS	Khushamadpur	8	42	Drinking	Concrete platform	Y
452	97.600	Hand Pump	LHS	Deonagar	8	42	Drinking	Concrete platform	Y
453	97.750	Hand Pump	LHS	Deonagar	6.8	20	Drinking	Earthern Platform	Y
454	97.800	Hand Pump	LHS	Deonagar	7.5	42	Drinking	Earthern Platform	Y
455	97.970	Hand Pump	RHS	Deonagar	8	42	Drinking	Concrete platform	Y
456	100.350	Hand Pump	RHS	Pratapur	8.3	42	Drinking	Concrete platform	Y
457	100.400	Well	RHS	Pratapur	6	15	Abandoned	Concrete platform	Y
458	100.500	Hand Pump	RHS	Pratapur	7.5	42	Drinking	Concrete platform	Y
459	100.520	Hand Pump	LHS	Pratapur	6	20	Drinking	Concrete platform	Y
460	100.550	Hand Pump	RHS	Pratapur	9	42	Drinking	Concrete platform	Y
461	100.600	Hand Pump	RHS	Pratapur	6.5	42	Drinking	Concrete platform	Y
462	101.110	Hand Pump	LHS	Bibiganj	3.5	20	Drinking	Concrete platform	Y
463	101.250	Hand Pump	LHS	Bibiganj	4	20	Drinking	Concrete platform	Y
464	101.300	Hand Pump	LHS	bibiganj	4.5	20	Drinking	Concrete platform	Y
465	102.700	Hand Pump	LHS	Bilwai	4	20	Drinking	Earthern Platform	Y
466	102.710	Hand Pump	LHS	Bilwai	11	42	Drinking	Concrete platform	N

Source: PPTA Consultant

Appendix 18A: Ground Water Source along the Project-(Kaptanganj-Naurangia Road ODR 24)

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth(feet)	Uses (Drinking/Washing)	Platform Type	Ownership Type	Impacted (Y/N)
1	0.010	RHS	HP	8.0	Kaptainganj Bandeliganj Chauraha	30-40	Drinking & Washing	No	Government	Y
2	0.055	LHS	HP	7.0	Chilwan	30-40	Drinking & Washing	Yes	Private	Y
3	0.650	RHS	HP	9.0	Chilwan Pagar	30-40	Drinking & Washing	Yes	Government	Y
4	0.800	LHS	HP	6.0	Chilwan	70-80	Drinking & Washing	Yes	Private	Y
5	1.600	RHS	HP	7.0	Chilwan	70-80	Drinking & Washing	Yes	Government	Y
6	1.620	RHS	HP	11.0	Chilwan	30-40	Washing	Yes	Private	N
7	1.670	RHS	HP	12.0	Chilwan	70-80	Drinking & Washing	Yes	Government	N
8	2.300	RHS	HP	6.0		40-50	Drinking	no	Private	Y
9	2.400	RHS	HP	8.5	Mishrauli	40-50	Drinking & Washing	Yes	Private	Y
10	2.400	LHS	HP	11.0	Mishrauli	40-50	Drinking & Washing	Yes	Private	N
11	2.500	LHS	HP	8.0	Mishrauli	40-50	Drinking & Washing	No	Private	Y
12	2.700	LHS	HP	9.0	Mishrauli	50-60	Drinking & Washing	No	Private	Y
13	2.750	LHS	HP	6.0	Mishrauli	50-60	Abondaoned	No	Private	Y
14	2.760	LHS	HP	6.0	Mishrauli	50-60	Abondaoned	No	Private	Y
15	2.800	RHS	HP	7.0	Mishrauli	60	Drinking & Washing	Yes	Government	Y
16	2.950	LHS	HP	7.0	Mishrauli	60-70	Drinking & Washing	Yes	Government	Y
17	3.000	RHS	HP	11.0	Mishrauli	60-70	Drinking & Washing	No	Private	N
18	3.200	LHS	HP	8.0	Mishrauli	50-60	Drinking & Washing	No	Private	Y
19	3.250	RHS	HP	8.0	Mishrauli	50-60	Drinking & Washing	No	Private	Y
20	3.300	RHS	HP	12.0	Mishrauli	50-60	Drinking & Washing	No	Private	N
21	3.400	LHS	HP	7.0	Mishrauli	50-60	Drinking & Washing	No	Private	Y
22	3.410	RHS	HP	10.0	Mishrauli	50-60	Drinking & Washing	No	Private	Y
23	3.460	RHS	HP	6.0	Mishrauli	70-80	Drinking & Washing	Yes	Government	Y
24	3.500	RHS	HP	8.0	Mishrauli	50-60	Drinking & Washing	Yes	Private	Y
25	3.600	LHS	HP	8.0	Mishrauli	50-60	Drinking & Washing	No	Private	Y
26	3.800	LHS	HP	7.0	Mishrauli	70-80	Drinking & Washing	Yes	Government	Y
27	3.850	LHS	HP	9.0	Mishrauli	50-60	Drinking & Washing	No	Private	Y
28	4.250	LHS	HP	7.0	Muli Chhapara	50-60	Drinking & Washing	No	Private	Y
29	4.300	LHS	HP	8.0	Muli Chhapara	50-60	Drinking & Washing	No	Private	Y
30	4.350	LHS	HP	5.0	Muli Chhapara	70-80	Drinking & Washing	Yes	Government	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth(feet)	Uses (Drinking/Washing)	Platform Type	Ownership Type	Impacted (Y/N)
31	4.350	LHS	HP	8.5	Muli Chhapara	50	Washing	No	Private	Y
32	4.400	RHS	HP	8.0	Hardi Chappra	50	Drinking& washing	No	Private	Y
33	4.500	RHS	HP	10.0	Hardi Chappra	70	Drinking& washing	Yes	Government	Y
34	5.000	LHS	HP	9.0	Parsia	60	Drinking& washing	No	Private	Y
35	5.100	RHS	HP	8.0	Parsia	70	Drinking& washing	Yes	Government	Y
36	5.100	LHS	HP	8.0	Parsia	60	Drinking& washing	No	Private	Y
37	5.180	RHS	HP	11.0	Parsia	60	Both	No	Private	N
38	5.300	LHS	HP	4.0	Parsia	60	Drinking& washing	No	Private	Y
39	5.350	RHS	HP	4.0	Parsia	60	Drinking& washing	No	Private	Y
40	5.400	LHS	HP	6.0	Parsia	60	Drinking& washing	No	Private	Y
41	5.400	RHS	HP	5.0	Parsia	60	Drinking& washing	No	Private	Y
42	5.420	RHS	HP	9.0	Parsia	120	Drinking& washing	Yes	Government	Y
43	5.420	LHS	HP	7.0	Parsia	50	Drinking& washing	No	Private	Y
44	5.420	LHS	HP	7.0	Parsia	50	Drinking& washing	No	Private	Y
45	5.420	RHS	HP	7.0	Parsia	50	Drinking& washing	Yes	Private	Y
46	5.500	RHS	HP	7.0	Parsia	50	Drinking& washing	No	Private	Y
47	5.520	RHS	HP	6.0	Parsia	120	Drinking& washing	Yes	Government	Y
48	5.600	LHS	HP	9.0	Parsia	60	Drinking& washing	No	Private	Y
49	5.650	RHS	HP	8.0	Parsia	60	Drinking& washing	No	Private	Y
50	5.700	RHS	HP	6.0	Parsia	120	Abondaoned	No	Government	Y
51	5.730	LHS	HP	8.0	Parsia	120	Drinking& washing	Yes	Government	Y
52	5.800	LHS	HP	10.0	Parsia	50	Drinking& washing	no	Private	Y
53	5.800	RHS	HP	10.0	Parsia	50	Drinking& washing	no	Private	Y
54	5.800	RHS	HP	10.0	Parsia	50	Drinking& washing	no	Private	Y
55	5.820	LHS	HP	10.0	Parsia	50	Drinking& washing	no	Private	Y
56	5.840	LHS	HP	10.0	Parsia	50	Drinking& washing	no	Private	Y
57	5.860	RHS	HP	9.0	Parsia	50	Drinking& washing	no	Private	Y
58	5.870	RHS	HP	8.0	Parsia	50	Drinking& washing	no	Private	Y
59	6.000	RHS	HP	7.0	kerwania	50	Drinking& washing	No	Private	Y
60	6.020	RHS	HP	8.0	kerwania	50	Drinking& washing	Yes	Private	Y
61	6.030	LHS	HP	9.0	kerwania	50	Drinking& washing	No	Private	Y
62	6.030	LHS	Pumping set	11.0	kerwania	250	Agricultural use	-	Private	N
63	6.040	LHS	HP	7.0	kerwania	70	Drinking& washing	Yes	Government	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth(feet)	Uses (Drinking/Washing)	Platform Type	Ownership Type	Impacted (Y/N)
64	6.200	LHS	HP	7.0	kerwania	70	Abondaoned	Yes	Government	Y
65	6.300	LHS	HP	7.0	kerwania	70	Drinking& washing	Yes	Government	Y
66	6.450	LHS	HP	11.0	kerwania	50	Both	Yes	Private	N
67	6.500	LHS	HP	10.0	kerwania	50	Drinking& washing	Yes	Private	Y
68	6.500	LHS	HP	10.0	kerwania	50	Drinking& washing	Yes	Private	Y
69	6.950	LHS	HP	9.0	Nirbhaya	50	Drinking& washing	No	Private	Y
70	7.200	LHS	HP	9.0	Nirbhaya	70	Drinking& washing	Yes	Government	Y
71	7.220	LHS	HP	7.0	Nirbhaya	70	Drinking& washing	No	Government	Y
72	7.300	LHS	HP	10.0	Nirbhaya	50	Drinking& washing	No	Private	Y
73	7.400	LHS	HP	8.0	Nirbhaya	50	Drinking& washing	Yes	Private	Y
74	7.480	LHS	HP	8.0	Nirbhaya	70	Drinking& washing	Yes	Government	Y
75	7.500	RHS	HP	5.0	Nirbhaya	50	Drinking& washing	No	Private	Y
76	7.550	RHS	HP	9.0	Nirbhaya	50	Drinking& washing	No	Private	Y
77	7.550	RHS	HP	10.0	Nirbhaya	50	Drinking& washing	no	Private	Y
78	7.600	LHS	HP	10.0	Nirbhaya	50	Drinking& washing	No	Private	Y
79	7.600	RHS	HP	8.0	Nirbhaya	70	Drinking& washing	Yes	Government	Y
80	7.610	RHS	HP	11.0	Nirbhaya	50	Both	No	Private	N
81	8.100	RHS	HP	7.0	Nirbhaya	70	Drinking	Yes	Government	Y
82	9.400	LHS	HP	10.0	Rambag	50	Drinking& washing	No	Private	Y
83	9.500	LHS	HP	9.0	Rambag	50	Drinking& washing	No	Private	Y
84	9.550	LHS	HP	8.0	Rambag	50	Drinking& washing	Yes	Private	Y
85	9.600	RHS	HP	5.0	Rambag	50	Drinking& washing	Yes	Private	Y
86	9.600	LHS	HP	8.0	Rambag	60	Drinking& washing	No	Private	Y
87	9.620	LHS	HP	7.0	Rambag	50	Drinking& washing	No	Private	Y
88	9.800	RHS	HP	10.0	RambagChauraha	50	Drinking& washing	No	Private	Y
89	9.860	LHS	HP	10.0	RambagChauraha	50	Drinking& washing	No	Private	Y
90	10.000	LHS	HP	11.0	RambagChauraha	50	Both	No	Private	N
91	10.590	LHS	HP	9.0	parasuran Chappara	50	Drinking& washing	No	Private	Y
92	10.900	LHS	HP	6.0	parasuran Chappara	50	Drinking& washing	No	Private	Y
93	10.920	RHS	HP	6.0	parasuran Chappara	50	Drinking& washing	No	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth(feet)	Uses (Drinking/Washing)	Platform Type	Ownership Type	Impacted (Y/N)
94	10.930	LHS	HP	10.0	parasuran Chappara	50	Drinking& washing	No	Private	Y
95	10.940	LHS	HP	7.0	parasuran Chappara	50	Drinking& washing	No	Private	Y
96	10.950	RHS	HP	10.0	parasuran Cappara	50	Drinking& washing	No	Private	Y
97	11.250	LHS	HP	6.0	Badal Chappra	50	Abondaoned	No	Private	Y
98	11.300	RHS	HP	9.0	Badal Chappra	80	Drinking& washing	Yes	Government	Y
99	11.400	RHS	HP	11.0	Badal Chappra	80	Both	Yes	Government	N
100	11.420	LHS	HP	8.0	Badal Chappra	50	Drinking& washing	No	Private	Y
101	11.500	LHS	HP	8.0	Badal Chappra	50	Drinking& washing	no	Private	Y
102	11.680	LHS	HP	7.0	Badal Chappra	50	Drinking& washing	Yes	Private	Y
103	11.700	LHS	HP	6.0	Badal Chappra	50	Drinking& washing	no	Private	Y
104	11.920	LHS	HP	12.0	Bhumihari Patti	60	Both	Yes	Government	N
105	11.950	LHS	HP	9.0	Bhumihari Patti	50	Drinking& washing	Yes	Private	Y
106	12.000	RHS	HP	9.0	Bhumihari Patti	60	Drinking& washing	no	Private	Y
107	12.180	LHS	well	8.0	Bhumihari Patti	25	Drinking& washing	Yes	Private	Y
108	12.200	LHS	HP	8.0	Bhumihari Patti	60	Abondaoned	Yes	Government	Y
109	12.800	LHS	HP	6.0	Pachpherwa	50	Drinking& washing	No	Private	Y
110	12.900	LHS	HP	9.0	Pachpherwa	50	Drinking& washing	No	Private	Y
111	12.930	LHS	HP	9.0	Pachpherwa	50	Drinking& washing	No	Private	Y
112	12.950	LHS	HP	8.0	Pachpherwa	80	Abondaoned	Yes	Government	Y
113	12.950	RHS	HP	8.0	Pachpherwa	60	Drinking& washing	No	Private	Y
114	13.000	LHS	HP	10.0	Pachpherwa	60	Drinking& washing	Yes	Private	Y
115	13.020	RHS	HP	8.0	Pachpherwa	60	Drinking& washing	No	Private	Y
116	13.200	LHS	HP	7.0	Pachpherwa	60	Drinking& washing	No	Private	Y
117	13.220	RHS	HP	6.0	Pachpherwa	60	Drinking& washing	Yes	Private	Y
118	13.250	RHS	HP	9.0	Pachpherwa	60	Drinking& washing	No	Private	Y
119	13.300	RHS	HP	10.0	Pachpherwa	60	Drinking& washing	Yes	Private	Y
120	13.400	LHS	HP	9.0	Pachpherwa	60	Drinking& washing	Yes	Private	Y
121	13.500	RHS	HP	8.0	Pachpherwa	60	Drinking& washing	No	Private	Y
122	13.510	RHS	HP	8.0	Pachpherwa	60	Drinking& washing	No	Private	Y
123	13.520	RHS	HP	8.0	Pachpherwa	60	Drinking& washing	No	Private	Y
124	13.520	LHS	HP	7.0	Pachpherwa	80	Drinking	Yes	Government	Y
125	13.700	RHS	HP	11.0	Khanu Chappra	60	Both	No	Private	N

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth(feet)	Uses (Drinking/Washing)	Platform Type	Ownership Type	Impacted (Y/N)
126	13.720	RHS	HP	11.0	Khanu Chappra	60	Both	No	Private	N
127	13.780	RHS	HP	10.0	Khanu Chappra	50	Drinking& washing	Yes	Private	Y
128	13.780	LHS	HP	11.0	Khanu Chappra	50	Both	No	Private	N
129	13.790	RHS	HP	9.0	Khanu Chappra	50	Drinking& washing	Yes	Private	Y
130	13.800	LHS	HP	9.0	Khanu Chappra	80	Abondaoned	No	Government	Y
131	13.810	LHS	HP	9.0	Khanu Chappra	60	Drinking& washing	No	Private	Y
132	14.200	LHS	HP	8.0	Khanu Chappra	50	Drinking& washing	No	Private	Y
133	14.900	LHS	HP	8.0	Pagdiyar Bazar	50	Drinking& washing	Yes	Private	Y
134	14.930	LHS	HP	9.0	Pagdiyar Bazar	50	Drinking& washing	Yes	Private	Y
135	15.000	LHS	HP	9.0	Pagdiyar Bazar	50	Drinking& washing	No	Private	Y
136	15.000	RHS	HP	10.0	Pagdiyar Bazar	50	Drinking& washing	Yes	Private	Y
137	15.020	LHS	HP	10.0	Pagdiyar Bazar	50	Drinking& washing	No	Private	Y
138	15.080	LHS	HP	8.0	Pagdiyar Bazar	50	Drinking& washing	No	Private	Y
139	15.200	RHS	HP	9.0	Pagdiyar Bazar	60	Drinking& washing	No	Private	Y
140	15.250	RHS	HP	11.0	Pagdiyar Bazar	60	Both	No	Private	N
141	15.300	RHS	HP	7.0	Pagdiyar Bazar	60	Drinking& washing	No	Private	Y
142	15.310	LHS	HP	11.0	Pagdiyar Bazar	60	Both	Yes	Private	N
143	15.330	RHS	HP	12.0	Pagdiyar Bazar	60	Both	No	Private	N
144	15.340	RHS	HP	8.0	Pagdiyar Bazar	60	Drinking& washing	No	Private	Y
145	15.600	LHS	HP	9.0	Pagdiyar Bazar	80	Drinking& washing	Yes	Government	Y
146	15.650	LHS	HP	10.0	Pagdiyar Bazar	50	Drinking& washing	Yes	Private	Y
147	15.660	LHS	HP	9.0	Pagdiyar Bazar	50	Drinking& washing	No	Private	Y
148	15.700	LHS	HP	8.0	Pagdiyar Bazar	80	Abondaoned	Yes	Government	Y
149	15.730	LHS	HP	7.0	Pagdiyar Bazar	50	Drinking& washing	No	Private	Y
150	15.780	LHS	HP	7.0	Pagdiyar Bazar	50	Drinking& washing	No	Private	Y
151	15.790	RHS	HP	9.0	Pagdiyar	60	Drinking& washing	no	Private	Y
152	15810.000	RHS	HP	8.0	Pagdiyar	60	Drinking& washing	Yes	Private	Y
153	16.000	RHS	HP	11.0	Pagdiyar	60	Both	no	Private	N
154	16.100	LHS	HP	7.0	Pagdiyar	60	Drinking& washing	Yes	Private	Y
155	16.200	LHS	HP	7.0	Sauraha Khurdha	60	Drinking& washing	no	Private	Y
156	16.500	LHS	HP	8.0	Sauraha Khurdha	60	Drinking& washing	no	Private	Y
157	16.800	RHS	HP	7.0	Chargharawa	60	Drinking& washing	No	Private	Y
158	16.800	LHS	HP	9.0	Chargharawa	60	Drinking& washing	No	Private	Y
159	16.830	LHS	HP	5.0	Chargharawa	60	Drinking& washing	No	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth(feet)	Uses (Drinking/Washing)	Platform Type	Ownership Type	Impacted (Y/N)
160	16.830	RHS	HP	9.0	Chargharawa	60	Drinking& washing	No	Private	Y
161	16.850	LHS	HP	7.0	Chargharawa	60	Drinking& washing	No	Private	Y
162	16.900	LHS	HP	6.0	Chargharawa	80	Drinking& washing	No	Government	Y
163	16.950	LHS	HP	9.0	Chargharawa	60	Drinking& washing	No	Private	Y
164	16.980	RHS	HP	6.0	Chargharawa	60	Drinking& washing	No	Private	Y
165	17.000	RHS	HP	7.0	Chargharawa	80	Drinking& washing	Yes	Government	Y
166	17.000	LHS	HP	7.0	Chargharawa	60	Drinking& washing	No	Private	Y
167	17.020	LHS	HP	10.0	Chargharawa	60	Drinking& washing	No	Private	Y
168	17.050	LHS	HP	10.0	Chargharawa	60	Drinking& washing	No	Private	Y
169	17.100	LHS	HP	11.0	Chargharawa	60	Both	No	Private	N
170	17.150	LHS	HP	9.0	Chargharawa	60	Drinking& washing	Yes	Private	Y
171	17.150	RHS	HP	12.0	Chargharawa	60	Both	No	Private	N
172	17.200	RHS	HP	7.0	Chargharawa	80	Drinking& washing	Yes	Government	Y
173	17.300	RHS	HP	11.0	Chargharawa	60	Both	No	Private	N
174	17.320	RHS	HP	9.0	Chargharawa	60	Drinking& washing	No	Private	Y
175	17.400	RHS	HP	8.0	Chargharawa	60	Drinking& washing	No	Private	Y
176	17.600	LHS	HP	9.0	Chargharawa	60	Drinking& washing	No	Private	Y
177	17.900	LHS	HP	9.0	Khairatia	60	Drinking& washing	No	Private	Y
178	17.900	RHS	HP	9.0	Khairatia	60	Drinking& washing	No	Private	Y
179	17.930	RHS	HP	8.0	Khairatia	60	Drinking& washing	No	Private	Y
180	18.050	LHS	HP	5.0	Khairatia Colony	60	Drinking& washing	Yes	Private	Y
181	18.700	RHS	HP	11.0	Khairatia Colony	100	drinking	Yes	Government	N
182	18.900	RHS	HP	10.0	Khairatia	60	Drinking& washing	No	Private	Y
183	18.950	LHS	HP	11.0	Khairatia	60	Both	No	Private	N
184	19.500	LHS	HP	9.0	Kalwari Patti	120	Drinking& washing	Yes	Government	Y
185	19.700	LHS	HP	7.0	Kalwari Patti	60	Drinking& washing	No	Private	Y
186	19.750	RHS	HP	7.0	Kalwari Patti	60	Drinking& washing	Yes	Private	Y
187	19.800	LHS	HP	7.0	Kalwari Patti	120	Drinking& washing	Yes	Government	Y
188	19.850	LHS	HP	8.0	Kalwari Patti	60	Drinking& washing	Yes	Private	Y
189	19.900	RHS	HP	7.0	Kalwari Patti	60	Drinking& washing	No	Private	Y
190	19.950	RHS	HP	9.0	Kalwari Patti	120	Drinking& washing	Yes	Government	Y
191	19.950	LHS	HP	8.0	Kalwari Patti	60	Drinking& washing	No	Private	Y
192	21.700	LHS	HP	8.0	Sirsia	60	Drinking& washing	No	Private	Y
193	21.700	RHS	HP	7.0	Sirsia	60	Drinking& washing	No	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth(feet)	Uses (Drinking/Washing)	Platform Type	Ownership Type	Impacted (Y/N)
194	22.450	RHS	HP	7.0	Naurangia Kotwa More	120	Drinking& washing	Yes	Government	Y
195	22.500	LHS	HP	7.0	Naurangia Kotwa More	60	Drinking& washing	No	Private	Y
196	22.600	RHS	HP	9.0	Naurangia Kotwa More	60	Drinking& washing	No	Private	Y
197	22.900	RHS	HP	7.0	Naurangia	60	Drinking& washing	No	Private	Y
198	23.000	RHS	HP	8.0	Naurangia	60	Drinking& washing	No	Private	Y
199	23.000	LHS	HP	10.0	Naurangia	60	Drinking& washing	No	Private	Y
200	23.080	LHS	HP	8.0	Naurangia	100	Drinking& washing	Yes	Government	Y
201	23.100	RHS	HP	10.0	Naurangia	60	Drinking& washing	no	Private	Y
202	23.800	RHS	HP	9.0	Naurangia	120	Drinking& washing	Yes	Government	Y
203	23.850	LHS	HP	8.0	Naurangia	60	Drinking& washing	no	Private	Y
204	23.860	LHS	HP	8.0	Naurangia	60	Drinking& washing	no	Private	Y
205	23.900	LHS	HP	8.0	Naurangia	60	Drinking& washing	no	Private	Y
206	23.900	LHS	HP	8.0	Naurangia	120	Drinking& washing	Yes	Government	Y
207	23.980	RHS	HP	7.0	Naurangia	60	Drinking& washing	No	Private	Y

Source: PPTA Consultant

Appendix 18B: Ground Water Source along the Project-(Kaptainganj-Hata-Gauribazar-Rudrapur)

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
1	0.030	LHS	HP	8.0	Kaptainganj Town	60	Drinking	No	Private	Y
2	0.180	RHS	HP	8.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
3	0.180	RHS	HP	6.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
4	0.200	LHS	Tap	9.0	Kaptainganj Town	supply water	Drinking	Yes	Government	Y
5	0.300	LHS	Tap	6.0	Kaptainganj Town	supply water	Drinking	Yes	Government	Y
6	0.320	LHS	HP	7.0	Kaptainganj Town	60	Drinking	No	Private	Y
7	0.380	RHS	Tap	4.5	Kaptainganj Town	supply water	Drinking	No	Government	Y
8	0.400	LHS	Tap	5.0	Kaptainganj Town	supply water	Drinking	Yes	Government	Y
9	0.420	LHS	HP	6.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
10	0.460	RHS	HP	5.5	Kaptainganj Town	60	Drinking	No	Private	Y
11	0.500	LHS	HP	8.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
12	0.530	RHS	HP	7.0	Kaptainganj Town	60	Drinking	No	Private	Y
13	0.600	RHS	Tap	6.5	Kaptainganj Town	supply water	Drinking	Yes	Government	Y
14	0.650	RHS	HP	6.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
15	0.670	RHS	HP	6.0	Kaptainganj Town	100	Drinking	Yes	Government	Y
16	0.680	RHS	HP	6.0	Kaptainganj Town	60	Drinking	No	Private	Y
17	0.800	RHS	HP	6.5	Kaptainganj Town	60	Drinking	No	Private	Y
18	0.850	LHS	HP	5.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
19	0.860	LHS	HP	5.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
20	0.900	LHS	HP	8.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
21	0.940	LHS	HP	8.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
22	1.100	LHS	HP	9.0	Kaptainganj Town	60	Drinking	Yes	Private	Y
23	1.150	LHS	HP	8.0	Kaptainganj Town	60	Drinking	No	Private	Y
24	1.160	RHS	HP	6.5	Kaptainganj Town	60	Drinking	Yes	Private	Y
25	1.180	RHS	HP	7.0	Kaptainganj Town	60	Drinking& washing	Yes	Private	Y
26	1.190	RHS	HP	7.0	Kaptainganj Town	100	Drinking& washing	Yes	Government	Y
27	1.220	RHS	HP	8.0	Kaptainganj Town	60	Drinking& washing	Yes	Private	Y
28	1.400	LHS	HP	8.0	Kaptainganj Town	100	Drinking& washing	Yes	Government	Y
29	1.500	LHS	HP	8.0	Kaptainganj Town	60	Drinking& washing	No	Private	Y
30	1.550	RHS	HP	9.0	Kaptainganj Town	60	Drinking& washing	No	Private	Y
31	1.600	RHS	HP	10.0	Kaptainganj Town	60	Drinking& washing	Yes	Private	Y
32	1.670	LHS	HP	10.0	Kaptainganj Town	60	Washing	Yes	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
33	2.300	LHS	HP	9.0	Dhadhi Tola	60	Drinking& washing	Yes	Private	Y
34	2.400	LHS	HP	9.0	Dhadhi Tola	100	Drinking& washing	Yes	Government	Y
35	2.500	RHS	HP	10.0	Dhadhi Tola	60	Drinking& washing	Yes	Private	Y
36	2.550	LHS	HP	8.0	Dhadhi Tola	60	Drinking& washing	No	Private	Y
37	2.580	RHS	HP	10.0	Dhadhi Tola	60	Drinking& washing	No	Private	Y
38	2.590	LHS	HP	7.0	Dhadhi Tola	100	Drinking& washing	Yes	Government	Y
39	3.800	LHS	HP	7.0	Semra	100	Drinking& washing	Yes	Government	Y
40	5.400	RHS	HP	5.5	Malukahi	60	Drinking& washing	No	Private	Y
41	5.450	LHS	HP	6.0	Malukahi	60	Drinking& washing	No	Private	Y
42	6.300	LHS	HP	5.5	Narayanapur	120	Drinking& washing	Yes	Government	Y
43	6.400	RHS	HP	7.0	Narayanapur	60	Drinking& washing	No	Private	Y
44	6.450	RHS	HP	8.0	Narayanapur	120	Drinking& washing	Yes	Government	Y
45	7.900	LHS	HP	9.0	Luxmipur	120	Abondoned	Yes	Government	Y
46	8.250	LHS	HP	9.0	Luxmipur	120	Drinking& washing	Yes	Government	Y
47	8.400	LHS	HP	7.0	Luxmipur	60	Drinking& washing	Yes	Private	Y
48	8.430	LHS	HP	10.0	Luxmipur	60	Drinking& washing	No	Private	Y
49	8.450	LHS	HP	10.0	Luxmipur	60	Drinking& washing	No	Private	Y
50	8.800	RHS	HP	10.0	Luxmipur	100	Drinking& washing	Yes	Government	Y
51	9.500	LHS	HP	10.0	Mathauli Bazar	100	Drinking	No	Government	Y
52	9.600	RHS	HP	6.0	Mathauli Bazar	60	Drinking& washing	Yes	Private	Y
53	9.750	LHS	HP	6.5	Mathauli Bazar	100	Abondoned	Yes	Government	Y
54	9.900	LHS	HP	10.0	Mathauli Bazar	100	Drinking& washing	Yes	Government	Y
55	9.920	RHS	HP	7.0	Mathauli Bazar	60	Drinking& washing	No	Private	Y
56	10.450	RHS	HP	7.0	Mathauli Bazar	60	Drinking& washing	Yes	Private	Y
57	10.550	LHS	HP	8.0	Mathauli Bazar	60	Drinking& washing	Yes	Private	Y
58	10.910	LHS	HP	8.0	Mathauli Bazar	100	Drinking& washing	Yes	Government	Y
59	11.300	LHS	HP	9.0	Lohepaar Chauraha	60	Drinking& washing	No	Private	Y
60	11.500	LHS	HP	7.0	Lohepaar Chauraha	60	Drinking& washing	No	Private	Y
61	11.580	LHS	HP	9.0	Lohepaar Chauraha	60	Drinking& washing	No	Private	Y
62	12.850	RHS	HP	9.0	Pakadi Madraha	120	Drinking& washing	Yes	Government	Y
63	12.900	RHS	HP	7.0	Pakadi Madraha	60	Drinking& washing	No	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
64	12.950	LHS	HP	8.0	Pakadi Madraha	100	Drinking& washing	Yes	Government	Y
65	13.100	RHS	HP	6.0	Pakadi Madraha	100	Drinking& washing	Yes	Government	Y
66	13.900	LHS	HP	7.0	Aziz Nagar	100	Drinking& washing	Yes	Government	Y
67	13.990	RHS	HP	5.0	Aziz Nagar	100	Drinking& washing	Yes	Government	Y
68	14.300	RHS	HP	8.0	Harpur	100	Drinking& washing	Yes	Government	Y
69	14.400	LHS	HP	8.0	Harpur	60	Drinking& washing	No	Private	Y
70	14.500	LHS	HP	8.0	Harpur	60	Drinking& washing	Yes	Private	Y
71	14.600	LHS	HP	7.0	Harpur	60	Abondoned	Yes	Private	Y
72	14.620	RHS	HP	8.0	Harpur	100	Drinking& washing	Yes	Government	Y
73	14.700	RHS	HP	7.0	Harpur	100	Drinking& washing	Yes	Government	Y
74	14.800	RHS	HP	5.0	Harpur	60	Drinking& washing	No	Private	Y
75	14.810	LHS	HP	9.0	Harpur	60	Drinking& washing	Yes	Private	Y
76	14.900	RHS	HP	5.0	Harpur	60	Drinking& washing	No	Private	Y
77	15.000	RHS	HP	9.0	Harpur	60	Drinking& washing	No	Private	Y
78	15.050	LHS	HP	8.0	Harpur	120	Drinking& washing	Yes	Government	Y
79	15.060	RHS	HP	8.0	Harpur	120	Drinking& washing	Yes	Government	Y
80	15.150	RHS	HP	8.0	Harpur	60	Washing	No	Private	Y
81	15.300	RHS	HP	6.0	Harpur	60	Drinking& washing	No	Private	Y
82	15.350	RHS	HP	6.0	Harpur	100	Drinking& washing	Yes	Government	Y
83	15.380	LHS	HP	6.5	Harpur	50	Drinking& washing	Yes	Private	Y
84	15.600	RHS	HP	9.0	Harpur	60	Drinking& washing	Yes	Private	Y
85	15.900	LHS	HP	9.0	Dharmpur	60	Drinking& washing	Yes	Private	Y
86	16.000	RHS	HP	7.0	Dharmpur	100	Drinking& washing	Yes	Government	Y
87	16.050	RHS	HP	9.0	Dharmpur	100	Drinking& washing	Yes	Government	Y
88	16.800	LHS	HP	10.0	Belwan	120	Drinking& washing	Yes	Government	Y
89	16.830	LHS	HP	7.0	Belwan	60	Drinking& washing	No	Private	Y
90	17.300	LHS	HP	9.0	Belwan	60	Drinking& washing	Yes	Private	Y
91	17.600	RHS	HP	7.0	Jangabazar	60	Drinking& washing	Yes	Private	Y
92	17.650	RHS	HP	4.0	Jangabazar	60	Drinking& washing	No	Private	Y
93	17.800	LHS	HP	10.0	Jangabazar	60	Drinking& washing	No	Private	Y
94	18.500	RHS	HP	7.0	Jangabazar	120	Drinking& washing	Yes	Government	Y
95	18.900	LHS	HP	9.0	Jangabazar	60	Drinking& washing	Yes	Private	Y
96	18.950	RHS	HP	10.0	Jangabazar	120	Drinking& washing	Yes	Government	Y
97	19.100	LHS	HP	9.0	Jangabazar	60	Drinking& washing	Yes	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
98	19.110	LHS	HP	9.0	Jangabazar	60	Drinking& washing	No	Private	Y
99	19.180	RHS	HP	10.0	Jangabazar	100	Drinking& washing	Yes	Government	Y
100	19.500	LHS	HP	7.5	Jangabazar	100	Drinking& washing	Yes	Government	Y
101	19.600	RHS	HP	8.0	Jangabazar	60	Drinking& washing	Yes	Private	Y
102	21.980	RHS	HP	8.0	Hata	100	Drinking& washing	Yes	Government	Y
103	22.000	RHS	HP	7.0	Hata	120	Drinking& washing	Yes	Government	Y
104	22.350	RHS	HP	6.0	Hata	60	Drinking& washing	No	Private	Y
105	22.400	RHS	HP	9.0	Hata	60	Drinking& washing	Yes	Private	Y
106	23.780	LHS	HP	7.0	Hata	60	Drinking& washing	Yes	Private	Y
107	24.000	RHS	HP	9.0	Hata	60	Drinking& washing	Yes	Private	Y
108	24.200	RHS	HP	8.0	Hata	120	Drinking& washing	Yes	Government	Y
109	24.600	RHS	HP	9.0	Hata	60	Drinking& washing	No	Private	Y
110	24.650	RHS	HP	8.0	Hata	60	Drinking& washing	Yes	Private	Y
111	24.700	RHS	HP	8.0	Hata	60	Drinking& washing	No	Private	Y
112	24.900	RHS	HP	7.0	Paragpur	100	Drinking& washing	Yes	Government	Y
113	26.700	LHS	HP	7.5	Madaraha	60	Drinking& washing	No	Private	Y
114	27.000	LHS	HP	6.0	Madaraha	100	Abondoned	Yes	Government	Y
115	28.300	RHS	HP	8.0	Motipakar	120	Drinking& washing	Yes	Government	Y
116	28.300	LHS	HP	7.0	Motipakar	60	Drinking& washing	No	Private	Y
117	28.600	RHS	HP	9.0	Motipakar	120	Drinking& washing	Yes	Government	Y
118	29.400	LHS	HP	8.0	Balua	60	Drinking& washing	No	Private	Y
119	29.500	LHS	HP	5.0	Balua	60	Abondoned	No	Private	Y
120	29.600	LHS	HP	8.0	Balua	60	Drinking& washing	Yes	Private	Y
121	29.620	LHS	HP	8.0	Balua	60	Drinking& washing	Yes	Private	Y
122	29.800	LHS	HP	7.0	Balua	60	Drinking& washing	Yes	Private	Y
123	30.100	RHS	HP	7.0	Balua	60	Drinking& washing	No	Private	Y
124	30.500	LHS	HP	7.0	Balua	60	Drinking& washing	No	Private	Y
125	30.650	LHS	HP	7.0	Balua	60	Drinking& washing	Yes	Private	Y
126	30.780	LHS	HP	10.0	Wakilganj	60	Drinking& washing	Yes	Private	Y
127	31.800	RHS	HP	9.0	Wakilganj	60	Drinking& washing	Yes	Private	Y
128	31.850	RHS	HP	9.0	Wakilganj	100	Drinking& washing	Yes	Government	Y
129	31.950	RHS	HP	9.0	Wakilganj	60	Drinking& washing	No	Private	Y
130	31.960	LHS	HP	9.0	Wakilganj	120	Drinking& washing	Yes	Government	Y
131	31.970	RHS	HP	9.0	Wakilganj	60	Drinking& washing	Yes	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
132	32.000	LHS	HP	9.0	Wakilganj	120	Drinking& washing	Yes	Government	Y
133	32.100	RHS	HP	5.0	Wakilganj	60	Drinking& washing	No	Private	Y
134	33.300	RHS	HP	8.0	Bakhara	120	Drinking& washing	Yes	Government	Y
135	33.900	RHS	HP	9.0	Bakhara	120	Drinking& washing	Yes	Government	Y
136	33.980	RHS	HP	9.0	Bakhara	60	Drinking& washing	No	Private	Y
137	34.000	LHS	HP	8.0	Bakhara	120	Drinking& washing	Yes	Government	Y
138	34.100	LHS	HP	7.0	Bakhara	120	Drinking& washing	Yes	Government	Y
139	34.150	LHS	HP	7.0	Bakhara	120	Drinking& washing	Yes	Government	Y
140	34.200	LHS	HP	9.0	Bakhara	60	Drinking& washing	Yes	Private	Y
141	34.220	RHS	HP	9.0	Bakhara	120	Drinking& washing	Yes	Government	Y
142	34.225	LHS	HP	9.0	Bakhara	60	Drinking& washing	Yes	Private	Y
143	34.300	LHS	HP	8.0	Bakhara	60	Drinking& washing	Yes	Private	Y
144	34.350	RHS	HP	9.0	Bakhara	60	Drinking& washing	Yes	Private	Y
145	34.400	RHS	HP	8.0	Bakhara	60	Drinking& washing	Yes	Private	Y
146	34.500	LHS	HP	8.0	Bakhara	120	Drinking& washing	Yes	Government	Y
147	34.530	LHS	HP	8.0	Bakhara	60	Drinking& washing	Yes	Private	Y
148	34.550	RHS	HP	6.0	Bakhara	70	Drinking& washing	No	Private	Y
149	34.600	LHS	HP	9.0	Bakhara	70	Drinking& washing	Yes	Private	Y
150	34.630	LHS	HP	7.0	Bakhara	70	Drinking& washing	Yes	Private	Y
151	34.650	LHS	HP	8.0	Bakhara	70	Drinking& washing	Yes	Private	Y
152	34.700	LHS	HP	8.0	Bakhara	120	Drinking& washing	Yes	Government	Y
153	34.800	LHS	HP	8.0	Bakhara	120	Drinking& washing	Yes	Government	Y
154	34.820	LHS	HP	8.0	Bakhara	120	Drinking& washing	Yes	Government	Y
155	34.930	LHS	HP	9.0	Bakhara	120	Drinking& washing	Yes	Government	Y
156	35.100	RHS	HP	9.0	Bakhara	120	Drinking& washing	Yes	Government	Y
157	35.800	RHS	HP	7.0	Bisunpura	70	Drinking& washing	Yes	Private	Y
158	36.300	RHS	HP	8.0	Bisunpura	120	Drinking& washing	Yes	Government	Y
159	36.900	LHS	HP	7.0	Bisunpura	120	Drinking& washing	Yes	Government	Y
160	37.100	RHS	HP	9.0	Kakwal	120	Drinking& washing	Yes	Government	Y
161	37.200	LHS	HP	8.0	Kakwal	70	Drinking	No	Private	Y
162	37.600	LHS	HP	8.0	Rampur Chauraha	120	Drinking& washing	Yes	Government	Y
163	37.650	RHS	HP	7.0	Rampur Chauraha	80	Drinking& washing	Yes	Private	Y
164	37.900	RHS	HP	7.0	Rampur Chauraha	120	Drinking& washing	Yes	Government	Y
165	38.500	RHS	HP	9.0	Chariyawan Khas	120	Drinking& washing	Yes	Government	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
166	39.100	RHS	HP	9.0	Dahhar Bisawa	120	Drinking& washing	Yes	Government	Y
167	39.300	RHS	HP	8.0	Dahhar Bisawa	120	Drinking& washing	Yes	Government	Y
168	39.500	RHS	HP	8.0	Dahhar Bisawa	70	Drinking& washing	No	Private	Y
169	39.750	LHS	HP	9.0	Dahhar Bisawa	120	Drinking& washing	Yes	Government	Y
170	40.300	LHS	HP	9.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
171	40.350	RHS	HP	9.0	Gauri Bazar	60	Drinking& washing	No	Private	Y
172	40.400	RHS	HP	9.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
173	40.500	RHS	HP	8.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
174	40.600	RHS	HP	9.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
175	40.700	RHS	HP	9.0	Gauri Bazar	60	Drinking& washing	Yes	Private	Y
176	40.750	RHS	HP	8.0	Gauri Bazar	60	Drinking& washing	Yes	Private	Y
177	41.000	LHS	HP	9.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
178	41.150	LHS	HP	9.0	Gauri Bazar	60	Drinking& washing	Yes	Private	Y
179	41.200	RHS	HP	9.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
180	41.300	RHS	HP	9.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
181	41.350	LHS	HP	8.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
182	41.400	LHS	HP	8.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
183	41.600	LHS	HP	8.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
184	42.600	RHS	HP	7.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
185	42.900	RHS	HP	8.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
186	43.000	LHS	HP	9.0	Gauri Bazar	120	Abondoned	No	Government	Y
187	43.100	LHS	HP	8.5	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
188	43.200	LHS	HP	7.0	Gauri Bazar	80	Drinking& washing	Yes	Private	Y
189	43.250	LHS	HP	8.0	Gauri Bazar	80	Drinking& washing	Yes	Private	Y
190	43.400	LHS	HP	9.0	Gauri Bazar	120	Drinking& washing	Yes	Government	Y
191	43.700	LHS	HP	8.0	MathiyaMafi	120	Drinking& washing	Yes	Private	Y
192	44.100	LHS	HP	8.0	MathiyaMafi	120	Drinking& washing	No	Private	Y
193	44.200	LHS	HP	7.0	MathiyaMafi	120	Drinking& washing	Yes	Government	Y
194	44.400	LHS	HP	7.0	MathiyaMafi	120	Drinking& washing	No	Private	Y
195	44.500	RHS	HP	9.0	MathiyaMafi	120	Drinking& washing	Yes	Government	Y
196	44.600	LHS	HP	9.0	MathiyaMafi	120	Drinking& washing	Yes	Government	Y
197	44.700	RHS	HP	8.0	MathiyaMafi	120	Drinking& washing	Yes	Government	Y
198	44.710	RHS	HP	8.0	Labkani More	60	Drinking& washing	No	Private	Y
199	45.000	LHS	HP	9.0	Labkani More	60	Drinking& washing	No	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
200	45.000	RHS	HP	9.0	Indupur	120	Drinking& washing	Yes	Government	Y
201	45.450	LHS	HP	7.0	Indupur	60	Drinking& washing	No	Private	Y
202	45.450	RHS	HP	9.0	Indupur	60	Drinking& washing	No	Private	Y
203	45.600	LHS	HP	7.0	Indupur	60	Drinking& washing	No	Private	Y
204	45.610	RHS	HP	6.0	Indupur	50	Drinking& washing	No	Private	Y
205	45.620	RHS	HP	8.0	Indupur	60	Drinking& washing	No	Private	Y
206	45.630	RHS	HP	7.0	Indupur	60	Drinking& washing	No	Private	Y
207	45.700	LHS	HP	8.0	Indupur	70	Drinking& washing	No	Private	Y
208	45.800	RHS	HP	8.0	Indupur	120	Drinking& washing	Yes	Government	Y
209	46.050	LHS	HP	7.0	Indupur	60	Drinking& washing	No	Private	Y
210	46.200	RHS	HP	10.0	Indupur	120	Drinking& washing	Yes	Government	Y
211	46.250	LHS	HP	7.0	Indupur	120	Drinking& washing	Yes	Government	Y
212	46.300	LHS	HP	9.0	Indupur	120	Drinking& washing	Yes	Government	Y
213	46.500	LHS	HP	10.0	Indupur	60	Drinking& washing	No	Private	Y
214	46.700	LHS	HP	10.0	Indupur	60	Drinking& washing	No	Private	Y
215	46.750	LHS	HP	9.0	Indupur	60	Drinking& washing	No	Private	Y
216	47.090	RHS	HP	6.0	Pannaha	60	Drinking& washing	No	Private	Y
217	47.180	RHS	HP	10.0	Pannaha	120	Drinking& washing	Yes	Government	Y
218	48.100	RHS	HP	10.0	Pannaha	60	Drinking& washing	No	Private	Y
219	48.500	RHS	HP	9.0	Kattai	120	Drinking& washing	Yes	Government	Y
220	48.700	RHS	HP	10.0	Kattai	60	Drinking& washing	No	Private	Y
221	48.900	LHS	HP	9.0	Kattai	60	Drinking& washing	No	Private	Y
222	49.080	LHS	HP	7.0	Kattai	60	Drinking& washing	No	Private	Y
223	49.120	LHS	HP	8.0	Kattai	60	Drinking& washing	Yes	Private	Y
224	49.150	RHS	HP	9.0	Kattai	120	Drinking& washing	Yes	Government	Y
225	49.160	RHS	HP	9.0	Kattai	60	Drinking& washing	No	Private	Y
226	49.200	RHS	HP	10.0	Kattai Chauraha	60	Drinking& washing	No	Private	Y
227	49.230	RHS	HP	10.0	Kattai Chauraha	60	Drinking& washing	No	Private	Y
228	49.300	RHS	HP	9.0	Kattai Chauraha	120	Drinking& washing	Yes	Government	Y
229	49.400	LHS	HP	8.0	Kattai Chauraha	120	Drinking& washing	Yes	Government	Y
230	50.280	LHS	HP	7.0	Belkunda	120	Drinking& washing	Yes	Government	Y
231	50.280	LHS	HP	9.0	Belkunda	120	Drinking& washing	No	Private	Y
232	50.400	LHS	HP	9.0	Belkunda	120	Drinking& washing	Yes	Government	Y
233	50.600	LHS	HP	6.0	Banshakti Bazar	120	Drinking& washing	Yes	Government	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
234	50.720	LHS	HP	8.0	Banshakti Bazar	120	Drinking& washing	Yes	Government	Y
235	50.800	LHS	HP	10.0	Banshakti Bazar	120	Drinking& washing	Yes	Government	Y
236	51.450	RHS	HP	9.0	Ram Luxan	60	Drinking& washing	No	Private	Y
237	51.450	RHS	HP	8.0	Ram Luxan	60	Drinking& washing	No	Private	Y
238	51.780	RHS	HP	10.0	Ram Luxan	60	Drinking& washing	No	Private	Y
239	51.800	RHS	HP	10.0	Ram Luxan	60	Drinking& washing	No	Private	Y
240	51.900	LHS	HP	9.0	Ram Luxan	60	Drinking& washing	No	Private	Y
241	51.950	LHS	HP	10.0	Ram Luxan	120	Drinking& washing	Yes	Government	Y
242	52.000	LHS	HP	10.0	Ram Luxan	120	Drinking& washing	Yes	Private	Y
243	52.050	RHS	HP	10.0	Ram Luxan	120	Drinking& washing	Yes	Government	Y
244	52.100	LHS	HP	10.0	Ram Luxan	60	Drinking& washing	Yes	Private	Y
245	52.400	RHS	HP	7.0	Ram Luxan	60	Drinking& washing	No	Private	Y
246	52.500	LHS	HP	9.0	Ram Luxan	60	Drinking& washing	Yes	Private	Y
247	52.500	RHS	HP	8.0	Ram Luxan	60	Drinking& washing	No	Private	Y
248	52.550	LHS	HP	8.0	Ram Luxan	60	Drinking& washing	Yes	Private	Y
249	52.570	RHS	HP	7.0	Ram Luxan	120	Drinking& washing	Yes	Government	Y
250	52.570	LHS	HP	8.0	Ram Luxan	60	Drinking& washing	Yes	Private	Y
251	52.650	RHS	HP	10.0	Ram Luxan	60	Drinking& washing	No	Private	Y
252	52.700	LHS	HP	9.0	Ram Luxan	60	Drinking& washing	Yes	Government	Y
253	52.750	LHS	HP	9.0	Ram Luxan	60	Drinking& washing	Yes	Private	Y
254	52.780	LHS	HP	9.0	Ram Luxan	60	Drinking& washing	Yes	Private	Y
255	52.900	LHS	HP	10.0	Ram Luxan	60	Drinking& washing	Yes	Private	Y
256	52.915	RHS	HP	9.0	Luxmipur Tola	60	Drinking& washing	Yes	Private	Y
257	53.000	RHS	HP	10.0	Luxmipur Tola	60	Drinking& washing	Yes	Private	Y
258	53.030	RHS	HP	10.0	Luxmipur Tola	60	Drinking& washing	Yes	Private	Y
259	53.300	LHS	HP	5.0	Luxmipur Tola	120	Drinking& washing	Yes	Government	Y
260	53.320	RHS	HP	9.0	Luxmipur Tola	120	Drinking& washing	Yes	Government	Y
261	53.400	RHS	HP	10.0	Luxmipur Tola	60	Drinking& washing	Yes	Private	Y
262	53.500	LHS	HP	10.0	Luxmipur	120	Drinking& washing	Yes	Government	Y
263	53.600	LHS	HP	9.0	Luxmipur	60	Drinking& washing	Yes	Private	Y
264	53.600	RHS	HP	8.0	Luxmipur	60	Drinking& washing	Yes	Private	Y
265	53.610	RHS	HP	8.0	Luxmipur	60	Drinking& washing	Yes	Private	Y
266	53.650	LHS	HP	10.0	Luxmipur	60	Drinking& washing	No	Private	Y
267	53.700	RHS	HP	8.0	Luxmipur	60	Drinking& washing	Yes	Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
268	53.730	RHS	HP	9.0	Luxmipur	60	Drinking& washing	Yes	Private	Y
269	53.800	LHS	HP	9.0	Luxmipur	60	Drinking& washing	No	Private	Y
270	53.850	LHS	HP	8.0	Luxmipur	60	Drinking& washing	No	Private	Y
271	53.900	RHS	HP	10.0	Luxmipur	60	Drinking& washing	Yes	Private	Y
272	54.100	RHS	HP	9.0	Luxmipur	60	Drinking& washing	Yes	Private	Y
273	54.500	LHS	HP	8.0	Chappauli	60	Drinking& washing	Yes	Private	Y
274	54.550	LHS	HP	7.0	Chappauli	120	Drinking& washing	Yes	Government	Y
275	54.700	LHS	HP	9.0	Chappauli	120	Drinking& washing	Yes	Private	Y
276	54.900	LHS	HP	9.0	Chappauli	60	Drinking& washing	Yes	Private	Y
277	55.000	RHS	HP	7.0	Chappauli	120	Drinking& washing	Yes	Government	Y
278	55.600	LHS	HP	8.0	Chappauli	60	Drinking& washing	No	Private	Y
279	55.620	RHS	HP	6.0	Chappauli	60	Drinking& washing	No	Private	Y
280	55.700	RHS	HP	9.0	Chappauli	60	Drinking& washing	No	Private	Y
281	55.780	RHS	HP	6.0	Chappauli	120	Drinking& washing	Yes	Government	Y
282	55.800	RHS	HP	6.0	Chappauli	60	Drinking& washing	Yes	Private	Y
283	55.900	RHS	HP	7.0	Chappauli	120	Drinking& washing	Yes	Government	Y
284	56.100	LHS	HP	8.0	Chappauli	60	Drinking& washing	No	Private	Y
285	56.500	LHS	HP	9.0	Gahila Dudhila	120	Drinking& washing	Yes	Government	Y
286	56.600	LHS	HP	10.0	Gahila Dudhila	60	Drinking& washing	Yes	Private	Y
287	56.700	RHS	HP	10.0	Gahila Dudhila	120	Drinking& washing	Yes	Government	Y
288	56.900	LHS	HP	9.0	Gahila Dudhila	60	Drinking& washing	Yes	Private	Y
289	57.100	LHS	HP	9.0	Gahila Dudhila	60	Drinking& washing	Yes	Private	Y
290	57.500	LHS	HP	8.0	Rudrapur	60	Drinking& washing	Yes	Private	Y
291	57.600	LHS	HP	10.0	Rudrapur	60	Drinking& washing	Yes	Private	Y
292	57.900	RHS	HP	10.0	Rudrapur	60	Drinking& washing	Yes	Private	Y
293	58.100	RHS	HP	8	Rudrapur	60	Drinking& washing	Yes	Private	Y
294	58.300	RHS	HP	7	Rudrapur	120	Drinking& washing	Yes	Government	Y
295	58.550	RHS	HP	9	Rudrapur	60	Drinking& washing	Yes	Private	Y
296	58.590	RHS	HP	9	Rudrapur	120	Drinking& washing	Yes	Government	Y
297	58.800	LHS	HP	10	Rudrapur	60	Drinking& washing	Yes	Private	Y
298	59.800	RHS	HP	7	Rudrapur	60	Drinking& washing	No	Private	Y
299	59.900	RHS	HP	10	Rudrapur Bypass	60	Drinking& washing	Yes	Private	Y
300	59.910	RHS	HP	7	Rudrapur Bypass	60	Drinking& washing	Yes	Private	Y
301	60.170	LHS	HP	10	Rudrapur Bypass	120	Drinking& washing	Yes	Government	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Ownership Type	Impacted (Y/N)
302	60.200	RHS	HP	8	Rudrapur Bypass	120	Drinking& washing	Yes	Private	Y

Source: PPTA Consultant

Appendix 19: Ground Water Source along the Project-(Mohanlalganj-Maurawan-Unnao Marg)

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Distance from mettled road	Ownership Type	Impacted (Y/N)
1	0.200	LHS	HP	6.5	Mohanlalganj	60	Abondoned	Yes		Private	Y
2	0.280	RHS	HP	6.5	Mohanlalganj	180	Drinking& washing	Yes		Government	Y
3	0.400	LHS	HP	9.0	Mohanlalganj	60	Drinking& washing	Yes		Private	Y
4	0.420	LHS	HP	8.0	Mohanlalganj	50	Drinking& washing	Yes		Private	Y
5	0.800	RHS	HP	7.0	Mohanlalganj	60	Drinking& washing	Yes		Private	Y
6	1.450	RHS	HP	5.5	Mohanlalganj (Nawalkheda)	180	Drinking& washing	Yes		Government	Y
7	2.300	RHS	HP	6.5	Ranikheda	180	Drinking& washing	Yes		Government	Y
8	2.350	RHS	HP	5.5	Ranikheda	180	Drinking& washing	Yes		Government	Y
9	2.600	RHS	HP	6.5	Ranikheda	60	Drinking& washing	Yes		Government	Y
10	2.620	RHS	HP	5.5	Ranikheda	180	Drinking& washing	Yes		Private	Y
11	2.700	RHS	HP	5.5	Ranikheda	180	Drinking& washing	Yes		Government	Y
12	4.000	LHS	HP	9.0	Ranikheda	180	Drinking& washing	Yes		Government	Y
13	7.500	LHS	HP	8.0	Uttargaon	180	Drinking& washing	Yes		Government	Y
14	7.580	LHS	HP	6.0	Uttargaon	180	Drinking& washing	Yes		Government	Y
15	7.700	LHS	HP	6.5	Uttargaon	180	Drinking& washing	Yes		Government	Y
16	7.900	RHS	HP	5.5	Sesandi	180	Drinking& washing	Yes		Government	Y
17	8.020	RHS	HP	8.0	Sesandi	180	Drinking& washing	Yes		Government	Y
18	9.400	LHS	HP	7.5	Sesandi	180	Drinking& washing	Yes		Government	Y
19	9.440	LHS	HP	7.0	Sesandi	180	Drinking& washing	Yes		Government	Y
20	9.550	LHS	HP	8.5	Sesandi	180	Drinking& washing	Yes		Government	Y
21	10.200	LHS	Well	10.0	Sesandi	10	Drinking& washing	Yes		Government	Y
22	10.250	RHS	HP	8.5	Sesandi	180	Drinking& washing	Yes		Government	Y
23	10.300	RHS	HP	8.5	Sesandi	40	Drinking& washing	Yes		Private	Y
24	10.400	RHS	HP	6.5	Amiliya Kheda	130	Drinking& washing	Yes		Government	Y
25	10.600	RHS	HP	9.5	Amiliya Kheda	150	Drinking& washing	Yes		Government	Y
26	11.600	LHS	HP	7.5	Meenapur Chauraha	150	Drinking& washing	Yes		Government	Y
27	13.250	RHS	HP	8.5	Jabrella	150	Drinking	Yes		Private	Y
28	13.260	RHS	HP	7.5	Jabrella	50	Drinking	Yes		Government	Y
29	13.800	LHS	HP	8.5	Jabrella	50	Drinking& washing	Yes		Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Distance from mettled road	Ownership Type	Impacted (Y/N)
30	14.000	RHS	HP	9.5	Jabrella	120	Drinking& washing	Yes		Government	Y
31	14.200	RHS	HP	9.5	Jabrella	50	Drinking& washing	Yes		Private	Y
32	14.250	LHS	HP	7.5	Jabrella	120	Drinking& washing	Yes		Government	Y
33	14.280	RHS	HP	10.0	Jabrella	50	Drinking& washing	Yes		Private	Y
34	14.500	RHS	Well	8.0	Jabrella	15	Dry/Abondoned	Yes		Government	Y
35	16.400	LHS	HP	6.0	Sanrenda Chauraha	150	Drinking& washing	Yes		Government	Y
36	16.700	RHS	HP	9.5	Atarhiyan Khera	150	Drinking& washing	Yes		Government	Y
37	17.000	LHS	HP	9.0	Kalu Kheda	50	Drinking& washing	Yes		Private	Y
38	17.400	LHS	HP	6.5	Kalu Kheda	150	Drinking& washing	Yes		Government	Y
39	17.600	LHS	HP	5.5	Kalu Kheda	50	Drinking& washing	Yes		Private	Y
40	17.680	RHS	HP	7.0	Kalu Kheda	50	Drinking& washing	Yes		Private	Y
41	17.700	RHS	HP	5.5	Kalu Kheda	120	Drinking& washing	Yes		Government	Y
42	17.900	LHS	HP	9.5	Kalu Kheda	120	Drinking& washing	Yes		Government	Y
43	17.950	RHS	HP	7.5	Kanchanpur	120	Drinking& washing	Yes		Government	Y
44	18.000	LHS	HP	8.5	Kanchanpur	50	Drinking& washing	No		Private	Y
45	18.100	RHS	HP	8.5	Kanchanpur	50	Drinking& washing	No		Private	Y
46	18.650	RHS	HP	8.5	Kanchanpur	120	Drinking& washing	Yes		Government	Y
47	18.670	LHS	HP	8.5	Kanchanpur	120	Drinking& washing	Yes		Government	Y
48	18.800	LHS	HP	7.7	Kanchanpur	120	Drinking& washing	Yes		Government	Y
49	18.900	RHS	HP	7.0	Kanchanpur	120	Drinking& washing	Yes		Government	Y
50	19.000	LHS	HP	8.5	Kanchanpur	50	Drinking& washing	Yes		Private	Y
51	19.070	RHS	Well	9.0	Kanchanpur	Dumped	Abondoned	Yes		Private	Y
52	19.080	LHS	HP	7.5	Kanchanpur	120	Drinking& washing	Yes		Government	Y
53	19.100	LHS	HP	7.5	Kanchanpur	50	Abondoned	No		Private	Y
54	19.200	RHS	HP	5.0	Kanchanpur	120	Drinking& washing	Yes		Government	Y
55	19.400	LHS	HP	5.5	Kanchanpur	120	Drinking& washing	Yes		Government	Y
56	20.400	RHS	HP	7.5	Sandauli	120	Drinking& washing	Yes		Government	Y
57	20.600	RHS	HP	6.5	Sandauli	120	Drinking& washing	Yes		Government	Y
58	24.300	RHS	HP	8.5	Bhawanipur	120	Drinking& washing	Yes		Government	Y
59	24.400	LHS	HP	8.0	Bhawanipur	120	Drinking& washing	Yes		Government	Y
60	24.410	RHS	Well	3.5	Bhawanipur	Dumped	Abondoned	Yes		Private	Y
61	24.450	RHS	HP	6.5	Bhawanipur	120	Drinking& washing	Yes		Government	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Distance from mettled road	Ownership Type	Impacted (Y/N)
62	24.500	LHS	HP	6.0	Bhawanipur	120	Drinking& washing	Yes		Government	Y
63	24.800	LHS	HP	9.5	Bhawanipur	120	Drinking& washing	Yes		Government	Y
64	24.900	RHS	HP	9.0	Bhawanipur	120	Drinking& washing	Yes		Government	Y
65	24.950	LHS	HP	8.5	Bhawanipur	120	Drinking& washing	Yes		Government	Y
66	25.000	LHS	HP	9.5	Bhawanipur	120	Drinking& washing	Yes		Government	Y
67	25.200	LHS	HP	9.5	Bhawanipur	50	Drinking& washing	Yes		Private	Y
68	26.100	LHS	HP	7.5	Bhawanipur	120	Drinking& washing	Yes		Government	Y
69	28.200	LHS	HP	8.0	Sawalian Kheda	50	Drinking& washing	Yes		Private	Y
70	28.300	LHS	HP	6.5	Sawalian Kheda	50	Drinking	Yes		Private	Y
71	28.400	LHS	HP	9.5	Mohanlal Kheda	120	Drinking& washing	Yes		Government	Y
72	28.700	LHS	HP	8.5	Mohanlal Kheda	120	Drinking& washing	Yes		Government	Y
73	29.100	RHS	HP	7.5	Bachaura	120	Drinking& washing	Yes		Government	Y
74	30.400	LHS	HP	5.5	Rasulpur	50	Drinking& washing	Yes		Private	Y
75	30.900	RHS	HP	9.0	Rasulpur	120	Drinking& washing	Yes		Government	Y
76	31.400	LHS	HP	6.5	Maurawan	120	Drinking& washing	Yes		Government	Y
77	31.430	RHS	HP	6.0	Maurawan	120	Drinking& washing	Yes		Government	Y
78	31.470	RHS	HP	6.5	Maurawan	120	Drinking& washing	Yes		Government	Y
79	31.500	LHS	HP	5.5	Maurawan	120	Drinking& washing	Yes		Government	Y
80	31.600	RHS	HP	6.5	Maurawan	50	Drinking& washing	Yes		Private	Y
81	31.610	LHS	HP	9.0	Maurawan	120	Drinking& washing	Yes		Government	Y
82	31.615	RHS	HP	6.5	Maurawan	50	Drinking& washing	Yes		Private	Y
83	31.640	LHS	HP	5.5	Maurawan	50	Drinking& washing	Yes		Private	Y
84	31.700	RHS	HP	5.0	Maurawan	50	Drinking& washing	Yes		Private	Y
85	31.800	LHS	HP	5.5	Maurawan	50	Drinking& washing	No		Private	Y
86	31.800	RHS	HP	5.5	Maurawan	120	Abondoned	Yes		Government	Y
87	31.900	RHS	Well	11.5	Maurawan	15	Abondoned	Yes		Government	N
88	31.960	RHS	HP	6.5	Maurawan	120	Drinking& washing	Yes		Government	Y
89	32.000	LHS	HP	7.5	Maurawan	50	Drinking& washing	Yes		Private	Y
90	32.300	LHS	HP	8.5	Maurawan	120	Drinking& washing	Yes		Government	Y
91	33.800	RHS	HP	7.0	Basaha Tiraha	120	Drinking& washing	Yes		Private	Y
92	33.850	LHS	HP	5.5	Basaha Tiraha	120	Drinking& washing	Yes		Government	Y
93	33.900	RHS	HP	7.0	Basaha Tiraha	120	Drinking& washing	Yes		Government	Y
94	33.950	LHS	HP	7.5	Basaha Tiraha	50	Drinking& washing	Yes		Private	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Distance from mettled road	Ownership Type	Impacted (Y/N)
95	34.200	RHS	HP	9.5	Basaha Tiraha	120	Drinking& washing	Yes		Government	Y
96	34.210	RHS	HP	6.5	Basaha Tiraha	50	Drinking& washing	Yes		Private	Y
97	35.000	LHS	HP	8.5	Bhatta Tiraha	50	Drinking& washing	No		Private	Y
98	37.500	LHS	HP	7.5	Banigaon	50	Drinking& washing	No		Private	Y
99	38.400	LHS	HP	7.0	Jullamau Tiraha	120	Drinking& washing	Yes		Government	Y
100	40.700	LHS	HP	9.0	Belamore Basaha	50	Drinking& washing	Yes		Private	Y
101	41.800	RHS	HP	6.5	Purwa Raj	50	Drinking& washing	No		Private	Y
102	41.900	LHS	HP	9.0	Durgapur	50	Drinking& washing	Yes		Private	Y
103	42.300	LHS	HP	9.5	Purwa MirriKheda	50	Drinking& washing	Yes		Private	Y
104	42.400	LHS	HP	9.5	Purwa MirriKheda	50	Drinking& washing	Yes		Private	Y
105	42.480	LHS	HP	10.5	Purwa	50	Drinking& washing	Yes		Private	N
106	42.500	LHS	HP	9.5	Purwa	50	Drinking& washing	Yes		Private	Y
107	42.600	LHS	HP	9.5	Purwa	50	Drinking& washing	Yes		Private	Y
108	42.700	LHS	HP	8.0	Purwa	120	Drinking& washing	Yes		Government	Y
109	42.700	RHS	HP	9.0	Purwa	50	Drinking& washing	Yes		Private	Y
110	42.800	RHS	HP	6.5	Purwa	120	Drinking& washing	Yes		Government	Y
111	42.900	RHS	HP	6.5	Purwa	50	Drinking& washing	Yes		Private	Y
112	42.950	LHS	HP	5.5	Purwa	50	Drinking& washing	Yes		Private	Y
113	42.950	RHS	HP	9.0	Purwa	120	Drinking& washing	Yes		Government	Y
114	43.000	RHS	HP	8.5	Purwa	60	Drinking& washing	No		Private	Y
115	43.100	LHS	HP	8.5	Purwa	50	Drinking& washing	No		Private	Y
116	43.200	RHS	HP	9.5	Purwa	50	Drinking& washing	No		Private	Y
117	43.500	LHS	HP	7.0	Purwa	120	Drinking& washing	Yes		Government	Y
118	43.600	RHS	HP	7.5	Purwa	50	Drinking& washing	Yes		Private	Y
119	43.680	LHS	HP	5.0	Purwa	120	Abondoned	Yes		Government	Y
120	43.800	RHS	HP	6.0	Purwa	50	Drinking& washing	No		Private	Y
121	43.850	RHS	HP	7.5	Purwa	50	Drinking& washing	No		Private	Y
122	43.910	LHS	HP	5.0	Purwa	120	Drinking& washing	Yes		Government	Y
123	43.920	RHS	HP	10.0	Purwa	120	Drinking& washing	Yes		Government	Y
124	43.940	LHS	HP	7.5	Purwa	120	Drinking& washing	Yes		Government	Y

S. No.	Chainage (km)	Side	Type of Sources	Distance from CL (m)	Settlement	Depth (feet)	Uses (Drinking/ Washing)	Platform Type	Distance from mettled road	Ownership Type	Impacted (Y/N)
125	43.950	LHS	HP	7.0	Purwa	50	Drinking& washing	Yes		Private	Y
126	43.970	LHS	HP	8.5	Purwa	60	Drinking& washing	No		Private	Y
127	43.970	RHS	HP	8.5	Purwa	60	Drinking& washing	No		Private	Y
128	43.990	RHS	HP	10.0	Purwa	60	Drinking& washing	No		Private	Y
129	44.000	RHS	HP	9.0	Purwa	120	Drinking& washing	Yes		Government	Y
130	44.200	LHS	HP	6.5	Purwa	120	Drinking& washing	Yes		Government	Y
131	44.220	LHS	HP	7.5	Purwa	50	Drinking& washing	Yes		Private	Y
132	44.300	LHS	HP	8.0	Purwa	50	Drinking& washing	Yes		Private	Y
133	44.500	LHS	HP	9.0	Purwa	50	Drinking& washing	Yes		Private	Y
134	46.700	RHS	HP	6.5	Taran Kheda	50	Drinking& washing	No		Private	Y
135	46.800	LHS	Well	9.5	Taran Kheda	50	Abondoned	Yes		Private	Y
136	47.000	RHS	HP	6.5	Taran Kheda	120	Drinking& washing	Yes		Government	Y
137	48.900	LHS	HP	8.5	Unchagaon Killa	50	Drinking& washing	No		Private	Y
138	48.300	RHS	HP	6.0	Unchagaon Killa	120	Drinking& washing	Yes		Government	Y
139	48.350	LHS	HP	9.5	Unchagaon Killa	120	Drinking& washing	Yes		Government	Y
140	48.400	LHS	HP	9.5	Unchagaon Killa	50	Drinking& washing	Yes		Private	Y
141	48.700	LHS	HP	8.5	Unchagaon Killa	50	Abandoned	No		Private	Y
142	49.000	RHS	HP	8.5	Lungarpur	50	Drinking& washing	No		Private	Y
143	49.100	LHS	HP	7.5	Lungarpur	50	Drinking& washing	Yes		Private	Y
144	49.200	LHS	HP	6.5	Lungarpur	50	Drinking& washing	Yes		Private	Y
145	49.200	RHS	HP	7.0	Lungarpur	50	Drinking& washing	Yes		Private	Y
146	49.300	RHS	HP	7.5	Lungarpur	120	Drinking& washing	Yes		Government	Y
147	52.600	LHS	HP	8.5	Mangant Kheda	60	Drinking& washing	Yes		Private	Y
148	52.650	RHS	HP	8.5	Mangant Kheda	60	Drinking& washing	Yes		Private	Y
149	52.700	RHS	HP	6.5	Mangant Kheda	50	Drinking& washing	Yes		Private	Y
150	52.750	RHS	HP	6.5	Mangant Kheda	60	Drinking& washing	Yes		Private	Y
151	52.750	LHS	HP	6.5	Mangant Kheda	120	Drinking& washing	Yes		Government	Y
152	52.780	RHS	HP	7.5	Mangant Kheda	50	Drinking& washing	Yes		Private	Y
153	52.800	LHS	HP	8.5	Mangant Kheda	120	Drinking& washing	Yes		Government	Y

Source: PPTA Consultant

Appendix 20: Ground Water Sources along Aliganj-Soron Marg

S. No	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (in m)	Uses for Drinking/ washing/ Abanoned	Platform type	Impacted (Y/N)
1	26.750	Hand Pump	RHS	Patiyali	9	38	Drinking	Cemented	Y
2	27.350	Hand Pump	LHS	Patiyali	5	38	Drinking	Cemented	Y
3	27.400	Hand Pump	LHS	Patiyali	6	12	Drinking	Cemented	Y
4	27.550	Hand Pump	RHS	Patiyali	4.5	38	Drinking	Cemented	Y
5	27.650	Hand Pump	LHS	Patiyali	4	12	Drinking	Cemented	Y
6	27.700	Hand Pump	LHS	Patiyali	3.5	38	Drinking	Cemented	Y
7	27.750	Hand Pump	LHS	Patiyali	5.5	12	Drinking	Cemented	Y
8	27.900	Hand Pump	RHS	Patiyali	6	38	Drinking	Cemented	Y
9	27.910	Hand Pump	RHS	Patiyali	5	38	Abandoned	Cemented	Y
10	27.930	Hand Pump	RHS	Patiyali	5	12	Abandoned	Brick	Y
11	27.980	Hand Pump	RHS	Patiyali	10	38	Drinking	Cemented	Y
12	28.150	Hand Pump	LHS	Patiyali	10	38	Drinking	No Platform	Y
13	28.200	Hand Pump	RHS	Patiyali	8	12	Drinking	Cemented	Y
14	28.250	Hand Pump	RHS	Patiyali	5.5	12	Drinking	Cemented	Y
15	28.450	Hand Pump	RHS	Patiyali	7.5	12	Drinking	Cemented	Y
16	28.700	Hand Pump	LHS	Patiyali	7	38	Drinking	Cemented	Y
17	28.750	Hand Pump	RHS	Patiyali	5	12	Drinking	Cemented	Y
18	29.600	Hand Pump	RHS	Patiyali	9	12	Drinking	No Platform	Y
19	29.980	Hand Pump	LHS	Patiyali	6	12	Drinking	Cemented	Y
20	30.400	Hand Pump	LHS	Patiyali	4	12	Drinking	Cemented	Y
21	31.200	Hand Pump	LHS	Alipur Dadar	4.5	38	Drinking	Cemented	Y
22	31.210	Hand Pump	LHS	Alipur Dadar	8	12	Drinking	Cemented	Y
23	31.600	Hand Pump	RHS	Alipur Dadar	7	38	Drinking	Cemented	Y
24	31.850	Hand Pump	LHS	Alipur Dadar	5	12	Abandoned	Cemented	Y
25	32.300	Hand Pump	LHS	Alipur Dadar	8	38	Drinking	Cemented	Y
26	32.600	Hand Pump	LHS	Alipur Dadar	6	12	Abandoned	No Platform	Y
27	33.100	Hand Pump	RHS	Ganjdundwara	6	38	Drinking	Cemented	Y
28	33.200	Hand Pump	LHS	Ganjdundwara	7.5	12	Drinking	Cemented	Y
29	33.210	Hand Pump	LHS	Ganjdundwara	4	38	Drinking	Cemented	Y
30	33.280	Hand Pump	LHS	Ganjdundwara	7.5	12	Drinking	Cemented	Y
31	33.290	Hand Pump	RHS	Ganjdundwara	5	38	Drinking	Cemented	Y

S. No	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (in m)	Uses for Drinking/ washing/ Abanoned	Platform type	Impacted (Y/N)
32	33.310	Hand Pump	LHS	Ganjdundwara	6	38	Drinking	Cemented	Y
33	33.400	Hand Pump	LHS	Ganjdundwara	6	12	Drinking	Cemented	Y
34	33.420	Hand Pump	LHS	Ganjdundwara	4	38	Drinking	Cemented	Y
35	33.500	Hand Pump	LHS	Ganjdundwara	4	38	Drinking	Cemented	Y
36	33.800	Hand Pump	RHS	Ganjdundwara	3	12	Drinking	Brick	Y
37	33.800	Hand Pump	LHS	Ganjdundwara	6	12	Drinking	Cemented	Y
38	33.830	Hand Pump	LHS	Ganjdundwara	5	38	Drinking	Brick	Y
39	34.150	Hand Pump	LHS	Ganjdundwara	4	38	Drinking	Cemented	Y
40	34.200	Hand Pump	LHS	Ganjdundwara	5	12	Drinking	Cemented	Y
41	34.220	Hand Pump	RHS	Ganjdundwara	3.5	12	Drinking	Cemented	Y
42	34.650	Hand Pump	RHS	Ganjdundwara	7	38	Abandoned	Cemented	Y
43	34.800	Hand Pump	LHS	Ganjdundwara	6	38	Drinking	Cemented	Y
44	35.010	Hand Pump	LHS	Ganjdundwara	4.5	38	Drinking	No Platform	Y
45	35.100	Hand Pump	RHS	Ganjdundwara	5	12	Drinking	Cemented	Y
46	35.130	Hand Pump	LHS	Ganjdundwara	6	38	Drinking	Cemented	Y
47	35.200	Hand Pump	LHS	Ganjdundwara	5.5	38	Drinking	Cemented	Y
48	35.200	Hand Pump	RHS	Ganjdundwara	4	12	Drinking	No Platform	Y
49	35.300	Hand Pump	LHS	Ganjdundwara	3.5	12	Drinking	Cemented	Y
50	35.350	Hand Pump	LHS	Ganjdundwara	6	38	Drinking	Cemented	Y
51	35.400	Hand Pump	RHS	Ganjdundwara	4	38	Drinking	Cemented	Y
52	35.430	Hand Pump	RHS	Ganjdundwara	3	12	Drinking	Cemented	Y
53	35.600	Hand Pump	RHS	Ganjdundwara	4	12	Drinking	Cemented	Y
54	35.800	Hand Pump	LHS	Ganjdundwara	4.5	38	Drinking	Cemented	Y
55	35.850	Hand Pump	RHS	Ganjdundwara	6	12	Drinking	Cemented	Y
56	35.850	Hand Pump	LHS	Ganjdundwara	6	12	Drinking	Cemented	Y
57	36.000	Hand Pump	LHS	Ganjdundwara	6	12	Drinking	No Platform	Y
58	36.030	Hand Pump	RHS	Ganjdundwara	5	38	Abandoned	No Platform	Y
59	36.080	Hand Pump	LHS	Ganjdundwara	7.5	38	Drinking	Cemented	Y
60	36.500	Hand Pump	LHS	Ganjdundwara	8	38	Drinking	Cemented	Y
61	36.950	Hand Pump	LHS	Sujawalpur	7.5	12	Drinking	Cemented	Y
62	37.000	Hand Pump	LHS	Sujawalpur	7	38	Abandoned	Cemented	Y
63	37.200	Hand Pump	LHS	Sujawalpur	8	12	Drinking	Cemented	Y
64	37.800	Hand Pump	LHS	Sujawalpur	7	12	Drinking	Brick	Y

S. No	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (in m)	Uses for Drinking/ washing/ Abanoned	Platform type	Impacted (Y/N)
65	39.300	Hand Pump	LHS	Sujawalpur	7.5	12	Drinking	Cemented	Y
66	39.600	Hand Pump	LHS	Gadka	6.5	38	Drinking	Cemented	Y
67	40.100	Hand Pump	RHS	Gadka	6	12	Drinking	Cemented	Y
68	40.750	Hand Pump	LHS	Gadka	7.5	38	Drinking	Cemented	Y
69	41.050	Hand Pump	LHS	Gadka	6.5	12	Drinking	Cemented	Y
70	41.070	Hand Pump	LHS	Gadka	7.5	12	Drinking	Cemented	Y
71	41.100	Hand Pump	RHS	Gadka	7	12	Abandoned	Cemented	Y
72	41.110	Hand Pump	LHS	Gadka	6	38	Abandoned	Cemented	Y
73	41.180	Hand Pump	RHS	Gadka	5	38	Abandoned	Cemented	Y
74	41.210	Hand Pump	LHS	Gadka	5	38	Drinking	Cemented	Y
75	41.300	Hand Pump	LHS	Gadka	6	12	Drinking	Cemented	Y
76	41.450	Hand Pump	RHS	Gadka	6	38	Drinking	Cemented	Y
77	41.850	Hand Pump	LHS	Gadka	6	12	Drinking	Cemented	Y
78	41.900	Hand Pump	LHS	Gadka	6	12	Drinking	Cemented	Y
79	42.050	Hand Pump	RHS	Gadka	7.5	12	Drinking	Cemented	Y
80	42.100	Hand Pump	LHS	Gadka	6	38	Abandoned	Cemented	Y
81	42.900	Hand Pump	RHS	Gadka	6	12	Drinking	Brick	Y
82	43.300	Hand Pump	LHS	Gadka	7	12	Drinking	Cemented	Y
83	43.500	Hand Pump	RHS	Gadka	9.5	38	Drinking	Cemented	Y
84	43.900	Hand Pump	RHS	Saibalpur	6	12	Drinking	Cemented	Y
85	43.950	Hand Pump	RHS	Saibalpur	5.5	12	Drinking	Cemented	Y
86	44.800	Hand Pump	RHS	Saibalpur	7	38	Drinking	Cemented	Y
87	45.250	Hand Pump	RHS	Egma	8	12	Drinking	Cemented	Y
88	45.300	Hand Pump	LHS	Egma	7.5	12	Abandoned	Cemented	Y
89	47.500	Hand Pump	LHS	Sahavar	7	38	Drinking	No Platform	Y
90	47.650	Hand Pump	RHS	Sahavar	6	38	Drinking	No Platform	Y
91	47.700	Hand Pump	RHS	Sahavar	4.5	38	Drinking	Cemented	Y
92	47.800	Hand Pump	LHS	Sahavar	5.5	38	Drinking	Cemented	Y
93	47.800	Hand Pump	RHS	Sahavar	6.5	12	Drinking	Cemented	Y
94	48.000	Hand Pump	LHS	Sahavar	5	38	Drinking	Cemented	Y
95	48.020	Hand Pump	RHS	Sahavar	4	12	Drinking	Cemented	Y
96	48.030	Hand Pump	LHS	Sahavar	5.5	38	Drinking	Cemented	Y
97	48.100	Hand Pump	LHS	Sahavar	5.5	38	Drinking	Cemented	Y

S. No	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (in m)	Uses for Drinking/ washing/ Abanoned	Platform type	Impacted (Y/N)
98	48.200	Hand Pump	RHS	Sahavar	4	38	Abandoned	Cemented	Y
99	48.450	Hand Pump	LHS	Sahavar	3	38	Drinking	Cemented	Y
100	48.650	Hand Pump	RHS	Sahavar	4	12	Drinking	Cemented	Y
101	48.800	Hand Pump	RHS	Sahavar	5.5	38	Drinking	Cemented	Y
102	48.500	Hand Pump	RHS	Sahavar	4.5	38	Drinking	Cemented	Y
103	48.600	Hand Pump	LHS	Sahavar	7.5	38	Drinking	Cemented	Y
104	49.600	Hand Pump	LHS	Sahavar	9.5	38	Drinking	Cemented	Y
105	49.700	Hand Pump	RHS	Sahavar	8.5	38	Drinking	Cemented	Y
106	49.850	Hand Pump	LHS	Sahavar	10	38	Drinking	Cemented	Y
107	49.900	Hand Pump	RHS	Sahavar	9	38	Drinking	Cemented	Y
108	50.050	Hand Pump	LHS	Jamalpur	8	38	Drinking	Cemented	Y
109	50.440	Hand Pump	LHS	Bhiloli	8	38	Drinking	Cemented	Y
110	52.500	Hand Pump	LHS	Tali	6.5	12	Drinking	Brick	Y
111	52.500	Hand Pump	LHS	Tali	7.5	12	Drinking	Brick	Y
112	52.750	Hand Pump	RHS	Tali	6	38	Drinking	Cemented	Y
113	53.150	Hand Pump	RHS	Tali	11	12	Drinking	Cemented	N
114	53.400	Hand Pump	LHS	Tali	10.5	12	Drinking	Cemented	N
115	53.600	Hand Pump	RHS	Yakutganj	8	12	Drinking	Cemented	Y
116	53.750	Hand Pump	RHS	Yakutganj	6.5	38	Drinking	Cemented	Y
117	53.820	Hand Pump	RHS	Yakutganj	5.5	38	Drinking	Cemented	Y
118	53.850	Hand Pump	LHS	Yakutganj	5	38	Drinking	Cemented	Y
119	53.900	Hand Pump	LHS	Yakutganj	5	12	Drinking	No Platform	Y
120	54.000	Hand Pump	LHS	Yakutganj	6.5	38	Drinking	Cemented	Y
121	54.200	Hand Pump	RHS	Yakutganj	5	38	Drinking	Cemented	Y
122	56.690	Hand Pump	LHS	Naugva	8.5	38	Drinking	Cemented	Y
123	56.760	Hand Pump	RHS	Naugva	8	38	Drinking	Cemented	Y
124	56.810	Hand Pump	RHS	Radhe Nagla	6	12	Abandoned	No Platform	Y
125	57.000	Hand Pump	LHS	Radhe Nagla	6	12	Drinking	Cemented	Y
126	57.000	Hand Pump	RHS	Radhe Nagla	7	38	Abandoned	No Platform	Y
127	57.100	Hand Pump	LHS	Radhe Nagla	6	38	Drinking	Cemented	Y
128	57.650	Hand Pump	LHS	Radhe Nagla	4.5	38	Drinking	Cemented	Y
129	57.860	Hand Pump	LHS	Radhe Nagla	7	12	Drinking	Cemented	Y
130	58.350	Hand Pump	RHS	Timmarpur	5.5	38	Drinking	Cemented	Y

S. No	Chainage	Type of Sources	Side	Village\ Settelmet	Distance from Center line(m)	Depth (in m)	Uses for Drinking/ washing/ Abanoned	Platform type	Impacted (Y/N)
131	58.400	Hand Pump	RHS	Timmarpur	5	12	Abandoned	No Platform	Y
132	58.420	Hand Pump	RHS	Timmarpur	5.5	38	Drinking	Cemented	Y
133	58.450	Hand Pump	RHS	Timmarpur	5	12	Abandoned	No Platform	Y
134	58.800	Hand Pump	LHS	Timmarpur	3.5	38	Drinking	Cemented	Y
135	59.200	Hand Pump	LHS	Humaiyunagar	7.5	12	Drinking	Cemented	Y
136	59.900	Hand Pump	LHS	Humaiyunagar	5.5	38	Drinking	Cemented	Y
137	60.500	Hand Pump	LHS	Humaiyunagar	6	38	Abandoned	Cemented	Y
138	60.950	Hand Pump	RHS	Soron	6	38	Drinking	Cemented	Y
139	61.070	Hand Pump	RHS	Soron	6	12	Abandoned	No Platform	Y
140	61.200	Hand Pump	RHS	Soron	8	12	Drinking	No Platform	Y
141	61.400	Hand Pump	RHS	Soron	8.5	38	Drinking	Cemented	Y
142	61.510	Hand Pump	LHS	Soron	4	38	Drinking	Cemented	Y
143	61.610	Hand Pump	RHS	Soron	5	38	Drinking	Cemented	Y

Source: PPTA Consultant

Appendix 21: List of Polluting Sources along Muzaffarnagar-Baraut

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
1	3.250	LHS	Plastic Industry	30	
2	3.270	LHS	Industry	35	
3	9.300	LHS	Brick Kiln	40	
4	9.400	RHS	Brick Kiln	90	
5	11.030	LHS	Brick Kiln	90	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
6	11.050	RHS	Brick Kiln	100	
7	11.400	LHS	Brick Kiln	80	
8	12.200	RHS	Brick Kiln	90	
9	12.700	LHS	Brick Kiln	130	
10	12.750	RHS	Kolu(Gud Industry)	30	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
11	12.800	RHS	Kolu(Gud Industry)	30	
12	12.850	RHS	Kolu(Gud Industry)	30	
13	12.900	RHS	Kolu(Gud Industry)	30	
14	12.900	LHS	Kolu(Gud Industry)	40	
15	15.050	LHS	Brick Kiln	70	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
16	21.750	LHS	Brick Kiln	50	
17	21.900	RHS	Brick Kiln	100	
18	23.750	RHS	Brick Kiln	80	
19	23.750	RHS	Brick Kiln	60	
20	24.400	LHS	Brick Kiln	50	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
21	24.450	LHS	Brick Kiln	80	
22	26.700	RHS	Kolu(Gud Industry)	40	
23	33.600	RHS	Brick Kiln	80	
24	33.900	LHS	Brick Kiln	150	
25	40.700	RHS	Brick Kiln	90	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
26	40.850	LHS	Kolu(Gud Industry)	60	
27	41.750	RHS	Kolu(Gud Industry)	50	
28	43.800	LHS	Kolu(Gud Industry)	50	
29	44.900	RHS	Brick Kiln	120	
30	46.800	RHS	Brick Kiln		

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
30	48.300	LHS	Kolu(Gud Industry)	25	
31	48.350	LHS	Kolu(Gud Industry)	25	
32	50.000	RHS	Brick Kiln	180	
33	51.200	LHS	Kolu(Gud Industry)	25	
34	51.400	LHS	Kolu(Gud Industry)	30	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
35	52.600	RHS	Kolu(Gud Industry)	30	
36	52.650	LHS	Kolu(Gud Industry)	10	
37	53.600	LHS	Brick Kiln	100	
38	55.300	LHS	Brick Kiln	80	
39	57.900	RHS	Brick Kiln	60	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
40	58.300	RHS	Brick Kiln	90	
41	58.600	RHS	Brick Kiln	125	
42	60.000	RHS	Brick Kiln	80	
43	60.750	RHS	Brick Kiln	60	

Source: PPTA Consultant

Appendix 22: List of Polluting Sources along Aliganj-Soron Marg

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
1	29.900	LHS	Brick Kiln	35	
2	30.300	LHS	Brick Kiln	150	
3	30.350	RHS	Brick Kiln	100	
3	31.050	LHS	Brick Kiln	80	
4	31.100	RHS	Brick Kiln	100	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
5	31.150	RHS	Brick Kiln	80	
6	31.250	LHS	Brick Kiln	60	
7	36.550	LHS	Brick Kiln	60	
8	36.600	RHS	Brick Kiln	100	
9	36.700	LHS	Brick Kiln	200	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
10	36.750	RHS	Brick Kiln	200	
11	40.080	RHS	Brick Kiln	100	
12	41.850	LHS	Brick Kiln	80	
13	42.800	RHS	Brick Kiln	150	
14	45.200	RHS	Brick Kiln	100	

S. No.	Chainage	Side	Type	Approximate Distance from Center Line	Photo
15	45.250	LHS	Brick Kiln	100	
16	50.600	LHS	Brick Kiln	100	

Source: PPTA Consultant

Appendix-23: PF Notification - Nanau-Dadon

VAN VIBHAG
MISCELLANIOUS
February 10, 1960.

(22)

No. 115/XIV-331-50- Whereas the Governor, Uttar Pradesh is of the opinion that the making of enquiry and record contemplated a under sub-section (3) of section 29 of the Indian Forest Act, 1927(Act No. XVI of 1927), will occupy such length of time as in the menatime toendager the rights of the State Government. Now, therefore, in exercise of the powersconfierred by the provise to the aforesaid sub-section and by the sub-section(1) of the said section, read with section 80-A of the aforesaid Act, the Governor of Uttar Pradesh is pleased to declare that pending such enquiry and record the provisions of Chapter IV of the siad Act, to be applicable to the landspecified in the schedule hereto :

SCHEDULE

District	Sl. No.	Name of road	Milage to be declared as Reserved or protected Forest M.	Fg.	Ft.	M.	Fg.	Ft.	Description of boundary
1	2	3	4			5			6
Meerut	1.	Meerut-Baghpat road	3	0	0	31	2	0	The
	2.	Bahgpat-Shahranpur	1	0	0	24	2	0	boundary
	3.	Baraut-Chapruali	1	0	0	9	0	0	of the
	4.	Baghpat Loni Shardra	0	0	0	17	2	250	land has
	5.	Meerut-Mawana	2	0	0	17	0	0	been
	6.	Meerut-Bulandshahr	2	0	0	29	0	0	demarcat-
	7.	D.R.M.raod	41	0	0	85	0	0	ed on
	8.	G.T.Road	870	0	0	873	0	0	the
	9.	Begamabad-Bastikri	1	0	0	6	0	0	grond
	10.	Moradnagar Railway	0	0	0	0	2	106	by stone
	11.	Feeder Modinagar Railway feeder	0	0	0	0	0	640	pillars. -do-
	12.	Modiddenput Railway feeder	0	0	0	0	4	10	-do-
	13.	Meerut-Sardhana Road	2	0	426	12	3	320	-do-
	14.	Dadurala-Saradhana	0	0	0	6	4	260	-do-
	15.	Bulandshahr-Siana Garh Road	24	0	0	31 and 32 fg.1 to3 + 200	mile		-do-
	16.	Meerut-Bareilly	23	9	0	31	3	200	-do-
	17.	National High way Rt.No.24	28	6	0	28	8	0	-do-
	18.	G.T.Road(Ghaziabd to Uttar Pradesh Border)	874	0	548	879 +6	2	70	
	19.	Ghaziabad Hapur Road	1	0	0	21	1	251	-do-
	20.	Hapur Garh Road				21	6	249 338	-do-
Muzaff- ar Nagar	1.	D.R.M. Road	1	0	484	19	4	70	-do-
	2.	Khatauli-Jansath-Miranpur-Bijnore	56	0	0	91	0	0	-do-
	3.	Muzaffarnagar	From Khatauli to mile 24	6	0	2	0	31	-do-
	4.	Shamli-Kairna	2	0	0	31	0	0	-do-
	4.	Muzaffarnagar Shahranpur	M.77 of D.R.M. road to M.10 of Muzaffarnagar Shahranpur Road						-do-
	5.	Muzaffarnagar Bijnore	Mile 73 D.R.M.road mile 21 of Bijnore road						The boundary of the land has
	6.	Morna Sukartal	0	0	0	3	0	0	been demarcated on the ground by stones
	7.	Muzaffarnagar Buchana	From village Taoli to Mile stone7 to Budhana						
	8.	Muzaffarnagar Bagh/at-Sharanpur road.	24	0	0&253	6	0		

Appendix 23: PF Notification – Nanau-Dadon

aran-1.	Saharanpur-Baghapt-Delhi	1	0	240	23	7	0	-do-
	2. Saharanpur-Chakrata road	0	1	460	28	0	0	-do-
	3. Delhi Rajpur-Mussoorie Road	19	0	0	128	0	0	-do-
	4. Saharanpur-Dehra Dun road	0	0	0	14	0	166	-do-
	5. Sharanpur-Nakur-Gangoh Road	1	4	330	27	5	230	-do-
	6. Gangoh-Titern Road	2	3	0	9	7	370	-do-
	7. Rookee Goods Shed Road	0	0	0	0	4	14	-do-
	8. Roorkee-Railway feeder	0	0	0	0	4	644	-do-
	9. Roorkee By pass Road	0	0	0	2	0	137	-do-
	10. Manglaru-Landhaura	0	0	0	4	5	0	-do-
	11. Roorkee-Landhaura	0	0	0	0	7	140	-do-
	12. Nawabganj Road	0	0	0	0	7	140	-do-
	13. Railway Station at Sahranpur	0	0	0	0	2	320	-do-
	14. Roorkee-Hardwar Road	6	0	0	9	0	0	-do-
		11	03	0	13	0	0	-do-
	15. overhead Bridge	14	0	0	19	0	0	-do-
	~~16.~~ By-pass Road	0	0	0	0	5	355	-do-
	16. N.H.Road							
	17. Saharanpur Ambala Road	0	0	0	3	0	0	3Milee
		0	0	0	14	5	313	-do-
	18. Muzaffarnagar				14	mile 5gf.313ft.		
4.	~~19.~~	10	0	0	31	1	398	-do-
5.								
6.Etah	1. Grand Trunk Road	742	0	0	2769	0	0	-do-
	2. Etah-Kasaganj Road	0	4	0	15	4	0	-do-
	3. Bareilly-Mathura Road	48	0	0	75	0	0	-do-
	4. Tundla- Raod	10	3	155		-	-	-do-
	5. Etah-Jalesar Road	0	1	623	33	0	0	-do-
	6. Etah-Aliganj Road	0	6	124	32	0	0	-do-
	7. Etah-Shikohabad	0	3	360	120	0	0	-do-
	8.							
7. Aligarh	1. Aligarh-Atrauli Raod	3	0	0	17	0	0	-do-
	2. Atrauli-Ramgaht	18	0	0	243	1/8	0	-do-
	3. Aligarh-Kashimpur	1	0	0	9	4	0	-do-
	4. Aligarh-Anupshahr	6	0	0	13	0	0	-do-
	5. Aligarh-Tapal Road	1	0	0	33	0	0	-do-
	6. G.T.Road	770	0	0	818	0	0	-do-
	7. Agra Aligarh	24	0	0	52	0	0	-do-
	8. Gomat-Bajan Road	1	0	0	5	0	0	-do-
	9. Aligarh-Shahdow actory	0	0	0	1	0	0	-do-
	~~10.~~ Summa Railway	0	0	0	0	2	362	-do-
	~~11x~~ Feeder Road							
	~~11.~~ Nanu-Dadon Road	1	0	0	10	0	0	-do-
	12. Bareilly-Mathura Road	76	0	0	113	0	0	-do-
	13. Sikandra Rao Railway Feeder Road	0	0	0	0	3	420	-do-
	~~14.~~ Hathras-Igalas Road	1	0	0	10	0	0	-do-
	~~15.~~ Aligarh-Raya Raod	2	0	0	20	0	0	-do-
	16. Hathras Junction	0	0	0	0	1	510	-do-

.....3.

Appendix 24 - PF Notification - Hussainganj

निदेशक/संयुक्त निदेशक, राजकीय मुद्रण एवं लेखन सामग्री, उत्तर प्रदेश इलाहाबाद/रेवेन्यू अलाहाबाद।

कृपया संलग्न अधिसूचना को अपने अंग्रेजी/हिन्दी संस्करण की अंग्रेजी/साधारण संस्करण के विशेषांक परिशिष्ट खण्ड (ख) भाग-4 में दिनांक ..... पृष्ठ संख्या में अत्यन्त प्रकाशित कराना सुनिश्चित करें तथा उसकी पच्चीस प्रतियां अपेक्षित संख्या की भेजें।

संलग्नक : यथोक्त

आज्ञा से,

विशेष सचिव।

पत्रांक 7228 (1)/14-2-43/86 दिनांकित

प्रतिलिपि निम्न को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित:—

1—मुख्य अर संरक्षक (निर्माणांग) उत्तर प्रदेश, लखनऊ।

2—अ०-संरक्षक/क्षेत्रीय निदेशक—

3—प्रभागीय अधिकारी/प्रभागीय निदेशक—

4—अन्य अभीक्षण अधिकारी—

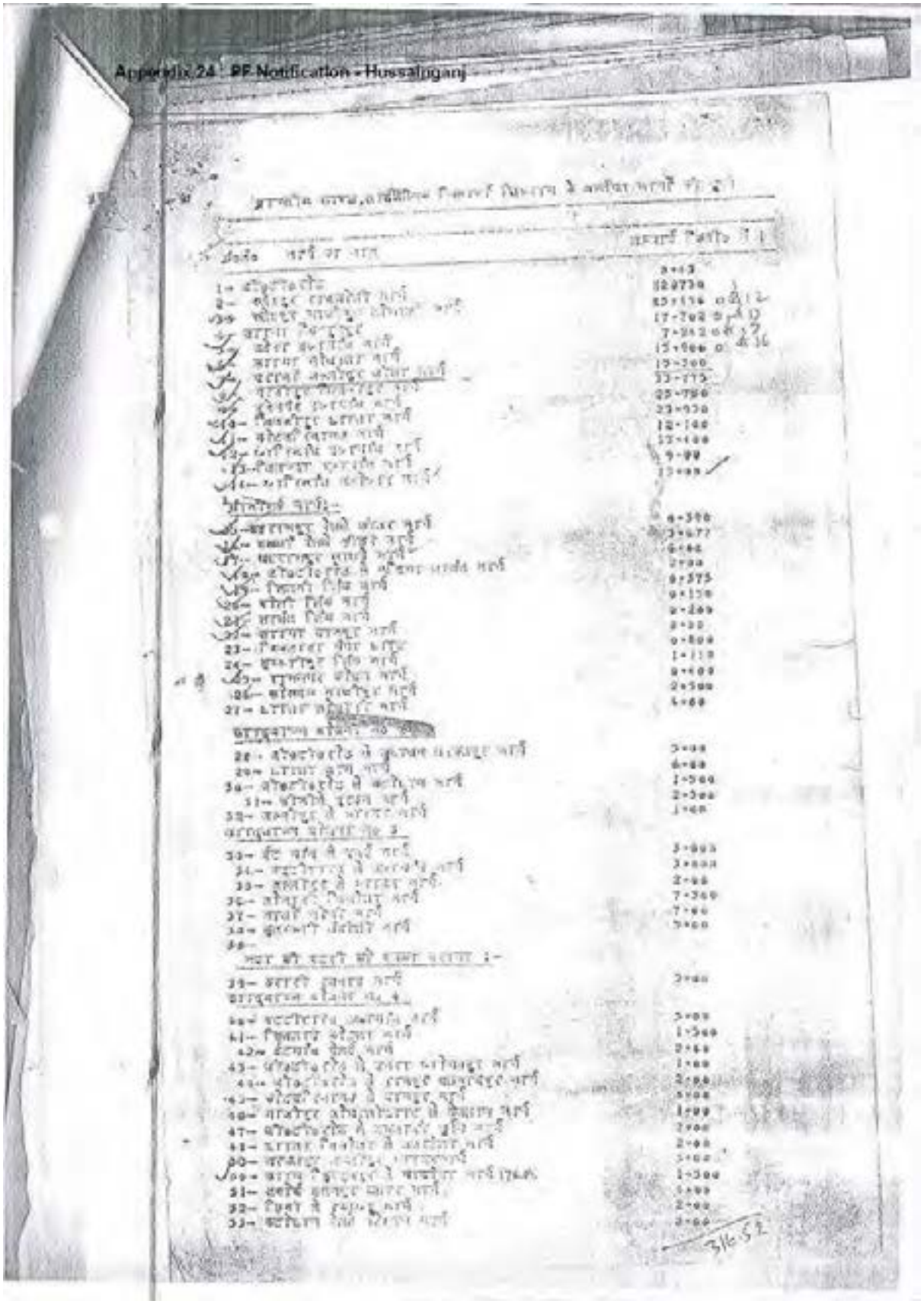
आज्ञा से,

विशेष सचिव।

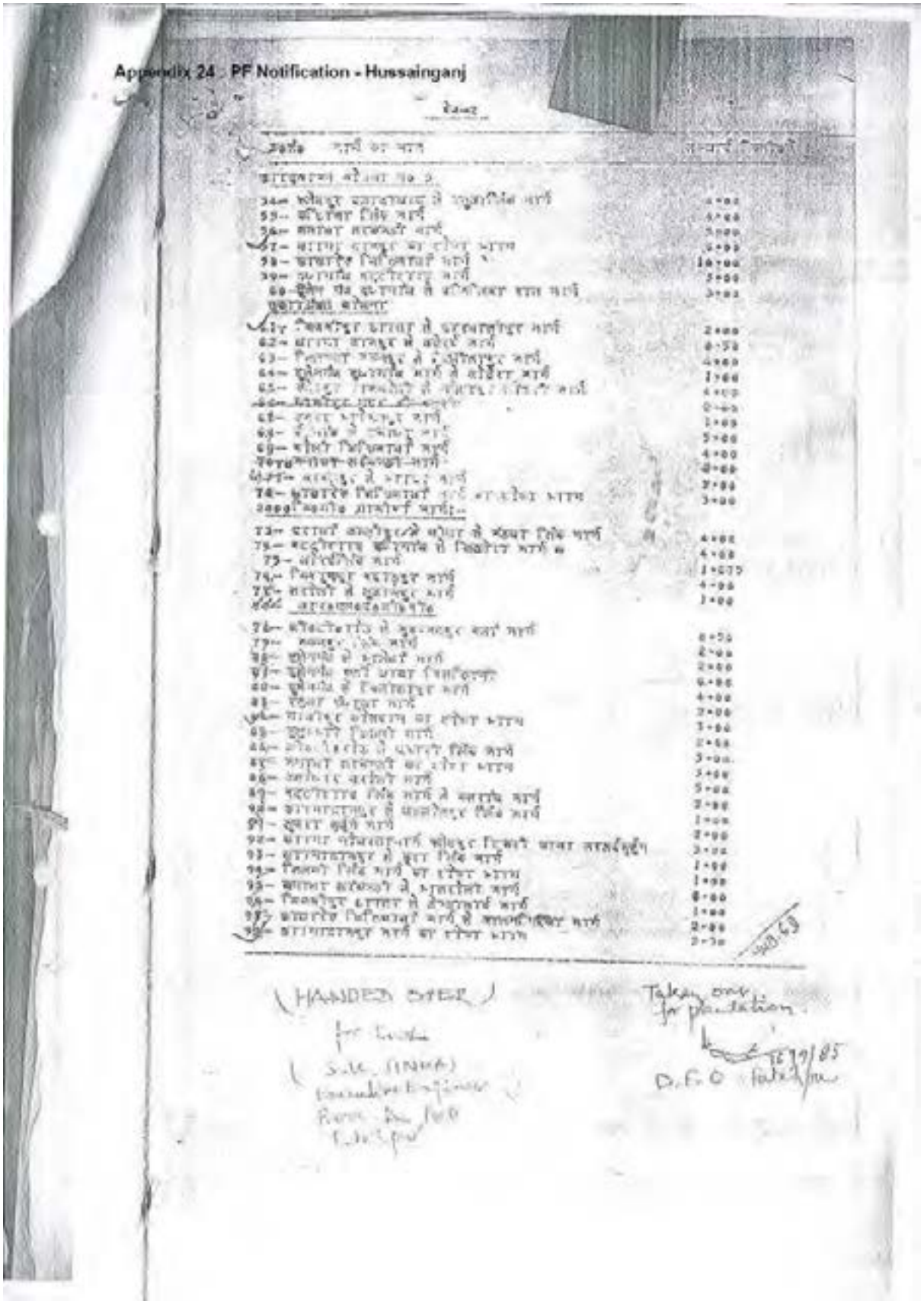
6/8

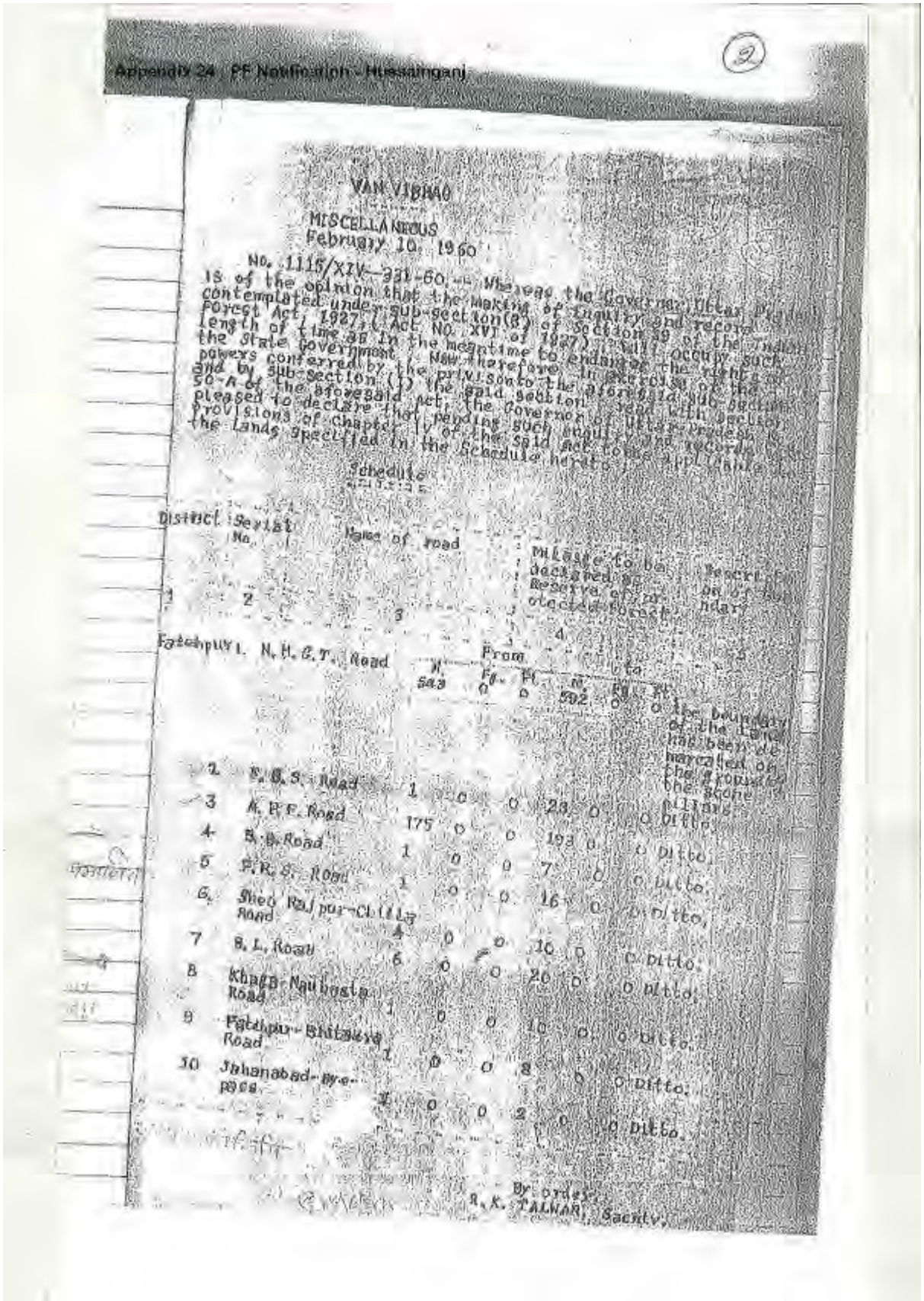
PSUP—A. P. I. Secretariat—8-5-86—(307)—1986—5,000 (E.)

Appendix 24 : PF Notification - Hussainganj



Appendix 24 - PF Notification - Hussainganj





Appendix 24 PF Notification - Hussainganj

(2)

VAN VIBHAG

MISCELLANEOUS
February 10, 1960

No. 1115/XIV-931-60.— Whereas the Governor of Uttar Pradesh is of the opinion that the making of inquiry and record contemplated under sub-section(2) of Section 29 of the Indian Forest Act, 1927, (Act NO. XVI of 1927) will occupy such length of time as in the meantime to endanger the rights of the State Government. Now therefore in exercise of the powers conferred by the provisions of the aforesaid sub-section and by sub-section (1) the said section 50-A of the aforesaid act, the Governor of Uttar Pradesh is pleased to declare that pending such inquiry and record to the provisions of chapter IV of the said Act to the lands specified in the Schedule hereto.

Schedule

District	Serial No.	Name of road	Mileage to be declared as Reserve or Protected forest	From			To			Remarks
1	2	3	4							
Fatehpur	1.	N. H. G. T. Road	M. 343	Fl. 0	Ft. 0		M. 502	Fl. 0	Ft. 0	The boundary of the land has been demarcated on the ground by the Range Officer
	2	E. B. S. Road	1	0	0		29	0	0	Ditto
	3	K. P. E. Road	175	0	0		193	0	0	Ditto
	4	B. B. Road	1	0	0		7	0	0	Ditto
	5	F. R. S. Road	1	0	0		16	0	0	Ditto
	6	Sheo Rajpur-Chilla Road	4	0	0		10	0	0	Ditto
	7	B. L. Road	6	0	0		20	0	0	Ditto
	8	Khaga-Naubasta Road	1	0	0		10	0	0	Ditto
	9	Fatehpur-Bhitaura Road	1	0	0		8	0	0	Ditto
	10	Jahanabad-Nyapura	1	0	0		2	0	0	Ditto

By order,
R. K. TALWAR, Secty.

Appendix 24 RF Notification - Hussaingani

(2)

VAN VIBHAG

MISCELLANEOUS

February 10, 1960

No. 1115/XIV-331-60.— Whereas the Governor, Uttar Pradesh is of the opinion that the making of inquiry and record contemplated under sub-section(3) of Section 29 of the Indian Forest Act, 1927 (Act No. XVI of 1927) will occupy such length of time as in the meantime to endanger the rights of the State Government. Now therefore in exercise of the powers conferred by the provisions of the aforesaid sub-section and by sub-section (1) the said section read with section 50-A of the aforesaid Act, the Governor of Uttar Pradesh is pleased to declare that pending such enquiry and record being the provisions of Chapter IV of the said Act to the applicable to the lands specified in the Schedule hereto.

Schedule

District	Serial No.	Name of road	Mileage to be declared as Reserve or protected forest			Particulars on ot[illegible] hgary		
1	2	3	4			5		
Fatehpur	1.	N. H. G. T. Road	From Fl. 543	Fg. 0	Pl. 0	to M. 592	Fg. 0	Pl. 0	The boundary of the land had been demarcated by the Forest Department by the stone pillars.
	2	P. W. D. Road	1	0	0	23	0	0	Ditto.
	3	A. P. F. Road	175	0	0	193	0	0	Ditto.
	4	B. D. Road	1	0	0	7	0	0	Ditto.
	5	P. R. D. Road	1	0	0	16	0	0	Ditto.
	6.	Shed Rajpur-Chilla Road	4	0	0	10	0	0	Ditto.
	7	B. L. Road	6	0	0	20	0	0	Ditto.
	8	Khaga-Naubasta Road	1	0	0	10	0	0	Ditto.
	9	Fatehpur-Bhitaura Road	1	0	0	8	0	0	Ditto.
	10	Jahanabad-Bya-pasa	1	0	0	2	0	0	Ditto.

By order,
R. K. TALWAR, Secy.

Appendix 25: List of Orchards
Muzaffarnagar-Baraut Road

S.No	Approximate Chainage		Side	Type	Settelment/Village	Approximate Distance from Center Line
	From	to				
1	3.100	3.150	RHS	Mango	Budhana More	10
2	6.950	7.000	RHS	Mango	Kironi Village	12
3	8.850	9.000	RHS	Mango	Tawli	15
4	11.100	11.130	RHS	Mango	Tawli	10
5	17.100	17.150	RHS	Mango	Kakda	20
6	17.300	17.320	LHS	Mango	Kakda	20
7	19.050	19.150	LHS	Mango	Sahpur	20
8	25.000	25.050	RHS	Mango	Madin Pur	10
9	27.500	27.550	RHS	Mango	Bhasana	10

Source: PPTA Consultant

List of Orchards along Haliyapur-Kurebhar-Bilwai Road

S.No	Approximate Chainage		Side	Type	Settlement/ Village	Approximate Distance from Center Line(m)
	From	To				
1	2.550	2.650	RHS	Mango	Dobhariya	15-20
2	4.000	4.050	RHS	Mango	Mukundpur	25-30
3	4.030	4.060	LHS	Mahua	Mukundpur	25-30
3	4.200		Both Side	Mango	Mukundpur	15-20
4	15.150	15.200	RHS	Poplar	Delhi Bazaar	15-20
5	17.500	17.510	RHS	Poplar	Delhi Bazaar	25-30
6	18.500		LHS	Mango	Pirusarayya	
7	19.200	19.350	Both Side	Mango	Pirusarayya	Road Side Plantation
8	20.800		RHS	Poplar	Radhe Pandit Purwa	15-20
9	20.900	20.935	LHS	Poplar	Radhe Pandit Purwa	15-20
10	27.000	29.500	Both Side	Mango	Dhanpatganj	Road Side Plantation
11	30.400	30.500	RHS	Chule	Sanjaynagar	15-20
12	30.900	31.700	Both Side	Mango	Ainpur	Road Side Plantation
13	32.100	33.550	Both Side	Mango	Dhaurhara	Road Side Plantation
14	37.100	37.130	LHS	Eucalyptus	Erul	15-20
15	38.100	38.200	RHS	Mango	Raghavpur	Road Side Plantation
16	38.250	38.280	RHS	Eucalyptus	Salimpur	Plantation
17	38.350	38.400	RHS	Mango	Salimpur	Road Side Plantation
18	41.700	42.100	RHS	Mango	Baraula	Road Side Plantation
19	42.300	42.800	RHS	Mango	Phulauna	Road Side Plantation
20	43.600	43.650	LHS	Mango	Phulauna	20-25
21	43.600	43.800	RHS	Mango	Phulauna	Road Side Plantation
22	45.000	45.050	RHS	Mango	Akhori	8-10
23	46.100	46.120	RHS	Eucalyptus	Dhudhu	15-20
24	47.800	47.880	Both Side	Mango	Bajhna	Road Side Plantation
25	56.000		Both Side	Eucalyptus	Samari Bazar	Plantation
26	56.300		RHS	Eucalyptus	Samari Bazar	Plantation
27	56.900		LHS	Eucalyptus	Samari Bazar	10
28	58.900	58.950	RHS	Eucalyptus	Chaurma	15-20
29	62.400		RHS	Eucalyptus	Birsinghpur	Plantation
30	63.100		RHS	Eucalyptus	Choure	50
31	65.700		RHS	Eucalyptus	Dharampur	20

S.No	Approximate Chainage		Side	Type	Settlement/ Village	Approximate Distance from Center Line(m)
	From	To				
32	69.500	69.550	RHS	Mango	Tadipur	15
33	73.100		RHS	Eucalyptus	Babhan Ganwan	Plantation
34	74.150	74.200	LHS	Eucalyptus	Khalispur Dingur	15-20
35	75.450		RHS	Mango	Dostpur	Road Side Plantation
36	78.000	78.050	LHS	Eucalyptus	Dostpur	10-15
37	80.750	80.780	RHS	Mango	Badhauli	30-35
38	81.200		RHS	Mango	Kaithi Jalapur	10-15
39	81.800	81.900	RHS	Eucalyptus	Kaithi Jalapur	8-10
40	99.000	99.700	Both Side	Mango	Pratapur	Road Side Plantation
41	100.300		RHS	Mango	Pratapur	10-15

Source: PPTA Consultant

List of Orchards along the Kaptanganj-Rudrapur

Sl. No.	Chainage	Side	Type of Orchard	Place	size
1	3.900	LHS	Mango	Semara	50X50
2	9.000	LHS	Mango	Mathauli	40X50
3	10.460	LHS	Mango	Mathauli	120X35
4	11.800	LHS	Mango	Ghewai	50X80
5	12.400	RHS	Mango	Ghewai	20X40
6	24.400	RHS	Mango	Hata	50X50
7	37.250	RHS	Mango	Kakwal	50X50
8	37.400	RHS	Mango	Kakwal	50X50
9	45.400	LHS	Mango	Indupur	50X30
10	46.600		Mango	Indupur	40X30
11	58.200	LHS	Mango	Rudrapur	100X60
12	59.950	LHS	Mango	Rudrapur	20X50

Source: PPTA Consultant

List of Orchards along Mohanlalganj-Maurawan-Unnao

Sl. No	Chainage	Side	Type of Orchad	Owned By	Place	size
1	4.000	LHS	Mango	Private	Dhanwara	100X100
2	7.000	LHS	Mango	Private	Uttargaon	50X50
3	8.300	LHS	Mango	Private	Sesandi	30X50
4	11.000	LHS	Mango	Private	Amiliya Kheda	50X100
5	14.800	RHS	Guawa	Private	Peetna Kheda	40X50
6	32.600	LHS	Mango & Jackfruit	Government	Maurawan	150X200
7	32.900	LHS	Mango	Government	Maurawan	300X200

Source: PPTA Consultant

List of Orchards (Aliganj-Soron)

S. No.	Approximate Chainage		Side	Type	Approximate Distance from Center Line	Settlement/ Village
	From	To				
1		30.950	LHS	Mango	10	Alipur Dadar
2	32.000	32.350	Both side	Mango	-	Alipur Dadar
3	32.600	32.800	Both side	Mango	-	Alipur Dadar
3	33.000	33.100	LHS	Mango	-	Ganjdundwara
4	33.150	33.200	RHS	Mango	-	Ganjdundwara
5	39.550	39.650	RHS	Mango	10	Gadka

S. No.	Approximate Chainage		Side	Type	Approximate Distance from Center Line	Settlement/ Village
	From	To				
6	43.100	43.200	RHS	Mango	-	Gadka
7	43.350	43.400	LHS	Mango	-	Gadka
8	43.500	43.600	RHS	Mango	-	Gadka
9	46.000	46.100	LHS	Mango	-	Egma
10	46.000	46.200	RHS	Guava	-	Egma
11	46.750		RHS	Mango	-	Sahavar
12	47.000		LHS	Mango	15	Sahavar
13	49.050	49.200	LHS	Mango	-	Sahavar
14	49.050	49.200	RHS	Mango	-	Sahavar
15	50.900	51.100	Both side	Mango	-	Jamalpur

Source: PPTA Consultant

APPENDIX 26: LIST OF SENSITIVE RECEPTORS-UPMDR

List of Education Facilities along Nanau-Dadon Road

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	0.110	School	Nanau	RHS	10
2	0.710	School	Nanau	LHS	8
3	6.500	School	Sinandarpur	LHS	7
4	9.100	College	Sinandarpur	LHS	7
5	9.630	School	Paharipur	LHS	7
6	11.780	College	Datawali	LHS	9
7	14.600	School	Tikta	RHS	9
8	14.780	School	Tikta	LHS	7
9	14.780	School	Tikta	LHS	30
10	16.650	School	Sihawali	LHS	12
11	18.400	School	Sihawali	RHS	12
12	19.650	School	Chharra	LHS	12
13	19.750	School	Chharra	LHS	7
14	22.000	School	Barauli	RHS	9
15	23.180	School	Bhamani	RHS	9
16	23.610	School	Bhamani	LHS	10
17	26.220	School	Atta	LHS	10
18	27.520	College	Dadau	RHS	13
19	28.900	College	Dadau	LHS	12
20	29.400	College	Nagla Bhore	LHS	8
21	29.970	School	Nagla Bhore	RHS	9

Source: DPR Consultant

List of Religious Facilitiesalong Nanau-Dadon Road

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
1	4.170	Mosque	Pilkhana	RHS	12
2	4.350	Majar	Pilkhana	LHS	5
3	5.080	Mosque	Pilkhana	RHS	15
4	5.710	Temple	Pilkhana	RHS	5
5	6.250	Temple	Sikandarpur	RHS	7
6	6.310	Temple	Sikandarpur	LHS	7
7	7.540	Temple	Sikandarpur	RHS	8
8	9.130	Temple	Paharipur	RHS	15
9	11.780	Temple	Barla	LHS	7
10	11.780	Majar	Barla	LHS	10
11	12.840	Temple	Tikta	LHS	6
12	14.780	Mosque	Tikta	RHS	6
13	17.050	Temple	Sihawali	RHS	11
14	20.020	Temple	Chharra	LHS	8
15	20.120	Temple	Chharra	RHS	4
16	20.500	Mosque	Chharra	RHS	6
17	22.570	Mosque	Barauli	RHS	8
18	29.200	Small Temple	Nagla Bhore	RHS	6
19	29.900	Temple	Nagla Bhore	RHS	3

Source: DPR Consultant

List of Medical Facilitiesalong Nanau-Dadon Road

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	19.500	Community Health Centre	Sihawali	LHS	12
2	20.380	Private Clinic	Chharra	LHS	6
3	28.910	Primary Health Centre	Dadau	RHS	8

Source: DPR Consultant

List of Education Facilities along Bulandshahar-Anoopshahar Road

S. No.	Existing Chainage (Km)	Type of Structure	Village/Settlement	Side	Distance from Centre Line (m)
1	20.400	School	Jatwai	LHS	19
2	24.750	School	Gehna Goverdhanpur	LHS	18
3	24.900	School	Bhipur	RHS	18
4	25.000	College	Bhipur	RHS	17
5	25.300	College	Bhipur	RHS	19
6	26.000	College	Bhipur	RHS	18
7	31.900	School	Birauli	RHS	15
8	32.240	College	Birauli	LHS	16
9	32.900	College	Hisawati	RHS	16
10	35.050	School	Aniwasai	LHS	20
11	38.750	College	Karanpur	LHS	19
12	43.200	School	Anupshahar	LHS	18
13	43.650	School	Achalpur	RHS	19
14	47.000	School	Rajaur	RHS	62
15	48.400	School	Jalalpur	LHS	16
16	50.960	School	Jirauli	LHS	19
17	51.350	College	Jirauli	LHS	43
18	52.910	School	Amarpur	RHS	11
19	54.750	School	Devi ka Nagla	RHS	18
20	55.320	College	Kheriya Baksh	LHS	64
21	56.500	School	Naya Baas (Qutubpur)	LHS	16
22 & 23	56.600	College & School	Bheempur Chowk	RHS	17

Source: DPR Consultant

List of Religious Facilities along Bulandshahar-Anoopshahar Road

S. No.	Existing Chainage (Km)	Type of Structure	Village/Settlement	Side	Distance from Centre Line (m)
1	20.710	Temple	Jatwai	LHS	14
2	21.550	Samadhi	Jatwai	RHS	20
3	22.930	Temple	Chanak Chauraha	LHS	6
4	23.400	Temple	Chanak Chauraha	LHS	12
5	24.250	Temple	Gehna Goverdhanpur	RHS	11
6	24.750	Temple	Gehna Goverdhanpur	RHS	9
7	24.800	Temple	Gehna Goverdhanpur	RHS	16
8	25.450	Temple	Bhipur	RHS	10
9	26.250	Temple	Bhipur	LHS	16
10	27.600	Temple	Salagwan	LHS	6
11	28.000	Temple	Salagwan	RHS	14
12	28.600	Temple	Salagwan	LHS	15
13	30.080	Temple	Tawli	LHS	18
14	31.500	Temple	Birauli	RHS	34
15	31.680	Temple	Birauli	LHS	11

S. No.	Existing Chainage (Km)	Type of Structure	Village/Settlement	Side	Distance from Centre Line (m)
16	31.900	Temple	Birauli	LHS	15
17	31.900	Temple	Birauli	RHS	8
18	32.250	Temple	Birauli	LHS	9
19	34.700	Temple	Aniwasai	LHS	42
20	34.970	Temple	Aniwasai	RHS	8
21	35.600	Temple	Aniwasai	RHS	7
22	35.850	Temple	Aniwasai	LHS	6
23	36.450	Temple	Dugrao	LHS	15
24	37.650	Temple	Dugrao	LHS	18
25	38.050	Temple	Karanpur	LHS	17
26	38.060	Temple	Karanpur	RHS	6
27	38.900	Temple	Karanpur	RHS	37
28	39.700	Temple	Anupshahar	RHS	18
29	40.120	Small Temple	Anupshahar	RHS	9
30	40.650	Temple	Anupshahar	RHS	17
31	43.650	Temple	Achalpur	LHS	21
32	44.300	Temple	Achalpur	LHS	8
33	46.050	Temple	Telia Nagla	LHS	21
34	47.000	Temple	Rajaur	RHS	27
35	47.800	Temple	Rajaur	LHS	17
36	47.830	Temple	Rajaur	LHS	26
37	47.890	Temple	Rajaur	RHS	8
38	48.320	Mazar	Jalalpur	RHS	9
39	49.350	Small Temple	Jalalpur	LHS	16
40	49.550	Small Temple	Jirauli	LHS	19
41	49.580	Small Temple	Jirauli	RHS	15
42	50.050	Temple	Jirauli	LHS	17
43	50.700	Temple	Jirauli	RHS	16
44	51.520	Temple	Jirauli	RHS	16
45	52.360	Temple	Amarpur	LHS	17
46	52.820	Temple	Amarpur	RHS	12
47	52.195	Temple	Amarpur	RHS	10
48	52.950	Temple	Amarpur	LHS	9
49	53.820	Temple	Devi ka Nagla	RHS	74
50	54.550	Temple	Devi ka Nagla	LHS	21
51	54.900	Temple	Devi ka Nagla	RHS	12
52	55.540	Temple	Kheriya Baksh	RHS	17
53	56.000	Temple	Naya Baas (Qutubpur)	RHS	25
54	56.220	Temple	Naya Baas (Qutubpur)	RHS	4
55	56.400	Temple	Naya Baas (Qutubpur)	RHS	18

Source: DPR Consultant

List of Medical Facilitiesalong Bulandshahar-Anoopshahar Road

S. No.	Existing Chainage (Km)	Type of Structure	Village/ Settlement	Side	Distance from Centre Line (m)
1	23.400	Hospital	Chanak Chauraha	LHS	33
2	38.350	Hospital	Karanpur	RHS	19
3	40.000	Hospital	Anupshahar	RHS	23

Source: DPR Consultant

List of Education Facilitiesalong Muzaffarnagar- Baraut Road

S. No.	Chainage (km)	Structure / Feature	Distance from CL (m)	Settlement	Side
1	3.840	School	16.6	Khanjhanpur	RHS
2	7.700	School	16.8	Khanjhanpur	LHS
3	9.200	School	19	Tawli	RHS
4	10.400	Madarsha	16	Tawli	RHS
5	12.550	School	17	Harsoli	RHS
6	15.820	School	14	Kakda	LHS
7	19.000	College	14.2	Shahpur	LHS
8	19.100	College	13	Shahpur	RHS
9	19.250	School	16.2	Shahpur	LHS
10	19.720	School	17	Shahpur	LHS
11	19.800	College	44.5	Shahpur	LHS
12	21.080	School	18.1	Shahpur	RHS
13	21.800	College	16.6	Shahpur	LHS
14	24.700	School	12.1	Shahdabbar	LHS
15	26.320	School	15	Madinpur	RHS
16	27.850	School	15.3	Bhasana	LHS
17	31.800	School	12.5	Budhana	LHS
18	35.250	College	12.20	Bitawdha	RHS
19	35.900	College	15.70	Bitawdha	LHS
20	41.320	College	13.8	Daha	RHS
21	45.380	School	4	Kanhar	LHS
22	47.820	College	10.6	Pusar	RHS
23	52.900	College	13.8	Bamnauli	LHS
24	53.995	College	13.8	Bamnauli	LHS
25	53.990	I.T.I College	14.2	Bamnauli	LHS
26	56.030	College	10.9	Bijraul	RHS
27	58.000	School	15.5	Baraut	RHS
28	59.100	School	16.8	Baraut	LHS
29	61.280	School	14.2	Baraut	LHS
30	61.340	School	12	Baraut	LHS
31	61.800	I.T.I College	6.4	Baraut	LHS
32	61.900	College/School	9.6	Baraut	RHS
33	61.900	College	5.2	Baraut	LHS

Source: DPR Consultant

List of Religious Facilitiesalong Muzaffarnagar- Baraut Road

S. No.	Chainage (Km)	Structure / Feature	Distance from CL (m)	Settlement	Side
1	4.800	Samadhi	17.0	Khanjhanpur	RHS
2	4.810	Samadhi	17.2	Khanjhanpur	RHS
3	4.900	Temple	17.0	Khanjhanpur	LHS
4	7.980	Mosque	13.8	Khanjhanpur	RHS
5	8.100	Edgah	16.1	Khanjhanpur	RHS
6	8.880	Peer	10.2	Khanjhanpur	LHS
7	10.420	Mosque	6.1	Tawli	LHS
8	13.920	Mosque	12.3	Harsoli	RHS
9	16.900	Temple	8.8	Kakda	RHS
10	17.000	Kabristan	15.6	Kakda	LHS
11	19.800	Temple	28.3	Shahpur	LHS
12	19.800	Temple	9.1	Shahpur	LHS
13	21.500	Ashram	16.0	Shahpur	LHS
14	24.050	Temple	9.0	Shahdabbar	LHS
15	24.400	Samadhi	16.0	Shahdabbar	RHS
16	24.950	Samadhi	6.5	Shahdabbar	LHS

S. No.	Chainage (Km)	Structure / Feature	Distance from CL (m)	Settlement	Side
17	25.530	Temple	8.5	Shahdabbar	RHS
18	26.330	Mosque	14.8	Madinpur	RHS
19	27.630	Mosque	15.5	Bhasana	RHS
20	28.020	Temple	8.5	Bhasana	LHS
21	30.400	Edgah	18.0	Budhana	RHS
22	30.500	Temple	15.0	Budhana	RHS
23	31.600	Temple	14.1	Budhana	RHS
24	34.800	Samadhi	19	Baiwala Chouki	RHS
25	35.100	Ashram	17.0	Baiwala Chouki	RHS
26	38.620	Edgah	9.9	Mindkali	LHS
27	40.350	Peer	10.1	Bhadal	LHS
28	42.250	Temple	8.4	Daha	RHS
29	42.720	Temple	6.0	Daha	LHS
30	43.220	Temple	13.6	Daha	LHS
31	44.900	Temple	12.9	Kanhar	LHS
32	45.850	Temple	5.2	Kanhar	RHS
33	46.820	Temple	8.3	Kanhar	RHS
34	46.900	Samadhi	10.8	Kanhar	RHS
35	47.900	Temple	8.9	Pusar	RHS
36	48.200	Temple	11.5	Pusar	RHS
37	48.850	Samadhi	23.0	Pusar	LHS
38	51.500	Temple	27.6	Bamnauli	RHS
39	51.800	Temple	45.6	Bamnauli	RHS
40	52.500	Temple	14.5	Bamnauli	RHS
41	56.550	Temple	68.8	Bijraul	RHS
42	58.820	Temple	10.2	Baraut	LHS

Source: DPR Consultant

List of Medical Facilitiesalong Muzaffarnagar- Baraut Road

S. No.	Chainage (Km)	Structure / Feature	Distance from CL (m)	Settlement	Side
1	19.080	Community Health Centre	24.8	Shahpur	LHS
2	19.600	Hospital	29.8	Shahpur	RHS
3	19.900	Hospital	10.8	Shahpur	RHS
4	20.300	Hospital	13.0	Shahpur	LHS
5	20.340	Hospital	9.0	Shahpur	RHS
6	20.350	Hospital	8.5	Shahpur	RHS
7	20.400	Hospital	12.5	Shahpur	LHS
8	20.700	Hospital	14.5	Shahpur	LHS
9	29.800	Hospital	18.2	Budhana	LHS
10	43.000	Primary Health Centre	23.4	Daha	LHS
11	55.920	Primary Health Centre	38.7	Bijraul	RHS
12	57.000	Veterinary Hospital	38.0	Bijraul	LHS

Source: DPR Consultant

List of Education Facilitiesalong Hussainganj to Alipur Marg

S. No.	Existing Chainage (Km)	Type of Structure	Village/Settlement	Side	Distance from Centre Line (m)
1	0.400	College	Hussainganj	RHS	59.600
2	1.130	College	Hussainganj	RHS	11.000
3	3.400	School	Bajrangapur	LHS	6.600

S. No.	Existing Chainage (Km)	Type of Structure	Village/Settlement	Side	Distance from Centre Line (m)
4	4.070	School	Patahpar	RHS	77.500
5	4.500	School	Rampur	RHS	8.900
6	5.950	School	Lakdi	LHS	10.000
7	12.000	College	Bela	LHS	7.600
8	12.000	School	Bela	LHS	27.500
9	15.100	School	Ahinda	RHS	33.000
10	16.500	School	Chhiwolaha	LHS	9.400
11	16.950	School	Chhiwolaha	LHS	55.200
12	17.100	College	Chhiwolaha	RHS	5.200
13	17.120	College	Chhiwolaha	RHS	5.100
14	17.420	School	Chhiwolaha	LHS	11.700
15	17.700	School	Chhiwolaha	LHS	55.500
16	18.900	School	Paliya Bujurg	LHS	8.200
17	18.900	School	Paliya bujurg	LHS	8.200
18	19.850	School	Semra	RHS	17.200
19	20.550	School	Manapur	LHS	11.000
20	20.600	College	Manapur	RHS	5.600
21	20.610	School	Manapur	LHS	10.200
22	22.150	School	Semra Manapur	RHS	6.600
23	22.153	College	Semra Manapur	RHS	6.600
24	23.200	School	Sukhha ka purwa	RHS	20.000
25	26.250	School	Hathgaon	RHS	17.600
26	26.300	College	Hathgaon	RHS	27.000
27	28.070	College	Hathgaon	LHS	12.000
28	28.170	School	Hathgaon	RHS	17.000
29	28.700	School	Adhari ka purwa	RHS	25.000
30	29.250	School	Adhari ka purwa	RHS	14.100
31	29.700	School	Ara chowk shahpur	RHS	16.200
32	33.000	School	Bahera chowki	LHS	23.200
33	33.880	School	Arayan	RHS	28.500
34	34.250	School	Arayan	RHS	68.100
35	36.030	School	Benchu ka purwa	RHS	22.500
36	37.140	School	Sultanpur ghosh	LHS	10.600
37	37.180	School	Sultanpur ghosh	RHS	8.900
38	37.930	School	Sultanpur ghosh	LHS	43.500
39	38.500	College	Sultanpur ghosh	LHS	9.500
40	38.700	College	Sultanpur ghosh	LHS	17.300
41	41.800	School	Prem nagar	RHS	8.000
42	41.920	School	Prem nagar	RHS	7.600
43	47.000	School	Afoi	RHS	42.300
44	48.650	Maha Vidyalaya	Alipur jeeta	RHS	8.400

Source: DPR Consultant

List of Religious Facilitiesalong Hussainganj to Alipur Marg

S. No.	Existing Chainage (Km)	Type of Structure	Village/Settlement	Side	Distance from Centre Line (m)
1	1.100	Temple	Hussainganj	RHS	11.100
2	3.195	Temple	bajrangapur	RHS	10.700
3	3.322	Temple	bajrangapur	LHS	7.000
4	4.660	Temple	rampur	RHS	24.100
5	5.000	Temple	rampur	RHS	3.000

S. No.	Existing Chainage (Km)	Type of Structure	Village/Settlement	Side	Distance from Centre Line (m)
6	6.020	temple	lakdi	LHS	11.500
7	6.025	Temple	lakdi	RHS	4.100
8	6.850	Temple	basawanpur	RHS	13.500
9	7.150	Temple	kandai ka pura	RHS	14.800
10	7.750	Temple	kandai ka pura	RHS	5.000
11	9.205	Temple	mawai	LHS	11.000
12	11.800	Temple	bela	RHS	13.100
13	11.900	Temple	bela	LHS	7.200
14	12.000	Temple	bela	LHS	17.900
15	14.160	Temple	bhosai ki sarai	LHS	8.000
16	16.720	Temple	chhiwolaha	LHS	4.700
17	18.400	Temple	paliya bujurg	RHS	9.900
18	18.720	Temple	paliya bujurg	LHS	5.200
19	18.800	Temple	paliya bujurg	RHS	5.000
20	20.050	Temple	semra	RHS	11.100
21	24.130	Temple	sandiya	RHS	10.000
22	25.400	Majar	Hathgaon	LHS	6.700
23	25.410	Idgah	Hathgaon	RHS	7.400
24	25.730	Mosque	Hathgaon	RHS	19.200
25	26.590	Temple	Hathgaon	LHS	7.300
26	28.550	Mosque	Adhari ka purwa	RHS	6.700
27	31.050	Majar (Dargah)	Sarai daras	LHS	26.200
28	35.800	Majar (Dargah)	Sarai (Karmipur chowk)	RHS	6.400
29	36.406	Temple	Chaube ki sarai	RHS	6.600
30	36.500	Temple	Chaube ki sarai	LHS	7.800
31	36.900	Temple	Usra Purwa	RHS	9.000
32	36.995	Temple	Usra Purwa	LHS	20.600
33	37.080	Temple	Usra Purwa	RHS	12.100
34	41.400	Mosque	Prem nagar	RHS	25.000
35	41.600	Temple	Prem nagar	LHS	15.000
36	41.720	Imam Bada	Prem nagar	LHS	4.700
37	42.470	Temple	Prem nagar	RHS	6.200
38	46.900	Mosque	Afoi	LHS	6.100
39	47.150	Mosque	Afoi	RHS	14.400

Source: DPR Consultant

List of Medical Facilitiesalong Hussainganj to Alipur Marg

S. No.	Existing Chainage (Km)	Type of Structure	Village/ Settlement	Side	Distance from Centre Line (m)
1	8.850	Hospital	Mawai	RHS	20.000
2	18.350	Hospital	Paliya bujurg	RHS	38.800
3	20.150	Hospital	Semra	RHS	20.000
4	27.400	Hospital	Hathgaon	RHS	12.000
5	37.600	Hospital	Sultanpur ghosh	LHS	10.500
6	41 .050	Hospital	Prem nagar	RHS	16.000

Source: DPR Consultant

List of Education Facilitiesalong Haliyapur-Kurebhar-Bilwai Road

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	0.100	School	Dobhihara	RHS	16.5

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
2	1.800	School	Dobhihara	LHS	80.0
3	1.800	Angan Wadi	Dobhihara	LHS	80.0
4	2.050	School	Dobhihara	RHS	6.0
5	3.000	School	Bandin House Mukandpur	RHS	12.0
6	3.650	School	Mukandpur	RHS	90.0
7	4.990	School	Bhawani Garh	RHS	13.5
8	5.400	Inter College	Bhawani Garh	RHS	86.0
9	5.600	School	Rencha	LHS	12.0
10	5.650	School	Rencha	RHS	37.0
11	7.550	School	Rencha	LHS	18.0
12	9.300	School	Govindpur	LHS	25.0
13	10.700	School	Singhni	LHS	21.0
14	10.900	School	Singhni	RHS	18.0
15	11.900	School	Bahurava	RHS	30.0
16	15.700	School	Delhi Bazar	RHS	49.0
17	15.900	School	Delhi Bazar	RHS	35.0
18	16.050	School	Delhi Bazar	LHS	15.0
19	16.150	School	Delhi Bazar	RHS	11.0
20	16.150	School	Delhi Bazar	LHS	15.0
21	16.400	School	Delhi Bazar	RHS	15.0
22	19.000	School	Peero Sariya	LHS	27.0
23	19.300	School	Peero Sariya	LHS	14.0
24	21.000	School	Ardia	LHS	13/38
25	22.200	School	Harora Bazra	LHS	11.5
26	24.300	School	Shanti Nagar	RHS	6.0
27	25.400	School	Dhanpta Ganj	LHS	11.0
28	25.650	School	Dhanpta Ganj	LHS	10.5
29	26.700	School	Dhanpta Ganj	RHS	7.5
30	28.600	School	Bhikarpur	LHS	46.0
31	30.700	School	Anpur	RHS	23.0
32	32.100	School	Tiwaripur	LHS	10.5
33	34.300	Inter College	Laxmi Market	LHS	12.0
34	36.250	School	Kurdan Gali Bah	LHS	11.5
35	36.300	School	Kurdan Gali Bah	RHS	22.0
36	37.550	School	Erur	RHS	12.0
37	38.800	School	Salim Pur	LHS	15.0
38	39.450	School	Makdumpur	RHS	58.0
39	42.700	ITI	Fulona Chauraha	LHS	24.5
40	47.150	School	Bajna	RHS	10.0
41	48.000	School	Bajna	RHS	52.0
42	56.700	School	Semri Bazar	LHS	8.0
43	58.400	School	Chouraha	LHS	19.0
44	61.360	School	Jamalpur	LHS	11.0
45	62.200	School	Sarai Norang	RHS	52.0
46	63.370	School	Sri Ram Naga	RHS	20/6
47	63.800	School	Danu Pati	LHS	18.0
48	65.000	School	gosai Singhpur	RHS	8.5
49	65.200	School	gosai Singhpur	RHS	5.5
50	67.450	Academy	Sikiya mor	LHS	14.0
51	68.800	School	Tajudinpur	LHS	9.0
52	70.650	Inter College	Cheete Patti	LHS	8.0
53	71.600	School	Karetha	LHS	88.0
54	73.600	School	Bhwangaya	LHS	25.0
55	73.650	School	Bhwangaya	RHS	6.0
56	77.400	Angan Wadi	Dostpur	RHS	9.0
57	77.600	School	Dostpur	LHS	7.0

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
58	79.350	College	Badholi	RHS	14.0
59	81.600	School	Kaith Dalalpur	RHS	10.0
60	81.700	School	Kaith Dalalpur	RHS	22.0
61	83.800	School	Gonhanapur	LHS	38.5
62	83.850	School	Gonhanapur	LHS	9.0
63	84.150	School	Akhand Nagar	RHS	9.5
64	86.700	School	Rahul Nagar	RHS	22.0
65	88.000	School	Bari Sahijan	LHS	9.0
66	91.200	School	Jahirudin pur	LHS	11.0
67	91.550	Inter College	Nanhukam Puram	LHS	90.0
68	91.600	School	Nanhra	LHS	16.0
69	92.300	Govt. School	Akhand Nagar	LHS	9.0
70	92.300	Kastruba Vidyalaya	Akhand Nagar	LHS	30.0
71	96.300	School	Khusmandpur	RHS	14.0
72	96.650	School	Khusmandpur	RHS	33.0
73	97.800	College	Khanpur Pillai Dev Nagar	LHS	11.0
74	97.820	School	Khanpur Pillai Dev Nagar	LHS	11.0
75	99.200	School	Bibiganj	LHS	15.0
76	99.350	School	Bibiganj	LHS	12.0
77	101.600	School	Belwai	RHS	20.0

Source: DPR Consultant

List of Religious Facilitiesalong Haliyapur-Kurebhar-Bilwai Road

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
1	0.020	Temple	Dobhiyara	LHS	17.5
2	1.900	Temple	Dobhiyara	RHS	10.0
3	7.950	Temple	Rencha	RHS	8.0
4	8.100	Temple	Shuklpur	LHS	20.0
5	8.800	Temple	Govindpur	LHS	9.0
6	12.700	Temple	Bahurava	RHS	45.0
7	12.900	Temple	Bahral	LHS	14.0
8	14.800	Temple	Sakal Devika Pura	LHS	22.0
9	15.700	Temple	Delhi Bazar	RHS	55.0
10	16.450	Temple	Delhi Bazar	LHS	20.0
11	18.500	Temple	Bairo Saiya	RHS	14.0
12	19.300	Mazar / Dargah	Peero Sariya	LHS	12.0
13	21.150	Temple	Harora Bazra	RHS	16.0
14	21.400	Temple	Harora Bazra	RHS	8.0
15	22.500	Temple	Harora Bazra	RHS	12.0
16	22.500	Samadhi	Harora Bazra	LHS	12.0
17	24.400	Samadhi	Dhanpta Ganj	LHS	15.0
18	25.450	Temple	Dhanpta Ganj	RHS	12.0
19	26.500	Temple	Dhanpta Ganj	LHS	12.0
20	26.650	Temple	Dhanpta Ganj	LHS	9.0
21	26.720	Temple	Dhanpta Ganj	RHS	9.0
22	26.900	Temple	Dhanpta Ganj	RHS	5.5
23	27.300	Temple	Dhanpta Ganj	RHS	7.0
24	28.990	Temple	Bhikarpur	LHS	13.0
25	29.800	Temple	Sanjay Nagar	RHS	8.0
26	30.200	Temple	Viran Sariya	RHS	
27	30.600	Temple	Anpur	LHS	16.0

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
28	31.700	Temple	Norhara	LHS	17.0
29	34.500	Temple	Laxmi Market	RHS	13.0
30	34.750	Mosque	Kure Bhar	LHS	11.0
31	35.600	Temple	Kure Bhar	LHS	6.0
32	35.950	Temple	Semri Road	RHS	12.0
33	36.900	Temple	Erule	RHS	17.0
34	37.800	Temple	Raghopur	RHS	40.0
35	37.800	Temple	Raghopur	RHS	40.0
36	39.750	Temple	Banraha	RHS	42.0
37	41.025	Temple	Baraula	LHS	11.0
38	41.050	Temple	Baraula	RHS	11.0
39	41.650	Temple	Baraula	RHS	4.5
40	44.150	Temple	Fulona Chauraha	LHS	6.5
41	44.700	Mosque	Arhodi Chourah	LHS	
42	45.700	Temple	Bajna	LHS	
43	47.200	Temple	Bajna	RHS	43.0
44	47.250	Temple	Bajna	RHS	4.0
45	47.250	Temple	Bajna	LHS	4.0
46	47.360	Temple	Bajna	RHS	42.0
47	47.750	Temple	Bajna	RHS	15.0
48	56.850	Temple	Semri Bazar	RHS	20.0
49	59.100	Temple	Chouraha	LHS	15.0
50	61.350	Temple	Jamalpur	RHS	11.0
51	61.500	Temple	Jamalpur	LHS	10.5
52	63.560	Mazar	Sri Ram Naga	RHS	18.0
53	68.050	Mazar	Sadipur	LHS	5.0
54	68.350	Mazar	Tajudinpur	LHS	27.0
55	68.700	Ashram	Tajudinpur	LHS	31.0
56	70.850	Temple	Cheete Patti	RHS	10.0
57	78.300	Temple	Bhwangaya	RHS	4.5
58	73.400	Temple	Bhwangaya	RHS	5.5
59	76.150	Mazar	Channiya dostpur	LHS	25.0
60	76.200	Mosque	Channiya dostpur	LHS	15.0
61	76.250	Mosque	Channiya dostpur	RHS	5.0
62	76.500	Temple	Dostpur	RHS	11.0
63	76.550	Mazar	Dostpur	RHS	12.0
64	77.550	Kabristan	Dostpur	LHS	33.0
65	77.650	Kabristan	Dostpur	RHS	13.5
66	77.650	Mazar	Dostpur	LHS	17.0
67	77.900	Mazar	Dostpur	LHS	15.0
68	78.250	Mosque	Dostpur	LHS	60.0
69	78.400	Mosque	Dostpur	RHS	49.0
70	79.250	Temple	Akhandpur	LHS	12.0
71	79.850	Temple	Badholi	LHS	8.0
72	79.860	Temple	Badholi	RHS	6.5
73	80.200	Temple	Badholi	LHS	8.0
74	81.500	Temple	Kaith Dalalpur	RHS	7.5
75	82.950	Temple	Kaith Dalalpur	LHS	4.0
76	83.000	Temple	Gonhanapur	LHS	6.0
77	84.100	Temple	Akhand Nagar	RHS	15.0
78	84.160	Temple	Akhand Nagar	RHS	4.0

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
79	86.000	Temple	Rahul Nagar	RHS	5.5
80	85.750	Temple	Rahul Nagar	RHS	3.5
81	88.100	Temple	Bari Sahijan	LHS	35.0
82	88.200	Temple	Bari Sahijan	LHS	5.0
83	90.050	Temple	Pathariya	LHS	5.5
84	92.700	Temple	Akhand Nagar	LHS	4.5
85	96.750	Mazar	Khusmandpur	LHS	3.0
86	101.500	Temple	Belwai	RHS	5.0

Source: DPR Consultant

List of Medical Facilitiesalong Haliyapur-Kurebhar-Bilwai Road

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	16.400	Primary Health Centre	Delhi Bazar	LHS	49
2	76.750	Community Health Centre	Dostpur	LHS	10
3	77.300	Hospital	Dostpur	RHS	6
4	77.800	Hospital	Dostpur	LHS	7
5	78.200	Hospital	Dostpur	RHS	23
6	79.400	Hospital	Badholi	LHS	11
7	84.800	Primary Health Centre	Akhand Nagar	LHS	55

Source: DPR Consultant

List of Education Facilitiesalong Naurangiya-Kaptanganj-Rudrapur Road

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
ODR-24 (Kaptanganj to Naurangiya)					
1	1.350	School	Kaptanganj	RHS	12.6
2	3.380	School	Misrauli	RHS	65.0
3	4.500	School	Hardichapra	RHS	11.9
4	5.865	School	Parsiya	LHS	22.5
5	6.070	School	Khatai Kwrwaniyan	RHS	5.5
6	6.900	College	Khatahi	LHS	11.0
7	9.660	College	Khatahi	RHS	7.5
8	13.780	School	Khanuapra	RHS	39.0
9	13.840	School	Khanuapra	LHS	11.5
10	14.350	School	Khanuapra	LHS	11.7
11	15.080	School	Pakadiyar Bazar	LHS	14.2
12	15.080	School	Pakadiyar Bazar	LHS	14.2
13	16.665	School	Chargharwa	RHS	7.1
14	17.910	School	Jagdeva	RHS	60.0
15	18.650	School	Khairatiya Shitlapur	RHS	5.4
16	18.800	School	Khairatiya Shitlapur	LHS	15.2
17	19.600	School	Kalwaripatti	RHS	26.4
18	21.900	School	Sirsiya	LHS	16.4
19	24.000	School	Naurangiya	LHS	12.2
MDR-25E (Kaptanganj to Rudrapur)					
1	1.030	College	Kaptanganj	LHS	33.0
2	1.040	School	Kaptanganj	RHS	12.0
3	1.100	School	Kaptanganj	RHS	11.2
4	1.500	School	Kaptanganj	LHS	54.0
5	5.130	School	Malkuhi	RHS	8.1

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
6	5.200	School	Malkuhi	LHS	37.0
7	5.350	School	Malkuhi	RHS	5.5
8	5.450	Madrasa	Malkuhi	RHS	11.7
9	7.100	School	Laxmipur	LHS	36.0
10	7.110	School	Laxmipur	LHS	20.0
11	8.950	College	Mathauli	LHS	12.5
12	10.750	School	Lohepur	LHS	11.5
13	11.900	School	Ghiwahi	LHS	10.3
14	13.200	School	Pakdia	RHS	10.7
15	14.980	School	Harpoor	LHS	13.2
16	16.600	School	Belwan sudana	RHS	22.0
17	17.600	School	Jhanga Sudama Chak	LHS	38.1
18	18.020	School	Jhanga	LHS	7.8
19	18.280	School	Jhanga	LHS	14.9
20	18.600	School	Jhanga	RHS	66.5
21	20.400	School	Radhiya-Devrya	LHS	13.3
22	18.665	School	Jhanga Bazar	LHS	9.2
23	20.990	School	Mahddipur	LHS	55.0
24	22.000	School	Hata	LHS	94.4
25	23.300	School	Hata	LHS	10.6
26	23.400	Academy (School)	Hata	LHS	14.2
27	23.550	School	Paragpur Baghnath	LHS	50.0
28	24.465	School	Paragpur Chowk	LHS	44.0
29	25.770	School	Gopalpur	RHS	13.8
30	26.000	School	Modraha	LHS	12.9
31	28.310	School	Balua	LHS	14.7
32	28.400	School	Balua	LHS	14.0
33	29.250	School	Devkali	LHS	12.2
34	29.650	School	Devkali	LHS	20.0
35	29.750	School	Devkali	RHS	15.0
36	31.320	School	Vakilaganj	LHS	15.1
37	33.300	College	Balchara	LHS	14.0
38	33.500	School	Balchara	LHS	13.9
39	34.263	School	Cheerchari Balchara	LHS	11.4
40	34.280	College	Cheerchari Balchara	LHS	19.5
41	35.100	School	Bishnupura Bakhara	LHS	20.5
42	35.750	School	Dumari Bishnupura	LHS	13.0
43	36.550	School	Kakamal	RHS	38.8
44	36.550	College	Kakamal	RHS	58.5
45	37.500	School	Kakamal	LHS	15.0
46	37.820	School	Pacholiya	LHS	25.1
47	38.800	School	Dhamar Vioshwari	RHS	14.1
48	39.750	College	Rampur	LHS	17.3
49	40.012	School	Gauri Bazar	RHS	7.6
50	40.200	School	Gauri Bazar	LHS	79.7
51	43.845	School	Patharhat	LHS	13.0
52	44.150	School	Indupur	LHS	8.4
53	44.160	School	Indupur	RHS	28.5
54	44.160	College	Indupur	RHS	35.3
55	44.480	College	Indupur	RHS	15.3
56	44.480	College	Indupur	LHS	28.3

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
57	44.590	School	Indupur	LHS	32.3
58	44.550	School	Indupur	RHS	60.3
59	44.570	School	Indupur	RHS	60.3
60	47.780	School	Katai	LHS	27.0
61	48.820	School	Awadhpur	RHS	66.0
62	48.820	School	Awadhpur	RHS	55.0
63	49.590	School	Balkunda	RHS	7.0
64	49.800	School	Banaspati Bazar	RHS	57.5
65	49.900	School	Banaspati Bazar	LHS	9.3
66	50.550	School	Ramlakshman	RHS	13.8
67	50.600	School	Ramlakshman	LHS	12.3
68	51.050	School	Ramlakshman	LHS	28.9
69	51.220	School	Ramlakshman	LHS	29.4
70	52.200	School	laxmipur	LHS	19.0
71	52.400	School	laxmipur	RHS	14.5
72	55.150	School	Chapali	RHS	38.0
73	56.310	School	Gahila	RHS	70.0

Source: DPR Consultant

List of Religious Facilitiesalong Naurangiya-Kaptanganj-Rudrapur Road

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
ODR-24 (Kaptanganj to Naurangiya)					
1	0.010	Temple	Kaptanganj	RHS	10.1
2	3.230	Temple	Misrauli	LHS	47.0
3	3.495	Temple	Misrauli	RHS	5.5
4	3.500	Temple in form of Banyan Tree	Misrauli	RHS	3.0
5	13.680	Temple	Khanuapra	LHS	10.3
6	15.130	Temple	Pakadiyar Bazar	RHS	7.0
7	15.780	Eidgah	Pakadiyar Bazar	RHS	7.0
8	16.000	Karbala	Pakadiyar Bazar	LHS	5.2
9	16.665	Temple	Chargharwa	LHS	21.5
10	17.900	Temple	Jagdeva	RHS	45.5
11	19.500	Temple	Kalwaripatti	RHS	18.0
12	23.950	Temple	Naurangiya	LHS	14.0
13	23.960	Temple	Naurangiya	LHS	11.0
MDR-25E (Kaptanganj to Rudrapur)					
1	0.450	Temple	Kaptanganj	LHS	11.5
2	3.740	Temple	Semra	LHS	10.1
3	7.000	Mosque	Laxmipur	LHS	50.0
4	7.100	Eidgah	Laxmipur	LHS	15.5
5	7.820	Temple	Laxmipur	LHS	15.5
6	17.550	Temple	Balwan Sudama	RHS	4.0
7	18.380	Temple	Jhanga	RHS	33.8
8	19.150	Temple	Bakarabad	LHS	7.9
9	18.385	Temple	Jhanga	RHS	45.2
10	24.450	Temple	Paragpur Chowk	LHS	27.0
11	27.400	Temple	Moti Pakad Shrikant	RHS	9.0
12	28.320	Temple	Balua	LHS	5.3
13	28.330	Temple	Balua	LHS	5.9

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
14	37.840	Temple	Pacholiya	RHS	14.5
15	40.300	Temple	Gauri Bazar	LHS	7.0
16	41.000	Temple	Gauri Bazar	RHS	7.0
17	42.000	Temple	Gauri Bazar	RHS	4.4
18	43.650	Temple	Mathiya	RHS	6.2
19	46.500	Temple	Pananchara	LHS	13.5
20	48.050	Temple	Katai	LHS	11.6
21	48.450	Temple	Divan Pakhara	RHS	94.2
22	49.440	Temple	Balkunda	LHS	107.0
23	51.390	Temple	Ramlakshman	RHS	39.7
24	52.990	Temple	Pipra	RHS	4.7
25	53.080	Temple	Pipra	RHS	4.3
26	51.100	Temple	Chapali	RHS	11.0
27	55.690	Temple	Gahila	RHS	14.5
28	56.660	Temple	Gahila	LHS	8.6
29	58.460	Temple	Rudrapur	RHS	23.0

Source: DPR Consultant

List of Medical Facilities along Naurangiya-Kaptanganj-Rudrapur Road

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
ODR-24 (Kaptanganj to Naurangiya)					
1	13.780	Hospital	Khanpura	RHS	59.5
MDR-25E (Kaptanganj to Rudrapur)					
1	0.800	Hospital	Kaptanganj	LHS	8.4
2	0.800	Hospital	Kaptanganj	RHS	12.9
3	18.350	Hospital	Jhanga	RHS	11.0
4	33.800	Hospital	Balchara	RHS	13.9
5	34.250	Hospital	Cheerchari Balchara	LHS	19.4
6	37.820	Hospital	Pacholiya	LHS	12.9
7	40.000	Hospital	Gauri Bazar	LHS	15.3
8	44.800	Hospital	Indupur	LHS	25.0
9	46.550	Hospital	Pananchara	LHS	13.5
10	47.350	Hospital	Pananchara	LHS	13.1
11	51.000	Hospital	Ramlakshman	LHS	12.7

Source: DPR Consultant

List of Education Facilities along Mohanlalganj-Maurawan-Unnao Marg

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	0.300	School	Mohanlalganj	RHS	7.0
2	1.650	School	Dehwa	LHS	50.0
3	1.900	Hostel	Dehwa	LHS	21.0
4	3.890	School	Dhanwara	RHS	29.0
5	6.500	Engineering Institute	Dhanwara	RHS	17.0
6	7.100	College	Dhanwara	RHS	15.5
7	9.900	School	Sisendi	RHS	12.0
8	13.500	School	Jabraila	RHS	4.5
9	14.000	School	Jabraila	LHS	41.0
10	17.550	School	Kalu Khera	RHS	6.0
11	17.700	School	Kalu Khera	RHS	21.0

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
12	18.600	School	Kalu Khera	LHS	7.0
13	22.500	College	Sarvan	LHS	18.0
14	24.300	School	Bhawaniganj	LHS	6.0
15	24.600	School	Bhawaniganj	LHS	12.0
16	25.400	Madarsa	Bhawaniganj	RHS	9.0
17	28.250	School	Sagauli	RHS	11.0
18	28.550	School	Sagauli	RHS	10.0
19	30.870	School	Sagauli	RHS	7.0
20	31.350	School	Maurawan	RHS	5.5
21	31.350	School	Maurawan	RHS	7.0
22	34.450	School	Purwa	RHS	26.0
23	36.650	School	Patan Nagar	LHS	14.0
24	38.150	School	Tusraur	RHS	11.0
25	40.250	School	Purwa	RHS	12.0
26	43.750	School	Kasrol	LHS	17.0
27	47.150	School	Uchha Gaon	LHS	8.0
28	47.400	School	Uchha Gaon	LHS	14.0
29	48.400	School	Langarpur	RHS	20.0

Source: DPR Consultant

List of Religious Facilities along Mohanlalganj-Maurawan-Unnao Marg

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
1	0.660	Majar	Mohanlalganj	LHS	13.0
2	1.300	Temple	Mohanlalganj	RHS	10.5
3	1.700	Temple	Dehwa	LHS	18.0
4	2.200	Temple	Dehwa	RHS	15.5
5	2.300	Temple	Dehwa	LHS	13.7
6	2.300	Temple	Dehwa	RHS	7.4
7	3.500	Temple	Maida Khera	LHS	17.2
8	4.200	Temple	Dhanwara	LHS	3.3
9	6.000	Temple	Dhanwara	LHS	4.0
10	6.500	Temple	Dhanwara	RHS	25.0
11	7.200	Temple	Dhanwara	LHS	15.0
12	7.300	Temple	Uttar Gaon	RHS	13.0
13	8.500	Temple	Sisendi	LHS	20.0
14	8.800	Temple	Sisendi	LHS	10.0
15	8.900	Temple	Sisendi	RHS	15.0
16	9.320	Temple	Sisendi	LHS	4.5
17	9.900	Temple	Sisendi	RHS	8.0
18	11.000	Temple	Sisendi	LHS	7.0
19	11.400	Temple	Meenapur	RHS	5.0
20	13.000	Temple	Jabraila	RHS	4.0
21	13.000	Temple	Jabraila	RHS	9.0
22	13.400	Temple	Jabraila	RHS	8.0
23	13.700	Temple	Jabraila	RHS	22.0
24	13.700	Temple	Jabraila	RHS	14.0
25	13.900	Temple	Jabraila	RHS	11.0
26	14.000	Temple	Jabraila	LHS	45.0
27	14.200	Temple	Jabraila	RHS	11.0

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
28	16.500	Temple	Pitana Khera	LHS	9.0
29	17.000	Temple	Kalu Khera	RHS	5.0
30	17.300	Temple	Kalu Khera	RHS	10.0
31	18.520	Temple	Kalu Khera	RHS	7.0
32	18.780	Temple	Kanchanpur	LHS	12.0
33	18.850	Temple	Kanchanpur	RHS	8.0
34	18.900	Temple	Kanchanpur	RHS	7.0
35	19.300	Temple	Kanchanpur	RHS	17.0
36	23.800	Mosque	Bhawaniganj	RHS	11.3
37	24.000	Temple	Bhawaniganj	LHS	4.0
38	24.100	Temple	Bhawaniganj	RHS	7.0
39	24.100	Temple	Bhawaniganj	RHS	9.0
40	24.200	Dargah	Bhawaniganj	RHS	17.0
41	26.400	Temple	Khudra	LHS	7.0
42	26.850	Temple	Khudra	LHS	5.0
43	27.150	Majar	Khudra	RHS	3.5
44	27.450	Temple	Khudra	LHS	16.0
45	27.750	Temple	Sagauli	LHS	7.0
46	28.150	Temple	Sagauli	LHS	10.0
47	28.950	Temple	Sagauli	LHS	8.0
48	30.350	Temple	Sagauli	RHS	18.0
49	31.350	Temple	Sagauli	RHS	8.0
50	31.450	Temple	Maurawan	RHS	7.5
51	31.450	Temple	Maurawan	LHS	60.0
52	32.250	Temple	Maurawan	LHS	50.0
53	32.950	Temple	Maurawan	RHS	6.0
54	36.150	Temple	Patan Nagar	RHS	4.0
55	37.750	Temple	Patan Nagar	LHS	7.0
56	38.150	Temple	Tusraur	RHS	7.0
57	38.250	Temple	Tusraur	LHS	7.0
58	41.250	Temple	Purwa	RHS	10.0
59	42.330	Majar / Mosque	Purwa	RHS	10.0
60	42.350	Mosque	Purwa	LHS	30.0
61	42.450	Temple	Purwa	LHS	13.0
62	43.550	Temple	Purwa	LHS	7.0
63	43.650	Majar	Purwa	LHS	9.0
64	43.850	Temple	Kasrol	RHS	5.0
65	44.050	Temple	Kasrol	LHS	5.0
66	47.250	Temple	Uchha Gaon	LHS	10.0
67	47.410	Temple	Uchha Gaon	LHS	7.0
68	47.420	Temple	Uchha Gaon	LHS	8.0
69	47.600	Temple	Uchha Gaon	LHS	15.0
70	47.800	Temple	Uchha Gaon	LHS	18.0
71	53.650	Temple	Bhiri-Chamcha	LHS	50.0

Source: DPR Consultant

List of Medical Facilitiesalong Mohanlalganj-Maurawan-Unnao Marg

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	4.100	Community Health Centre	Dhanwara	LHS	10.0
2	17.100	Hospital	Kalu Khera	LHS	16.0

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
3	17.600	Veterinary Hospital	Kalu Khera	RHS	80.0
4	17.650	Hospital	Kalu Khera	RHS	22.0
5	25.700	Private Doctor shop	Khudra	LHS	10.0
6	26.750	Hospital	Khudra	LHS	11.0
7	31.150	Clinic	Sagauli	RHS	12.0
8	31.550	Community Health Centre	Maurawan	RHS	8.0
9	31.550	Pathology lab	Maurawan	LHS	8.0
10	33.750	Private Doctor shop	Muraita	LHS	8.0
11	43.050	Community Health Centre	Purwa	LHS	8.0
12	43.450	Clinic	Purwa	LHS	9.0

Source: DPR Consultant

List of Education Facilitiesalong Aliganj-Soron Marg

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	30.970	School	Alipur Dadar	LHS	11
2	34.200	School	Ganj dundwara	LHS	6.5
3	35.600	School	Ganj dundwara	LHS	5
4	41.500	School	Gadka	RHS	21.5
5	46.300	Inter College	Sahawar	RHS	11.5
6	46.320	College	Sahawar	RHS	11.5
7	46.400	College	Sahawar	RHS	11.5
8	47.910	School	Sahawar	RHS	6
9	47.915	School	Sahawar	RHS	4
10	48.900	Inter College	Sahawar	LHS	11.5
11	50.230	Junior high School	Jamalpur	RHS	9.5
12	54.250	School	Yakutganj	RHS	9.5
13	59.200	Junior high School	Humaupur	LHS	10.5
14	62.500	School (with Ambedkar Asram)	Soron	RHS	5

Source: DPR Consultant

List of Religious Facilitiesalong Aliganj-Soron Marg

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
1	27+100	Temple	Patiyali	RHS	8.7
2	28+200	Temple	Patiyali	LHS	11.8
3	28+760	Majar	Patiyali	LHS	5.3
4	30+850	Temple	Patiyali	LHS	5.2
5	31+750	Temple	Alipur dadar	RHS	4
6	34+350	Mosque	Ganj dundwara	RHS	7
7	34+400	Mosque	Ganj dundwara	RHS	4.3
8	34+730	Mosque	Ganj dundwara	RHS	3.5
9	36+420	Mosque	Ganj dundwara	LHS	3.2
10	36+930	Mosque	Sujawar Ganj dundwara	RHS	5
11	37+650	Temple	Sarpara	LHS	5
12	40+400	Ashram	Gadka	RHS	9
13	47+400	Temple	Sahawar	LHS	5.5
14	74+900	Temple	Sahawar	RHS	3.5
15	48+300	Temple	Sahawar	LHS	3
16	48+520	Mosque	Sahawar	LHS	3
17	48+600	Mosque	Sahawar	LHS	2.5
18	48+700	Mosque	Sahawar	LHS	2.5
19	49+300	Arthi Asthal	Sahawar	LHS	1
20	49+320	Eid gha	Sahawar	LHS	5

S. No.	Chainage km	Type of Structure	Village	Side	Distance from Centre Line (m)
21	52+600	Temple	Tali	RHS	2.8
22	52+620	Temple	Tali	LHS	6.8
23	53+880	Temple	Lakhmipur Gopal Singh	RHS	3.5
24	54+130	Temple	Yakutganj	RHS	4.2
25	54+300	Temple	Yakutganj	RHS	4.5
26	57+130	Temple	Radhnala	RHS	5
27	61+320	Temple	Soron	LHS	4

Source: DPR Consultant

List of Medical Facilitiesalong Aliganj-Soron Marg

S. No.	Chainage No.	Type of Structure	Village	Side	Distance from Centre Line (m)
1	27+700	Private Clinic	Patiyali	LHS	3.5
2	36+000	Private Clinic	Ganjdungwara	RHS	5
3	52+920	Primary Health Centre	Yakutganj	RHS	50

Source: DPR Consultant

Appendix 27: Aggregate and sand Quarry Areas Identified

Road stretches	Chainage (km)	Side	Lead (km)	Location	Ownership	Quarry
MDR 82W (ND)	0	LHS	201	Ghatri	Private	Aggregate
	0	RHS	229	Haldwani	Private	Aggregate
	0	LHS	120	Kachla	-	sand
MDR 81C (HA)	24.000	LHS	155	Karbai	Private	Aggregate
	24.000	LHS	150	Shakergarh	Private	Aggregate
	24.000	LHS	114	Banda Cane river	-	sand
MDR 135W (MB)	3.000	RHS	160	Jahangirabad	Private	Aggregate
	3.000	LHS	330	Kotputili	Private	Aggregate
	-	LHS	55	Yamuna river, Jharkheri	-	sand
MDR 66E (HK)	79.000	LHS	214	Sankargarh	-	Aggregate
	79.000	LHS	79	Dala	-	Aggregate
		LHS	79	Banda Cane river		sand
MDR 58W (BA)	22.000	RHS	30	Jahangirabad	Private	Aggregate
	22.000	LHS	250	Kotputili	Private	Aggregate
	22.000	LHS	120	Kachala District Badaun	-	sand
	22.000	RHS	15	Ganga River Narora	-	sand
ODR24 & MDR 25E (NKV)	40.000 (MDR 25E)	LHS	337	Surkut	-	Sand & aggregate
	40.000 (MDR 25E)	LHS	385	Dalla	-	Aggregate
MDR 52 C (MM)	26.00	RHS	191	Kabrai	-	Aggregate
MDR 45W (AS)	30.000	LHS	75.00	Kachhla	private	Sand
	30.000	LHS	215.00	Haldwani	Private	Aggregate
	30.000	LHS	249.00	Ghatri	Private	Aggregate

Source: DPR Consultant

Borrow Areas Identified

Road stretches	Chainage (km)	Side	Lead (km)	Location	Approximate quantity available in cum
MDR 82W (ND)	5.5	LHS	1.0	Nanau Kanalia pond	6069
	14.8	LHS	0.5	Tikta Village pond	9105
	23.5	RHS	0.5	Bhamori Kalan	12140
MDR 81C (HA)	8.000	LHS	0.2	Kanahiyapara Pond	6069
	12.000	LHS	2.5	Bela Village	12140
	13.500	RHS	0.5	Baghaipura	12140
	23.200	RHS	1	Saraisama Village	15176
	27.600	RHS	1	Village Hathiya sahar	9105
MDR 135W (MB)	10.000	RHS	1	Tawli Village	6069
	50.000	RHS	0.5	Bijrol Village	12140
MDR 66E (HK)	5.600	LHS	0.6	Bhawanigarh Raich	6476
	71.600	LHS	1.0	Kaithwan	3238
	65.500	RHS	2.0	Khempur (Ugadpur)	6476
	60.600	RHS	0.5	Virsinghpur	8094
	16.300	RHS	0.2	Delhi Bazar	3238
	90.100	LHS	1.5	Dharmapur	9713
	81.800	RHS	1.8	Hamjapur	4857
	31.100	RHS	0.5	Malin Saray	3238
	43.000	RHS	0.7	Gaura	4857
MDR 58W	39.500	LHS	1	Dungra Jogi village	4046

Road stretches	Chainage (km)	Side	Lead (km)	Location	Approximate quantity available in cum
(BA)	25.00	RHS	0.5	Ghana Village	8100
	45.300	LHS	0.5	Telia Nagalka	6070
ODR24 (KN) & MDR 25E (KV)	5.500 (ODR 24)	LHS	0.6	Near Khatan Prsiya	12140
	10.150 (MDR 25E)	RHS	1	Near Lohepar	6069
	13.500 (MDR 25E)	RHS	2	Varhgam marg	12140
	21.800 (MDR 25E)	LHS	0.5	Near Kharoda Bazar	6069
	55.000 (MDR 25E)	RHS	0.1	Near Dhapoli Village pond	6069
MDR 52 C (MM)	11.120	LHS	1.00	Near Meenapur	6470
	28.080	RHS	2.50	Near Sukha Khera	4820
	47.140	LHS	2.00	Near Mirzapur Sumhari	3500
MDR 45W (AS)	27.000	RHS	0.5	Patiyali	6470
	30.060	LHS	2.5	Nagla China	3500
	55.990	RHS	3.2	Nagariya	4200
Total					240003

Source: DPR Consultant

APPENDIX 28: GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS

[1][SCHEDULE – VI]

(See rule 3A)

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
1.	Colour and odour	See 6 of Annexure-I	--	See 6 of Annexure -I	See 6 of Annexure-I
2.	Suspended solids mg/l, Max.	100	600	200	(a) For process waste water- 100 (b) For cooling water effluent 10 percent above total suspended matter of influent
3.	Particulate size of suspended solids	Shall pass 850 micron IS Sieve	--	--	(a) Floatable solids, max. 3 mm. (b) Settleable solids, max. 850 microns.
[2]4.	...	.	..	...	—
5.	pH Value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
6.	Temperature	shall not exceed 5°C above the receiving water temperature	--	--	shall not exceed 5°C above the receiving water temperature

1. Schedule VI inserted by Rule 2(d) of the Environment (Protection) Second Amendment Rules, 1993 notified vide G.S.R. 422(E) dated 19.05.1993, published in the Gazette No. 174 dated 19.05.1993.
2. Omitted by Rule 2(d)(i) of the Environment (Protection) Third Amendment Rules 1993 vide Notification No.G.S.R.801(E), dated 31.12.1993.

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
7.	Oil and grease mg/l Max.	10	20	10	20
8.	Total residual chlorin mg/l Max.	1.0	--	--	1.0
9.	Ammonical nitrogen (as N), mg/l Max.	50	50	--	50
10.	Total Kjeldahl Nitrogen (as NH_3) mg/l, Max.	100	--	--	100
11.	Free ammonia (as NH_3) mg/l, Max.	5.0	--	--	5.0
12.	Biochemical Oxygen demand [1][3 days at 27°C] mg/l max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/l, max.	250	--	--	250
14.	Arsenic (as As), mg/l, max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg), mg/l, Max.	0.01	0.01	--	0.01
16.	Lead (as Pb) mg/l, Max.	0.1	1.0	--	2.0
17.	Cadmium (as Cd) mg/l, Max.	2.0	1.0	--	2.0
18.	Hexavalent Chromium (as Cr+6), mg/l max.	0.1	2.0	--	1.0

[1] Substituted by Rule2 of the Environment (Protection) Amendment Rules, 1996 notified by G.S.R.176, dated 2.4.1996 may be read as BOD (3 days at 27°C) wherever BOD 5 days 20°C occurred.

S. No	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
19.	Total chromium (as Cr.) mg/l, Max.	2.0	2.0	—	2.0
20.	Copper (as Cu) mg/l, Max.	3.0	3.0	—	3.0
21.	Zinc (As Zn.) mg/l, Max.	5.0	15	—	15
22.	Selenium (as Se.) mg/l, Max.	0.05	0.05	—	0.05
23.	Nickel (as Ni) mg/l, Max.	3.0	3.0	—	5.0
[1]24.	* * *	*	*	*	*
[1]25.	* * *	*	*	*	*
[1]26.	* * *	*	*	*	*
27.	Cyanide (as CN) mg/l Max.	0.2	2.0	0.2	0.2
[1]28.	* * *	*	*	*	*
29.	Fluoride (as F) mg/l Max.	2.0	15	—	15
30.	Dissolved Phosphates (as P), mg/l Max.	5.0	—	—	—
[1]31.	* * *	*	*	*	*
32.	Sulphide (as S) mg/l Max.	2.0	—	—	5.0
33.	Phenolic compounds (as C_6H_5OH) mg/l, Max.	1.0	5.0	—	5.0

[1] Omitted by Rule 2(d)(i) of the Environment (Protection) Third Amendment Rules, 1993 vide Notification No.G.S.R.801(E), dated 31.12.1992.

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2			3	
		(a)	(b)	(c)	(d)
34.	Radioactive materials				
	(a) Alpha emitter micro curie/ml	10^{-7}	10^{-7}	10^{-8}	10^{-7}
	(b) Beta emitter micro curie/ml	10^{-6}	10^{-6}	10^{-7}	10^{-6}
35.	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
36.	Manganese (as Mn)	2 mg/l	2 mg/l	--	2 mg/l
37.	Iron (as Fe)	3 mg/l	3 mg/l	--	3 mg/l
38.	Vanadium (as V)	0.2 mg/l	0.2 mg/l	--	0.2 mg/l
39.	Nitrate Nitrogen	10 mg/l	--	--	20 mg/l
[1]40.	* * *	*	*	*	*

[1] Omitted by Rule 2(d)(i) of the Environment (Protection) Third Amendment Rules, 1993 vide Notification No. G.S.R. 801(E) dated 31.12.1993

Appendix 29: Impact and Mitigation for ponds along Nanao to Dadao (MDR 82W)

S. No.	Chainage (km)	Side	Distance from Center line(m)	Use	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
1	*0.73*	*LHS*	*5*	*Waste Water disposal/ Eutrophied*	*241.8*	*90*	*45*	1.41% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (22m)**	Nil*
2	*0.8*	*LHS*	*10*	*Waste Water disposal/ Eutrophied*	*2590*	*0*	*0*	1. high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (28m)	Nil*
3	*3.78*	*LHS*	*10*	*Irrigation*	*494*	*0*	*0*	1. high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	Silt fencing (32m)	Nil
4	*11.1*	*RHS*	*8*	*Waste Water Pond/ Eutrophied*	*1350*	*38*	*19*	1. 3% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (22m)**	Nil*
5	*15.18*	*LHS*	*16*	*Storage of Rainwater/ Domestic use/ Eutrophied*	*2480*	*0*	*0*	1. Low risk of oil spill 2. low risk of siltation	1. Low risk of oil spill 2. low risk of siltation	Less	can be taken up for complete enhancement (Silt fencing during construction / enhancement for 74m)	

Source:PPTA Consultant

** As it receives domestic wastes and managing domestic waste is not in the scope of this project*

***Retaining wall shall be provided if required for stability of road along the waste disposal ponds that are getting reclaimed*

note-length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road

Source:PPTA Consultant

Impact and Mitigation for ponds along Hussainganj to Alipur (MDR 81C)

S. No.	Chainage	Side	Distance from CL(m)	Uses	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
1	13.500	RHS	6.5	Storage of Rainwater/ Eutrophied	810.0	105	157.5	1. 12% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1. Retaining wall (30m) 2.Deepening	
2	13.600	LHS	5.0	Storage of Rainwater/ Eutrophied	200.0	100	150	1. 50% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1. Retaining wall (20 m) 2.Deepening	
3	14.900	LHS	3.5	Storage of Rainwater/ Eutrophied	247.0	123.5	154.375	1. 50% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1. Retaining wall (20 m) 2.Deepening	
4	16.350	LHS	4.5	Storage of Rainwater/ Eutrophied	702.0	143	71.5	1. 20% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1. Retaining wall (26 m) 2.Deepening	
5	18.600	LHS	4.0	Domestic uses/ Eutrophied	500.0	60	60	1. 12% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	moderate	1. Retaining wall (10m) 2.Deepening	
6	19.000	LHS	6.0	Storage of Rainwater	300.0	60	90	1.20% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (15m) 2. Deepening	
7	19.400	LHS	20.0	Storage of Rainwater	600.0	0	0	1. Low risk of oil spill 2. low risk of siltation	1. Low risk of oil spill 2. low risk of siltation	less	Silt Fencing (34m)	Nil
8	21.050	RHS	10.0	Domestic uses/ Eutrophied	600.0	0	0	1. High risk of oil spill 2. High risk of siltation	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt fencing (34m)	Nil *
9	23.500	RHS	9.0	Storage of Rainwater	1750.0	25	25	1. 2% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	severe	1.Retaining wall (25m) 2. Deepening	

S. No.	Chainage	Side	Distance from CL(m)	Uses	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
10	*23.500*	*RHS*	*12.0*	*Storage of Rainwater/ Eutrophied*	*300.0*	0	0	1. High risk of siltation 2. High risk of Oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt fencing (20m)	
11	*24.100*	*RHS*	*15.0*	*Domestic uses*	*4200.0*	0	0	1. Low risk of siltation 2. Low risk of Oil spill	1. Low risk of siltation 2. Low risk of Oil spill	Less (only 10 % of the ponds boundary faces the road)	Can be considered for complete enhancement (Reconstruction of the Embankment with turfing)	
12	*28.500*	*RHS*	*4.5*	*Storage of Rainwater*	*1200.0*	110	165	1. 9% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (20m) 2.Deepening	
13	*35.800*	*LHS*	*8.0*	*Storage of Rainwater*	*50.0*	10	10	1. 20% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1. Retaining wall (5m) 2.Deepening	
14	*36.700*	*LHS*	*18.0*	*Storage of Rainwater*	*6000.0*	0	0	No impact	No impact	Negligible	Nil(Intervening structures are present)	
15	*36.800*	*LHS*	*12.0*	*Storage of Rainwater*	*1400.0*	0	0	1. High risk of siltation 2. High risk of Oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (44m) +intercepting ditch +small sedimentation pit	
16	*39.100*	*LHS*	*20.0*	*Storage of Rainwater*	*2400.0*	0	0	1. Low risk of oil spill 2. Low of siltation	1. Low risk of oil spill 2. low risk of siltation	less	Silt Fencing (40m)	Nil
17	*46.600*	*RHS*	*13.0*	*Storage of Rainwater*	*1800.0*	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	Silt Fencing (44m)+ intercepting ditch +small sedimentation pit	Nil

S. No.	*Chainage*	*Side*	*Distance from CL(m)*	*Uses*	*Total area (sq.m)*	*Impacted area in sq.m*	*volumetric capacity loss (cum)*	*Impact (construction)*	*Impact (Operation)*	*Degree of Impact*	*Mitigation (Construction)*	*Mitigation (Operation)*
18	*47.600*	*LHS*	*15.0*	*domestic use/ waste disposal*	*150.0*	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of siltation 2. Low risk of Oil spill	Moderate	Silt Fencing (19 m) + intercepting ditch +small sedimentation pit	Nil*

Source: PPTA Consultant
** As it receives domestic wastes and managing domestic waste is not in the scope of this project*
***Retaining wall shall be provided if required for stability of road along the waste disposal ponds that are getting reclaimed*
Note-length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road

Impact and Mitigation for ponds along Muzaffarnagar to Baraut (MDR 135W)

S. No.	*Chainage (km)*	*Side*	*Distance from Center line(m)*	*Use*	*Total area (sq.m)*	*Impacted area in sq.m*	*volumetric capacity loss (cum)*	*Impact (construction)*	*Impact (Operation)*	*Degree of Impact*	*Mitigation (Construction)*	*Mitigation (Operation)*
1	9.970	RHS	10	domestic use	4875	0	0	1. high risk of siltation 2. Hish risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	Can be taken up for complete enhancement as it is still not much degraded	
2	10.230	RHS	12	Waste Disposal/ Eutrophied	1924	0	0	1. High risk of siltation 2. Hish risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Intercepting ditch (56 m) and small sedimentation pit	Nil*
3	16.770	RHS	6	Waste Disposal/ Eutrophied	16799	428	856	1 .3% reclamation 2. high risk of siltation 3. Hish risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (161 m)**	Nil*
4	25.490	RHS	7	domestic use	1344	126	220.5	1. 9% reclamation 2. high risk of siltation 3. Hish risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	severe	1.Retaining wall (42m) 2. Deepening	
5	45.400	RHS	8	Domestic use/ eutrophied	2030	58	29	1.3% reclamation 2. high risk of siltation 3. Hish risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	severe	1.Retaining wall (29m) 2. Deepening 3.Cleaning	
6	61.550	LHS	7	Domestic use	2416	207	51.75	1. 9% reclamation 2. high risk of siltation 3. Hish risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	severe	1.Retaining wall (69m) 2. Deepening	

Source:PPTA Consultant

** As it receives domestic wastes and managing domestic waste is not in the scope of this project*

***Retaining wall shall be provided if required for stability of road along the waste disposal ponds that are getting reclaimed*

note-length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road

Impact and Mitigation for ponds along Haliyapur to Kurebhar (MDR 66E)

S. No.	*Chainage (km)*	*Side*	*Distance from Center line(m)*	*Use*	*Total area (sq.m)*	*Impacted area in sq.m*	*volumetric capacity loss (cum)*	*Impact (construction)*	*Impact (Operation)*	*Degree of Impact*	*Mitigation (Construction)*	*Mitigation (Operation)*
1	1.600	LHS	7	Waste Water Pond	352	15	3.75	1. 4% reclamation 2. Moderate risk of siltation 3. Moderate risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	moderate (10% of the boundary faces the road)	Silt fencing (12m)**	Nil*
2	2.500	RHS	20	Fishing/ rain water storage/ recharge	1935	0	0	No Impact	No Impact	Negligible	Nil as Earthen embankment already exists	
3	3.670	RHS	8	Domestic use	1080	54	54	1. 5% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	severe	1.Retaining wall (28 m) 2. Deepening 3.Cleaning	
4	14.450	LHS	15	Waste Water Pond	792	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of siltation 2. Low risk of Oil spill	Moderate	Intercepting ditch (37m) + small sedimentation pit	Nil*
5	19.025	LHS	6.5	Waste Water Pond	2542	164.5	123.375	1. 6% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (45m)**	Nil*
6	20.410	RHS	15	domestic use	3010	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of siltation 2. Low risk of Oil spill	Moderate	Silt Fencing (43 m)+ intercepting ditch and sedimentation pit	Nil

S. No.	Chainage (km)	Side	Distance from Center line(m)	Use	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
7	37.260	LHS	7	Waste Water Pond	1170	90	22.5	1.7% reclamation 2. Moderate risk of siltation 3. Moderate risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	Moderate	Silt fencing (43m)**	Nil*
8	40.280	RHS	20	Fishing/ rain water storage/ recharge	3300	0	0	No Impact	No Impact	Negligible	Nil as shrubs and a road is present in the intervening space.	
9	47.090	LHS	6	Waste Water Pond	700	64	48	1. 9% reclamation 2. Moderate risk of siltation 3. Moderate risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	moderate	1.Silt fencing (29m)**	Nil*
10	48.240	RHS	6	Waste Water Pond	575	36	18	1. 6% reclamation 2. Moderate risk of siltation 3. Moderate risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	moderate	Silt fencing (29m)**	Nil*
11	58.280	On Both Sides of the Road	5	Waste Water Pond	1980	85	63.75	1. 4% reclamation 2. Moderate risk of siltation 3. Moderate risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	moderate	Silt fencing (40m)**	Nil*
12	61.730	LHS	6.5	Waste Water Pond	1575	269.5	67.375	1. 17% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	moderate	Silt fencing (79m)**	Nil*

S. No.	Chainage (km)	Side	Distance from Center line(m)	Use	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
13	62.320	RHS	8	Fishing/ irrigation	1512	48	48	1. 3% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	severe	1. Retaining wall (24m) 2. Deepening	
14	68.250	LHS	18	Domestic use	3192	0	0	1. Low risk of siltation 2. Low risk of Oil spill	1. Low risk of siltation 2. Low risk of Oil spill	Less	Silt Fencing (42 m)	Nil
15	76.500	RHS	15	Domestic use /Fishing	17952	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of siltation 2. Low risk of Oil spill	Moderate	Can be taken up for complete enhancement	
16	77.000	RHS	5	Waste Water Pond	2100	350	87.5	1. 16% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Low risk of siltation 2. Low risk of Oil spill	Moderate	Silt Fencing (74m)**	Nil*
17	90.050	LHS	7	Domestic use/ fishing/ irrigation	3328	138	172.5	1. 4% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (60 m) 2. Deepening	
18	91.400	Both Sides	8	Domestic use/Fishing	3078	60	75	1. 2% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	Can be taken up for complete enhancement (It is attached to a canal that will help keep fresh water that can be used to recharge ground water)	

Source: PPTA Consultant

** As it receives domestic wastes and managing domestic waste is not in the scope of this project*

***Retaining wall shall be provided if required for stability of road along the waste disposal ponds that are getting reclaimed*

Note-*length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road*

Impact and Mitigation for ponds along Bulandshahar to Annopshahar (MDR 58W)

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
1	*20.850*	*LHS*	16	Irrigation / rain water storage	700	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	Silt Fencing (39 m)	Nil
2	*48.050*	*RHS*	5	Irrigation / rain water storage	250	150	112.5	1. 60% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (54 m) 2. Deepening	

Source: PPTA Consultant
note-length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road

Impact and Mitigation for ponds along Kaptanganj to Naurangia (ODR-24)

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	Volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
1	6+700	Both side	crossing	Storage of Rainwater	346360	0	0	1. Moderate risk of siltation 2.Moderate risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.Silt fencing (100 m)	Nil
2	12.400	LHS	10.0	Storage of Rainwater	900	0	0	1. High risk of siltation 2.High risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	Severe	1.Silt fencing (29 m)	Nil
3	16.600	Both Side	crossing	storage of Rainwater	1400	0	0	1. Moderate risk of siltation 2.Moderate risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	1.Silt fencing (34 m)	NIl
4	16.700	LHS	10.0	storage of Rainwater	2000	0	0	1. High risk of siltation 2.High risk of oil spill	1. Moderate risk of oil spill 2.	Severe	1.Silt fencing (10m)	NIl

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	Volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
									Moderate of siltation			
5	19.600	RHS	15.0	Storage of Rainwater	100	0	0	1. Moderate risk of siltation 2.Moderate risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	Moderate	1. Silt fencing (65m) + intercepting ditches and small sedimentation pit	Nil

Source:PPTA Consultant

** As it receives domestic wastes and managing domestic waste is not in the scope of this project*

***Note**-length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road*

Impact and Mitigation for ponds along Kaptanganj to Varhaaj (MDR-25E)

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
1	17.700	Both side	10.0	Storage of Rainwater	8000	0	0	1. High risk of siltation 2.High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	Can be taken up for complete enhancement	
2	24.100	RHS	15.0	Storage of Rainwater	1600	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.Silt fencing (70 m) +intercepting ditches and small sedimentation pit	Nil
3	32.100	LHS	10.0	Storage of Rainwater	3000	0	0	1. High risk of siltation 2.High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Silt fencing (28 m)	Nil

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
4	45.900	RHS	15.000	Storage of Rainwater	3750	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1. Silt fencing (70m) +intercepting ditches and small sedimentation chamber	Nil
5	55.700	RHS	15.000	Storage of Rainwater	3000	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.Silt fencing (65 m) +intercepting ditches and small sedimentation chamber	Nil
6	56.400	crossing	crossing	Storage of Rainwater	900	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Low	1.Silt fencing (24 m)	Nil, as culvert wall is present and length facing the road is only 3m
7	58.500	RHS	30.000	Storage of Rainwater	8000	0	0	No impact	No impact	Negligible	Can be taken up for enhancement (landscaping)	
8	59.700	LHS	20.000	Storage of Rainwater	450	0	0	1. Low risk of oil spill 2. low risk of siltation	1. Low risk of oil spill 2. low risk of siltation	Low	Silt fencing (30m)	Nil

Source:PPTA Consultant

** As it receives domestic wastes and managing domestic waste is not in the scope of this project*

Note-*length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road*

Impact and Mitigation for ponds along Mohanlalganj to Maurawan to unnao Marg (MDR-52 C)

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	Volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
1	0.280	Both side	9	Waste disposal	770	35	52.5	1. 4% reclamation 2.Moderate risk of siltation 3. Moderate risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (39m)**	Nil*
2	2.48.	LHS	11	Waste disposal	660	0	0	1.High risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Intercepting ditch+ small sedimentation pit (34m)	Nil*
3	6.800	crossing	crossing	Irrigation		0	0	1. Moderate risk of siltation 2.Moderate risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (12m)	Nil, as culvert wall is present and length facing the road is only 3m
4	7.800	RHS	10	Waste disposal	2500	0	0	1.high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (54m)	Nil*
5	7.850	LHS	10	Waste disposal	4000	0	0	1.high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (44m)	Nil*
6	8.000	RHS	5	Waste disposal	1000	100	150	1. 10% reclamation 2. Moderate risk of siltation 3. Moderate risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (54m)**	Nil*
7	8.050	Both side	7	Waste disposal	1000	280	560	1. 28% reclamation 2. Moderate risk of siltation 3.Moderate risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (44m)**	Nil*

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	Volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
8	8.300	LHS	8	Waste disposal	2500	30	45	1. 2% reclamation 2. Moderate risk of siltation 3. Moderate risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (44m)**	Nil*
9	8.300	RHS	8	Irrigation	450	30	75	1. 6% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (34 m) 2. Deepening	
10	8.600	LHS	8	Storage of Rainwater	300	30	90	1. 10% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (24 m) 2. Deepening	
11	15.200	LHS	12	Storage of Rainwater	4520	0	0	1.high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	severe	1.Silt fencing (45 m) +intercepting ditch + small sedimentation pit	
12	17.200	RHS	15	Irrigation	750	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.Silt fencing (20 m) ++intercepting ditch + small sedimentation pit	
13	17.800	RHS	15	Storage of Rainwater	400	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.Silt fencing (20 m) +intercepting ditch + small sedimentation pit	
14	18.500	RHS	15	Waste disposal	1200	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	Intercepting ditch (44m) + small sedimentation pit	Nil*
15	18.670	LHS	15	Waste disposal	1400	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	Intercepting ditch (44m) + small sedimentation pit	Nil*

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	Volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
16	19.920	LHS	15	Waste disposal	1000	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	Intercepting ditch (44m) + small sedimentation pit	Nil*
17	24.000	RHS	20	Waste disposal	1200	0	0	1. Low risk of oil spill 2. low risk of siltation	1. Low risk of oil spill 2. low risk of siltation	Low	Intercepting ditch (44m) + small sedimentation pit	Nil*
18	28.300	LHS	10	Storage of Rainwater	100	0	0	1. High risk of siltation 2.High risk of oil spill	1. Low risk of oil spill 2. low risk of siltation	Severe	1.Silt fencing (14 m)	Nil
19	31.200	LHS	8	Storage of Rainwater	400	40	80	1. 10% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (24 m) 2. Deepening	
20	32.300	LHS	10	Waste disposal	1200	0	0	1.high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (44m)	Nil*
21	32.900	RHS	7	Storage of Rainwater	900	90	90	1. 10% reclamation 2. high risk of siltation 3. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Severe	1.Retaining wall (34 m) 2. Deepening	
22	33.700	crossing	crossing	Waste disposal	800	0	0	1.high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Silt Fencing (44m)	Nil*
23	44.800	RHS	12	Waste disposal	400	0	0	1.high risk of siltation 2. High risk of oil spill	1. Moderate risk of oil spill 2. Moderate of siltation	Moderate	Intercepting ditch (24m) + small sedimentation pit	Nil*

S. No.	Chainage	Side	Distance from CL (m)	Uses	Total area (sq.m)	Impacted area in sq.m	Volumetric capacity loss (cum)	Impact (construction)	Impact (Operation)	Degree of Impact	Mitigation (Construction)	Mitigation (Operation)
24	45.000	RHS	15	Domestic Uses	1200	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1. Can be taken up for enhancement	
25	47.400	RHS	25	Marshy /fishery	1110000	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.can be taken up for enhancement in the form of landscaping. Silt fencing shall be provided (150m)	
26	49.000	LHS	15	Storage of Rainwater	600	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.Silt fencing (44 m) ++intercepting channel +small sedimentation pit	
27	49.200	RHS	15	Fishing	7200	0	0	1. Moderate risk of oil spill 2. Moderate of siltation	1. Low risk of oil spill 2. low risk of siltation	Moderate	1.Silt fencing (70 m) +intercepting channel +small sedimentation pit	Nil

** As it receives domestic wastes and managing domestic waste is not in the scope of this project*
***Retaining wall shall be provided if required for stability of road along the waste disposal ponds that are getting reclaimed*
Note-*length of silt fencing is 4 m (2m on either side) more than the length of pond facing the road*
Source: PPTA Consultant

APPENDIX 30: RESULTS OF TEEMP MODEL FOR NANAO TO DADAO

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	57277.9798	55389.26	55389.26	56832.981	59264.44	59264.44	58805.2881	59299.67	59299.67
2018	2475.30466	2374.706	2374.706	2454.6174	2530.195	2530.195	2558.60081	2530.195	2530.195
2019	2509.3446	2410.14	2410.14	2490.79602	2569.258	2569.258	2593.31203	2569.258	2569.258
2020	2547.60715	2449.523	2449.523	2531.04112	2612.583	2612.583	2632.37136	2612.583	2612.583
2021	2590.11363	2492.9	2492.9	2575.39428	2660.221	2660.221	2675.79876	2660.221	2660.221
2022	2636.90966	2540.332	2540.332	2623.91872	2712.246	2712.246	2723.6393	2712.246	2712.246
2023	2688.06354	2591.902	2591.902	2676.69815	2768.752	2768.752	2775.96148	2768.752	2768.752
2024	2722.36698	2627.159	2627.159	2712.62087	2807.753	2807.753	2810.87317	2807.753	2807.753
2025	2760.16674	2665.718	2665.718	2740.62005	2850.323	2850.323	2837.67126	2850.323	2850.323
2026	2801.47924	2707.609	2707.609	2783.27603	2896.497	2896.497	2879.71072	2896.497	2896.497
2027	2846.33548	2752.873	2752.873	2829.38579	2946.323	2946.323	2925.37935	2946.323	2946.323
2028	2894.78014	2801.564	2801.564	2879.00331	2999.863	2999.863	2974.72174	2999.863	2999.863
2029	2928.69696	2836.147	2836.147	2914.10942	3038.205	3038.205	3009.12212	3038.205	3038.205
2030	2965.47111	2873.445	2873.445	2951.9936	3079.484	3079.484	3046.44688	3079.484	3079.484
2031	3005.11465	2913.477	2913.477	2981.01182	3123.723	3123.723	3074.69712	3123.723	3123.723
2032	3047.64874	2956.272	2956.272	3024.44249	3170.956	3170.956	3117.84382	3170.956	3170.956
2033	3093.10309	3001.865	3001.865	3070.72476	3221.224	3221.224	3163.96719	3221.224	3221.224
2034	3125.6146	3034.857	3034.857	3104.10002	3257.878	3257.878	3196.83448	3257.878	3257.878
2035	3160.57561	3070.185	3070.185	3128.08198	3297.06	3297.06	3220.10244	3297.06	3297.06
2036	3197.99909	3107.869	3107.869	3166.18824	3338.793	3338.793	3257.93113	3338.793	3338.793
2037	3281.28418	3180.713	3180.713	3194.95693	3383.103	3383.103	3330.30288	3418.334	3418.334

PM (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	65.44	65.44	65.44
2018	2.56	2.56	2.56
2019	2.65	2.65	2.65
2020	2.73	2.73	2.73
2021	2.81	2.81	2.81
2022	2.90	2.90	2.90
2023	3.00	3.00	3.00
2024	3.07	3.07	3.07
2025	3.14	3.14	3.14
2026	3.21	3.21	3.21
2027	3.29	3.29	3.29
2028	3.36	3.36	3.36
2029	3.42	3.42	3.42
2030	3.48	3.48	3.48
2031	3.54	3.54	3.54
2032	3.60	3.60	3.60
2033	3.66	3.66	3.66
2034	3.70	3.70	3.70
2035	3.74	3.74	3.74
2036	3.78	3.78	3.78
2037	3.81	3.81	3.81

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	774.75	774.75	774.75
2018	27.54	27.54	27.54
2019	28.66	28.66	28.66
2020	29.84	29.84	29.84
2021	31.07	31.07	31.07
2022	32.37	32.37	32.37
2023	33.72	33.72	33.72
2024	34.83	34.83	34.83
2025	35.98	35.98	35.98
2026	37.18	37.18	37.18
2027	38.41	38.41	38.41
2028	39.70	39.70	39.70
2029	40.75	40.75	40.75
2030	41.83	41.83	41.83
2031	42.94	42.94	42.94
2032	44.08	44.08	44.08
2033	45.25	45.25	45.25
2034	46.19	46.19	46.19
2035	47.15	47.15	47.15
2036	48.13	48.13	48.13
2037	49.12	49.12	49.12

Construction	CO2
	(tons)
TOTAL	3288
2018	3288
2019	0
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0
2037	0

Source: TEEMP Output (PPTA Consultant)

RESULTS OF TEEMP MODEL FOR MUZAFFARNAGAR TO BARAUT

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	352452.725	550635.9	550635.9	479320.065	585034	585034	482654.6	585371	585371
2018	13934.0622	22396.15	22396.15	18920.7559	24507.93	24507.93	19079.165	24507.93	24507.93
2019	14191.2546	22920.92	22920.92	19322.5929	25380.05	25380.05	19430.52	25380.05	25380.05
2020	14499.6176	23488.3	23488.3	19740.2934	26015	26015	19852.53	26015	26015
2021	14820.4206	24099.43	24099.43	20174.8323	27024.29	27024.29	20291.646	27024.29	27024.29
2022	15154.4469	24755.62	24755.62	20627.2666	27764.97	27764.97	20748.947	27764.97	27764.97
2023	15502.5475	25458.4	25458.4	21098.7451	28097.92	28097.92	21225.606	28097.92	28097.92
2024	15865.6491	25920.9	25920.9	21590.5175	28177.71	28177.71	21722.901	28177.71	28177.71
2025	16244.7623	26417.3	26417.3	22103.947	28312.41	28312.41	22242.228	28312.41	28312.41
2026	16640.9918	26948.17	26948.17	22640.5227	28500.07	28500.07	22785.109	28500.07	28500.07
2027	17055.5474	27514.19	27514.19	23201.8747	29101.43	29101.43	23353.215	29101.43	29101.43
2028	17489.7572	28116.15	28116.15	23789.7919	29422.65	29422.65	23948.379	29422.65	29422.65
2029	17945.0821	28510.78	28510.78	24406.2411	29893.32	29893.32	24572.616	29893.32	29893.32
2030	18423.1332	28933.54	28933.54	25053.3902	30397.12	30397.12	25228.151	30397.12	30397.12
2031	18925.6918	29384.66	29384.66	25733.6348	31001.28	31001.28	25917.443	31001.28	31001.28
2032	19454.7325	29864.45	29864.45	26449.6292	31372.86	31372.86	26643.219	31372.86	31372.86
2033	20012.4503	30373.3	30373.3	27204.3219	31643.03	31643.03	27408.51	31643.03	31643.03
2034	20601.2923	30722.34	30722.34	28000.9983	31875.75	31875.75	28216.696	31875.75	31875.75
2035	21223.9957	31093.12	31093.12	28843.3302	32010.61	32010.61	29071.559	32010.61	32010.61
2036	21883.6316	31485.71	31485.71	29735.4348	32174.33	32174.33	29977.341	32174.33	32174.33
2037	22583.6586	32232.45	32232.45	30681.9446	32361.23	32361.23	30938.821	32698.24	32698.24

PM (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	418.90	656.17	656.17
2018	24.56	24.56	24.56
2019	24.18	25.52	25.52
2020	23.80	26.52	26.52
2021	23.42	27.55	27.55
2022	23.04	28.62	28.62
2023	22.66	29.74	29.74
2024	22.28	30.56	30.56
2025	21.90	31.40	31.40
2026	21.52	32.25	32.25
2027	21.14	33.13	33.13
2028	20.75	34.02	34.02
2029	20.37	34.64	34.64
2030	19.99	35.27	35.27
2031	19.61	35.90	35.90
2032	19.23	36.54	36.54
2033	18.85	37.17	37.17
2034	18.47	37.59	37.59
2035	18.09	38.00	38.00
2036	17.71	38.40	38.40
2037	17.33	38.79	38.79

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	5873.79	9548.13	9548.13
2018	326.15	326.15	326.15
2019	322.73	341.65	341.65
2020	319.31	357.93	357.93
2021	315.90	375.04	375.04
2022	312.48	393.02	393.02
2023	309.06	411.90	411.90
2024	305.65	426.76	426.76
2025	302.23	442.18	442.18
2026	298.81	458.19	458.19
2027	295.40	474.80	474.80
2028	291.98	492.03	492.03
2029	288.56	505.52	505.52
2030	285.15	519.41	519.41
2031	281.73	533.70	533.70
2032	278.31	548.41	548.41
2033	274.90	563.55	563.55
2034	271.48	575.69	575.69
2035	268.07	588.06	588.06
2036	264.65	600.66	600.66
2037	261.23	613.48	613.48

Construction	CO2
	(tons)
TOTAL	6028
2018	6028
2019	0
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0
2037	0

Source: TEEMP Output (PPTA Consultant)

RESULTS OF TEEMP MODEL FOR BULANDSHAHAR TO ANOOPSHAHAR

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	284591.532	282816	282816	300175.2	300175.2	300175.2	302255.36	300358.6	300358.6
2017	10842.2684	10752.25	10752.25	11699.999	11700	11700	11797.954	11700	11700
2018	11172.9091	11082.54	11082.54	12064.024	12064.02	12064.02	12162.425	12064.02	12064.02
2019	11527.0841	11436.16	11436.16	12524.248	12524.25	12524.25	12623.871	12524.25	12524.25
2020	11905.6493	11813.98	11813.98	12941.745	12941.74	12941.74	13042.233	12941.74	12941.74
2021	12309.5618	12216.96	12216.96	13468.446	13468.45	13468.45	13570.615	13468.45	13468.45
2022	12739.8785	12646.17	12646.17	13944.254	13944.25	13944.25	14047.686	13944.25	13944.25
2023	13061.1194	12967.11	12967.11	14138.589	14138.59	14138.59	14241.196	14138.59	14138.59
2024	13401.6335	13307.17	13307.17	14358.977	14358.98	14358.98	14460.998	14358.98	14358.98
2025	13761.9617	13666.9	13666.9	14605.255	14605.26	14605.26	14706.912	14605.26	14605.26
2026	14142.7036	14046.91	14046.91	15012.903	15012.9	15012.9	15115.365	15012.9	15012.9
2027	14544.5174	14447.85	14447.85	15303.394	15303.39	15303.39	15405.827	15303.39	15303.39
2028	14843.6009	14746.74	14746.74	15485.059	15485.06	15485.06	15586.771	15485.06	15485.06
2029	15158.5075	15061.34	15061.34	15811.828	15811.83	15811.83	15913.851	15811.83	15811.83
2030	15489.5699	15391.98	15391.98	16156.421	16156.42	16156.42	16258.882	16156.42	16156.42
2031	15837.1584	15739.04	15739.04	16519.278	16519.28	16519.28	16622.299	16519.28	16519.28
2032	16201.6795	16102.92	16102.92	16839.231	16839.23	16839.23	16942.512	16839.23	16839.23
2033	16468.3883	16369.57	16369.57	17055.933	17055.93	17055.93	17158.853	17055.93	17055.93
2034	16748.2993	16649.33	16649.33	17225.994	17225.99	17225.99	17328.255	17225.99	17225.99
2035	17041.6149	16942.4	16942.4	17410.67	17410.67	17410.67	17512.466	17410.67	17410.67
2036	17393.4261	17428.64	17428.64	17608.957	17608.96	17608.96	17756.384	17792.34	17792.34

PM (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	323.71172	323.7117	323.7117
2017	11.819889	11.81989	11.81989
2018	12.312252	12.31225	12.31225
2019	12.823988	12.82399	12.82399
2020	13.355624	13.35562	13.35562
2021	13.907676	13.90768	13.90768
2022	14.48064	14.48064	14.48064
2023	14.922549	14.92255	14.92255
2024	15.374534	15.37453	15.37453
2025	15.836469	15.83647	15.83647
2026	16.308181	16.30818	16.30818
2027	16.78945	16.78945	16.78945
2028	17.142108	17.14211	17.14211
2029	17.496655	17.49666	17.49666
2030	17.852589	17.85259	17.85259
2031	18.209359	18.20936	18.20936
2032	18.566361	18.56636	18.56636
2033	18.796277	18.79628	18.79628
2034	19.021413	19.02141	19.02141
2035	19.241097	19.2411	19.2411
2036	19.454609	19.45461	19.45461

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	4800.45247	4800.452	4800.452
2017	160.519618	160.5196	160.5196
2018	168.486166	168.4862	168.4862
2019	176.858116	176.8581	176.8581
2020	185.655487	185.6555	185.6555
2021	194.899188	194.8992	194.8992
2022	204.61105	204.6111	204.6111
2023	212.536035	212.536	212.536
2024	220.761005	220.761	220.761
2025	229.29605	229.296	229.296
2026	238.151483	238.1515	238.1515
2027	247.337828	247.3378	247.3378
2028	254.720067	254.7201	254.7201
2029	262.303639	262.3036	262.3036
2030	270.092223	270.0922	270.0922
2031	278.089418	278.0894	278.0894
2032	286.298732	286.2987	286.2987
2033	292.649395	292.6494	292.6494
2034	299.113694	299.1137	299.1137
2035	305.691354	305.6914	305.6914
2036	312.381919	312.3819	312.3819

Construction	CO2
	(tons)
TOTAL	4055.2
2017	4055.2
2018	0
2019	0
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0

Source: TEEMP Output (PPTA Consultant)

RESULTS OF TEEMP MODEL FOR HUSSAINGANJ TO ALIPUR

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	51259.8278	50238.31	50238.31	51194.572	54309.54	54309.54	52604.933	54695.2	54695.2
2017	2039.01281	1989.894	1989.894	2033.014	2133.269	2133.269	2100.6381	2151.129	2151.129
2018	2087.84677	2038.835	2038.835	2082.9445	2188.019	2188.019	2150.4124	2205.876	2205.876
2019	2140.94342	2091.914	2091.914	2137.0742	2247.276	2247.276	2204.5564	2265.174	2265.174
2020	2198.42198	2149.257	2149.257	2195.5325	2311.189	2311.189	2263.1904	2329.169	2329.169
2021	2260.42315	2211.009	2211.009	2258.4689	2379.924	2379.924	2326.4569	2398.028	2398.028
2022	2327.10857	2277.338	2277.338	2326.0531	2453.673	2453.673	2394.5197	2471.938	2471.938
2023	2376.74299	2326.974	2326.974	2376.6216	2509.255	2509.255	2445.0756	2527.549	2527.549
2024	2429.82802	2379.974	2379.974	2430.6058	2568.51	2568.51	2499.1666	2586.863	2586.863
2025	2486.4425	2436.419	2436.419	2488.0907	2631.535	2631.535	2556.8722	2649.978	2649.978
2026	2546.67742	2496.406	2496.406	2549.1726	2698.44	2698.44	2618.2844	2717	2717
2027	2610.63555	2560.038	2560.038	2613.9593	2769.344	2769.344	2683.507	2788.05	2788.05
2028	2657.19174	2606.603	2606.603	2661.3542	2821.612	2821.612	2730.8795	2840.338	2840.338
2029	2706.49482	2655.852	2655.852	2702.96	2876.811	2876.811	2772.3467	2895.58	2895.58
2030	2758.58958	2707.83	2707.83	2755.7781	2934.997	2934.997	2825.3168	2953.831	2953.831
2031	2813.52797	2762.594	2762.594	2811.4194	2996.234	2996.234	2881.1903	3015.154	3015.154
2032	2871.36886	2820.203	2820.203	2869.9459	3060.591	3060.591	2940.0267	3079.618	3079.618
2033	2912.43927	2861.338	2861.338	2911.7316	3106.909	3106.909	2981.718	3125.931	3125.931
2034	2955.68296	2904.597	2904.597	2955.6703	3155.544	3155.544	3025.6293	3174.578	3174.578
2035	3001.12091	2950.003	2950.003	2992.9588	3206.525	3206.525	3062.769	3225.588	3225.588
2036	3079.32856	3011.234	3011.234	3041.2167	3259.884	3259.884	3142.3767	3293.832	3293.832

PM (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	49.99	49.99	49.99
2017	1.93	1.93	1.93
2018	2.00	2.00	2.00
2019	2.07	2.07	2.07
2020	2.14	2.14	2.14
2021	2.21	2.21	2.21
2022	2.28	2.28	2.28
2023	2.34	2.34	2.34
2024	2.40	2.40	2.40
2025	2.46	2.46	2.46
2026	2.52	2.52	2.52
2027	2.58	2.58	2.58
2028	2.63	2.63	2.63
2029	2.67	2.67	2.67
2030	2.72	2.72	2.72
2031	2.76	2.76	2.76
2032	2.80	2.80	2.80
2033	2.83	2.83	2.83
2034	2.86	2.86	2.86
2035	2.88	2.88	2.88
2036	2.91	2.91	2.91

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	656.14	656.14	656.14
2017	22.97	22.97	22.97
2018	23.96	23.96	23.96
2019	25.00	25.00	25.00
2020	26.08	26.08	26.08
2021	27.21	27.21	27.21
2022	28.40	28.40	28.40
2023	29.39	29.39	29.39
2024	30.42	30.42	30.42
2025	31.48	31.48	31.48
2026	32.58	32.58	32.58
2027	33.72	33.72	33.72
2028	34.64	34.64	34.64
2029	35.58	35.58	35.58
2030	36.54	36.54	36.54
2031	37.53	37.53	37.53
2032	38.54	38.54	38.54
2033	39.32	39.32	39.32
2034	40.11	40.11	40.11
2035	40.92	40.92	40.92
2036	41.73	41.73	41.73

Construction	CO2
	(tons)
TOTAL	5370.4
2017	5370.4
2018	0
2019	0
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0

Source: TEEMP Output (PPTA Consultant)

RESULTS OF TEEMP MODEL FOR HALIYAPUR TO KHUREBHAR

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	123719.384	121287.1	121287.1	123648.76	129635.7	129635.7	127009.17	130543.4	130543.4
2017	4974.80778	4854.967	4854.967	4965.7608	5160.081	5160.081	5130.9368	5203.282	5203.282
2018	5094.02735	4974.656	4974.656	5088.5703	5290.999	5290.999	5253.0988	5334.1	5334.1
2019	5222.94619	5103.761	5103.761	5220.9643	5432.021	5432.021	5385.2338	5475.12	5475.12
2020	5361.80261	5242.536	5242.536	5363.2078	5583.438	5583.438	5527.584	5626.629	5626.629
2021	5510.88053	5391.28	5391.28	5515.6088	5745.586	5745.586	5680.4387	5788.959	5788.959
2022	5670.50798	5550.332	5550.332	5678.5172	5918.845	5918.845	5844.1323	5962.487	5962.487
2023	5782.85039	5663.069	5663.069	5794.033	6042.576	6042.576	5959.0944	6086.13	6086.13
2024	5903.033	5783.438	5783.438	5917.317	6174.515	6174.515	6082.1112	6218.054	6218.054
2025	6031.19443	5911.588	5911.588	6048.5246	6314.833	6314.833	6213.3229	6358.428	6358.428
2026	6167.50023	6047.694	6047.694	6180.3273	6463.73	6463.73	6345.1946	6507.448	6507.448
2027	6312.14182	6191.956	6191.956	6318.2283	6621.432	6621.432	6483.3661	6665.338	6665.338
2028	6411.33921	6291.604	6291.604	6413.3599	6731.282	6731.282	6577.7058	6775.068	6775.068
2029	6516.94859	6397.5	6397.5	6521.4252	6847.854	6847.854	6685.3686	6891.58	6891.58
2030	6629.0369	6509.72	6509.72	6635.9062	6971.239	6971.239	6799.6593	7014.959	7014.959
2031	6747.68857	6628.355	6628.355	6749.0615	7101.543	7101.543	6912.6476	7145.31	7145.31
2032	6873.00469	6753.512	6753.512	6866.4825	7238.889	7238.889	7030.0511	7282.755	7282.755
2033	6961.93983	6842.889	6842.889	6950.5276	7337.675	7337.675	7113.3325	7381.416	7381.416
2034	7055.93825	6937.202	6937.202	7046.4534	7441.776	7441.776	7208.8209	7485.437	7485.437
2035	7155.03838	7036.497	7036.497	7139.4181	7551.245	7551.245	7301.3442	7594.87	7594.87
2036	7336.75715	7174.516	7174.516	7235.0619	7666.148	7666.148	7475.7217	7745.983	7745.983

PM (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	144.09616	144.0962	144.0962
2017	5.3805416	5.380542	5.380542
2018	5.5896308	5.589631	5.589631
2019	5.8066674	5.806667	5.806667
2020	6.0318686	6.031869	6.031869
2021	6.2654464	6.265446	6.265446
2022	6.5076061	6.507606	6.507606
2023	6.6922359	6.692236	6.692236
2024	6.8809495	6.88095	6.88095
2025	7.0736974	7.073697	7.073697
2026	7.2704124	7.270412	7.270412
2027	7.4710084	7.471008	7.471008
2028	7.6123775	7.612377	7.612377
2029	7.7544246	7.754425	7.754425
2030	7.8969478	7.896948	7.896948
2031	8.0397255	8.039725	8.039725
2032	8.1825151	8.182515	8.182515
2033	8.2759832	8.275983	8.275983
2034	8.3671281	8.367128	8.367128
2035	8.4556733	8.455673	8.455673
2036	8.5413251	8.541325	8.541325

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	2073.53709	2073.537	2073.537
2017	70.7838558	70.78386	70.78386
2018	74.1257853	74.12579	74.12579
2019	77.6340155	77.63402	77.63402
2020	81.3167211	81.31672	81.31672
2021	85.1824428	85.18244	85.18244
2022	89.2400997	89.2401	89.2401
2023	92.5234326	92.52343	92.52343
2024	95.9288799	95.92888	95.92888
2025	99.4605505	99.46055	99.46055
2026	103.122644	103.1226	103.1226
2027	106.919446	106.9194	106.9194
2028	109.886405	109.8864	109.8864
2029	112.93297	112.933	112.933
2030	116.060536	116.0605	116.0605
2031	119.270459	119.2705	119.2705
2032	122.564056	122.5641	122.5641
2033	125.157256	125.1573	125.1573
2034	127.790307	127.7903	127.7903
2035	130.462837	130.4628	130.4628
2036	133.174393	133.1744	133.1744

Construction	CO2
	(tons)
TOTAL	10412
2017	10412
2018	0
2019	0
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0

Source: TEEMP Output (PPTA Consultant)

RESULTS OF TEEMP MODEL FOR NAURANGIA -KAPTANGANJ -RUDRAPUR

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business -as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	141843.514	140295.8	140295.8	142664.9	150957.6	150957.6	144327.21	151050.5	151050.5
2018	5780.00	5696.58	5696.58	5868.41	6107.42	6107.42	5954.41	6107.42	6107.42
2019	5905.30	5822.74	5822.74	5988.02	6245.44	6245.44	6072.90	6245.44	6245.44
2020	6041.36	5959.44	5959.44	6127.85	6394.89	6394.89	6212.04	6394.89	6394.89
2021	6188.39	6106.91	6106.91	6264.31	6556.03	6556.03	6347.92	6556.03	6556.03
2022	6346.68	6265.47	6265.47	6426.20	6729.19	6729.19	6509.53	6729.19	6729.19
2023	6516.56	6435.43	6435.43	6599.76	6914.74	6914.74	6682.98	6914.74	6914.74
2024	6638.58	6558.03	6558.03	6714.96	7049.27	7049.27	6797.37	7049.27	7049.27
2025	6769.36	6689.24	6689.24	6848.65	7193.15	7193.15	6930.62	7193.15	7193.15
2026	6909.06	6829.22	6829.22	6975.56	7346.55	7346.55	7057.12	7346.55	7346.55
2027	7057.83	6978.15	6978.15	7117.21	7509.68	7509.68	7198.41	7509.68	7509.68
2028	7215.89	7136.23	7136.23	7277.96	7682.77	7682.77	7359.12	7682.77	7682.77
2029	7327.95	7248.74	7248.74	7365.94	7806.65	7806.65	7446.35	7806.65	7806.65
2030	7447.33	7368.46	7368.46	7487.24	7938.36	7938.36	7567.30	7938.36	7938.36
2031	7574.11	7495.47	7495.47	7599.36	8077.99	8077.99	7679.08	8077.99	8077.99
2032	7708.39	7629.87	7629.87	7727.89	8225.66	8225.66	7807.35	8225.66	8225.66
2033	7850.30	7771.81	7771.81	7856.27	8381.52	8381.52	7935.52	8381.52	8381.52
2034	7957.10	7878.93	7878.93	7957.78	8499.62	8499.62	8036.65	8499.62	8499.62
2035	8069.92	7991.99	7991.99	8049.77	8624.17	8624.17	8128.20	8624.17	8624.17
2036	8188.84	8111.07	8111.07	8154.14	8755.25	8755.25	8232.24	8755.25	8755.25
2037	8350.56	8322.01	8322.01	8257.60	8919.27	8919.27	8372.10	9012.16	9012.16

PM (tons)	Business -as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	167.76	167.76	167.76
2018	6.38	6.38	6.38
2019	6.61	6.61	6.61
2020	6.85	6.85	6.85
2021	7.10	7.10	7.10
2022	7.36	7.36	7.36
2023	7.62	7.62	7.62
2024	7.82	7.82	7.82
2025	8.03	8.03	8.03
2026	8.24	8.24	8.24
2027	8.46	8.46	8.46
2028	8.68	8.68	8.68
2029	8.83	8.83	8.83
2030	8.99	8.99	8.99
2031	9.15	9.15	9.15
2032	9.30	9.30	9.30
2033	9.46	9.46	9.46
2034	9.57	9.57	9.57
2035	9.67	9.67	9.67
2036	9.77	9.77	9.77
2037	9.86	9.86	9.86

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	2360.85	2360.85	2360.85
2018	82.42	82.42	82.42
2019	86.03	86.03	86.03
2020	89.82	89.82	89.82
2021	93.79	93.79	93.79
2022	97.94	97.94	97.94
2023	102.30	102.30	102.30
2024	105.86	105.86	105.86
2025	109.54	109.54	109.54
2026	113.36	113.36	113.36
2027	117.32	117.32	117.32
2028	121.41	121.41	121.41
2029	124.66	124.66	124.66
2030	127.99	127.99	127.99
2031	131.40	131.40	131.40
2032	134.90	134.90	134.90
2033	138.50	138.50	138.50
2034	141.41	141.41	141.41
2035	144.38	144.38	144.38
2036	147.39	147.39	147.39
2037	150.44	150.44	150.44

Construction	CO2
	(tons)
TOTAL	9206.4
2018	9206.4
2019	0
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0
2037	0

Source: TEEMP Output (PPTA Consultant)

RESULTS OF TEEMP MODEL FOR MOHANLALGANJ TO UNNAO

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	115064.3	113585.3	113585.3	119328.6	123831.3	123831.3	120958.4	123909.8	123909.8
2017	4239.664	4170.48	4170.48	4269.483	4505.219	4505.219	4340.309	4505.219	4505.219
2018	4348.438	4279.328	4279.328	4380.345	4625.943	4625.943	4451.082	4625.943	4625.943
2019	4454.387	4385.364	4385.364	4481.756	4744.103	4744.103	4552.288	4744.103	4744.103
2020	4579.002	4509.756	4509.756	4598.759	4881.964	4881.964	4669.362	4881.964	4881.964
2021	5159.311	5083.099	5083.099	5165.097	5506.102	5506.102	5242.531	5506.102	5506.102
2022	5310.943	5234.24	5234.24	5301.845	5673.805	5673.805	5379.533	5673.805	5673.805
2023	5428.11	5351.409	5351.409	5411.011	5804.1	5804.1	5488.56	5804.1	5804.1
2024	5549.994	5473.206	5473.206	5517.936	5939.62	5939.62	5595.347	5939.62	5939.62
2025	5679.36	5602.366	5602.366	5631.729	6083.27	6083.27	5709.123	6083.27	6083.27
2026	5815.839	5738.533	5738.533	5751.977	6245.756	6245.756	5829.462	6245.756	6245.756
2027	5963.802	5886.029	5886.029	5903.631	6409.607	6409.607	5981.631	6409.607	6409.607
2028	6061.501	5983.905	5983.905	6016.954	6541.055	6541.055	6094.962	6541.055	6541.055
2029	6169.99	6092.413	6092.413	6143.012	6662.469	6662.469	6221.206	6662.469	6662.469
2030	6286.146	6208.479	6208.479	6349.234	6792.163	6792.163	6428.598	6792.163	6792.163
2031	6407.903	6330.066	6330.066	6522.741	6927.851	6927.851	6602.86	6927.851	6927.851
2032	6535.289	6457.207	6457.207	6794.259	7082.878	7082.878	6876.272	7082.878	7082.878
2033	6619.259	6541.437	6541.437	6970.258	7177.559	7177.559	7052.991	7177.559	7177.559
2034	6709.637	6631.982	6631.982	7271.985	7279.276	7279.276	7356.861	7279.276	7279.276
2035	6804.417	6726.861	6726.861	7923.251	7410.209	7410.209	8014.152	7410.209	7410.209
2036	6941.289	6899.126	6899.126	8923.289	7538.396	7538.396	9071.317	7616.901	7616.901

PM (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	118.1665	118.1665	118.1665
2017	4.159315	4.159315	4.159315
2018	4.314648	4.314648	4.314648
2019	4.462434	4.462434	4.462434
2020	4.626964	4.626964	4.626964
2021	5.252837	5.252837	5.252837
2022	5.439078	5.439078	5.439078
2023	5.591139	5.591139	5.591139
2024	5.741708	5.741708	5.741708
2025	5.895072	5.895072	5.895072
2026	6.051256	6.051256	6.051256
2027	6.214288	6.214288	6.214288
2028	6.319887	6.319887	6.319887
2029	6.431034	6.431034	6.431034
2030	6.545541	6.545541	6.545541
2031	6.658346	6.658346	6.658346
2032	6.770538	6.770538	6.770538
2033	6.831858	6.831858	6.831858
2034	6.894155	6.894155	6.894155
2035	6.953941	6.953941	6.953941
2036	7.012453	7.012453	7.012453

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	1661.832	1661.832	1661.832
2017	53.11889	53.11889	53.11889
2018	55.54583	55.54583	55.54583
2019	57.97031	57.97031	57.97031
2020	60.62435	60.62435	60.62435
2021	69.39021	69.39021	69.39021
2022	72.52707	72.52707	72.52707
2023	75.20453	75.20453	75.20453
2024	77.91485	77.91485	77.91485
2025	80.72943	80.72943	80.72943
2026	83.6546	83.6546	83.6546
2027	86.75967	86.75967	86.75967
2028	89.08568	89.08568	89.08568
2029	91.52497	91.52497	91.52497
2030	94.10329	94.10329	94.10329
2031	96.68592	96.68592	96.68592
2032	99.36834	99.36834	99.36834
2033	101.3168	101.3168	101.3168
2034	103.3559	103.3559	103.3559
2035	105.4298	105.4298	105.4298
2036	107.5219	107.5219	107.5219

Construction	CO2
	(tons)
TOTAL	5918.4
2017	5918.4
2018	0
2019	0
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0.6831
2036	0

Source: TEEMP Output (PPTA Consultant)

RESULTS OF TEEMP MODEL FOR ALIGANJ TO SORON

CO2 (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Roughness			Capacity			Capacity + Roughness		
	37498.87	37018.94	37018.94	37692.53	39857.03	39857.03	38205.31	39882.1	39882.1
2019	1477.583	1453.471	1453.471	1495.181	1559.247	1559.247	1519.984	1559.247	1559.247
2020	1513.809	1489.767	1489.767	1532.352	1598.985	1598.985	1557.079	1598.985	1598.985
2021	1554.611	1530.556	1530.556	1574.181	1643.469	1643.469	1598.918	1643.469	1643.469
2022	1596.797	1572.701	1572.701	1617.36	1689.541	1689.541	1642.134	1689.541	1689.541
2023	1645.136	1620.904	1620.904	1666.793	1742.069	1742.069	1691.704	1742.069	1742.069
2024	1693.225	1668.859	1668.859	1710.685	1794.478	1794.478	1735.654	1794.478	1794.478
2025	1732.099	1707.73	1707.73	1750.436	1836.945	1836.945	1775.405	1836.945	1836.945
2026	1773.23	1748.821	1748.821	1792.411	1881.891	1881.891	1817.418	1881.891	1881.891
2027	1812.482	1788.052	1788.052	1827.02	1924.915	1924.915	1851.973	1924.915	1924.915
2028	1861.915	1837.328	1837.328	1877.292	1978.636	1978.636	1902.404	1978.636	1978.636
2029	1907.618	1882.92	1882.92	1918.152	2028.533	2028.533	1943.304	2028.533	2028.533
2030	1944.852	1920.152	1920.152	1956.016	2069.322	2069.322	1981.168	2069.322	2069.322
2031	1984.108	1959.377	1959.377	1990.975	2112.241	2112.241	2016.096	2112.241	2112.241
2032	2022.885	1998.122	1998.122	2025.288	2154.727	2154.727	2050.377	2154.727	2154.727
2033	2066.991	2042.132	2042.132	2069.864	2202.782	2202.782	2095.049	2202.782	2202.782
2034	2110.5	2085.549	2085.549	2108.65	2250.349	2250.349	2133.868	2250.349	2250.349
2035	2142.454	2117.544	2117.544	2135.746	2285.53	2285.53	2160.861	2285.53	2285.53
2036	2178.659	2153.739	2153.739	2173.227	2327.465	2327.465	2198.36	2327.465	2327.465
2037	2215.573	2190.63	2190.63	2210.383	2367.804	2367.804	2235.538	2367.804	2367.804
2038	2264.341	2250.587	2250.587	2260.522	2408.098	2408.098	2298.021	2433.176	2433.176

PM (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	46.12867	46.12867	46.12867
2019	1.733674	1.733674	1.733674
2020	1.797414	1.797414	1.797414
2021	1.865003	1.865003	1.865003
2022	1.933441	1.933441	1.933441
2023	2.007407	2.007407	2.007407
2024	2.079916	2.079916	2.079916
2025	2.139516	2.139516	2.139516
2026	2.200763	2.200763	2.200763
2027	2.25673	2.25673	2.25673
2028	2.324089	2.324089	2.324089
2029	2.384319	2.384319	2.384319
2030	2.432003	2.432003	2.432003
2031	2.480035	2.480035	2.480035
2032	2.524788	2.524788	2.524788
2033	2.575063	2.575063	2.575063
2034	2.620003	2.620003	2.620003
2035	2.648321	2.648321	2.648321
2036	2.680763	2.680763	2.680763
2037	2.710051	2.710051	2.710051
2038	2.735374	2.735374	2.735374

Nox (tons)	Business-as-usual scenario	Project without Induced Traffic	Project with Induced Traffic
	Capacity		
	705.4673	705.4673	705.4673
2019	24.42811	24.42811	24.42811
2020	25.51415	25.51415	25.51415
2021	26.63178	26.63178	26.63178
2022	27.8248	27.8248	27.8248
2023	29.07885	29.07885	29.07885
2024	30.3762	30.3762	30.3762
2025	31.45281	31.45281	31.45281
2026	32.62052	32.62052	32.62052
2027	33.72683	33.72683	33.72683
2028	34.99528	34.99528	34.99528
2029	36.2196	36.2196	36.2196
2030	37.2513	37.2513	37.2513
2031	38.30529	38.30529	38.30529
2032	39.35776	39.35776	39.35776
2033	40.51394	40.51394	40.51394
2034	41.62833	41.62833	41.62833
2035	42.49219	42.49219	42.49219
2036	43.43925	43.43925	43.43925
2037	44.35356	44.35356	44.35356
2038	45.25679	45.25679	45.25679

Construction	CO2
	(tons)
TOTAL	3890.8
2019	3890.8
2020	0
2021	0
2022	0
2023	0
2024	0
2025	0
2026	0
2027	0
2028	0
2029	0
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0
2037	0
2038	0

Source: TEEMP Output (PPTA Consultant)

Appendix 31: Predicted Noise Levels along the MDR 82W-Nanao to Dadao

Chainage No	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Honking & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
0.11	School	RHS	10	55.6	46.1	60.9	51.2	51.9	42.2	44.9	35.2
0.71	School	LHS	8	57.4	47.9	62.6	52.9	53.6	43.9	46.6	36.9
6.50	School	LHS	7	58.4	48.9	63.7	54.0	54.7	45.0	47.7	38.0
9.10	College	LHS	7	58.4	48.9	63.7	54.0	54.7	45.0	47.7	38.0
9.63	School	LHS	7	58.4	48.9	63.7	54.0	54.7	45.0	47.7	38.0
11.78	College	LHS	9	56.4	47.0	61.7	52.0	52.7	43.0	45.7	36.0
14.60	School	RHS	9	56.4	47.0	61.7	52.0	52.7	43.0	45.7	36.0
14.78	School	LHS	7	58.4	48.9	63.7	54.0	54.7	45.0	47.7	38.0
14.78	School	LHS	30	46.7	37.2	52.0	42.3	43.0	33.3	36.0	26.3
16.65	School	LHS	12	54.2	44.7	59.4	49.7	50.4	40.7	43.4	33.7
18.40	School	RHS	12	54.2	44.7	59.4	49.7	50.4	40.7	43.4	33.7
19.50	Community Health Centre	LHS	12	54.2	44.7	59.4	49.7	50.4	40.7	43.4	33.7
19.65	School	LHS	12	54.2	44.7	59.4	49.7	50.4	40.7	43.4	33.7
19.75	School	LHS	7	58.4	48.9	63.7	54.0	54.7	45.0	47.7	38.0
20.38	Private Clinic	LHS	6	59.6	50.1	64.8	55.2	55.8	46.2	48.8	39.2
22.00	School	RHS	9	56.4	47.0	61.7	52.0	52.7	43.0	45.7	36.0
23.18	School	RHS	9	56.4	47.0	61.7	52.0	52.7	43.0	45.7	36.0
23.61	School	LHS	10	55.6	46.1	60.9	51.2	51.9	42.2	44.9	35.2
26.22	School	LHS	10	55.6	46.1	60.9	51.2	51.9	42.2	44.9	35.2
27.52	College	RHS	13	53.5	44.0	58.8	49.1	49.8	40.1	42.8	33.1
28.90	College	LHS	12	54.2	44.7	59.4	49.7	50.4	40.7	43.4	33.7
28.91	Primary Health Centre	RHS	8	57.4	47.9	62.6	52.9	53.6	43.9	46.6	36.9
29.40	College	LHS	8	57.4	47.9	62.6	52.9	53.6	43.9	46.6	36.9
29.97	School	RHS	9	56.4	47.0	61.7	52.0	52.7	43.0	45.7	36.0

Source: CoRTN Output (DPR Consultant)

Appendix 31: Predicted Noise Levels along the MDR BULANDSHAR – ANOOPSHAR ROAD

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit and Hornkey		Year 2030 with Speed Limit, Horn Key & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
20.40	School	LHS	19.0	55.1	51.0	61.0	56.3	58.0	53.3	51.0	46.3
23.40	Hospital	LHS	33.3	50.6	46.5	56.5	51.7	53.5	48.7	46.5	41.7
24.75	School	LHS	18.0	55.6	51.5	61.5	56.7	58.5	53.7	51.5	46.7
24.90	School	RHS	17.8	55.7	51.6	61.6	56.8	58.6	53.8	51.6	46.8
25.00	College	RHS	17.3	55.9	51.8	61.8	57.1	58.8	54.1	51.8	47.1
25.30	College	RHS	18.8	55.2	51.1	61.1	56.4	58.1	53.4	51.1	46.4
26.00	College	RHS	17.5	55.8	51.7	61.7	57.0	58.7	54.0	51.7	47.0
31.90	School	RHS	15.0	57.1	52.9	62.9	58.2	59.9	55.2	52.9	48.2
32.24	College	LHS	15.8	56.6	52.5	62.5	57.8	59.5	54.8	52.5	47.8
32.90	College	RHS	16.0	56.5	52.4	62.4	57.7	59.4	54.7	52.4	47.7
35.05	School	LHS	19.8	54.8	50.7	60.7	56.0	57.7	53.0	50.7	46.0
38.35	Hospital	RHS	19.2	55.1	51.0	60.9	56.2	57.9	53.2	50.9	46.2
38.75	College	LHS	19.1	55.1	51.0	61.0	56.3	58.0	53.3	51.0	46.3
40.00	Hospital	RHS	22.5	53.8	49.7	59.7	54.9	56.7	51.9	49.7	44.9
43.20	School	LHS	18.0	55.6	51.5	61.5	56.7	58.5	53.7	51.5	46.7
43.65	School	RHS	18.7	55.3	51.2	61.2	56.4	58.2	53.4	51.2	46.4
47.00	School	RHS	62.0	45.5	41.4	51.4	46.7	48.4	43.7	41.4	36.7
48.40	School	LHS	16.4	56.3	52.2	62.2	57.5	59.2	54.5	52.2	47.5
50.96	School	LHS	18.9	55.2	51.1	61.1	56.3	58.1	53.3	51.1	46.3
51.35	College	LHS	43.2	48.5	44.4	54.3	49.6	51.3	46.6	44.3	39.6
52.91	School	RHS	10.5	59.9	55.8	65.8	61.1	62.8	58.1	55.8	51.1
54.75	School	RHS	17.6	55.8	51.7	61.7	56.9	58.7	53.9	51.7	46.9
55.32	College	LHS	63.5	45.3	41.2	51.2	46.5	48.2	43.5	41.2	36.5
56.50	School	LHS	16.2	56.4	52.3	62.3	57.6	59.3	54.6	52.3	47.6
56.60	College / School	RHS	16.6	56.2	52.1	62.1	57.4	59.1	54.4	52.1	47.4

Predicted Noise Levels along MDR 135W-Muzaffarnagar to Baraut

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Honking & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
3.84	School	RHS	16.6	56.3	53.6	61.8	58.4	52.8	49.4	45.8	42.4
7.70	School	LHS	16.8	56.2	53.5	61.7	58.3	52.7	49.3	45.7	42.3
9.20	School	RHS	19.0	55.2	52.5	60.7	57.3	51.7	48.3	44.7	41.3
10.40	Madarsha	RHS	16.0	56.6	53.9	62.1	58.7	53.1	49.7	46.1	42.7
12.55	School	RHS	17.0	56.1	53.4	61.6	58.2	52.6	49.2	45.6	42.2
15.82	School	LHS	14.0	57.7	55.0	63.2	59.8	54.2	50.8	47.2	43.8
19.00	College	LHS	14.2	57.5	54.8	63.1	59.7	54.1	50.7	47.1	43.7

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Honking & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
19.08	Community Health Centre	LHS	24.8	53.0	50.3	58.5	55.2	49.5	46.2	42.5	39.2
19.10	College	RHS	13.0	58.3	55.6	63.8	60.4	54.8	51.4	47.8	44.4
19.25	School	LHS	16.2	56.5	53.8	62.0	58.6	53.0	49.6	46.0	42.6
19.60	Hospital	RHS	29.8	51.5	48.8	57.0	53.7	48.0	44.7	41.0	37.7
19.72	School	LHS	17.0	56.1	53.4	61.6	58.2	52.6	49.2	45.6	42.2
19.80	College	LHS	44.5	48.3	45.6	53.8	50.4	44.8	41.4	37.8	34.4
19.90	Hospital	RHS	10.8	59.7	57.0	65.2	61.9	56.2	52.9	49.2	45.9
20.30	Hospital	LHS	13.0	58.3	55.6	63.8	60.4	54.8	51.4	47.8	44.4
20.34	Hospital	RHS	9.0	61.2	58.5	66.7	63.3	57.7	54.3	50.7	47.3
20.35	Hospital	RHS	8.5	61.6	58.9	67.1	63.8	58.1	54.8	51.1	47.8
20.40	Hospital	LHS	12.5	58.6	55.9	64.1	60.7	55.1	51.7	48.1	44.7
20.70	Hospital	LHS	14.5	57.4	54.7	62.9	59.5	53.9	50.5	46.9	43.5
21.08	School	RHS	18.1	55.6	52.9	61.1	57.7	52.1	48.7	45.1	41.7
21.80	College	LHS	16.6	56.3	53.6	61.8	58.4	52.8	49.4	45.8	42.4
24.70	School	LHS	12.1	58.8	56.1	64.3	61.0	55.3	52.0	48.3	45.0
26.32	School	RHS	15.0	57.1	54.4	62.6	59.2	53.6	50.2	46.6	43.2
27.85	School	LHS	15.3	56.9	54.2	62.5	59.1	53.5	50.1	46.5	43.1
29.8	Hospital	LHS	18.2	55.5	52.8	61.0	57.7	52.0	48.7	45.0	41.7
31.80	School	LHS	12.5	58.6	55.9	64.1	60.7	55.1	51.7	48.1	44.7
35.25	College	RHS	12.2	58.8	56.1	64.3	60.9	55.3	51.9	48.3	44.9
35.90	College	LHS	15.7	56.7	54.0	62.2	58.9	53.2	49.9	46.2	42.9
41.32	College	RHS	13.8	57.8	55.1	63.3	59.9	54.3	50.9	47.3	43.9
43.00	Primary Health Centre	LHS	23.4	53.5	50.8	59.0	55.6	50.0	46.6	43.0	39.6
45.38	School	LHS	4.0	67.3	64.6	72.8	69.4	63.8	60.4	56.8	53.4
47.82	College	RHS	10.6	59.9	57.2	65.4	62.0	56.4	53.0	49.4	46.0
52.90	College	LHS	13.8	57.8	55.1	63.3	59.9	54.3	50.9	47.3	43.9
53.99	College	LHS	13.8	57.8	55.1	63.3	59.9	54.3	50.9	47.3	43.9
53.99	I.T.I College	LHS	14.2	57.5	54.8	63.1	59.7	54.1	50.7	47.1	43.7
55.92	Primary Health Centre	RHS	38.7	49.4	46.7	54.9	51.5	45.9	42.5	38.9	35.5
56.03	College	RHS	10.9	59.7	57.0	65.2	61.8	56.2	52.8	49.2	45.8
57.00	Veterinary Hospital	LHS	38.0	49.6	46.9	55.1	51.7	46.1	42.7	39.1	35.7
58.00	School	RHS	15.5	56.8	54.1	62.3	59.0	53.3	50.0	46.3	43.0
59.10	School	LHS	16.8	56.2	53.5	61.7	58.3	52.7	49.3	45.7	42.3
61.28	School	LHS	14.2	57.5	54.8	63.1	59.7	54.1	50.7	47.1	43.7
61.34	School	LHS	12.0	58.9	56.2	64.4	61.0	55.4	52.0	48.4	45.0
61.80	I.T.I College	LHS	6.4	63.9	61.1	69.4	66.0	60.4	57.0	53.4	50.0
61.90	College / School	RHS	9.6	60.7	58.0	66.2	62.8	57.2	53.8	50.2	46.8
61.90	College	LHS	5.2	65.4	62.7	70.9	67.5	61.9	58.5	54.9	51.5

Source: CoRTN Output (DPR Consultant)

Predicted Noise Levels along MDR 81C-Hussainganj to Alipur

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
15.10	School	RHS	33.0	44.4	40.2	50.3	46.2	41.3	37.2	34.3	30.2
16.50	School	LHS	9.4	54.5	50.3	60.4	56.4	51.4	47.4	44.4	40.4
16.95	School	LHS	55.2	40.2	36.0	46.1	42.0	37.1	33.0	30.1	26.0
17.10	College	RHS	5.2	59.1	54.9	65.0	60.9	56.0	51.9	49.0	44.9
17.12	College	RHS	5.1	59.2	55.0	65.1	61.1	56.1	52.1	49.1	45.1
17.42	School	LHS	11.7	52.7	48.6	58.7	54.6	49.7	45.6	42.7	38.6
17.70	School	LHS	55.5	40.1	35.9	46.0	42.0	37.0	33.0	30.0	26.0
18.35	Hospital	RHS	38.8	43.0	38.8	49.0	44.9	40.0	35.9	33.0	28.9
18.90	School	LHS	8.2	55.6	51.4	61.5	57.4	52.5	48.4	45.5	41.4
18.90	School	LHS	8.2	55.6	51.4	61.5	57.4	52.5	48.4	45.5	41.4
19.85	School	RHS	17.2	49.6	45.5	55.6	51.5	46.6	42.5	39.6	35.5
20.15	Hospital	RHS	20.0	48.4	44.2	54.3	50.3	45.3	41.3	38.3	34.3
20.55	School	LHS	11.0	53.2	49.1	59.2	55.1	50.2	46.1	43.2	39.1
20.60	College	RHS	5.6	58.5	54.3	64.4	60.4	55.4	51.4	48.4	44.4
20.61	School	LHS	10.2	53.8	49.7	59.8	55.7	50.8	46.7	43.8	39.7
22.15	School	RHS	6.6	57.3	53.1	63.2	59.1	54.2	50.1	47.2	43.1
22.15	College	RHS	6.6	57.3	53.1	63.2	59.1	54.2	50.1	47.2	43.1
23.20	School	RHS	20.0	48.4	44.2	54.3	50.3	45.3	41.3	38.3	34.3
26.25	School	RHS	17.6	49.5	45.3	55.4	51.3	46.4	42.3	39.4	35.3
26.30	College	RHS	27.0	46.0	41.8	51.9	47.9	42.9	38.9	35.9	31.9
27.40	Hospital	RHS	12.0	52.5	48.4	58.5	54.4	49.5	45.4	42.5	38.4
28.07	College	LHS	12.0	52.5	48.4	58.5	54.4	49.5	45.4	42.5	38.4
28.17	School	RHS	17.0	49.7	45.6	55.7	51.6	46.7	42.6	39.7	35.6
28.70	School	RHS	25.0	46.6	42.4	52.5	48.5	43.5	39.5	36.5	32.5
29.25	School	RHS	14.1	51.2	47.1	57.2	53.1	48.2	44.1	41.2	37.1
29.70	School	RHS	16.2	50.1	45.9	56.0	52.0	47.0	43.0	40.0	36.0
33.00	School	LHS	23.2	47.2	43.0	53.1	49.1	44.1	40.1	37.1	33.1
33.88	School	RHS	28.5	45.5	41.4	51.5	47.4	42.5	38.4	35.5	31.4
34.25	School	RHS	68.1	38.4	34.3	44.4	40.3	35.4	31.3	28.4	24.3
36.03	School	RHS	22.5	47.5	43.3	53.4	49.3	44.4	40.3	37.4	33.3
37.14	School	LHS	10.6	53.5	49.4	59.5	55.4	50.5	46.4	43.5	39.4
37.18	School	RHS	8.9	54.9	50.7	60.8	56.8	51.8	47.8	44.8	40.8
37.60	Hospital	LHS	10.5	53.6	49.4	59.5	55.5	50.5	46.5	43.5	39.5
37.93	School	LHS	43.5	42.1	37.9	48.0	44.0	39.0	35.0	32.0	28.0
38.50	College	LHS	9.5	54.4	50.2	60.3	56.3	51.3	47.3	44.3	40.3
38.70	College	LHS	17.3	49.6	45.4	55.5	51.5	46.5	42.5	39.5	35.5
41 .050	Hospital	RHS	16.0	50.2	46.0	56.1	52.1	47.1	43.1	40.1	36.1
41.80	School	RHS	8.0	55.8	51.6	61.7	57.6	52.7	48.6	45.7	41.6
41.92	School	RHS	7.6	56.2	52.0	62.1	58.0	53.1	49.0	46.1	42.0
47.00	School	RHS	42.3	42.3	38.1	48.2	44.2	39.2	35.2	32.2	28.2
48.65	Maha Vidyalaya	RHS	8.4	55.4	51.2	61.3	57.3	52.3	48.3	45.3	41.3

Source: CoRTN Output (DPR Consultant)

Predicted Noise Levels along MDR 66E- Haliyapur to Khurebhar

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
2+050	School	RHS	6.0	57.8	54.5	63.9	60.3	54.9	51.3	47.9	44.3
3+000	School	RHS	12.0	52.3	49.1	58.5	54.8	49.5	45.8	42.5	38.8
4+990	School	RHS	13.5	51.4	48.1	57.5	53.9	48.5	44.9	41.5	37.9
5+600	School	LHS	12.0	52.3	49.1	58.5	54.8	49.5	45.8	42.5	38.8
16+050	School	LHS	15.0	50.6	47.3	56.7	53.1	47.7	44.1	40.7	37.1
16+150	School	RHS	11.0	53.0	49.8	59.2	55.5	50.2	46.5	43.2	39.5
16+150	School	LHS	15.0	50.6	47.3	56.7	53.1	47.7	44.1	40.7	37.1
16+400	School	RHS	15.0	50.6	47.3	56.7	53.1	47.7	44.1	40.7	37.1
19+300	School	LHS	14.0	51.1	47.8	57.3	53.6	48.3	44.6	41.3	37.6
22+200	School	LHS	11.5	52.7	49.4	58.8	55.2	49.8	46.2	42.8	39.2
24+300	School	RHS	6.0	57.8	54.5	63.9	60.3	54.9	51.3	47.9	44.3
25+400	School	LHS	11.0	53.0	49.8	59.2	55.5	50.2	46.5	43.2	39.5
25+650	School	LHS	10.5	53.4	50.1	59.6	55.9	50.6	46.9	43.6	39.9
26+700	School	RHS	7.5	56.1	52.8	62.2	58.6	53.2	49.6	46.2	42.6
32+100	School	LHS	10.5	53.4	50.1	59.6	55.9	50.6	46.9	43.6	39.9
34+300	Inter College	LHS	12.0	52.6	47.4	58.7	53.2	49.7	44.2	42.7	37.2
36+250	School	LHS	11.5	53.0	47.8	59.1	53.5	50.1	44.5	43.1	37.5
37+550	School	RHS	12.0	52.6	47.4	58.7	53.2	49.7	44.2	42.7	37.2
38+800	School	LHS	15.0	50.8	45.6	56.9	51.4	47.9	42.4	40.9	35.4
47+150	School	RHS	10.0	54.1	48.9	60.2	54.6	51.2	45.6	44.2	38.6
56+700	School	LHS	8.0	54.7	52.5	60.7	57.9	51.7	48.9	44.7	41.9
61+360	School	LHS	11.0	52.2	50.0	58.2	55.4	49.2	46.4	42.2	39.4
63+370	School	RHS	7.0	55.8	53.5	61.8	59.0	52.8	50.0	45.8	43.0
65+000	School	RHS	8.5	54.2	52.0	60.3	57.4	51.3	48.4	44.3	41.4
65+200	School	RHS	5.5	57.6	55.4	63.6	60.8	54.6	51.8	47.6	44.8
67+450	School	LHS	14.0	50.3	48.0	56.3	53.5	47.3	44.5	40.3	37.5
68+800	School	LHS	9.0	53.8	51.6	59.8	57.0	50.8	48.0	43.8	41.0
70+650	Inter College	LHS	8.0	54.7	52.5	60.7	57.9	51.7	48.9	44.7	41.9
73+650	School	RHS	6.0	56.9	54.7	63.0	60.1	54.0	51.1	47.0	44.1
76+750	Community Health Centre	LHS	10.0	53.0	50.7	59.0	56.2	50.0	47.2	43.0	40.2
77+300	Hospital	RHS	6.0	56.9	54.7	63.0	60.1	54.0	51.1	47.0	44.1
77+400	Angan Wadi	RHS	9.0	53.8	51.6	59.8	57.0	50.8	48.0	43.8	41.0
77+600	School	LHS	7.0	55.8	53.5	61.8	59.0	52.8	50.0	45.8	43.0
77+800	Hospital	LHS	7.0	55.8	53.5	61.8	59.0	52.8	50.0	45.8	43.0
79+350	College	RHS	14.0	50.3	48.0	56.3	53.5	47.3	44.5	40.3	37.5
79+400	Hospital	LHS	11.0	52.2	50.0	58.2	55.4	49.2	46.4	42.2	39.4
81+600	School	RHS	10.0	53.0	50.7	59.0	56.2	50.0	47.2	43.0	40.2
83+850	School	LHS	9.0	53.8	51.6	59.8	57.0	50.8	48.0	43.8	41.0

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
84+150	School	RHS	9.5	53.4	51.1	59.4	56.6	50.4	47.6	43.4	40.6
88+000	School	LHS	9.0	53.8	51.6	59.8	57.0	50.8	48.0	43.8	41.0
91+200	School	LHS	11.0	52.2	50.0	58.2	55.4	49.2	46.4	42.2	39.4
92+300	Govt School	LHS	9.0	53.8	51.6	59.8	57.0	50.8	48.0	43.8	41.0
96+300	School	RHS	14.0	50.3	48.0	56.3	53.5	47.3	44.5	40.3	37.5
97+800	College	LHS	11.0	52.2	50.0	58.2	55.4	49.2	46.4	42.2	39.4
97+820	School	LHS	11.0	52.2	50.0	58.2	55.4	49.2	46.4	42.2	39.4
99+200	School	LHS	15.0	49.7	47.5	55.7	52.9	46.7	43.9	39.7	36.9
99+350	School	LHS	12.0	51.5	49.3	57.5	54.7	48.5	45.7	41.5	38.7

Source: CoRTN Output (DPR Consultant)

Predicted Noise Levels along Naurangiya-Kaptanganj –Rudrapur- ODR 24 & MDR 25E

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
ODR-24 (Kaptanganj to Naurangiya)											
1.35	School	RHS	12.6	52.5	49.9	58.9	56.0	49.9	47.0	42.9	40.0
3.38	School	RHS	65.0	39.2	36.6	45.5	42.6	36.5	33.6	29.5	26.6
4.50	School	RHS	11.9	53.0	50.4	59.3	56.4	50.3	47.4	43.3	40.4
5.87	School	LHS	22.5	47.8	45.3	54.2	51.3	45.2	42.3	38.2	35.3
6.07	School	RHS	5.5	59.0	56.4	65.3	62.4	56.3	53.4	49.3	46.4
6.90	College	LHS	11.0	53.6	51.0	59.9	57.0	50.9	48.0	43.9	41.0
9.66	College	RHS	7.5	56.6	54.1	63.0	60.1	54.0	51.1	47.0	44.1
13.78	Hospital	RHS	59.5	39.4	36.9	45.8	42.9	36.8	33.9	29.8	26.9
13.78	School	RHS	39.0	43.4	40.8	49.7	46.8	40.7	37.8	33.7	30.8
13.84	School	LHS	11.5	53.3	50.7	59.6	56.7	50.6	47.7	43.6	40.7
14.35	School	LHS	11.7	53.1	50.5	59.4	56.6	50.4	47.6	43.4	40.6
15.08	School	LHS	14.2	51.6	49.0	57.9	55.0	48.9	46.0	41.9	39.0
15.08	School	LHS	14.2	51.6	49.0	57.9	55.0	48.9	46.0	41.9	39.0
16.67	School	RHS	7.1	57.1	54.5	63.4	60.5	54.4	51.5	47.4	44.5
17.91	School	RHS	60.0	39.8	37.3	46.2	43.3	37.2	34.3	30.2	27.3
18.65	School	RHS	5.4	59.1	56.6	65.5	62.6	56.5	53.6	49.5	46.6
18.80	School	LHS	15.2	51.0	48.4	57.3	54.4	48.3	45.4	41.3	38.4
19.60	School	RHS	26.4	46.5	44.0	52.9	50.0	43.9	41.0	36.9	34.0
21.90	School	LHS	16.4	50.4	47.8	56.7	53.8	47.7	44.8	40.7	37.8
24.00	School	LHS	12.2	52.8	50.2	59.1	56.2	50.1	47.2	43.1	40.2
MDR-25E (Kaptanganj to Rudrapur)											
0.80	Hospital	LHS	8.4	56.8	52.9	63.4	59.2	54.4	50.2	47.4	43.2
0.80	Hospital	RHS	12.9	53.3	49.5	60.0	55.8	51.0	46.8	44.0	39.8
1.03	College	LHS	33.0	45.7	41.9	52.3	48.2	43.3	39.2	36.3	32.2
1.04	School	RHS	12.0	53.9	50.1	60.5	56.4	51.5	47.4	44.5	40.4
1.10	School	RHS	11.2	54.5	50.7	61.1	56.9	52.1	47.9	45.1	40.9
1.50	School	LHS	54.0	41.7	37.9	48.3	44.2	39.3	35.2	32.3	28.2
5.13	School	RHS	8.1	57.0	53.2	63.7	59.5	54.7	50.5	47.7	43.5
5.20	School	LHS	37.0	44.8	41.0	51.4	47.2	42.4	38.2	35.4	31.2
5.35	School	RHS	5.5	60.0	56.2	66.6	62.5	57.6	53.5	50.6	46.5
5.45	Madrasa	RHS	11.7	54.1	50.3	60.7	56.6	51.7	47.6	44.7	40.6
7.10	School	LHS	36.0	45.0	41.2	51.6	47.5	42.6	38.5	35.6	31.5
7.11	School	LHS	20.0	49.8	46.0	56.4	52.2	47.4	43.2	40.4	36.2
8.95	College	LHS	12.5	53.6	49.8	60.2	56.0	51.2	47.0	44.2	40.0

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
10.75	School	LHS	11.5	54.3	50.5	60.9	56.7	51.9	47.7	44.9	40.7
11.90	School	LHS	10.3	55.1	51.3	61.8	57.6	52.8	48.6	45.8	41.6
13.20	School	RHS	10.7	54.8	51.0	61.5	57.3	52.5	48.3	45.5	41.3
14.98	School	LHS	13.2	53.2	49.3	59.8	55.6	50.8	46.6	43.8	39.6
16.60	School	RHS	22.0	49.0	45.2	55.7	51.5	46.7	42.5	39.7	35.5
17.60	School	LHS	38.1	44.6	40.7	51.2	47.0	42.2	38.0	35.2	31.0
18.02	School	LHS	7.8	57.3	53.5	64.0	59.8	55.0	50.8	48.0	43.8
18.28	School	LHS	14.9	52.2	48.4	58.8	54.6	49.8	45.6	42.8	38.6
18.35	Hospital	RHS	11.0	54.6	50.8	61.2	57.1	52.2	48.1	45.2	41.1
18.60	School	RHS	66.5	40.0	36.2	46.6	42.5	37.6	33.5	30.6	26.5
20.40	School	LHS	13.3	53.1	49.3	59.7	55.5	50.7	46.5	43.7	39.5
18.67	School	LHS	9.2	56.0	52.2	62.7	58.5	53.7	49.5	46.7	42.5
20.99	School	LHS	55.0	41.6	37.8	48.2	44.0	39.2	35.0	32.2	28.0
22.00	School	LHS	94.4	37.2	33.3	43.8	39.6	34.8	30.6	27.8	23.6
23.30	School	LHS	10.6	54.9	51.1	61.5	57.4	52.5	48.4	45.5	41.4
23.40	Academy (School)	LHS	14.2	52.6	48.8	59.2	55.0	50.2	46.0	43.2	39.0
23.55	School	LHS	50.0	42.3	38.5	49.0	44.8	40.0	35.8	33.0	28.8
24.47	School	LHS	44.0	43.4	39.6	50.0	45.8	41.0	36.8	34.0	29.8
25.77	School	RHS	13.8	52.8	49.0	59.4	55.2	50.4	46.2	43.4	39.2
26.00	School	LHS	12.9	53.3	49.5	60.0	55.8	51.0	46.8	44.0	39.8
28.31	School	LHS	14.7	52.3	48.5	58.9	54.7	49.9	45.7	42.9	38.7
28.40	School	LHS	14.0	52.7	48.9	59.3	55.1	50.3	46.1	43.3	39.1
29.25	School	LHS	12.2	53.8	50.0	60.4	56.2	51.4	47.2	44.4	40.2
29.65	School	LHS	20.0	49.8	46.0	56.4	52.2	47.4	43.2	40.4	36.2
29.75	School	RHS	15.0	52.1	48.3	58.8	54.6	49.8	45.6	42.8	38.6
31.32	School	LHS	15.1	52.1	48.3	58.7	54.5	49.7	45.5	42.7	38.5
33.30	College	LHS	14.0	52.7	48.9	59.3	55.1	50.3	46.1	43.3	39.1
33.50	School	LHS	13.9	52.7	48.9	59.4	55.2	50.4	46.2	43.4	39.2
33.80	Hospital	RHS	13.9	52.7	48.9	59.4	55.2	50.4	46.2	43.4	39.2
34.26	School	LHS	11.4	54.3	50.5	61.0	56.8	52.0	47.8	45.0	40.8
34.28	College	LHS	19.5	50.0	46.2	56.6	52.4	47.6	43.4	40.6	36.4
34.25	Hospital	LHS	19.4	50.0	46.2	56.7	52.5	47.7	43.5	40.7	36.5
35.10	School	LHS	20.5	49.6	45.8	56.2	52.0	47.2	43.0	40.2	36.0
35.75	School	LHS	13.0	53.3	49.5	59.9	55.7	50.9	46.7	43.9	39.7
36.55	School	RHS	38.8	44.4	40.6	51.0	46.9	42.0	37.9	35.0	30.9
36.55	College	RHS	58.5	41.1	37.3	47.7	43.5	38.7	34.5	31.7	27.5
37.50	School	LHS	15.0	52.1	48.3	58.8	54.6	49.8	45.6	42.8	38.6
37.82	Hospital	LHS	12.9	53.3	49.5	60.0	55.8	51.0	46.8	44.0	39.8

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
37.82	School	LHS	25.1	50.1	43.1	55.3	48.5	46.3	39.5	39.3	32.5
38.80	School	RHS	14.1	54.8	47.8	60.0	53.2	51.0	44.2	44.0	37.2
39.75	College	LHS	17.3	53.1	46.1	58.3	51.6	49.3	42.6	42.3	35.6
40.00	Hospital	LHS	15.3	54.1	47.1	59.3	52.5	50.3	43.5	43.3	36.5
40.01	School	RHS	7.6	59.7	52.7	64.9	58.1	55.9	49.1	48.9	42.1
40.20	School	LHS	79.7	40.7	33.7	45.9	39.1	36.9	30.1	29.9	23.1
43.85	School	LHS	13.0	55.4	48.4	60.6	53.9	51.6	44.9	44.6	37.9
44.15	School	LHS	8.4	58.9	51.9	64.1	57.3	55.1	48.3	48.1	41.3
44.16	School	RHS	28.5	49.1	42.1	54.3	47.5	45.3	38.5	38.3	31.5
44.16	College	RHS	35.3	47.3	40.3	52.5	45.8	43.5	36.8	36.5	29.8
44.48	College	RHS	15.3	54.1	47.1	59.3	52.5	50.3	43.5	43.3	36.5
44.48	College	LHS	28.3	49.1	42.1	54.3	47.6	45.3	38.6	38.3	31.6
44.59	School	LHS	32.3	48.0	41.1	53.2	46.5	44.2	37.5	37.2	30.5
44.55	School	RHS	60.3	43.0	36.0	48.2	41.4	39.2	32.4	32.2	25.4
44.57	School	RHS	60.3	43.0	36.0	48.2	41.4	39.2	32.4	32.2	25.4
44.80	Hospital	LHS	25.0	50.1	43.1	55.3	48.6	46.3	39.6	39.3	32.6
46.55	Hospital	LHS	13.5	55.1	48.1	60.3	53.6	51.3	44.6	44.3	37.6
47.35	Hospital	LHS	13.1	55.4	48.4	60.6	53.8	51.6	44.8	44.6	37.8
47.78	School	LHS	27.0	49.5	42.5	54.7	47.9	45.7	38.9	38.7	31.9
48.82	School	RHS	66.0	42.2	35.2	47.4	40.7	38.4	31.7	31.4	24.7
48.82	School	RHS	55.0	43.7	36.7	48.9	42.1	39.9	33.1	32.9	26.1
49.59	School	RHS	7.0	60.3	53.3	65.5	58.8	56.5	49.8	49.5	42.8
49.80	School	RHS	57.5	43.3	36.4	48.5	41.8	39.5	32.8	32.5	25.8
49.90	School	LHS	9.3	58.1	51.1	63.3	56.5	54.3	47.5	47.3	40.5
50.55	School	RHS	13.8	54.9	48.0	60.1	53.4	51.1	44.4	44.1	37.4
50.60	School	LHS	12.3	55.9	48.9	61.1	54.3	52.1	45.3	45.1	38.3
51.00	Hospital	LHS	12.7	55.6	48.6	60.8	54.0	51.8	45.0	44.8	38.0
51.05	School	LHS	28.9	49.0	42.0	54.2	47.4	45.2	38.4	38.2	31.4
51.22	School	LHS	29.4	48.8	41.8	54.0	47.2	45.0	38.2	38.0	31.2
52.20	School	LHS	19.0	52.4	45.4	57.6	50.8	48.6	41.8	41.6	34.8
52.40	School	RHS	14.5	54.5	47.6	59.7	53.0	50.7	44.0	43.7	37.0
55.15	School	RHS	38.0	46.7	39.7	51.9	45.2	42.9	36.2	35.9	29.2
56.31	School	RHS	70.0	41.7	34.8	46.9	40.2	37.9	31.2	30.9	24.2

Source: CoRTN Output (DPR Consultant)

Predicted Noise Levels along Mohanlalganj to Unnao- MDR 52C

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
0.30	School	RHS	7.0	59.4	53.0	66.0	58.8	57.0	49.8	50.0	42.8
1.65	School	LHS	50.0	43.6	37.2	50.2	42.9	41.2	33.9	34.2	26.9
1.90	Hostel	LHS	21.0	50.6	44.3	57.3	50.0	48.3	41.0	41.3	34.0
3.89	School	RHS	29.0	48.0	41.6	54.6	47.4	45.6	38.4	38.6	31.4
4.10	Community Health Centre	LHS	10.0	56.6	50.2	63.2	56.0	54.2	47.0	47.2	40.0
6.50	Engineering Institute	RHS	17.0	52.4	46.0	59.0	51.7	50.0	42.7	43.0	35.7
7.10	College	RHS	15.5	53.1	46.7	59.7	52.5	50.7	43.5	43.7	36.5
9.90	School	RHS	12.0	55.2	48.8	61.8	54.5	52.8	45.5	45.8	38.5
13.50	School	RHS	4.5	62.7	56.3	69.4	62.1	60.4	53.1	53.4	46.1
14.00	School	LHS	41.0	45.2	38.8	51.8	44.6	42.8	35.6	35.8	28.6
17.10	Hospital	LHS	16.0	52.8	46.5	59.5	52.2	50.5	43.2	43.5	36.2
17.55	School	RHS	6.0	60.6	54.2	67.2	60.0	58.2	51.0	51.2	44.0
17.60	Veterinary Hospital	RHS	80.0	39.7	33.4	46.4	39.1	37.4	30.1	30.4	23.1
17.65	Hospital	RHS	22.0	50.3	43.9	56.9	49.6	47.9	40.6	40.9	33.6
17.70	School	RHS	21.0	50.6	44.3	57.3	50.0	48.3	41.0	41.3	34.0
18.60	School	LHS	7.0	59.4	53.0	66.0	58.8	57.0	49.8	50.0	42.8
22.50	College	LHS	18.0	51.9	45.5	58.5	51.2	49.5	42.2	42.5	35.2
24.30	School	LHS	6.0	60.6	54.2	67.2	60.0	58.2	51.0	51.2	44.0
24.60	School	LHS	12.0	55.2	48.8	61.8	54.5	52.8	45.5	45.8	38.5
25.40	Madarsa	RHS	9.0	57.5	51.1	64.1	56.8	55.1	47.8	48.1	40.8
25.70	Private Doctor shop	LHS	10.0	56.6	50.2	63.2	56.0	54.2	47.0	47.2	40.0
26.75	Hospital	LHS	11.0	55.9	49.5	62.5	55.2	53.5	46.2	46.5	39.2
28.25	School	RHS	11.0	55.9	49.5	62.5	55.2	53.5	46.2	46.5	39.2
28.55	School	RHS	10.0	56.6	50.2	63.2	56.0	54.2	47.0	47.2	40.0
30.87	School	RHS	7.0	58.8	54.8	65.4	60.4	56.4	51.4	49.4	44.4
31.15	Clinic	RHS	12.0	54.5	50.5	61.1	56.1	52.1	47.1	45.1	40.1
31.35	School	RHS	5.5	60.6	56.6	67.2	62.2	58.2	53.2	51.2	46.2
31.35	School	RHS	7.0	58.8	54.8	65.4	60.4	56.4	51.4	49.4	44.4
31.55	Community Health Centre	RHS	8.0	57.7	53.8	64.3	59.4	55.3	50.4	48.3	43.4
31.55	Pathology lab	LHS	8.0	57.7	53.8	64.3	59.4	55.3	50.4	48.3	43.4
33.75	Private Doctor shop	LHS	8.0	57.7	53.8	64.3	59.4	55.3	50.4	48.3	43.4
34.45	School	RHS	26.0	48.3	44.3	54.9	49.9	45.9	40.9	38.9	33.9
36.65	School	LHS	14.0	53.3	49.3	59.9	54.9	50.9	45.9	43.9	38.9

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
38.15	School	RHS	11.0	55.2	51.2	61.8	56.8	52.8	47.8	45.8	40.8
40.25	School	RHS	12.0	52.4	48.5	59.1	54.1	50.1	45.1	43.1	38.1
43.05	Community Health Centre	LHS	8.0	57.7	53.8	64.3	59.4	55.3	50.4	48.3	43.4
43.45	Clinic	LHS	9.0	56.8	52.8	63.4	58.4	54.4	49.4	47.4	42.4
43.75	School	LHS	17.0	51.7	47.7	58.3	53.3	49.3	44.3	42.3	37.3
47.15	School	LHS	8.0	57.7	53.8	64.3	59.4	55.3	50.4	48.3	43.4
47.40	School	LHS	14.0	53.3	49.3	59.9	54.9	50.9	45.9	43.9	38.9
48.40	School	RHS	20.0	50.4	46.4	57.0	52.0	48.0	43.0	41.0	36.0

Source: CoRTN Output (DPR Consultant)

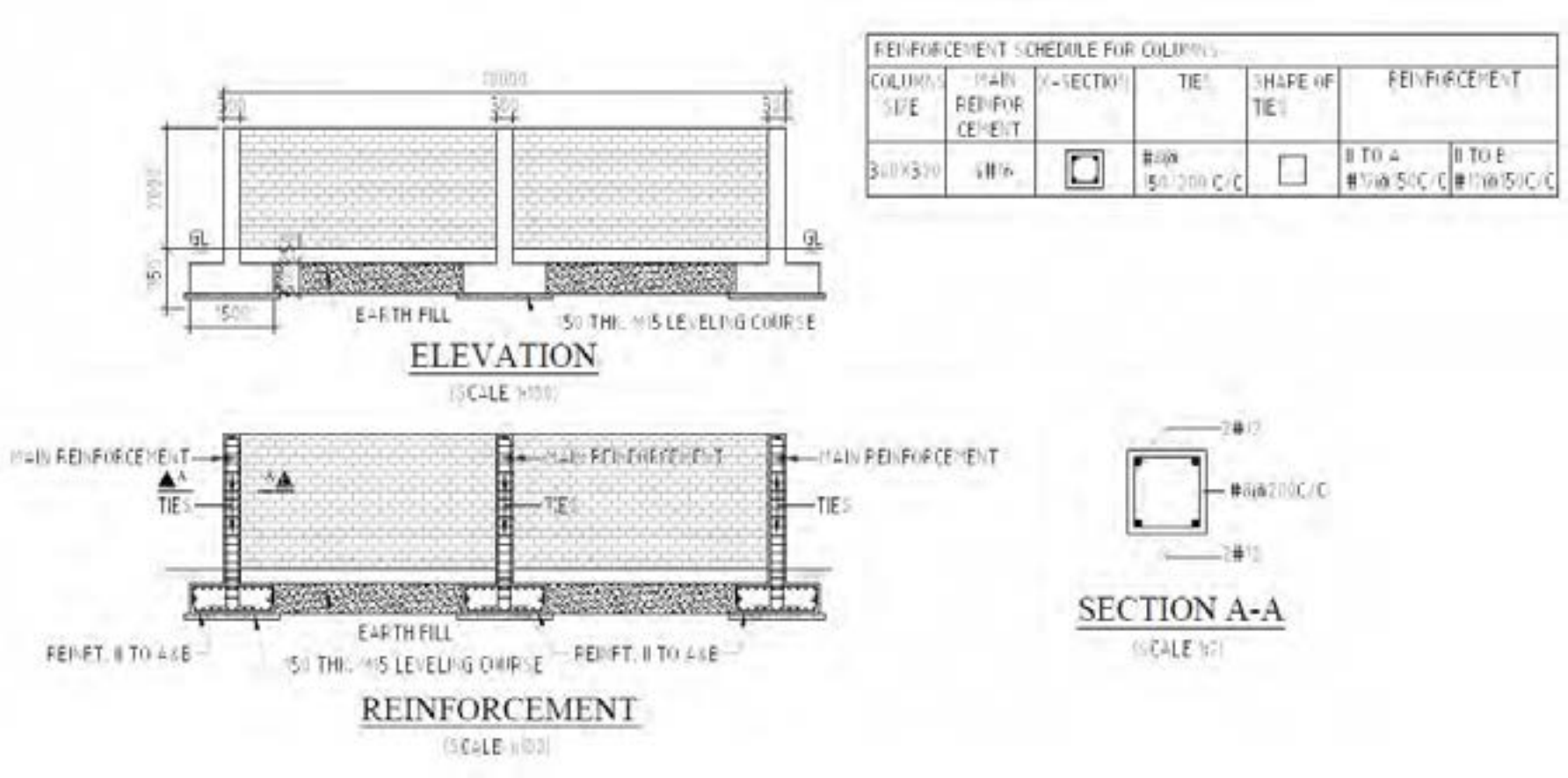
Predicted Noise Levels along Aliganj to Soron – MDR 45 W

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
27.70	Private Clinic	LHS	3.5	64.0	56.8	70.1	61.7	61.1	52.7	54.1	45.7
30.97	School	LHS	11	55.3	48.1	61.5	53.1	52.5	44.1	45.5	37.1
34.20	School	LHS	6.5	59.5	52.3	65.6	57.2	56.6	48.2	49.6	41.2
35.60	School	LHS	5	61.5	54.3	67.6	59.2	58.6	50.2	51.6	43.2
36.00	Private Clinic	RHS	5	61.5	54.3	67.6	59.2	58.6	50.2	51.6	43.2
41.50	School	RHS	21.5	49.9	42.7	56.1	47.7	47.1	38.7	40.1	31.7
46.30	Inter College	RHS	11.5	55.0	47.8	61.1	52.7	52.1	43.7	45.1	36.7
46.32	College	RHS	11.5	55.0	47.8	61.1	52.7	52.1	43.7	45.1	36.7
46.40	College	RHS	11.5	55.0	47.8	61.1	52.7	52.1	43.7	45.1	36.7
47.91	School	RHS	6	60.1	52.9	66.2	57.8	57.2	48.8	50.2	41.8
47.92	School	RHS	4	63.1	55.9	69.2	60.8	60.2	51.8	53.2	44.8
48.90	Inter College	LHS	11.5	55.0	47.8	61.1	52.7	52.1	43.7	45.1	36.7
50.23	Junior high School	RHS	9.5	52.3	48.8	57.3	53.7	48.3	44.7	41.3	37.7
52.92	Primary Health Centre	RHS	50	38.9	35.4	43.8	40.2	34.8	31.2	27.8	24.2

Chainage No.	Type of Structure	Side	Distance from CL (m)	Noise Level dB(A)							
				Model predicted Year 2015		Year 2030 without Mitigation		2030 with Speed Limit, Hornkey & Building Wall		Year 2030 with Speed Limit, Building Wall & Noise Barrier	
				Day	Night	Day	Night	Day	Night	Day	Night
54.25	School	RHS	9.5	52.3	48.8	57.3	53.7	48.3	44.7	41.3	37.7
59.20	Junior high School	LHS	10.5	51.5	48.1	56.5	52.9	47.5	43.9	40.5	36.9
62.50	School	RHS	5	57.3	53.8	62.2	58.6	53.2	49.6	46.2	42.6

Source: CoRTN Output (DPR Consultant)

Appendix 32: Typical Design for Noise barrier



Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Nanau Dadau

S. No.	Existing Chainage (Km)	Features	Village	Side	Length along the road (m)	Boundary Wall Present / Height (m)	Mitigation
1	0.110	School	Nanau	RHS	50	No	Noise Barrier Proposed
2	0.710	School	Nanau	LHS	70	Yes / 1	
3	6.500	School	Sinandarpur	LHS	20	Yes / 1	
4	9.100	College	Sinandarpur	LHS	45	Yes / 1	
5	14.600	School	Tikta	RHS	20	Yes / 1	
6	14.780	School	Tikta	RHS	50	No	
7	16.650	School	Sihawali	LHS	60	Yes / 1	
8	18.400	School	Sihawali	RHS	10	Yes / 1	
9	19.500	Community Health Centre	Sihawali	LHS	40	Yes / 1.5	
10	22.000	School	Barauli	RHS	30	Yes / 1	
11	26.220	School	Atta	LHS	50	No	
12	28.900	Inter College	Dadau	LHS	60	No	
13	28.910	Primary Health Centre	Dadau	RHS	15	Yes / 1.5	
14	29.970	School	Nagla Bhore	RHS	40	No	

Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Muzaffarnagar-Baraut

S. No.	Existing Chainage (Km)	Features	Village	Side	Physical Impact	Length along the road (m)	Boundary Wall Present / Height (m)
1	3.840	School	Khanjhanpur	RHS	No	43	Yes / 1.8
2	7.700	School	Khanjhanpur	LHS	No	44	Yes / 1.1
3	10.400	Madarsha	Tawli	RHS	No	52	Yes / 1.5
4	15.820	School	Kakda	LHS	No	76	Yes / 1.8
5	19.000	College	Shahpur	LHS	No	75	Yes / 1.0
6	19.100	College	Shahpur	RHS	No	105	No
7	19.250	School	Shahpur	LHS	No	40	No
8	19.720	School	Shahpur	LHS	No	12	No
9	21.800	College	Shahpur	LHS	No	25	No
10	27.850	School	Bhasana	LHS	No	42	Yes / 1.5
11	31.800	School	Budhana	LHS	No	25	No
12	43.000	Primary Health Centre	Daha	LHS	No	122	Yes / 1.5
13	45.380	School	Kanhar	LHS	Yes	36	Yes / 1.5
14	52.900	College	Bamnauli	LHS	No	85	Yes / 0.8
15	53.990	I.T.I College	Bamnauli	LHS	No	28	No
16	55.920	Primary Health Centre	Bijrol	RHS	No	75	Yes / 1.5
17	56.030	College	Bijraul	RHS	No	90	Yes / 1.4
18	59.100	School	Baraut	LHS	No	75	Yes / 1.8
19	61.280	School	Baraut	LHS	No	25	No
20	61.340	School	Baraut	LHS	No	24	No

Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Bulandshahar-Anoopshahar

S. No.	Existing Chainage (Km)	Features	Village	Side	Likely Physical Impact	Length along the road (m)	Boundary Wall Present / Height (m)
1	20.400	School	Jatwai	LHS	No	30	30.4/1.6
2	24.900	School	Bhipur	RHS	No	51	51/1.6
3	31.900	School	Birauli	RHS	No	22	22/1.6
4	32.900	College	Hisawati	RHS	No	92	No
5	35.050	School	Aniwasai	LHS	No	87	86.6/1.1
6	38.350	Hospital	Karanpur	RHS	No	33	33/1.6
7	38.750	College	Karanpur	LHS	No	84	84/1.8
8	43.200	School	Anupshahar	LHS	No	27	No
9	43.650	School	Achalpur	RHS	No	43	43.2/1.4
10	50.960	School	Jirauli	LHS	No	14	No
11	54.750	School	Devi ka Nagla	RHS	No	43	No
12	56.500	School	Naya Baas (Qutubpur)	LHS	No	27	No
13 & 14	56.600	College & School	Bheempur Chowk	RHS	No	92	92/1.4

Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Hussainganj-Alipur

S. No.	Existing Chainage (Km)	Features	Side	Village	Length along the road (m)	Boundary Wall Present / Height (m)	Mitigation
1	16.50	School	LHS	Chhiblaha	4	No	Noise Barrier Proposed
2	17.10	College	RHS	Chhiblaha	16	No	
3	17.12	College	RHS	Chhiblaha	16	No	
4	17.42	School	LHS	Chhiblaha	20	No	
5	18.90	School	LHS	Paliya Bujurg	45	Yes/1.5	
6	18.90	School	LHS	Paliya Bujurg	24	Yes/1.4	
7	20.55	School	LHS	Manapur	10	No	
8	20.60	College	RHS	Manapur	160	Yes/1.8	
9	20.61	School	LHS	Manapur	26	No	
10	22.15	School	RHS	Semra Manapur	22.2	Yes/1.4	
11	22.15	College	RHS	Semra Manapur	48	Yes/1.4	
12	27.40	Hospital	RHS	Hathgaon	110	Yes/1.3	
13	28.07	College	LHS	Hathgaon	55	Yes/1.7	
14	29.25	School	RHS	Adhari ka purwa	66	Yes/1.7	
15	37.14	School	LHS	Sultanpur ghosh	16	No	
16	37.18	School	RHS	Sultanpur ghosh	8	No	
17	37.60	Hospital	LHS	Sultanpur ghosh	12	1.700	

S. No.	Existing Chainage (Km)	Features	Side	Village	Length along the road (m)	Boundary Wall Present / Height (m)	Mitigation
18	38.50	College	LHS	Sultanpur ghosh	210	1.200	
19	41.80	School	RHS	Premnagar	9	No	
20	41.92	School	RHS	Premnagar	5	No	

Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Naurangiya-Kaptanganj-Barhaaj Marg

S. No.	Existing Chainage (Km)	Features	Village	Side	Length along the road (m)	Boundary Wall Present, Length / Height (m)
ODR24 (Kaptanganj to Naurangiya)						
1	1.350	School	Chilwan Kaptanganj	RHS	49	49.0/1.7
2	4.500	School	Hardichapra	RHS	26	26.0/1.4
3	6.070	School (Boundary wall likely to be affected)	Khatai Kwrwaniyan	RHS	12.2	12.2/2
4	6.900	College	Khatahi	LHS	118	118.0/1.5
5	9.660	College	Khatahi	RHS	63.5	63.5/0.7
6	13.840	School	Khanuapra	LHS	13.5	No
7	15.080	School	Pakadiyar Bazar	LHS	51.5	No
8	15.080	School	Pakadiyar Bazar	LHS	32.5	No
9	18.800	School	Khairatiya Shitlapur	LHS	40	No
10	21.900	School	Sirsiya	LHS	125	125.0/1.0
11	24.000	School	Nauranganj	LHS	53.5	No
MDR25E (Kaptanganj to Rudrapur)						
1	0.800	Hospital	Kaptanganj	LHS	7	No
2	0.800	Hospital	Kaptanganj	RHS	3	No
3	1.040	School	Kaptanganj	RHS	38	No
4	1.100	School	Kaptanganj	RHS	14	No
5	5.130	School	Malkuhi	RHS	65	65/1.0
6	5.350	School	Malkuhi	RHS	37	No
7	5.450	Madrasa	Malkuhi	RHS	14.3	No
8	11.900	School	Ghiwahi	LHS	18	No
9	13.200	School	Pakdi Madrah	RHS	61	61/1.5
10	14.980	School	Harpoor Verma	LHS	17	No
11	20.400	School	Radhiya-Devrya	LHS	16.1	16.1/1.7
12	18.665	School	Jhanga Bazar	LHS	7.4	No
13	18.350	Hospital	Jhanga	RHS	60	60.0/1.0
14	25.770	School	Gopalpur	RHS	26.5	No
15	26.000	School	Modraha	LHS	36.2	No
16	28.310	School	Balua	LHS	14	No
17	28.400	School	Balua	LHS	28.3	No
18	29.250	School	Devkali	LHS	27	No
19	29.750	School	Devkali	RHS	18.8	18.5/1.0
20	31.320	School	Vakilaganj	LHS	8.2	No
21	33.500	School	Balchara	LHS	62.1	62.1/1.3
22	33.800	Hospital	Balchara	RHS	60	60.0/1.1
23	34.263	School	Cheerchari	LHS	8	No

S. No.	Existing Chainage (Km)	Features	Village	Side	Length along the road (m)	Boundary Wall Present, Length / Height (m)
			Balchara			
24	35.750	School	Dumari Bishnupura	LHS	8.2	No
25	37.500	School	Kakamal	LHS	13.4	No
26	37.820	Hospital	Pacholiya	LHS	10.6	No
27	38.800	School	Dhamar Vioshwari	RHS	37.5	37.5/1.3
28	39.750	College	Rampur	LHS	8.4	No
29	40.000	Hospital	Gauri Bazar	LHS	10.4	No
30	40.012	School	Gauri Bazar	RHS	19.3	No
31	43.845	School	Patharhat	LHS	16	16.0/1.8
32	44.150	School	Indupur	LHS	35.7	60.5/1.2
33	44.480	College	Indupur	RHS	56.5	No
34	47.350	School	Pananchara	LHS	41.2	12.0/1.0
35	49.590	School	Balkunda	RHS	38	32.3/1.4
36	49.900	School	Banaspati Bazar	LHS	12	6.5/1.8
37	50.550	School	Ramlakshman	RHS	6.8	No
38	50.600	School	Ramlakshman	LHS	4.3	No
39	51.000	Hospital	Ramlakshman	LHS	74	74.0/1.8
40	52.400	School	Laxmipur	RHS	11.5	No

Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Haliyapur-Kurebhar

S. No.	Existing Chainage (Km)	Features	Village	Side	Length along the road (m)	Boundary Wall Present, Length / Height (m)
1	2.050	School	Dobhihara	RHS	20	20.0/1.5
2	3.000	School	Bandin House Mukandpur	RHS	22	-
3	4.990	School	Bhawani Garh	RHS	60	60/1
4	5.600	School	Rencha	LHS	32	-
5	16.050	School	Delhi Bazar	LHS	42	-
6	16.150	School	Delhi Bazar	RHS	13	-
7	16.150	School	Delhi Bazar	LHS	8	-
8	16.400	School	Delhi Bazar	RHS	27	-
9	19.300	School	Peero Sariya	LHS	5	-
10	22.200	School	Harora Bazra	LHS	9	-
11	24.300	School	Shanti Nagar	RHS	36	36/1.5
12	25.400	School	Dhanpta Ganj	LHS	45	45/1.5
13	25.650	School	Dhanpta Ganj	LHS	12	-
14	26.700	School	Dhanpta Ganj	RHS	82	82/1.5
15	32.100	School	Tiwaripur	LHS	10	10/1.3
16	34.300	Inter College	Laxmi Market	LHS	7.5	-
17	36.250	School	Kurdan Gali Bah	LHS	60	60/2
18	37.550	School	Erur	RHS	13	-
19	38.800	School	Salim Pur	LHS	45	-
20	47.150	School	Bajna	RHS	40	40/1.2
21	56.700	School	Semri Bazar	LHS	41	41/1.7
22	61.360	School	Jamalpur	LHS	100	100/1.5
23	63.360	School	Sri Ram Naga	RHS	40	-
24	65.000	School	Gosai Singhpur	RHS	27	27/1.5
25	65.200	School	Gosai Singhpur	RHS	20	20/1

S. No.	Existing Chainage (Km)	Features	Village	Side	Length along the road (m)	Boundary Wall Present, Length / Height (m)
26	67.450	School	Sikiya mor	LHS	72	-
27	68.800	School	Tajudinpur	LHS	41	-
28	70.650	Inter College	Cheete Patti	LHS	242	242/1
29	73.650	School	Bhwangaya	RHS	53	53/1.5
30	76.750	Community Health Centre	Dostpur	LHS	130	130/1.5
31	77.300	Hospital	Dostpur	RHS	7	7/1.5
32	77.400	Angan Wadi	Dostpur	RHS	20	-
33	77.600	School	Dostpur	LHS	29	29/2
34	77.800	Hospital	Dostpur	LHS	29	29/1.5
35	79.350	College	Badholi	RHS	7	-
36	79.400	Hospital	Badholi	LHS	8.5	-
37	81.600	School	Kaith Dalalpur	RHS	35	-
38	83.850	School	Gonhanapur	LHS	25	-
39	84.150	School	Akhand Nagar	RHS	31	31/1.2
40	88.000	School	Bari Sahijan	LHS	123	-
41	91.200	School	Jahirudin pur	LHS	70	70/0.5
42	92.300	Govt School	Akhand Nagar	LHS	54	54/1.3
43	96.300	School	Khusmandpur	RHS	32	32/1.2
44	97.800	College	Khanpur Pillai Dev Nagar	LHS	156	156/1.5
45	97.820	School	Khanpur Pillai Dev Nagar	LHS	33	33/0.5
46	99.200	School	Bibiganj	LHS	40	-
47	99.350	School	Bibiganj	LHS	28	-

Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Aliganj to Soron

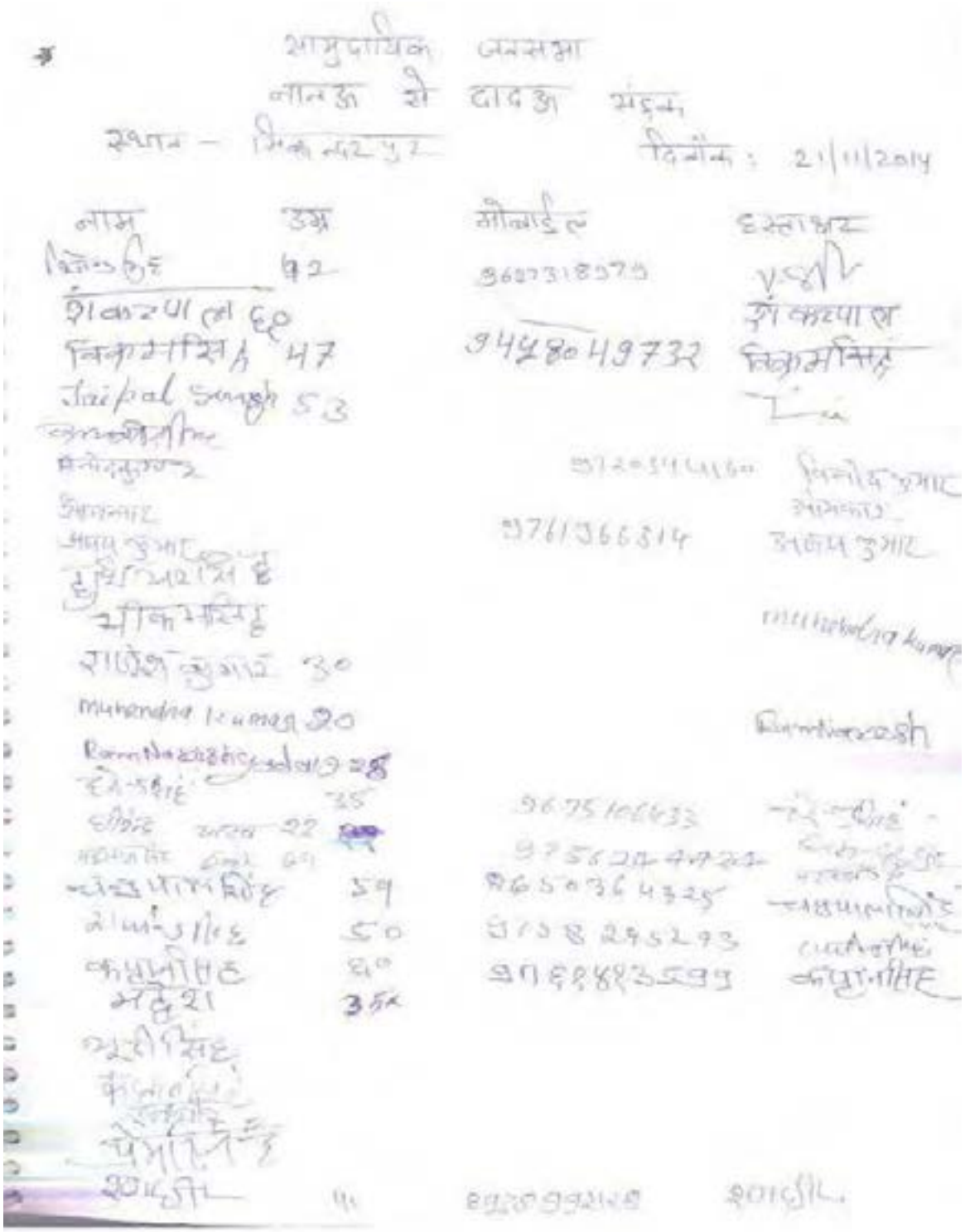
S. No.	Existing Chainage (Km)	Features	Village	Side	Physical Impact	Length along the road (m)	Boundary Wall Present / Height (m)
1	30+970	School	Alipur Dadar	LHS	No	20	Yes / 1.5
2	35+600	School	Ganj dundwara	LHS	Yes	9	No
3	46+300	Inter College	Sahawar	RHS	No	45	Yes / 1.5
4	47+910	School	Sahawar	RHS	No	6	No
5	48+900	Inter College	Sahawar	LHS	No	50	No
6	54+250	School	Yakutganj	RHS	No	50	Yes / 1.5
7	59+200	Junior high School	Humaupur	LHS	No	40	No

Source: DPR Consultant

Noise Sensitive receptor / Barrier Locations- Mohanlalganj to Unnao

S. No.	Existing Chainage (Km)	Features	Village	Side	Length along the road (m)	Boundary Wall Present, Length / Height (m)
1	0.300	School	Mohanlalganj	RHS	25	25 / 1
2	4.100	Community Health Centre	Dhanwara	LHS	10	10 / 1.6
3	18.600	School	Kalu Khera	LHS	35	35 / 0.5
4	24.600	School	Bhawaniganj	LHS	10	-
5	25.700	Private Doctor shop	Khudra	LHS	3	-
6	26.750	Hospital	Khudra	LHS	50	-
7	28.250	School	Sagauli	RHS	10	-
8	28.550	School	Sagauli	RHS	10	-
9	30.870	School	Sagauli	RHS	40	40 / 1.2
10	31.150	Clinic	Sagauli	RHS	20	-
11	31.350	School	Maurawan	RHS	34	34 / 1.8
12	31.550	Pathology lab	Maurawan	LHS	60	60 / 1
13	33.750	Private Doctor shop	Muraita	LHS	18	-
14	36.650	School	Patan Nagar	LHS	30	30 / 1.8
15	38.150	School	Tusraur	RHS	40	40 / 1
16	43.050	Community Health Centre	Purwa	LHS	100	100 / 1.5
17	43.450	Clinic	Purwa	LHS	35	-
18	47.400	School	Bhwangaya	RHS	28	28 / 1

Source: DPR Consultant

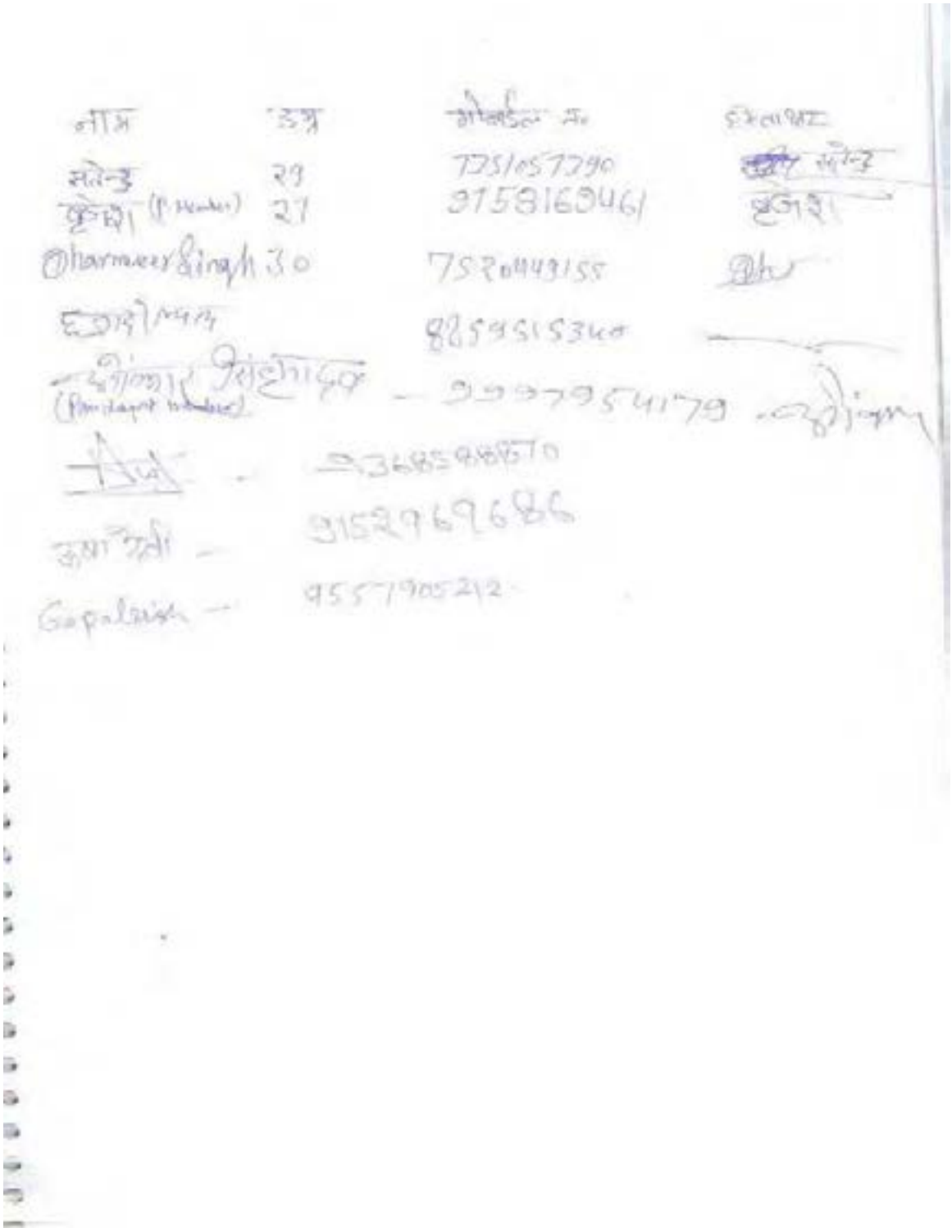


सामुदायिक जनसभा

लानजी से दादजी मंडल

दिनांक : 21/11/2014

नाम	उम्र	मोबाईल	हस्ताक्षर
[illegible]	42	9687318979	
[illegible]	47	9414049732	
Jaipal Singh	53		
[illegible]		9716366814	
[illegible]	30		
Mahendra Kumar	20		
[illegible]	25		
[illegible]	22	9675166633	
[illegible]	59	8650364325	
[illegible]	50	9018295293	
[illegible]	60	9418483593	
[illegible]	35		



Uttar Pradesh PWD

Project Name:

Interview Schedule for FGDs

Name of Village/Township: [illegible] Chainage: kms

Hours: 3:00 PM Time Date: 21/11/2014

S. No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	[illegible]	[illegible]			40		[illegible]	
2	[illegible]				65		[illegible]	[illegible]
3	[illegible]				50			
4	[illegible]				65			
5	[illegible]				16			
6	[illegible]				16			
7	[illegible]				19			
8	[illegible]				30			
9	[illegible]				40			
10	[illegible]				30			
11	[illegible]				40			
12	[illegible]				40			
13	[illegible]				40			
14	[illegible]				50			
15	[illegible]				30			
16	[illegible]				30			8958116145
17	[illegible]				50			
18	[illegible]				40			
19	[illegible]				40		7409354325	Mobile Signal Not Found

Uttar Pradesh (PWD)

Project Name -

Interview Schedule for FGDs

Name of Village/Township _____ Chainage _____ kms

Hours Time Date -

S.NO	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1				M	40			
2				M	18			
3				M	28			
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Uttar Pradesh PWD

Project Name -

Interview Schedule for PGDA

Name of Village/Tolanat is Daulat nagar Chainage 49.650

Hour's Time Date - 25.11.19

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No
1	Pankaj	Bus	Daulat nagar	M	20	Gen		
2	Rahul Pk	Bus	-do-	M	25	Gen		
3	Parmanand Pyk	Agri. Lab	-do-	M	60	Gen		
4	Suraj pal	Agri. Lab	-do-	M	40	Gen		
5	Yogendra Kumar	Agri. Lab	-do-	M	35	Gen		8954219846
6	Pratap Choudhary	Agri.	Usheni	M	60	Gen		
7	Lagat Singh	Bus	Daulat nagar	M	45	Gen		
8	Prempal Singh	Retired	-do-	M	51	Gen		
9	Pancham Singh	Retired Army	-do-	M	48	Gen		8954568422
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Uttar Pradesh PWD

Project Name :- Rehabilitation - Augmentation

Interview Schedule for FGDs

Name of Village/Township :- Jasauli Chainage 29 - 31 kms

Hour :- Time :- Date :- 26.12.14

S.No.	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Liyakat Khan	Grocery Store	Jasauli	M	39	Muslim		8650914948
2	Satish	Tea Shop	-do-	M	52	Muslim		
3	Pinku Ch.	HP	-do-	M	32	Muslim		
4	Balwant Ch.	Agri. Labour	-do-	M	60	Muslim		
5	Kalyan Ch.	Agriculture	-do-	M	62	Muslim		
6	Lalmani Kumar Pradhan	Pradhan	-do-	M	70	Muslim		
7	Nagendra Ram	Grocery Store	-do-	M	28	Muslim		
8	Lokesh	Grocery Store	-do-	M	20	Muslim		
9	Rahul	Pradhan	-do-	M	-	Muslim		7409106388
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Uttar Pradesh PWD

Project Name: Kuldhulan - Amarpur.

Interview Schedule for FGDs

Name of Village/Township: Amarpur Chainage 52-53km

Hours Time: 2:30pm Date: 27-11-14

S No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Vishal S/o Suvachan	Police	Amarpur	M	15			9761767490
2	Vikas		"	m	18	-		9719070369
3	Roby	Student	Amar	M	20	-		8941988472
4	Shiv Kumar	Student	"	m	26	-		9627968088
5	Parlem Lal	wages	"	m	3-	-	--	—
6	Ramdeen	student	"	m	16	-		9627941901
7	Raghuraj	wages	—	-	30	-		--
8	Vedprakash	wages	—	-	32			9720877353
9	Rajveer Singh	wages	—	-	4w	-		9758216129
10	Tajmal Singh	wages	—	-	40	-		9761347113
11	Mohar Singh	wages	—	-	-			9536529726
12	Tajpal Singh	-	-	-	5-	-		9627274893
13	Ramesh Chand	UP	—	-	50	-		9756707653
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Uttar Pradesh,PWD

Project Name:- Rehabilitation - Amphibian

Interview Schedule for FGDs

Name of Village/Township Dabai Chauraha. Chainage: 56.57 kms

Hours — Time 11 Am - Date - 27.11.14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Jeetam Prased Sharma	Business	Dabai	M	72	H		9719500340
2	Rajendar Singh	Business	"	M	40	H		
3	Sheespal singh	Electric business	"	M	45	H		9761086130
4	Kunwar Pal Singh	Teacher	"	M	45	H		9719741488
5	Yogendra	Labour	"	M	25	H		9719999 9951
6	Jhamiram Singh	Business	"	M	60	H		8650424812
7	Mukesh Kumar	Teacher	"	M	45	H		9719533008
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Uttar Pradesh PWD

Project Name:

Interview Schedule for FGDs

Name of Village/Township: Rajsaul Chainage: 56.4 kms

Hours: Time: Date: 12-11-14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Satpal	Agriculture	Rajsaul	M	65	Gen		
2	Rohtas	Cycle rep	Gangnauli	M	40	Gen		8923114070
3	Salim	unemployed	Shauli	M	22			9557023019
4	Vijay pal	cycle rep	Bhainsa	M	35	Gen		8791220360
5	Ashok	cycle rep	Rajsaul	M	25	Gen		8936708418
6	Babubam	labour	Rajsaul	M	20	SC		—
7	Ram Niwas	Basti	Sirsali	M	45	Gen		8755583069
8	Arvind	Student	Rajsaul	M	18	OBC		9917871450
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Uttar Pradesh/PWD

Project Name:

Interview Schedule for FGDs

Name of village/Township: Sahdabad Chainage 85.26kms

Hours: Time: Date: 13.11.14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Pawan Kr	Student	Sahdabad	M	18	SC		
2	Mankan	Agriculture Labour	— do —	M	60	SC		
3	Mohan	Agriculture labour	— do —	M	55	SC		
4	Jaleram	Agriculture Labour	— do —	M	55	SC		
5	Sanjit Kum	Student	— do —	M	19	SC	Sharkit	8923233589
6	Sachin pal	Agriculture Labour	— do —	M	20	SC		7830725946
7	Sunil Kumar	labour	— do —	M	25	SC		
8	Deepchand	Agriculture Labour	— do	M	39	SC		9997951933
9	Ramghuram	Labour	— do —	M	35	SC		
10	Babu Ram	Labour	— do —	M	45	SC		
11	Ajab Singh	Labour	— do	M	65	SC		
12	Gaurav Pal	Student	— do —	M	15	SC		
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Uttar Pradesh PWD

Project Name: -

Interview Schedule for FGDs

Name of Village/Township: Daha Chainage _____ kms

Hours Time Date :-

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Mehak Singh	Agriculture labour	Daha	M	65	Gen		
2	Sukhvir Singh	Agriculture labour	Daha	M	55	Gen		
3	Jag Mohan	-do-	Daha	M	60	Gen		
4		-do-	Daha	M	55	Gen		
5	Satpal Singh	-do-	-do-	M	65	Gen		7055217499
6	Ribender	-do-	-do-	M	55	Gen		
7	Om prakash	-do-	-do-	M	55	Gen		
8	Sukvir Singh	-do-	-do-	M	55	Gen		
9	Ramesh Singh	-do-	-do-	M	57	Gen		9058736874
10	Harpal Singh	-do-	-do-	M	58	Gen		
11	Ramesh Singh	-do-	-do-	M	59	Gen		
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Uttar Pradesh PWD

Project Name :-

Interview Schedule for FGDs

Name of Village/Township: Saiyhak Chainage _____ kms

Hours: Time: Date - 15.11.14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Sajid	Teiloe	Saiyhak	M	45			
2	Mehetbam Ali	labour	- do -	M	50			
3	Abdul Kadir	Agriculture	- do -	M	18			9927108543
4	Jamin	Driver	- do -	M	57			
5	Suleman	labour	- do -	M	45			
6	Jamid	Agriculture labour	- do -	M	35			
7	Amanyah	Atmosphere maker	- do -	M	17			
8	Mohd Imran	Rajai Mistri	- do -	M	45			
9	Mohd Khalid	Paper Shop	- do -	M	42			895-8908[illegible]6
10	Irfan	Hair Dresser	- do -	M	32			
11	Salman	Labour	- do -	M	24			8982344[illegible]6
12	Mohd Asif	Agriculture Labour	- do -	M	22			9012978907
13	Mohd. Aziz	Tunnel (Mistri)	- do -	M	30			9528922226
14	Mohd. Imam	Plumber	- do -	M	22			9012339735
15	Phool Singh	Sarpanch	- do -	M	30			
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Uttar Pradesh PWD

Project Name :-

Interview Schedule for FGDs

Name of Village/Township: Tauli Chainage _____ kms

Hours: Time: Date:- 19-11-14

S. No.	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Sawkin	Panchayat	Tauli	M	30	M		8476032584
2	Noorhasan	Agriculture	Tauli	M	32	M		9758476548
3	N. Sen	Agriculture	Biaseda	M	30	M		-
4	Anil KR	Advocate	Lachoda	M	45	H		9612840179
5	Abdul Rahman	Agriculture Labour	Tauli	M	44	M		-
6	Gulfam	Driver	Tauli	M	30	M		8937044315
7	Sajid	Agriculture	Tauli	M	31	M		-
8	Nasim	Student	Tauli	M	14	M		-
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Uttar Pradesh,PWD

Project Name

Interview Schedule for FGDs

Name of Village/Township Budhana Chainage _____ kms

Hours Time Date 14.11.14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Soni	Student	Bakul Lodi	M	25	Lodi		
2	Rakesh	Shoes Maker	Budhana	M	65	Lodi		
3	Rajesh	Shoes Maker	Budhana	M	41	Lodi		
4	Kanhaiyalal	Shoes Maker	Budhana	M	45	Lodi		
5	Ramchandra	Agriculture	Budhana	M	45	Lodi		9719886341
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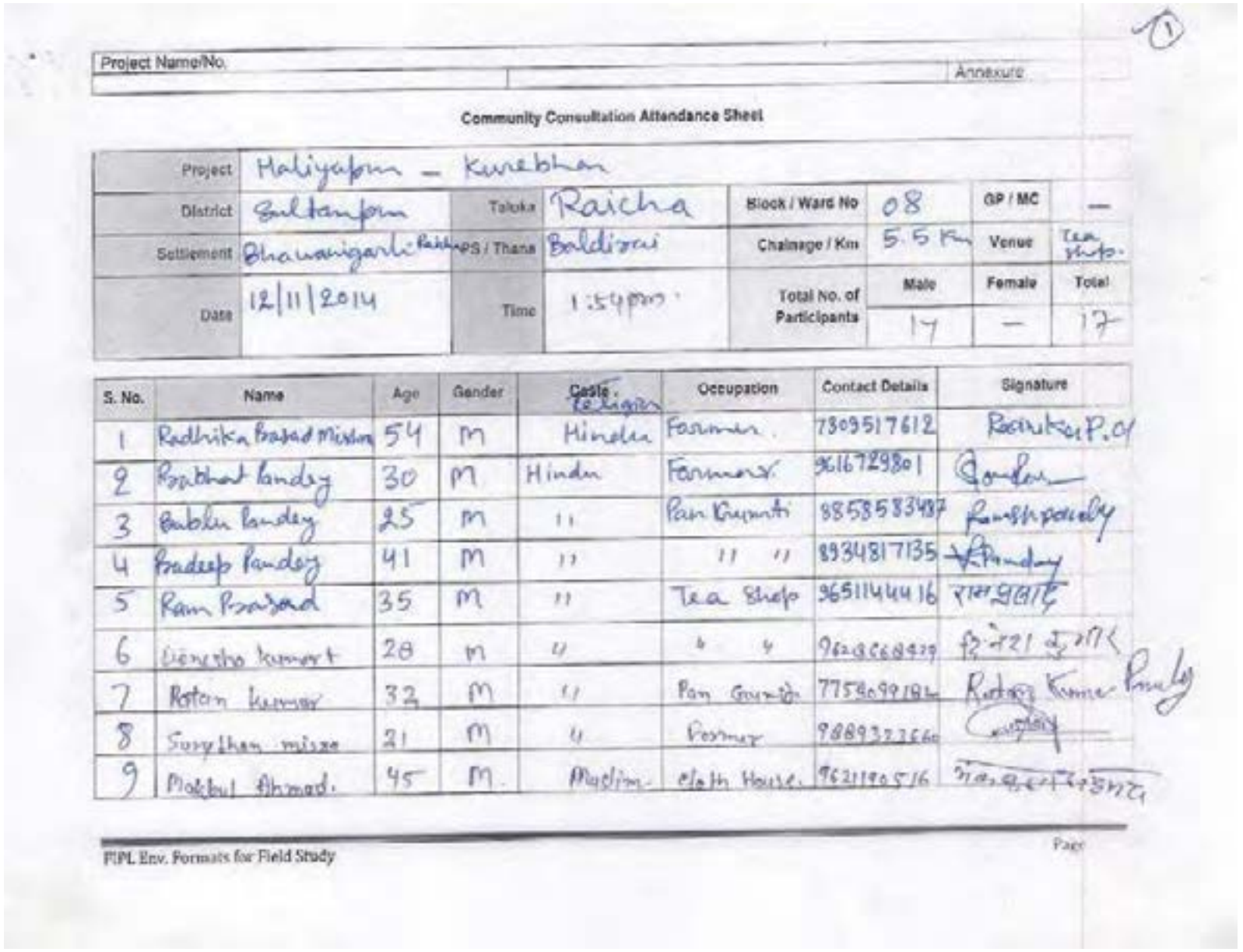
Project Name/No.		Annexure

Community Consultation Attendance Sheet

Project	Haliyapur - Kurekhan MDR - 66 E							
District	Sultanpur	Taluka	Kurekhan	Block / Ward No	–	GP / MC	–	
Settlement	Kurekhan Chauck	PS / Thana	Kurekhan	Chainage / Km	[illegible]	Venue	Kurekhan Chauck	
Date	12/11/2014	Time	12:03 pm	Total No. of Participants	Male	Female	Total	
					40	–	40	

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Md. Islam Kadri	45	M	Muslim	Hair Cutting Saloon	9005227138	
2	Mr Sanjay Maurya	28	M	Hindu	Medical Shop Bajeev Medical	9454525578	
3	Rajesh Chauraisiya	44	M	"	Paan shop	9450716227	
4	Shri Kumar	32	M	"	Mobile shop	9621414232	
5	Vikendra Kr. Tiwari	38	M	"	Medical Shop Secretary/ Medical	9451777787	
6	Bindy Lal	55	M	Hindu	Ground night guard security		
7	Jahid Hasan	50	M	Muslim	Cycle Shop	7752993556	
8	Fajluddin	60	M	"	Bangle's Shop	7897355499	
9	Md. Irshad	32	M	"	Cleaned Store	7379583608	
10	Gulab Chand	35	M	Hindu	" "	8127449968	



Project Name/No. | Annexure

Community Consultation Attendance Sheet

Project	Haliyapur – Kurebhan						
District	Sultanpur	Taluka	Raicha	Block / Ward No	08	GP / MC	—
Settlement	Bhawanigarh Patti	PS / Thana	Baldirai	Chainage / Km	5.5 Km	Venue	Tea shop.
Date	12/11/2014	Time	1:54pm	Total No. of Participants	Male: 14	Female: —	Total: 17

S. No.	Name	Age	Gender	Caste / Religion	Occupation	Contact Details	Signature
1	Radhika Prasad Mishra	54	M	Hindu	Farmer.	7309517612	Radhika P. M
2	Prabhat Pandey	30	M	Hindu	Farmer	9616729801	Prabhat
3	Bablu Pandey	25	M	"	Pan Gumti	8858583487	Bablu Pandey
4	Pradeep Pandey	41	M	"	" "	8934817135	Pradeep Pandey
5	Ram Prasad	35	M	"	Tea Shop	9651144416	राम प्रसाद
6	Dinesh kumar	28	M	"	" "	9628668939	दिनेश कुमार
7	Ratan Kumar	32	M	"	Pan Gumti	7759099184	Ratan Kumar Pandey
8	Suryabhan misra	21	M	"	Farmer	9889377660	Suryabhan
9	Maqbul Ahmad.	45	M	Muslim	Cloth House.	9621190516	मकबूल अहमद

(9)

Project Name/No. | Annexure

Project	Haldyapur - Kewakotha						
District	–	Taluka	–	Block / Ward No	–	GP / MC	–
Settlement	–	PS / Thana	–	Chainage / Km	–	Venue	–
Date	–	Time	–	Total No. of Participants	Male	Female	Total
					–		–

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
10	Saurabha Kumar	15	M	Hindu	students	9919626612	
11	Ram kripal mishra	48	"	"	Ration shop	9554639475	
12	Ghisiyaram	60	"	"	Pan shop	9912926157	
13	Radhe syam	55	"	"	Barber	8573923884	
14	Gya Parshad yadav	38	"	"	Farmer	9569946512	
15	Ram baran	28	"	"	Pan shop	9912926157	
16	Kailash Nath	25	"	"	Tea shop	8808949413	
17	Ram Parshad	72	"	"	Retired	9795871162	

Project Name/No.

Annexure

Community Consultation Attendance Sheet

Project	Haliyapur to Kurebhan up to Belwai							
District	Sultanpur	Taluka	Harauna	Block / Ward No	—	GP / MC	—	
Settlement	Harauna Market	PS / Thana	—	Chainage / Km	—	Venue	Hotel.	
Date	13.11.2014	Time	11:14 Am	Total No. of Participants	Male: 10	Female: —	Total: 10	

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Sukhdeo Prasad	33	M	Hindu	Pedimate Gumti	9436813716	
2	Mahatma Prasad	46	M	Hindu	Kirana Shops	9792086486	
3	Rambhan Shukla	40	M	Hindu	Unemployed	9918333428	
4	Parasnath Mishra	65	M	Hindu	Retired Teacher	7388138075	
5	Ramvijay Singh	50	M	Hindu	Medical store	9453654460	
6	Gyanchand	48	M	"	Sweets Shops	9794744895	
7	Kalisahay Pandey	60	M	"	Farmer	9721365611	
8	Shivram Pandey	48	M	"	Agriculture	9918105410	
9	Vinod Kumar	32	M	"	Atta Chakki	9670896004	
10	Harish Chandra	55	M	"	Kirana Shop	9984955437	

Project Name/No. | Annexure

Community Consultation Attendance Sheet

Project	Haliyal – Belavagi marking.							
District		Taluka	Semari Bajar	Block / Ward No	Jaisingh pur	GP / MC	—	
Settlement	Veer Singh pur Belavagi marking	PS / Thana	Jaisingh pur	Chainage / Km	0.0.00	Venue	Shops.	
Date	14/11/14	Time	Photo No. 453	Total No. of Participants	Male	Female	Total	
					6	1	7	

S. No.	Name	Age	Gender	Caste Religion	Occupation	Contact Details	Signature
1	Udaysrat	45	M	Hindu	Medicine shop	9450853529	(illegible)
2	Shivomprakash	46	M	"	Steel Shops	7054364855	
3	Moh. Kgun Nisar Ahmed	55	F	Muslim	Stretching shops.	9452099065	
4	Chatthu Thrader	50	M	Hindu	Crockery shop		
5	Ramesh Sirsath	40	M	Hindu	" "	9450044081	
6	Ram Gopal	18	M	"	Agro seed shops	7374919764	
7	Moh. Ayub	58	M	Muslim	Bangles Shop	9455404788	
8							
9							

Project Name/No. | Annexure

Project	Kaliyapur – Kumarbhan – Bhalwari						
District	Sultanpur	Taluka	Belwai – Kolan – Chauraha	Block / Ward No	—	GP / MC	—
Settlement	Belwai chauraha	PS / Thana		Chainage / Km	109-00	Venue	Belwai chauraha
Date	14.11.14	Time	3:32 pm	Total No. of Participants	Male: 7	Female:	Total: 7

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Jamadar Singh	68	M	Hindu	Ret. Teacher & Councillor	7376339251	
2	Arvind Kr Pandey	38	M	Hindu	Advocate	9450326123	
3	Gyan Prakash Singh	45	M	"	Home Owner for shopping	7376446059	
4	Atmaram Tiwari	65	M	"	Agriculture	9213377213	
5	Lalta Prasad Yadav	48	M	"	Tea Stall	8765442365	
6	Parmanand Dixit	45	M	Hindu	Agriculture	9956237366	
7	Dr. Ranjeet Kr. Singh	36	M	"	Teacher Lecturer	8792264859	
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10							

Project Name - Hussainganj Afghan Road

Interview Schedule for FGDs

Name of Village/Township: Hussainganj

Chainage _____ kms

Hours _____ time 4:00 pm Date - 14/12/14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Shamim	Shop	Hussainganj	M	35	Gen		
2	Wasim	Shop	— do —	M	30	Gen		9628494120
3	Radha Kisan	Service	— do —	M	40	Gen		967-301976
4	Mahesh	Pan Shop	— do —	M	30	Gen		7588146767
5	Chandra	Farmer	— do —	M	45	Gen		7754811
6	Satyendra	Farmer	Tehrpur	M	30	Gen		9670185249
7	Yogendra	Student	Hussainganj	M	25	Gen		
8	Pawan	Service	— do —	M	28	Gen		
9	Santosh	Farmer	— do —	M	35	Gen		9726246840
10	Badku	Farmer	— do —	M	35	Gen		
11	Mohd Sabir	Farmer	— do —	M	40	Gen		8127327451
12	Rajpal	Farmer	— do —	M	45	Gen		
13	Amit	Farmer	— do —	M	25	Gen		8280799869
14	Jamil	Farmer	— do —	M	35	Gen		9793981550
15	Golu	Farmer	— do —	M	27	Gen		
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Uttar Pradesh PWD

Project Name: Hariharganj - Akipur Road

Chainage Schedule for FGDs

Name of Village/Township: Mauza Chesala Chainage 0·000 - 9·000 kms

Hours Time 5:15 pm Date 14/12/14

S.No.	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Gyan chand Pal	Ram	Mauza	M	38	Lu		9865527915
2	Rehak	Ram	- do -	M	43	Lu		
3	Hariprakash	Ram	- do -	M	40	Lu		9952692093
4	Ram Sakhar	Agri	- do -	M	35	Lu		9648995256
5	Rakesh	-	- do -	M	22	Lu		8423405670
6	Vinod Kr	Student	- do -	M	20	Lu		8115694829
7	Surya Kr Sharma	Ram	- do -	M	55	Lu		
8	Satendra	Ram	- do -	M	41	Lu		9956801817
9	Ram Pravesh	Ram	- do -	M	49	Lu		
10	Surya pratap	Ram	- do -	M	40	Lu		
11	Rahul Nishad	Ram	- do -	M	28	Lu		9453478231
12	Rajesh	Ram	- do -	M	40	Lu		9455308242
13	Kaka Singh	Ram	- do -	M	65	Lu		
14	Ram Shankar	Ram	- do -	M	60	Lu		
15	Surya Kr	Driver	- do -	M	45	Lu		9823886 9817
16	Gulab Chand Nishad	Teacher	- do -	M	55	Lu		8259803 7917
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Uttar Pradesh PWD

Project Name :- Hamirpur Alipur Road

Interview Schedule for PDIs

Name of Village/Township: Reen nagar

Chainage 43·000 - 44·000 kms

Date: 15.12.14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Sunil	Lab	Reen nagar	M	35	Lodh		5888854270
2	Mahadeo Sgh	Bus	do	M	60	Lodh		
3	Mohd Yusuf	Bus	do	M	40	Lodh		9918209275
4	Babulal	Agri.	do	M	65	Lodh		
5	Mahyar Ahm	Lab	do	M	55	Lodh		
6	Guddi	Bus	do	M	30	Lodh		
7	Narendra	Bus	do	M	29	Lodh		9839854239
8	Ram Kg	Agri	Dwarka	M	45	Lodh		
9	Ram Nivas	Bus	Reen nagar	M	40	Lodh		
10	Ram Bahadur	Lab	do	M	43	Lodh		
11	Bhupendra Sgh	Bus	do	M	30	Lodh		9839423552
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Uttar Pradesh PWD

Project Name :- Hamirpur Alipur Road

Interview Schedule for FGDs

Name of Village/Township Hathgaon Chainage 26+830 - 2.8+000 km

Hours Time 11.40 pm Date 15.12.14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Shiva	Farmer	Hathgaon	M	25	Gen		
2	Ankit Pandey	Farmer	do	M	25	Gen		
3	Pradhan	Farmer	do	M	35	Gen		
4	Dhirendra Singh	Farmer	do	M	35	Gen		8423644076
5	Jitendra Singh	Farmer	do	M	30	Gen		9918663641
6	Nazeem	Farmer	Hathgaon	M	25	Gen		
7	Mukesh	Farmer	do	M	40	Gen		7585796115
8	Kanchan	Farmer	Hathgaon	M	50	Gen		
9	Mewa Lal	Farmer	do	M	58	Gen		
10	Mahendra Singh	Farmer	do	M	65	Gen		9721337427
11	Mahipal	Safai	do	M	25	Gen		
12	Sanjay	do	do	M	30	Gen		
13	Ram Gopal	Panchayat	do	M	55	Gen		
14	Surender	Farmer	do	M	45	Gen		
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Uttar Pradesh PWD

Project Name - Aurraiya Alipur Road

Interview Schedule for FGDs

Name of Village/Town/City Aurraiya Bahera Sadat Chainage 33·000 - 24·000 kms

Hours 12·30 pm Date 15·12·16

S. No.	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Shyam Yadav	Business	Aurraiya	M	45	Gen		8756723502
2	Sharad Yadav	Business	- do -	M	25	Gen		9837823863
3	Ram Niwas	Business	Chaubeji	M	35	Gen		9997607811
4	Raj Kr.	Business	Aurraiya	M	25	Gen	Raj Kumar	
5	Bhola Nath	Business	- do -	M	45	Gen		
6	Ramavtar	Business	- do -	M	50	Gen		
7	Ajay Kr.	Business	- do -	M	45	Gen		
8	Mohd Rehan	Student	- do -	M	40	M		9935244748
9	Shamshad	Teacher	- do -	M	45	M		
10	Mohd. Shafiq	Carpenter	- do -	M	35	M		
11	Ayaz Mohd	Medical Shop	- do -	M	28	M		8423957008
12	Mohd. Taj	Real Estate	- do -	M	35	M		9935364260
13	Mohammad Shafi	Shop	- do -	M	28	M		8400122285
14	Talat Rizvi	Teacher	- do -	F	29	M		9125378218
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Uttar Pradesh PWD

Project Name - Haridwar Bypass Road

Interview Schedule for FGDs

Name of Village/Township Chivlaha Chainage 16·000 - 18·000 kms

Hours Time 2:10 pm Date 15.12.14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Dinesh	Hotel	Chivlaha	M	28	Gen		9458970022
2	Hafiz Gul	Pan	Chak Bhaiwala	M	38	Gen		9759321084
3	Vinod Pratap	Farm	Chivlaha	M	40	Gen		9837744535
4	Kedarnath	Agri	— do —	M	68	Gen		8859341571
5	Ramprakash	Agri	— do —	M	40	Gen		9568919851
6	Kisanpal	Gen	— do —	M	42	Gen		
7	Manoj Kr	Pan shop	— do —	M	35	Gen		
8	Ram Gopal	Agri	— do —	M	55	Gen		
9	Dayaram	Driver	Bala	M	28	Gen		
10	Ajay Kumar	Farm	Chivlaha	M	32	Gen		9450811337
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Project Name:

Interview Schedule for FGDs

Name of village/Township: M.G. Samudra Chainage: 7-4 KM

Hours: 9:00 Time: 1 hrs Date: 15/12/14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact no.
1	Vinod Madaiya	Panch	Mirasmalli	M	35	Koli		02115-76464
2	Chan Sahoo	Panch	— do —	M	55	Koli		
3	Bagsaheb	Agri	— do —	M	81	Koli		
4	Rani	Panch	— do —	M				
5	Ram Nath	Shop	— do —	M	45			
6	Addya	Shop	— do —	M	56			7447835788
7	Ramjoshi	Shop	— do —	M	60			
8	D. R. D. Postal	medicine	— do —	M	74			
9	Sharma	Shop	— do —	M	50			
10	Nagnath	Shop	— do —	M	50			
11	Ram Nath	Teacher	— do —	M	42			7057105585
12	Ramdas	G staff	— do —	M	28			8263925747
13	Rangil	Salesman	— do —	M	78			
14	Ram Bhai	Salesman	— —	M	45	SC		
15	Lalchand	Labour	— —	M	50	SC		
16	Ramchand	Labour Shop	— —	M	52	SC		
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Uttar Pradesh PWD

Project Name :-

Interview Schedule for FGDs

Name of Village/Township: Nishanya Chainage _____ kms

Hours Time: Date: 13-12-14

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Ashok	Shop	Nishanya	M	29			
2	Ram Paresh	Kisan	Nishanya	M	40			
3	Surain Pathak	Shop	"	M	50			7897078218
4	Saravan	Shop	"	M	32			8601323347
5	Ardhesh	Shop	"	M	35			8005565718
6	Nandlal	Shop	"	M	40			8604373236
7	munna	Shop	"	M	35			9936238760
8	Pramod	Medical	"	M	45			
9	Rakesh soma	Shop	"	M	32			9695069873
10	Ramchandra	Shop	"	M	45			9450861908
11	Hira Yadav	Shop	"	M	45			7582842665
12	Pawan (pan)	Shop	"	M	25			9926720217
13	Basmati	-	—	F	40		—	—
14	Kitabi	—	—	F	60		—	—
15	Moti Sarai	—	—	F	50		—	—
16	Pankaj	—	"	M	35			
17	Ramulay	—	"	M	35			
18	Ram Sajeevan	Agri	"	M	45			9305
19								

Uttar Pradesh (NR)

Project Name :-

Interview Schedule for FGDs

Name of Village/Township Chakia Bhimlapatti Chandauli Distt.

Hours Time Date- 13.12.19

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Shantosh	Shop	Chakia Bhimlapatti	m	22	ZHGTG		9554411490
2	Ram Bach	Shop	"	m	70			9956893571
3	Shayam Dev	Shop	"	m	60			76-7713593
4	Man Dev	Shop	"	m	60			
5	Shubhash	Mason	"	m	27			
6	Pankaj	Shop	"	m	60			
7	Mukraj	Mason	"	m	70			
8	Shukdeo	Shop	"	m	110			8233666027
9	Jnardan Mistri	Shop	"	m	70			9794417627
10	Pramod Dubi		"	m	34			
11	Devnath Kumar	Shop	"	m	34			8282916933
12	Sadalanand	Resident	"	m	62			9996994648
13	Ramdev	Resident		m	60			—
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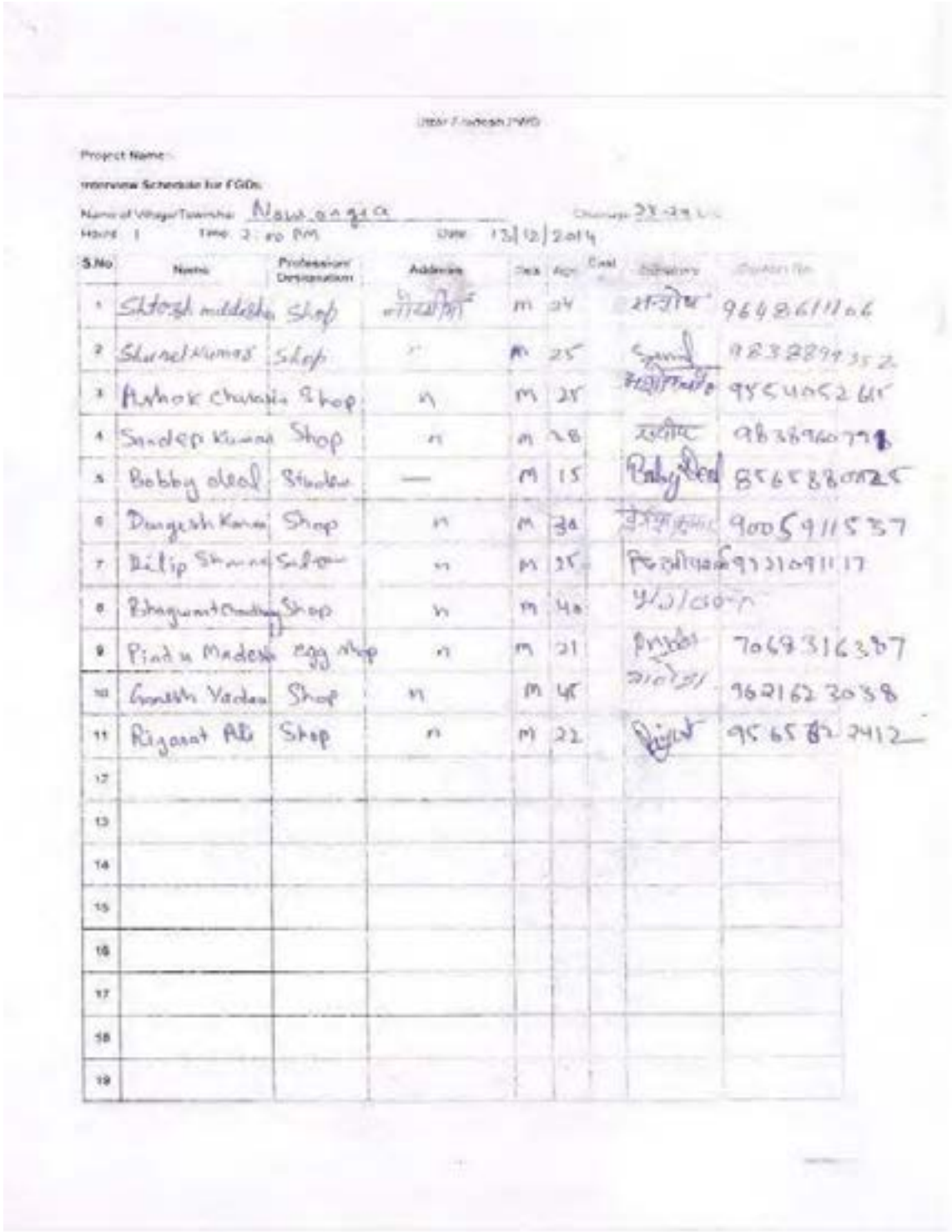

Project Name:

Interview Schedule for FGDs

Name of Village/Township: Nawapara

Hours: 1 Time: 2:40 PM Date: 13/12/2014

S.No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No
1	Shtosh middeshe	Shop		m	24			9648611106
2	Sharnet Kumar	Shop	"	m	25			9832899352
3	Ashok Chandra	Shop	"	m	28			9854052661
4	Sandeep Kumar	Shop	"	m	28			9838960779
5	Bobby deol	Student	—	m	15			8565880825
6	Dangesh Kanu	Shop	"	m	30			9005911537
7	Dilip Sharma	Salon	"	m	25			9731091117
8	Bhagwant Chadha	Shop	"	m	40			
9	Pintu Madesh	egg shop	"	m	21			7069316387
10	Ganesh Yadav	Shop	"	m	45			9621623038
11	Rizwan Ali	Shop	"	m	22			9565822412
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Project Name:

Interview Schedule for FGDs

Name of Village/Townships: Bachalpur Mug (Makiligaon)

Hills

Plains

S.No	Name	Profession/ Designation	Location	Sex	Age	Caste	Signature	Contact No.
1	Ram Nanga Lunpte	Pastor	Makiligaon	M	35	Kuki		
2	Sukdeb L	Pastor	- do -	M	35	Kuki		9721028897
3	Bikola	Pastor	- do -	M	40	Kuki		
4	Dalip	Agri	- do -	M	85	Kuki		8948121489
5	Anda Yoda	Agri	- do -	M	65	Kuki		9854853263
6	Hoshilal	Agri	- do -	M	55	Kuki		9919985230
7	Damanu?	Agri	- do -	M	55			
8	Lyngel Lkohar	Agri	- do -	M	50			
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Project Name :-

Interview Schedule for FGDs

Name of Village/Township: Gaud Basti Dist.: Chhatarpur Tehsil: Tehsil

S No	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Santosh	Pradhan	Gaud Basti	M	35	Lodhi		8052524419
2	Satish Kumar	Shop	— do —	M	35	Lodhi		9425[illegible]085
3	Sukhram	Shop	— do —	M	35	Lodhi		
4	Ayodhya	Pradhan	— do —	M	40	Lodhi		9993610[illegible]
5	Mohan	Pradhan	— do —	M	25	Lodhi	Mohan Singh	
6	Manoj	Pradhan	— do —	M	24	Lodhi		9425051559
7	Bhagwan Singh	Pradhan	— do —	M	55	Lodhi		[illegible]
8	Jaiprakash	Pradhan	— do —	M	28	Lodhi		[illegible]
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Uttar Pradesh PWD

Project Name:

Interview Schedule for FGDs

Name of Village/Township: Jhansi Chainage: km's

Hours Time Date

S. No.	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
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Uttar Pradesh PWD

Project Name

Interview Schedule for FGDs

Name of Village/Township Chapauli Chainage ____ KM

Hours Time Date

S No.	Name	Profession/ Designation	Address	Sex	Age	Caste	Signature	Contact No.
1	Zindagi	Res	Chapauli	M	55	Lodh		9795695510
2	Ravindra	Res	-do-	M	45	Lodh		
3	Raj Kamal	Res	-do-	M	40	Lodh		9795698245
4	Ambika	Res	-do-	M	29	Lodh		7275322514
5	Sivanath	Student	-do-	M	21	Lodh		8127956645
6	Bikramjit	Student	-do-	M	24	Lodh		
7	Abhishek	Student	do	M	23	Lodh		9936894578
8	Pradeep	Student	-do-	M	26	Lodh		
9	Rakhan	Res	-do-	M	55	Lodh		
10	Mrinalika	Res	-do-	M	60	Lodh		
11	Santosh	Res	-do-	M	40	Lodh		9400854593
12	Gopalram	Res	-do-	M	47	Lodh		7607782781
13	Ramesh	Res	-do-	M	28	Lodh		8484000 1719
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Project Name/No: Uttar Pradesh Major District Road Improvement Works

Community Consultation Attendance Sheet

Project	Mohanlalganj – Unnao Marg.						
District	Lucknow	Taluka	Mohanlalganj	Block / Ward No		GP / MC	
Settlement	Dhanwara	PS / Thana	Mohanlalganj	Chainage / Km	4.2 Km	Venue	Dhanwara
Date	11/06/2015	Time	10:50 AM	Total No. of Participants	Male: 15	Female: –	Total: 15

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1-	[illegible]	49		[illegible]	[illegible]	9793976972	
2-	Ankur	26	M	Jaiswal	Busn	9721766910	
3-	[illegible]	27	"	[illegible]	Elec Asst	7800753182	
4-	[illegible]	27	"		[illegible]	3648369285	
5-	Sanjay Singh	53	"	Singh	—	—	
6-	Shatrughan	40	M	"	—	—	
7-	Harish Chandra	65	M	Harijan	[illegible]	—	
8-	Hari Deen	70	M	"	"	—	
9-	Shubham	18	M	"	"	8953600301	

Project Name/No. — Same —

Annexure

Community Consultation Attendance Sheet

Project	— Same —						
District	Lucknow	Taluka	Mohanlal ganj	Block / Ward No	Mohanlalganj	GP / MC	
Settlement	Dham Dara	PS / Thana	Mohanlal ganj	Chainage / Km	4-2 Km.	Venue	Gharwara
Date	1/6/2015	Time	10:50 AM	Total No. of Participants	Male	Female	Total
					—	—	—

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
10	Vishnu Singh	35	M	Singh	[illegible]	—	[redacted]
11	Phool chand	20	M	Dhanak	मजदूर	86 01194 35	
12	Rajender Singh	30	M	Singh	[illegible]	9956094643	
13.	[illegible]	40	M	[illegible]	[illegible]	9935335963	[illegible]
14	[illegible]	62	M	[illegible]	[illegible]	9793845851	[illegible]
15	Rakesh Pal	42	M		[illegible]	9793930482	[illegible]

Project Name/No. Uttar Pradesh Nagar District Road Improvement Works

Annexure

Community Consultation Attendance Sheet

Project	Mohan Lodgaon – Unnao Marg						
District	Unnao	Taluka	Purwa	Block / Ward No	Asholee	GP / MC	
Settlement	Jabrela Market	PS / Thana	Asholee	Chainage / Km	13.000	Venue	Jabrela
Date	11/06/2013	Time	3.00 PM	Total No. of Participants	Male	Female	Total
					16	1	17

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1-	Mahesh yadav			Yadav	[illegible]	8965417690	[illegible]
2-	Mata Prashad	60	M	Lodh	[illegible]	—	[illegible]
3-	Kamlesh	35	M	Gautam	Mistri	8005375624	[illegible]
4-	Ram Naresh	36	M	"	"	—	[illegible]
5-	Niraj	20	M	Rakoat	"	7857576746	[illegible]
6-	Naresh	19	M	Rajpoot	"	9793978025	[illegible]
7-	Vinodh Kumar	40	M	Tiwari	"	9956232452	[illegible]
8-	Avadhesh	50	M	Verma	"	9506150126	[illegible]
9-	Ranjeet Kumar	28	M	Yadav	"	9451528644	[illegible]

Project Name/No: Annexure:

Community Consultation Attendance Sheet

Project								
District	Unnao	Taluka	Purwa	Block / Ward No		GP / MC		
Settlement	Jabrela Market	PS / Thana	Achalganj	Chainage / Km	13.000	Venue	Jabrela Market	
Date	11/6/2015	Time	3.00 PM	Total No. of Participants	Male	Female	Total	
					—	—	—	

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
10	Raju	50	M	Savita	कृषि	—	राजू
11	Sharju	75	M	Kashaf	"	—	शरजू
12	गोपाल	35	M	Rawat	"	9793748022	गोपाल
13.	Raju	38	M	Gautam	मजदूरी	8932909525	राजू
14.	Daya Ram	45	M	Rawat	"	—	दया राम
15.	Bapu	75	M	Rajhoot	"	—	बापू
16.	Darghi lal	70	M	Bari	"	—	दरगही
17	विजय कुमार	50				8765417690	विजय कुमार

Project Name/No. Uttar Pradesh Nagar District Road Improvement Works

Annexure

Community Consultation Attendance Sheet

Project	Mohanlalganj – Unnao Marge						
District	Unnao	Taluka	Purwa	Block / Ward No	Ashelwa	GP / MC	
Settlement	Khalu Kheda	PS / Thana	Asoha	Chainage / Km	17.080	Venue	Kalu Kheda
Date	10.06/2015	Time	2.30 PM	Total No. of Participants	Male: 18	Female: –	Total: 18

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	[illegible]	60			[illegible]	9415025541	
2	[illegible]	45			[illegible]	9415025541	
3	[illegible]	36			Business	9450773116	
4	[illegible]	21	M	[illegible]	"	9793458781	[illegible]
5	[illegible]	18	M		"	8765417771	[illegible]
6	[illegible]	32	M	[illegible]	[illegible]	9005020629	[illegible]
7	[illegible]	70		[illegible]	[illegible]	9956907187	[illegible]
8	[illegible]	35		[illegible]	[illegible]		
9	[illegible]	28	M	[illegible]	[illegible]	8400316574	[illegible]

Project Name/No. —

Annexure

Community Consultation Attendance Sheet

Project	—						
District	Unnao	Taluka	Purwa	Block / Ward No	Ashoha	GP / MC	
Settlement	Khalu Kheda	PS / Thana	Purwa Ashoha	Chainage / Km	17.000	Venue	Khalukheda
Date	10.06.2017	Time	2.30 PM	Total No. of Participants	Male	Female	Total
					—	—	—

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	[illegible]	45	M	[illegible]	मजदूरी	—	[illegible]
2.	[illegible]	40	M	दीक्षित	मजदूरी	—	[illegible]
3.	[illegible]	30	M	रावत	"	—	[illegible]
4.	[illegible]	50	M	"	"	8052136277	[illegible]
5.	[illegible]	26	M	"	"	—	[illegible]
6.	[illegible]	55	M	बाजपेई	"	8853414124	[illegible]
7.	[illegible]	27	M	"	"	9452267990	[illegible]
8	[illegible]	20	M	मोहयाल	Business	9565406339	[illegible]
9	[illegible]	22	M		Student	9565406339	[illegible]

Project Name/No. Uttar Pradesh Major District Road Improvement Work — Annexure:

Community Consultation Attendance Sheet

Project	Mohan Jalgaon – Unnao, Marg						
District	Unnao	Taluka	Hilauli	Block / Ward No		GP / MC	—
Settlement	Mauraiya	PS / Thana	Mauraiya	Chainage / Km	31.000	Venue	Mauraiya
Date	8/06/2015	Time	2:20 PM	Total No. of Participants	Male	Female	Total
					15	—	15

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	[illegible]	62	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	68	"	[illegible]	[illegible]	-	[illegible]
3	[illegible]	60	"	"	"	[illegible]	[illegible]
4.	[illegible]	[illegible]	"	"	"	[illegible]	[illegible]
(5)	[illegible]	35	"	"	[illegible]	[illegible]	[illegible]
(6)	[illegible]	28	"	"	[illegible]	9621047000	[illegible]
(7)	[illegible]	68	"		Teacher	9621989448	[illegible]
(8)	A.K. Maurya	50	"		LT (Service)	9451944475	[illegible]
(9)	Vijay Bahadur	40	"		Citizen	"	[illegible]

Project Name/No. —Same—

Annexure:

Community Consultation Attendance Sheet

Project	—Same—						
District	Umrao	Taluka	Hilauli	Block / Ward No		GP / MC	
Settlement	Mauraida	PS / Thana	Mauraida	Chainage / Km	31.000	Venue	Mauraida
Date	8/06/2015	Time	2:20 PM	Total No. of Participants	Male —	Female —	Total —

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1-	Krishn Chandra	38	M	Pathak	Business	9755615514	
2-	[illegible]	75	M	Mahendra	Hindu		
3	Jai Prakash	25	M	Sharma	Service	9935118601	
4-	Anil Kumar Tiwari	44.	M	Vishwakarma	Business	7621406481	Anilkumar Tiwari
5-	[illegible]	30	m	Rathi	[illegible]		[illegible]
6-	[illegible]	50	M	[illegible]	Business	8896629916	[illegible]

Project Name/No. Uttar Pradesh Major District Road Improvement Works — Annexure

Community Consultation Attendance Sheet

Project	Mohanlalganj – Unnao Marg						
District	Unnao	Taluka	Purwa	Block / Ward No		GP / MC	
Settlement	Mangat Kheda	PS / Thana	Purwa	Chainage / Km	50.000	Venue	
Date	09/06/2015	Time	3.30 PM	Total No. of Participants	Male	Female	Total
					11	7	18

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1-	Tarawati	45	F	Brahmin	[illegible]	—	तारावती
2-	Ritee	24	F	"	"	—	प्रीती
3-	Suman	35	F	"	"	—	सुमन
4-	Manju	24	F	"	"	—	मन्जू
5-	Bindu Devi	18	F	"	—	—	बिन्दु देवी
6-	Ramkumar	50	M	"	[illegible]	—	रामकुमार
7	Rashmi	18	F	"	—	—	रश्मी
8-	Shiv Kali	45	F	"	"	—	शिव काली
9	Dharmendra Kumar	24	M		Village head	8009105002	

Project Name/No. Sarai

Annexure:

Community Consultation Attendance Sheet

Project	Sarai						
District	Unnao	Taluka	Purwa	Block / Ward No	Asiwha	GP / MC	
Settlement	Mangat Kheda	PS / Thana	Purwa	Chainage / Km	50000	Venue	
Date	9/06/2015	Time	3:30 PM	Total No. of Participants	Male	Female	Total
					—	—	—

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	Rocky	24	M	Gautam	Mjdoori	9041460855	Rocky
2-	Ravi Shankar	24	M	"	दुकान	—	रवि शंकर
3-	Ram Kishor	40	M	"	"	9651895228	रामकिशोर
4.	Allakey	48	M	"	"	8601123492	अलगेपी
5.	Ram Lal	45	M	"	"	—	रामलाल
6.	Garibey	60	M	"	"	—	गरीबे
7.	Ram Khilawan	55	M	"	"	—	राम खिलावन
8.	Guddu	23	M	"	"	7081019659	गुड्डू
9.	Puti Lal	65	M	"	"	8601049990	पुतीलाल

Project Name/No. Uttar Pradesh Major District Road Improvement Works

Annexure:

Project	Mahmudalganj - Unnao Marga.						
District	Unnao	Taluka	Unnao	Block / Ward No	Pichiya	GP / MC	
Settlement	Tauna	PS / Thana	Purawa	Chainage / Km	54.800	Venue	
Date	12/06/2015	Time	9.00 AM	Total No. of Participants	Male	Female	Total
					20	—	20

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	[illegible]	30	[illegible]		[illegible]	[illegible]	[illegible]
2	[illegible]	45	m		[illegible]	9621493036	[illegible]
3	[illegible]	46	m		[illegible]	9455587795	[illegible]
4	[illegible]	[illegible]	m			—	[illegible]
5	[illegible]	43	m		मजदूरी	9452350487	[illegible]
6	[illegible]	[illegible]	m		मजदूरी	—	[illegible]
7	Rufan	35	m		मजदूरी	—	
8	[illegible]	25	m		Student		[illegible]
9	[illegible]	29	m		Business		[illegible]
10	[illegible]	31	m		Business man		[illegible]

Project Name/No. — Sarai —

Annexure:

Project	— Sarai —						
District	Unnao	Taluka	Unnao	Block / Ward No		GP / MC	
Settlement	Faura	PS / Thana	Purwa	Chainage / Km	54+800	Venue	Faura
Date	12/06/2015	Time	9:00 AM	Total No. of Participants	Male	Female	Total
					—	—	—

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
11	[illegible]	26	[illegible]	[illegible]		8687[illegible]	Sanjay Kumar
12	[illegible]	36	"				[illegible]
13	[illegible]	23	"		मजदूरी		[illegible]
14	[illegible]	25	"		Business		[illegible]
15	विजय पाल	40	"		खेती		[illegible]
16	[illegible]	71	"		Business		विनोद
17	पवन शुक्ला	37	"		Teacher		Pawan Shukla
18	[illegible]	31	"		Teacher		[illegible]
19	[illegible]	42	"		Business		[illegible]
20	[illegible]	47	"		Business		[illegible]

Project Name/No: Uttar Pradesh Major District Road improvement Project. Annexure:

Community Consultation Attendance Sheet

Project	Aliganj – Sooori marg (MDR-45W)						
District	Kasganj	Taluka	Sahawar	Block/Ward no	Sahawar	/ MC	Sahawar
Settlement	Sahawar	PS / Thana	Sahawar	Chainage / Km	48+420	Venue	Tent shop ward no.:
Date	14.06.2015	Time	8:30 AM	Total No. of Participants	Male: 14	Female: –	Total: 14

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	मुन्ने	36	M	अलवी	मजदूरी	9720066214	
2.	राशिद	23	M	अलवी	मजदूरी		
3.	दिलशाद खाँ	35	M	पठान	मजदूरी	9486949819	
4.	शिवम पाण्डे	17	M	ब्राह्मण	मजदूरी		
5.	सुभाष अहमदाबादी	53	M	[illegible]	व्यापार	9719060136	
6.	मोनू	21	M	कबीर	मजदूरी	9536557087	
7.	शादाब खाँ	34	M	पठान	मजदूरी	8057501908	
9	जैनाब खमगाड़ा	30	M	खमगाड़ा	[illegible]	9719052321	
10	अरबाज खान	17	M	पठान	पढ़ाई	9058177267	

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Project Name/No.	Uttar Pradesh Road Improvement Project.	Annexure:

Community Consultation Attendance Sheet

Project	Rajganj — Soson marg						
District	Kaziganj	Taluka	Sahawaj	Block/Ward no	07	GP/MC	Sahawaj
Settlement	Sahawaj	PS / Thana	Sahawaj	Chainage / Km	48+470	Venue	Tent Shop ward no. 7.
Date	14.06.2015	Time	8:30 AM	Total No. of Participants	Male: 14	Female: —	Total: 14

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
11	निजाम रवांन	30	M	पठानें	कृषि	8273913920	निजाम रवांन
12	फैजल खान	18	M	पठान	स्टेज	7500250998	फैजल खान
13	नासिरुद्दीन खाँन	45	M	पठान	~~[illegible]~~ दुकानदार	9528808896	नासिर उद्दीन
14	शमीम उल्लाह	62	M	पठान	दुकानदारी	9536627224	शमीम उल्लाह खाँ

Project Name/No.	Uttar Pradesh Major District Road improvement project.	Annexure:

Community Consultation Attendance Sheet

Project	~~Uttar Pradesh~~ Aliganj — Sasan marg (MDR-45W)						
District	Kasganj	Taluka	Patyali	Block/Ward No.	07.	GP/MC	Patyali
Settlement	Patyali	PS / Thana	Patyali	Chainage / Km	281210	Venue	Sabhasad House.
Date	14.06.2015	Time	12:30PM	Total No. of Participants	Male 15	Female 1	Total 16

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	जौली	19	M	दिवाकर	मजदूरी	—	—
2.	मुहम्मिन	35	M	लौहार	मजदूरी	—	मुहम्मद
3.	धर्मेन्द्र	28	M	ठाकुर	किसान	9720158486	
4.	शेर मौहम्मद	50	M	लौहार	मजदूरी	9780202381	शेरमुहम्मद
5.	गंगा प्रसाद	70	M	राजेश	मजदूरी	—	गंगाप्रसाद
6.	सत्तार	40	M	लौहार	मजदूरी	8057398446	सत्तार
7.	लालू	30	M	राजेश	कृषी	9720826001	लाल
8	मजहर अली	50	M	लौहार	मजदूरी	9690767713	
9.	विजय	20	M	खटिक	मजदूरी	9568334486	विजय

Project Name/No.	Uttar Pradesh Major District Road improvement Project.	Annexure:

Community Consultation Attendance Sheet

Project	Aligarj – Soron marg.						
District		Taluka	Patyali	Block/Ward No.	07	GP/MC	Patyali
Settlement	Patyali	PS / Thana	Patyali	Chainage / Km	28+210	Venue	Sabhyad House
Date	14.06.2015	Time	12:30 PM	Total No. of Participants	Male: 15	Female: 01	Total: 16

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
10	मूलीसिंह	62	M	कंजर	मजदूरी	—	मूलीसिंह
11	मुख्तार हसन	32	M	मुस्लिम	व्यापार	9720293128	मु० हसन
12	[illegible]	37	M	[illegible]	[illegible]	7417669639	[illegible]
13	Buland. Akhtar	34	M.	Shaikh. muslim (Teacher)		9410935500	[illegible]
14	मोहम्मद शकिल	35	M	लोहार	मजदूरी	9627188936	[illegible]
15	रामस्वरूप	50	M	धोबी	मजदूरी	—	सूरज सुरजी
16	सूरजमुखी	60	~~M~~ F	कंजर	मजदूरी	—	

Project Name/No.	Uttar Pradesh Major District Road improvement project	Annexure:

Community Consultation Attendance Sheet

Project	Aligarj – Soron marg (MDR 45 W)					
	Taluka: Shaucarh	Block/Ward No. Shaucarh	GP/MC Tali			
Settlement: Tali	PS / Thana: Shaucarh	Chainage / Km: 52+810	Venue: Jawar Singh Shop in middle of village			
Date: 14/06/2015	Time: 04:00 pm	Total no. of Participants:	Male: 20	Female: –	Total: 20	

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Ganga Sahay	48	m	Kashyap	Village Pradhan	9761762685	Ganga Sahay
2	Lankesh	55	m	"	Ex Majdooree	—	लंकेश
3	Bhudev Singh	60	m	"	farmer	8954016528	—
4	Jakar Singh	28	m	"	Majdoree	8c06279545	Javar Singh
5	Ram Singh	36	m		"	9012429674	रामसिंह
6	Baburam	65	m	"	"	—	बाबूराम
7	Satypal	28	m	"	"	9012475739	सत्यपाल
8	Raj pal	18	m	"	"	9536911367	राजपाल
9	Sankar	56	m	"	"	—	शंकर सिंह

Project Name/No. Uttar Pradesh Major District Road Improvement Project. | Annexure:

Community Consultation Attendance Sheet

Project	Aliganj – Sasan Marg						
District	Kasganj	Taluka	Sahawar	Block/ Ward No.	Sahawar	GP/MC	Tali
Settlement	Tali	PS / Thana	Sahawar	Chainage / Km	52+810	Venue	Jaya Singh shop in middle of village
Date	14/06/2015	Time	04:00 PM	Total No. of Participants	Male: 20	Female: —	Total: 20

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
11	Lakhan	28	M	"	"	8449380350	लाखन
12	Shyam Lal	26	"	"		9690599416	श्यामलाल
13	Shushpal	18	"	"	"	—	Suresh Kumar
14	Saveish	23	"	"		8476974502	
15	Papu	50	"	"		9639423535	
16	Maharveer	23	"	"		8449174799	महावीर
18	Harveer	26	"	"	"	7568775092	
19	Bhudar	45	"	"	"	—	
20	Todi singh	30	"	"	"	—	
21	Dilak Singh	30	"	"		—	

Project Name/No.	Uttar Pradesh Major District Road Improvement Project.	Annexure:

Project	Aliganj – Sasan Marg (MDR 45W)						
District	Kasganj	Taluka	Sahawar	Block / Ward No	Sahawar	GP / MC	Lakhmipur Gopal Singh
Settlement	Lakhmipur Gopal Singh	PS/Thana	Sahawar	Chainage/Km	53+920	Venue	Narendra Singh Shop-near mandi.
Date	15.06.2015	Time	9:00 AM	Total No. of Participants	Male: 40	Female: –	Total: 40

S. No.	Name नाम	Age उम्र	Gender M/F	Caste जाति	Occupation व्यवसाय	Contact Details फोन नं०	Signature
1.	अनिल कुमार	25	M	[illegible]	किसान	8958986829	[illegible]
2.	सुरेन्द्र सिंह	48	"	[illegible]	खेती	8958039940	सु रे न्द्र
3.	[illegible]	30	"	[illegible]	किसान	9759602738	[illegible]
4.	[illegible]	18	"	[illegible]	[illegible]	7409457946	[illegible]
5.	[illegible]	45	"	[illegible]	[illegible]		[illegible]
6.	[illegible]	22	"	[illegible]	[illegible]	9411913948	[illegible]
7.	[illegible]	26	"	"	खेती	9627971083	[illegible]
8.	[illegible]	34	"	[illegible]	"	9928578064	[illegible]
9.	[illegible]	30	"	[illegible]	[illegible]	9954066916	[illegible]
10.	[illegible]	48	"	[illegible]	खेती	8650295915	[illegible]

Project Name/No.	Uttar Pradesh Major District Road Improvement project	Annexure:

Project	Aligarj to Soron Marg (MDR-45W)						
District	Kasganj	Taluka	Sahawar	Block / Ward No	Sahawar	GP / MC	Lakhmipur Gopal Singh
Settlement	Lakhmipur Gopal Singh	PS/Thana	Sahawar	Change / Km	534920	Venue	Narendra Singh Shop near Mandir
Date	15.06.2015	Time	9:30 AM	Total No. of Participants	Male 40	Female —	Total 40

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
11.	[illegible]	16	M	[illegible]	[illegible]	95688398[illegible]	[illegible]
12.	[illegible]	63	M	[illegible]	11	9568243960	[illegible]
13.	[illegible]	45	M	[illegible]	11	2810702[illegible]	[illegible]
14.	[illegible]	45	M	[illegible]	11	97601646[illegible]	[illegible]
15.	[illegible]	30	M	[illegible]	11	9634336[illegible]	[illegible]
16.	[illegible]	80	M	[illegible]	11	9659021721	[illegible] Shubhkar
17.	[illegible]	31	M	[illegible]	[illegible]	8954315[illegible]	[illegible] Akash
18.	[illegible]	21	11	[illegible]	[illegible]	7409848[illegible]	[illegible]
19	[illegible]	20	m	[illegible]	[illegible]	7351800[illegible]	[illegible]
20	[illegible]	21	m	[illegible]	[illegible]	8394857894	[illegible]

Project Name/No.	Uttar Pradesh Major District Road Improvement Project.	Annexure:

Project	Aliganj — Sadar Marg (MDR-45W)						
District	Kasganj	Taluka	Sahawar	Block / Ward No	Sahawar	GP / MC	Lakhmipur Gopal Singh
Settlement	Lakhmipur Gopal Singh	PS/Thana	Sahawar	Chainage / Km	534920	Venue	Nandram Shop near mandir
Date	15.06.2015	Time	9:00 AM	Total No. of Participants	Male 40	Female —	Total 40

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
21	विजेन्द्रसिंह	40	M	ठाकुर	कृषि	9720312355	विजेन्द्रसिंह
22	धीरेश	32	M	यादव	कृषि	9720917098	धीरेश
23	रामौतार	30	M	यादव	कृषि	7830261933	रामौतार
24	दिनेश	36	M	यादव	कृषि	8512477398	दिनेश
25	महेन्द्र	37	M	यादव	कृषि	—	महेन्द्र
26	हरिश्चन्द्र	30	M	प्रजापति	मजदूरी	—	हरिश्चन्द्र
27.	अलहसनुद्दीन	45	M	मुसलमान	11	8006102144	इरशादुद्दीन
28.	रामसिंह	65	11	ठाकुर	11	9627021774	रामसिंह
29	शिवजी	70	11	ब्राह्मण	11	—	शिवजी
30	मुनीश	25	11	जाट	11	8650248219	मुनीश

Project Name/No.	Uttar Pradesh Major District Road Improvement project	Annexure:

Project	Aligarj – Soron Marg (MDR-45W)						
District	Kashganj	Taluka	Sahawag	Block / Ward No	Sahawag	GP / MC	Lakhmipur Gopal Singh
Settlement	Lakhmipur Gopal singh	PS/Thana	Sahawag	Chainge /km	53+920	Venue	Narendra shop near mandir
Date	15.06.2015	Time	9:00 AM	Total No. of Participants	Male 40	Female —	Total 40

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
31	देवपाल	36	M	प्रजापति	मजदूरी	9458456941	देवपाल
32	अमित	31	M	उपाध्याय	कृषि	—	
33	अजयकुमार	43	M	ब्राह्मण	कृषि	8006675969	
34	चन्द्रपाल	38	M	ब्राह्मण	कृषि	—	
35	रतनसिंह	41	M	प्रजापति	व्यवसाय मेकेनिक शेयर	9720904865	
36	गुड्डू	22	M	कबीर	मजदूरी	8650321458	गुड्डू
37	सरनदास	70	M	[illegible]	कृषि		
38	मधु	32	M	तेली	मजदूरी		मधु
39	आकाश	18	M	पासी	कृषि	9927850064	आकाश
40	नन्दकिशोर	23	M	[illegible]	मजदूरी	7500604469	

Project Name/No: Uttar Pradesh Major District Road improvement Project. Annexure:

Community Consultation Attendance Sheet

Project	Aliganj — Soron marg (MDR-45W)						
District	Kasganj	Taluka	Patyali	Block/ Ward no.	Ganjdundwara	GP/MC	Ganjdundwara
Settlement	Ganjdundwara	PS / Thana	Ganjdundwara	Chainage / Km	164 300	Venue	Nagar Palika office
Date	15.06.2015	Time	2:00 PM	Total no. of Participants	Male: 10	Female: —	Total: 10

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	MUNNBER Husain	60	M	Pathan	chairman	9761844291	
2.	Ibrat Yar Khan	48	M.	Pathan	Farmer.	9456809519	
3.	[illegible]	52	M	Sharma	Govt. Job	9412548695	
4.	[illegible]	40	M	Pathan	Farmer	9690157609	
5.	[illegible]	45	M	Pathan	Farmer	9690157609 / 9639080310	
6.	[illegible]	58	M.	Pathan	Govt. Job	9568226234	
7.	[illegible]	40	M	Pathan	Sabhsad/farmer	—	
8	[illegible]	53	M	Sharma	Business	7x2084[illegible]	
9.	[illegible]	60	M	Thakur	Govt. Job	—	
10	[illegible]	62	M	Gupta	Govt. Job	941-879271	

Page

Project Name/No.	Uttar Pradesh major District Road improvement Project.	Annexure

Community Consultation Attendance Sheet

Project	Aligarj – Soron marg (MDR-45W)					
District	Kasganj	Taluka	Kashganj	Block/Ward no.	Soron	Timbarpur
Settlement	Timbarpur	PS / Thana	Soron	Chainage / Km		Venue
Date	16/06/2015	Time	12:30	Total No. of Participants	Male 17	Female — Total 17

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	Anjum	30	m	Pathan	village Pardhan	9758632792	
2	Sushil kumar	22	m	Jatav	majduree	9675823596	
3	Satendar kumar	25	m	Jatav	Private Job	9911278060	
4	Baniwari	50	m	"	Shopkeeper	—	
5	Ram chander	30	m	"	majduree	—	
6	Babbu	18	m	"	Student	—	
7.	Mujafar	24	m	Pathan	majduree	9012854147	
9.	Purshotam	42	m	Jatav	Mason	—	
10	Roshan Lal	35	m	"	majduree	9756850194	

Project Name/No.	Uttar Pradesh Major District Road Improvement Project.	Annexure:

Community Consultation Attendance Sheet

Project	Aliganj – Sooon marg (MDR-45W)						
District	Kasganj	Taluka	Sooon	Block/Ward No	Sooon	GP/MC	Timbarpur
Settlement	Timbarpur	PS / Thana	Sooon	Chainage / Km		Venue	Banwari Shop
Date	16/06/2015	Time	12:30	Total No. of Participants	Male: 17	Female: —	Total: 17

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
10	Eid ul damajang	65	m	Pathan	Farmer	9536081730	
11	Charn Singh	56	m	Jatav	Student	—	
12	Ashok	30	m	"	Mjdoore		
13	Ganga Ram	40	m	"	"		
15	mafiubkhan	50	m	Pathan	"		
17	Lala Singh	18	m	"	"		

Project Name/No.	Uttar Pradesh Major District Road Improvement project.	Annexure:

Project	Uttar Pradesh Major District Road Improvement project. (MDR 45W)						
District	Kasganj	Taluka	Sahawar	Block / Ward No	Sahawar	GP / MC	Gadka
Settlement	Gadka	PS/Thana	Sahawar	Chainage /km	39+100	Venue	Raja ki chopal
Date	17.06.2015	Time	10:30AM	Total No. of Participants	Male: 20	Female: 0	Total: 20

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	Hamid Ali	46	m	Pathan	Panchayat member	9675875835	
2	Jakir	35	m	"	farmer	—	
3	mohajam	21	m	"	student	9760251297	
4	Liyakat Ali	50	m	"	farmer	—	
5	lal mohumad	78	m	"	"	—	
6	Sanjay	19	m	Nai	Nai (Hajam)	—	
7	Islakh khan	55	m	"	farmer	—	
8	Bablu	24	m	Nai (Hajam)	Nai	—	
9	Shanur	19	m	Pathan	Glass work	8445079127	
10	Rajpal	55	m	Nai	Nai	—	

Project Name/No	Uttar Pradesh Major Distric Road Improvement Project	Annexure:

Project	Aliganj – Sorom Marg (MDR 45W)						
District	Kashganj	Taluka	Sahawar	Block / Ward No	Shawar	GP / MC	Gadka
Settlement	Gadka	PS/Thana	Sahawar	Chainage/km	39+100	Venue	chopal (Rajaki)
Date	17.06.2015	Time	10:30 AM	Total No. of Participants	Male 20	Female 0	Total 20

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
11	Arvind	30	m	Rathor	Majdooree.	—	Arvind
12	Rampal	40	m	Nai	11	—	Rampal
13	Anwar	28	m	Pathan	Glass work	9642101327	Anwar
14	Imran	24	m	11	11	9997591541	Imran
15	Jagbeer	25	m	Nai	Farmer		Jagbeer
16	Lifakat	28	m	Pathan	Student	—	Ali Hasan
17	Dharamveer	35	m	Nai	Farmer	—	Dharamveer
18	Murfid	26	m	Pathan	Glass work	—	Murfid
19	Ram Lal	78	m	Nai	Farmer	—	Ram Lal
20	Jansher	85	m	Pathan	Farmer	—	—

Public Consultation

Road Section: Narnaul - Dadam

(Km. 0 to 30)

Name of Village/Township: _____ Chainage _____ kms Date _____ Time _____ Hours:

S.No.	Name	Profession	Address	Sex	Age	Signature
1	Nazruddin	Jeep Driver	Pilakheda	M	32	
2	Nabid	Auto driver	Pilakheda	M	25	
3	Shabir	Business	Narnaul	M	30	
4	Fakira	Auto driver	Pilakheda	M		
5	Vivek Kumar	"	Rajasthan	M	28	
6	Naved Singh	Worker	Nagludhpura	M	45	
7	Mohammad Shahid	Truck Driver	Pilakheda	M	45	
8	Sardarmal Raj	"	Pilakheda	M	30	
9	Lokesh Yadav	Milkman	Shahanagar	M	35	
10	Mahavir Singh Yadav	Truck Driver	"	M	40	
11	Dharamvir	Farmer	"	M	35	
12	Shankar	Shop Owner	Chainage	M	38	
13	Dr Arvind Kumar	Doctor	"	M	60	
14	Jitender Kumar	Chemist	"	M	29	
15	Asgar Ali	Worker	"	M	55	

Name of Proprietors: MOEED AHMED

Public Consultation

Road Section: Narnaul - Dadam

(Km. 0 to 30)

Name of Village/Township: _____ Chainage _____ kms Date _____ Time _____ Hours:

S.No.	Name	Profession	Address	Sex	Age	Signature
1	Mahamad Tahir	Auto driver	Dhanan	M	55	
2	Pradeep	farmer	Dadam	M	35	
3	Vijay	Dhobi	Dadam	M	25	
4	Sant Singh	[illegible]	Rajlakhod	M	47	
5	Ugal Kishori	Teacher	"	M	46	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Name of Proprietors: MOEF AHMED

Format : A-5

DOCUMENTATION OF FOCUS GROUP DISCUSSION

Road Section: Narau - Dadam (Km. 20.100)

(Km. 4.200 to)

Section No.	1				
Questionnaire No.	1				

Interview Schedule for FGDs Pakkana 4.200

Name of Village/Township : Chainage kms Date 24/12/14 Time 2-3 Hours:

Name of the Facilitators: D. K. Dash / Location: Chairman House

S. No.	Name	Profession	Address	Sex	Age	Caste	Signature
1	Md. Asif	Chairman	Pakkana	M	38	OBC	
2	[illegible]	Cultivator	do	M	42	BC	
3	[illegible]	-do-	" "	M	32	" "	
4	[illegible]	-do-	" "	M	35	" "	
5	[illegible]	-do-	" "	M	33	" "	
6	[illegible]	-do-	" "	M	45	" "	
7	[illegible]	-do-	" "	M	46	" "	
8	[illegible]	-do-	" "	M	70	" "	
9	[illegible]	-do-	" "	M	31	" "	
10	[illegible]	Labour	" "	M	28	" "	

Q.1 Do you have any problem due to the existing road? Mobile- 7895317071 → Chairman Pakkana

Q.2 Have you heard about the project? If yes, what do you know about it?

Q.3 If the road has to be expanded, which side should be expansion take place and why?

Q.4 Bypass, via duct or raised roads - which is a better alternative? Why?

Q.5 Why not the other two choices? Give reasons

Q.6 Which option is likely to cause minimum risk of accidents to the human beings?

Q.7 If bypass, which side?

Q.8 If the widening of the road necessitates dislocation, where would you like to be relocated? (Area)?

Q.9 What form of compensation would you prefer?

DDM
RSA Trivandrum

Format : A-5

DOCUMENTATION OF FOCUS GROUP DISCUSSION

Road Section: Nasau - Badan

(Km. 20-50 to _____)

Section No. _____

Questionnaire No. 5

Interview Schedule for FGDs

Name of Village/Township: Chhara Chainage 20.500 kms Date 25/11 Time 4-00 PM Hours

Name & Designation - D.K. Desai Location - Chairman House

S. No.	Name	Profession	Address	Sex	Age	Caste	Signature
1	[illegible]	Business	Chhara	M	26	Hindu	[illegible]
2	[illegible]	- do -	- do -	M	50	"	[illegible]
3	[illegible]	- do -	- do -	M	55	"	[illegible]
4	[illegible]	- do -	- do -	M	28	"	[illegible]
5	[illegible]	- do -	- do -	M	35	OBC	[illegible]
6	[illegible]	- do -	- do -	M	32	-	[illegible]
7	[illegible]	- do -	- do -	M	24	OBC	[illegible]
8	[illegible]	Labour	- do -	M	45	OBC	[illegible]
9	[illegible]	Business	- do -	M	44	"	[illegible]
10	[illegible]	- do -	- do -	M	33	-	[illegible]

Q.1 Do you have any problem due to the existing road?

Q.2 Have you heard about the project? If yes, what do you know about it?

Q.3 If the road has to be expanded, which side should be expansion take place and why?

Q.4 Bypass, via duct or raised roads - which is a better alternative? Why?

Q.5 Why not the other two choices? Give reasons.

Q.6 Which option is likely to cause minimum risk of accidents to the human beings?

Q.7 If bypass, which side?

Q.8 If the widening of the road necessitates dislocation, where would you like to be relocated? (Area)?

Q.9 What form of compensation would you prefer?

Public Consultation

Road Section: Anupshahar - Bulandshahr

(Km. _____ to _____)

Name of Village/Township: _____ Chainage _____ kms Date _____ Time _____ Hours

S.No.	Name	Profession	Address	Sex	Age	Signature
1	Ram Shankar Goyal	Ref. Principal	Anupshahar	M	75	
2	Yogesh Pratap Singh	Govt Emp.	Anupshahar	M	39	
3	Vaidpal	Govt Emp.	Salwara	M	40	
4	Harvinder Singh	J.E. EK Dy	Anupshahar	M	35	
5	Harveer Khan	Shop owner	"	M	37	
6	Sonu Bajpai	" "	"	M	35	
7	Mahavir Das	Auto driver	Veerpur	M	57	
8	Devender Kumar	"	Veerpur	M	35	
9	Ajay Singh	"	Anupshahar	M	59	
10	Roshan Lal	Truck Driver	Anupshahar	M	43	
11	Ravi dutt	"	Anupshahar	M	29	
12	Mukesh	"	Lohara	M	48	
13	Asif	"	Lohara		53	
14						
15						

Name of Proprietors:

Format : A-5

DOCUMENTATION OF FOCUS GROUP DISCUSSION

ad Section: _____

(Km. 20.200 to _____)

Section No.						
Questionnaire No.						

Interview Schedule for FGDs

Name of Village/Township: Jatrana Chainage 20.20 kms Date 27/12/14 Time _____ Hours:

S. No.	Name	Profession	Address	Sex	Age	Caste	Signature
1	राम मूर्ति सिंह	Pardhan	Jatrana	M	58	OBC	
2	[illegible]	[illegible]	- do -	M	50	"	
3	[illegible]	Craftmanship	- do -	M	48	"	
4	[illegible]	- do -	- do -	M	42	"	
5	[illegible]	- do -	- do -	M	52	"	
6	[illegible]	- do -	- do -	M	40	"	
7	[illegible]	Labour	- do -	M	45	"	
8	[illegible]	- do -	- do -	M	48	"	
9	[illegible]	- do -	- do -	M	34	"	
10	[illegible]	Business	- do -	M	40	"	

Q.1 Do you have any problem due to the existing road?

Q.2 Have you heard about the project? If yes, what do you know about it?

Q.3 If the road has to be expanded, which side should be expansion take place and why?

Q.4 Bypass, via duct or raised roads - which is a better alternative? Why?

Q.5 Why not the other two choices? Give reasons.

Q.6 Which option is likely to cause minimum risk of accidents to the human beings?

Q.7 If bypass, which side?

Q.8 If the widening of the road necessitates dislocation, where would you like to be relocated? (Area)?

Q.9 What form of compensation would you prefer?

DOCUMENTATION OF FOCUS GROUP DISCUSSION

Road Section: Muzaffarnagar to Baraut (MDR 138W)

(Km 39.600 to 40.200)

Section No.	1				
Questionnaire No.	6				

Interview Schedule for FGDs

Name of Village/Township BHARAL Chainage 40000 kms Date 15/2/15 Time 1 AM/PM Hours: 1.30 AM

Name of Facilitators: Vikya Ku Nath

S. No.	Name	Profession	Address	Sex	Age	Caste	Signature
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	〃	〃	〃	32	〃	[illegible]
3	[illegible]	〃	〃	〃	33	〃	[illegible]
4	[illegible]	किसान	〃	4	55	4	[illegible]
5	[illegible]	〃	〃	〃	30	〃	[illegible]
6	[illegible]	〃	〃	〃	70	〃	[illegible]
7	[illegible]	〃	〃	〃	55	〃	[illegible]
8	[illegible]	〃	〃	〃	45	〃	[illegible]
9	[illegible]	〃	〃	〃	55	〃	[illegible]
10	[illegible]	〃	〃	〃	62	〃	[illegible]
11	[illegible]	〃	〃	〃	30	जाट	[illegible]
12	[illegible]	छात्र	〃	〃	23	जाट	[illegible]
13	[illegible]	नौकर	〃	〃	19	जाट	[illegible]
14	[illegible]	नौकर	〃	〃	20	जाट	[illegible]
15	[illegible]	दुकान	〃	〃	25	जाट	[illegible]
16	[illegible]	नौकर	〃	〃	18	जाट	[illegible]
17	[illegible]	किसान	〃	〃	40	〃	[illegible]
18	[illegible]	दुकान	〃	〃	24	〃	Rahul
19	[illegible]	Nashi	〃	〃	45	〃	[illegible]
20	[illegible]	किसान	〃	〃	30	〃	[illegible]

15/2/15

DOCUMENTATION OF FOCUS GROUP DISCUSSION

Road Section: Muzaffarnagar to Baraut (MDR 135W)

(Km. 29-800 to 32.400)

Section No.	1			
Questionnaire No.	5			

Interview Schedule for FGDs

Name of Village/Township : BUDHANA Chainage 31 000 kms Date 15/2/15 Time 10.00 AM Hours: 1 Hrs

Name of Facilitators: Dikya Ku. Kak.

S. No.	Name	Profession	Address	Sex	Age	Caste	Signature
1	Jagjeet Singh	Business	Budhana	M	43	OBC	
2	Dharmraj Kori	"	-do-	M	48	OBC	
3	Prem Tyagi	Farmer	-do-	M	33	-do-	
4	Punit Kumar	Shopkeeper	-do-	M	47	-do-	
5	Kuldeep Kumar		-do-	M	51	-do-	
6	Mr. Jitender Tyagi	Chairman	-do-	M	36	-do-	
7	Rajendra Singh	Business	-do-	M	40	-do-	
8	Sunil Saini	-do-	-do-	M	51	-do-	
9	Punit Tyagi	Contractor	-do-	M	34	-do-	
10	Lokesh Kumar	Business	-do-	M	32	Gen	
11	Akbar Ali	Business	-do-	M	48	Gen	
12							
13							
14							
15							
16							
17							
18							
19							
20							

15/2/15

Public Consultation

Road Section: Muzaffar nagar - Shamli

(Km 3 to 62)

Name of Village/Township: _____ Chainage _____ kms Date _____ Time _____ Hours

S. No.	Name	Profession	Address	Sex	Age	Signature	Vehicle no.
1	Devendra Singh	Truck Driver	Jhanj	M	50		UP 12 B 8612
2	Mehboob	Auto driver	Sirsali	M	45		UP12T 0867
3	Shahid	Truck Driver	Shamli	M	40	Shahid	UP12 9274
4	Zamir uddin	"	Shamli	M	45		UP12 7343
5	Aejaz	Tractor Driver	Tanda	M	30		UP 12 T 540
6	Mohd Tanvir	" "	Khadeli	M	28		
7	Shaffam	Taxi Driver	Shamli	M	26		
8	Nisar Ahmad	Auto driver	Shamli	M	49		UP12 6016
9	Mohammad	"	"	M	40		UP12
10	Lokesh	Tractor Driver	Shamli	M	40		
11	Sanjay	Truck Driver	Kandhla	M	50		UP12 9876
12	Monu	Truck Driver	Pundhir	M	24		UP12 1862
13	Anil	"	Pundhir	M	22		
14							
15							

Name of Proprietors:

Public Consultation

Road Section: Muzaffarnagar to Baraut

(Km. _____ to _____)

Name of Village/Township: _____ Chainage _____ kms Date _____ Time _____ Hours

S. No.	Name	Profession	Address	Sex	Age	Signature
1	Mohd. Ansan	Truck Driver	Budhana	M		HR 38 F 3901
2	Tasum	"		M		
3	Parvez Alam	"		M		
4	Pappu	"				
5	Salim	"				
6	Charan Singh	"				
7	Mohd. Farzan	"				
8	" Gulfam	"				
9	Murtazir	"				
10	Zeeshan	Card Painter	Shahpur	M		
11	Iqbal	"		M		
12	Abid			M		
13	Aleem			M		
14	Aamir			M		
15	Kamil			M		

Name of Proprietors:

Project Name/No.	Maliyapur to Kurebhar
	Annexure:

Community Consultation Attendance Sheet

Project	UPMORIP (Maliyapur to Kurebhar)							
District	Sultanpur	Taluka			Block/Ward No	Kurebhar Mandal	GP/MC	
Settlement		PS/Thana			Chainage/Km	0.1000	Venue	
Date	26/2/15	Time			Total No. of Participants	Male	Female	Total
Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
1	Ajay Kumar	35	M		Tea vendor	Maliyapur	अजय कुमार	
2	Ashish Mishra	23	M		Student	"	Ashish mishra	
3	Vishnu nath	30	M		Truck Driver	"	विष्णु नाथ	
4	Agyawati Singh	50	F		Housewife	Kalwasiya Kag Purwa	अग्यावती	
5	Sushila Singh	27	F		"	"	सुशीला सिंह	
6	Nisha Devi	35	F		"	"	निशा	
7	Pawan Kr. Yadav	30	M		Shopkeeper	Pipra Kandhari	पवन कुमार यादव	
8	Narendra Singh	50	M		"	"	नरेन्द्र सिंह	
9	Santosh Kr. Yadav	28	M		"	"	संतोष	
10	Sonu	30	M		"	"	सोनू	
11	Shiv Kumar	40	M		"	"	शिव कुमार	
12	Mohammad Hasan	45	M		"	"	मो० हसन	

Project Name/No.	Maliyapur to Kurabhag	
		Annexure:

Community Consultation Attendance Sheet

Project	UPMDRIP Chaliyapur to Kurabhag							
District	Sultanpur	Taluka		Block/Ward No		GP/MC	
Settlement	Dhobiyan	PS/Thana		Chainage/Km		Venue	
Date	28/2/15	Time		Total No. of Participants	Male	Female	Total

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Surjanath Mishra	35	M		Stakeholder	Dhobiyan	
2	Ashok Upadhyay	35	M			"	
3	Ramnaresh Ramjiyan	38	M			"	
4	Tulsi Ram	40	M			"	
5	Shatrughan Bhagat	48	M			"	
6	Ram Chand	32	M			"	
7	Anurag Sharma	22	M			"	
8	Mukund Prabhakar	33	M			"	

Project Name/No. UP MDR IP	
Haliyapur to Kusabhar	Annexure:

Community Consultation Attendance Sheet

Project	Haliyapur to Kusabhar							
District	Sultanpur	Taluka			Block/Ward No	Delhi Bazar	GP/MC	
Settlement	Delhi Bazar	PS/Thana			Chainage/Km		Venue	
Date	28/2/15	Time	10:30 AM		Total No. of Participants	Male	Female	Total
						6		

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Ram Bahadur	45	Male		Pradhan	094521 74666	
2	Shiv kumar	35	Male		Gram Sabha member	Delhi Bazar	
3	Brahma Singh	50	Male		"	"	
4	Ajay Tiwari	45	Male		"	"	Ajay Tiwari
5	Ankit Tiwari	25	Male		"	"	Ajay Tiwari
6	Om Prakash	55	Male		Gram Sabha member	"	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project	UPMDRIP (Naliyapur to Kumbhar)							
District	Sultanpur	Taluka			Block/Ward No		GP/MC	
Settlement	Pimsara 329	PS/Thana			Chainage/Km		Venue	
Date	28/2/15	Time			Total No. of Participants	Male	Female	Total

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Surya Pratap Singh	29			Milk Car Driver	Pimsara 329	
2	Brijendra Mohan Singh	45			"	"	Brijendra mohan
3	Vibin Singh	35			"	"	
4	Uday Bhan Singh	50			"	"	
5	Ramji Ram Singh	52	M		Principal	Primary agg 09648 266 80	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project	Haliyapur to . Mushhar						
District		Taluka		Block/Ward No		GP/MC	
Settlement	Chorams	PS/Thana		Chainage/Km		Venue	
Date	28/2/14	Time		Total No. of Participants	Male	Female	Total

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Ramlaut Yadav	70	Male		farmer	Chorams	रामलौट यादव
2	Ram Nath Yadav	40	Male		"	"	रामनाथ यादव
3	Shyam Yadav	55	Male		"	"	श्याम यादव
4	Sanjay Singh	43	M				Sanjay Singh
5	Anil Mishra	49	M				
6	Babloo lal	37	M				बबलू लाल
7	Khanedar Sher	68	M				
8	Nitin Singh	63	M				नितिन
9	A.K. Singh	51	M				A.K. Singh
10	Babu Singh	40	M				बाबू सिंह
11	Jony Singh	30	M				जोनी
12							

Project Name/No.	Maliyapur to Kumbhar	
		Annexure:

Community Consultation Attendance Sheet

Project	UPMDRIP, Chaliyapur to Kumbhar							
District	Jaunpur	Taluka	Bibiganj		Block/Ward No		GP/MC	
Settlement	Bibiganj	PS/Thana	Shahganj		Chainage/Km	101	Venue	
Date	1/8/15	Time	1:25		Total No. of Participants	Male	Female	Total

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Ram Milan	45	Male		Shopkeeper	Bibiganj	राममिलन
2	Surya Prakash	42	Male			"	सूर्यप्रकाश
3	Jay Prakash	35	Male			"	
4	Brijit Kumar	40	Male			"	ब्रिजीत कुमार
5	Baby Ram	52	Male			"	बाबूराम
6	Vishwabandhu Jaiswal	29	Male			"	
7	Ram Kr Sharma	65	Male			"	रामकुमार
8	Manoj Kumar	25	Male				मनोज कुमार
9							
10							
11							
12							

Project Name/No.	UPMDR IP		
Haliyapur	10	Kurabhar	Annexure:

Community Consultation Attendance Sheet

Project	UP MDR IP (Haliyapur to Kurabhar							
District	Sultanpur	Taluka			Block/Ward No		GP/MC	
Settlement	Kurabhar	PS/Thana	Kurabhar		Chainage/Km	35-36	Venue	Kurabhar
Date	1/8/15	Time	4:00 PM		Total No. of Participants	Male	Female	Total
						3		
Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
1	Nic Forh SM Khan	25	Male		Stakeholder	Kurabhar		
2	Faraj Ali	22	Male			"		
3	Zaghum Ahmad	20	Male			"		
4	Asif Aslam	18	Male			"		
5	Ayaz Ahmad	18	Male			"		
6	Anwar Painter	36	Male			"		
7	Mo Kayyum Beg	44	Male			"		
8	Meharban Riyazuddin	35	Male			"		
9	Indian Institute of Upadhyay	25	Male			"		
10	Moh. Aasif	22	Male			"		
11	Mohd Khan	40	Male			"		
12	Sarfaraz Khan	34	Male			"		
13	Arif Khan	39	Male			"		

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project	UPMDR IP (Maliyapur to Kumbhar)							
District	Sultanpur	Taluka		Block/Ward No		GP/MC		
Settlement		PS/Thana		Chainage/Km		Venue		
Date		Time		Total No. of Participants	Male	Female	Total	

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
14	Nafeez Pathan	38	Male			Kumbhar	
15	Rajy Khan	22	Male			"	Rajy Khan
16	Shanukat Ali	32	Male			"	
17			Male			"	
18		42	Male			"	
19			Male			"	
20		25	Male			"	
21		46	Male			"	
22		65	Male			"	
23	Md Hasan Khan	19	Male			"	
24		20	Male			"	
25		63	Male			"	
26		27	Male			"	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project	UPMDRIP (Malyapur to Kumbhar)							
District	Sindhudurg	Taluka			Block/Ward No		GP/MC	
Settlement		PS/Thana			Chainage/Km		Venue	
Date		Time			Total No. of Participants	Male	Female	Total
Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
27	Md Ameen	45	Male			Kumbhar		
28	Mohd Abdul	45	Male		Pradhan	"		
29	Kaleem Khan	40	Male			"	K.Khan	
30	Chavan	60	Male			"	Chavan	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project	UPMDRIP - 81c. Hussaingang - Alpun-Jita							
District	Fatehpur	Taluka		Block/Ward No		GP/MC	1	
Settlement	Afoi	PS/Thana	Sultanpur Gadh	Chainage/Km	48.00	Venue	Afoi Ashram	
Date	18/02/15	Time	3.16 P.M	Total No. of Participants	Male	Female	Total	
					5		5	

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	HEERALAL	52	MALE	SC.	AGRICULTURE	9984000818	Heeralal
2.	PARMESWAR SINGH	56	"	GEN.	"		
3.	SHIVBHANSAN SINGH	60	"	GEN	"	9794048670	
4.	JAYNARAYAN	56	"	GEN	"		
5.	RAMA KANT	70	"	"	"		

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	FATEH PUR	Taluka	KHAGA		Block/Ward No	AIRANYA	GP/MC	MOHD PUR GAUNTI
Settlement		PS/Thana	GHOSH		Chainage/Km		Venue	
Date	18/02/15	Time	4.02 PM		Total No. of Participants	Male	Female	Total
						5		5

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	VISAL	44	M		Employes		
2	Narendra	45	"			.	
3	Shri Ram	50	"		Agri	9198197449	
4	Roop Singh	38	"	OBC	Agri	9935259173	
5	Syam Lal	47	"	SC		8127905491	—

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	Fatehpur	Taluka	KHAGIA		Block/Ward No	ARAYA	GP/MC	MOHD PUR GHANTI
Settlement	CHAUK SARAY	PS/Thana	SULTANPUR GHOSE		Chainage/Km		Venue	CHAK SARAY
Date	18/02/15	Time	4.21 PM		Total No. of Participants	Male: 5	Female	Total
Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
1	MAHRAJ DIN	60	MALE	SC	AGRI		-	
2	DAYA RAM	24	11	OBC	AGRI	955975 2571		
3	RAJU	35	11	SC	11			
4	BHANU PRATAPSINGH		11	JEN				
5	JAYPAL MOURYA	55	11	OBC	LABOUR	789774 1572		

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	Fatehpur	Taluka	KHAGIA		Block/Ward No	AIRAN YA	GP/MC	GHAUNTI
Settlement	PREM NAGAR	PS/Thana	SULTANPUR		Chainage/Km		Venue	
Date	18/02/15	Time	4.33 P.M		Total No. of Particlpants	Male	Female	Total
						5		

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	MOHI UDDIN	45	MALE	JEN	—		
2.	Phool Chand	28	"	SC	-		
3.	NIJA MUDDIN	40	"	JEN	DRIVING	8173867343	
4	MIYAJ AHMAD	65	"	JEN	AGRI		——
5	SUNDAR LAL	40	"	"	"	—	——
6.	Ramesh lal	42	"	GEN	Agri		R. Lal
7.	Mukesh	38	"	"	"		
8.	Mohan lal	35	"	"	Agri		Mohan.
9.	Durgesh	30	"	"	"	-	Durgesh
10.	NITIN	28	"	"	"	-	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	PTP.	Taluka	HADGAM		Block/Ward No	HADGAM	GP/MC	
Settlement		PS/Thana	HADGAM		Chainage/Km		Venue	
Date	18/12/15	Time	5.17		Total No. of Participants	Male	Female	Total
						7		

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	Rehan Ahmad		MALE				
2.	I HASAN		11				
3.	LOKNATH	55	11	OBC	LABOUR		
4.	BHUPENDRA	32	11	11	AMPLOYES	9125765989	
5	MOHD RAFI	40	11	11	CHAIR. PERSON	9435081354	
6.	SIVA KANT	27	11	JEN	OCUPATION TEA SELLING	8601603575	Shiva Kant
7	SAHIBE ALAM	22	11	OBC	PAN SELLER	8574646374	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	Fatehpur	Taluka	Fatehpur		Block/Ward No	Bhitaura	GP/MC	Chhenauka
Settlement	Husaingarj	PS/Thana	Husaingarj		Chainage/Km		Venue	
Date	19/2/19	Time	11.01 p.M		Total No. of Participants	Male 10	Female	Total
Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
1.	Satyendra Maurya	38	Male	OBC	Agri		सत्येन्द्र	
2.	Jagannath Prasad	57	Male	"	Employees	961659 9652	जगन्नाथ प्रसाद	
3	Devi Dayal	50	Male	OBC	"	945479 7097	देवी	
4.	Akhilesh	17	MALE	SC	Worker	8564062 953	अखिलेश	
5	Dhirendr	15	Male	"	"		धीरेन्द्र	
6.	Awdhesh Kumar	28	"	SC	Agricaltur	875635 9309	अवधेश कुमार	
7	Sarda Prasad	30	Male	OBC	Dairy	8808 132616	सरदा प्रसाद	
8	Chandra Sekhar	35	"	"	"	705462 5370	चन्द्र शेखर	
9.	Krishna Pal	50	"	JEN	Agriculture	964093 0977	कृष्णपाल	
10.	Manoj Kumar	35	"	JEN		945436 0832	मनोज कुमार	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	FTP	Taluka	Fatehpur	Block/Ward No	Bhitoura	GP/MC	SIMAURA	
Settlement	Bajrangapur	PS/Thana	Husainganj	Chainage/Km		Venue	Bajrangapur	
Date	19/12/15	Time	1.00 P.M	Total No. of Participants	Male	Female	Total	
					13			

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Indrapal	60	Male	OB.C	Agriculture		इंद्र पाल
2	Rambabu	26	"	"	"	842344 3894	—
3.	Krishna Kumar	55	"	"	"		कृष्ण कुमार
4.	Sangram Singh	23	"	"	"	962857 1029	संग्राम सिंह
5.	Dipendra Singh	20	"	"	"	9918817 17	दीपेन्द्र सिंह
6.	Balram	22	"	"	"	96480 53806	बलराम
7	Rahul	20	"	"	"	969557 3885	Rahul
8.	Mahendra	16	"	"	"		—
9.	Chiragh Lal	60	"	"	"		—
10.	Jawahar Lal	30	"	"	"	—	—
11	Kallu	30	"	"	"	—	कल्लू
12	Ram Narayan	40	"	"	Driving	967041 2110	रामनारायण
13	Sarvesh	30	"	"	Agriculture	8127 6365	Sarvesh

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	Fatehpur	Taluka	Fatehpur		Block/Ward No		GP/MC	RAMPUR
Settlement	Rampur	PS/Thana	HUSAINGANG		Chainage/Km		Venue	
Date	19/02/15	Time	3.00		Total No. of Participants	Male	Female	Total

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Munna Mourya	28	Male	OBC	Agri	9936979561	
2.	Ram babu Mourya	25	11	11	11	9598349021	
3	Sushil Kumar	20	11	11	11	8423480846	
4.	Bihari Lal Pal	30	11	11	11		—
5.	Ram	28	11	11	11		—

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	Fatehpur	Taluka	Fatehpur	Block/Ward No	Bhitaura	GP/MC	Kandhaikapurwa	
Settlement		PS/Thana	Husain Ganj	Chainage/Km		Venue		
Date	19/02/15	Time	05:02 P.M	Total No. of Participants	Male 9	Female 4	Total 13	

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Ramesh Chandra	55	male	OBC	Agri.	—	रमेश चन्द्र
2.	Ram Singh	63	"	"	"	—	—
3.	Rad. Raj	70	"	"	"	—	—
4.	Yogendra	22	"	"	"	8542028631	योगेन्द्र कुमार
5.	Dharam Singh	42	"	"	"	9793717052	
6.	Kamlesh	35	"	"	"	—	—
7	Mahesh	42	"	"	"	9651249972	महेश सिंह
8.	Surend	40	"	"	"	—	सुरेन्द्र
9.	Rakesh	35	"	"	Labour	—	राकेश
10	Dev Rati	55	Female	Jen	Agri.	—	—
11	Suraj Kali	55	"	OBC	Agri	—	—
12	Sandhya Devi	35	"	"	"	—	संध्या
13	Gajraj Singh	16	"	"	"	—	गजराज सिंह

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

Project								
District	Fatehpur	Taluka	Fatehpur	Block/Ward No	Bhitaura	GP/MC	Mawai	
Settlement	Bela	PS/Thana	Husain Ganj	Chainage/Km	12	Venue	Bela	
Date	19/02/15	Time	0.5.08 P.M	Total No. of Participants	Male	Female	Total	
					10		10	

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Kamlesh	35	Male	SC	Labour		
2	Durgesh	25	〃	〃	Agri	9455302255	दुर्गेश कुमार
3	Dharam Pal	45	〃	〃	Labour		—
4	Dariyav Singh	20	〃	〃	Studey	8726206023	दरियाव सिंह
5	Durgesh	40	〃	JEN		—	—
6	Sirbir Singh	45	〃	JEN	Construction (WMM)	8009271447	
7	Jhoori	22	〃	SC	Labour		झूरा
8	NITIN	14	〃	SC	Study		Nitin
9	Mohan Lal	39	〃	JEN	—		मोहन लाल
10	Dev Narayan	40	〃	SC	Raj Mistri		—

Attendance Sheet/उपस्थिति पंजिका

स्थानः- लक्ष्मणपुर दिनाँकः- 20/02/2018

क्रमांक	नाम	उम्र	व्यवसाय	संपर्क सूत्र	हस्ताक्षर
1-	Virendra singh	29	Agric.	9559714056	
2-	Surendra	20	Agric.		
3-	Dheerendra	20	Agric		
4-	Shivbaran	32	Agric.	9198775450	
5-	Kamlesh	27	Labour		
6-	Narsingh	20	Labour		
7-	Rajendra kumar	28	Agric.	9935970586	

Attendance Sheet/उपस्थिति पंजिका

स्थानः– Ahinda. दिनाँकः– 20/02/16

क्रमांक	नाम	उम्र	व्यवसाय	संपर्क सूत्र	हस्ताक्षर
1-	Girdharilal	55	Agric.		गिरधारीलाल
2-	Ashok kumar	40	Agric	8853897177	अशोक कुमार
3-	Bachchulal	55	Agric.	8004541604	बच्चूलाल
4-	Subhash	30	Agric	9621853078	सुभाष चन्द्रवन्द
5-	Ramesh	31	Labour		रमेश
6-	Rambahadur	18	Labour		रामबहादुर
7-	Anantram	46	Agric.		अनन्तराम
8-	Ramkripal	56	Agric.		रामकृपाल
9-	Jagdish	45	Labour		जगदीश

Format: A-5

TA-8427 IND: UTTAR PRADESH MAJOR DISTRICT ROAD INVESTMENT PROGRAM
(43574-022)
DOCUMENTATION OF FOCUS GROUP DISCUSSION

Road Section: _____

(Km _____ to _____)

Section No.					
Questionnaire No.					

Interview Schedule for FGDs

Name of Village/Township: Hathigaon Chainage 30-35 kms Date 21/02/15 Time 4.10 P.M Hours:

S. No.	Name	Profession	Address	Sex	Age	Caste	Signature
1	Raju	Cultivator	Hadgaon	M	28	SC	राजू
2	Virendra	Bussiness	Hathgaon Chauraha	M	30	"	
3	Adesh	Auto driver	"	M	29	SC	
4	Master. Gorakhpur	"	"	M	32	"	
5	Pappu	"	"	M	35	"	
6	Lalai	"	"	M	28	"	
7	Suresh	"	"	M	27	"	सुरेश
8	Chetram	"	"	M	26	"	चेतराम
9	Dushyay	"	Hasanpur Kasba	M	35	"	दुशाय
10	Navel	"	Rathipur	M	35	"	नवल

Q.1 Do you have any problem due to the existing road? NO

Q.2 Have you heard about the project? If yes, what do you know about it? Yes

Q.3 If the road has to be expanded, which side should be expansion take place and why? both sides

Q.4 Bypass, via duct or raised roads - which are a better alternative? Why? N/O

Q.5 Why not the other two choices? Give reasons. Road is already exist, no need for extra acquisition

Q.6 Which option is likely to cause minimum risk of accidents to the human beings? present

Q.7 If bypass, which side? N/A

Q.8 If the widening of the road necessitates dislocation, where would you like to be relocated? (Area)?

Q.9 What form of compensation would you prefer? As per Govt. and ads o- benefit to local people in

Format: A-5

TA-8427 IND: UTTAR PRADESH MAJOR DISTRICT ROAD INVESTMENT PROGRAM
(43574-022)
DOCUMENTATION OF FOCUS GROUP DISCUSSION

Road Section: _____

(Km. _____ to _____)

Section No.						
Questionnaire No.						

Interview Schedule for FGDs

Name of Village/Township: Afai Chainage 97.48 kms Date 21/02/15 Time 3:30 P.M Hours.

S. No.	Name	Profession	Address	Sex	Age	Caste	Signature
1	Shivam	Auto starter	Madagang	M	25	U	शिवम
2	Alam	U	Purkasi	M	20	Muslim	आलम
3	Dasram	U	U	M.	20	U	देसराम
4	Shivkumarsingh	U	U	M	20	GEN.	शिवकुमारसिंह
5	Bhagvandeen	U	Alamtaag	M	20	OBC	भगवानदीन
6	Deepu Singh	U	Kasao	M	25	GEN	Deepusingh2
7	Ruwab Ali	Auto driver	Purkasi	M	22	Muslim	Ruwab Ali 9793017308
8							
9							
10							

Q.1 Do you have any problem due to the existing road? No

Q.2 Have you heard about the project? If yes, what do you know about it? Yes

Q.3 If the road has to be expanded, which side should be expansion take place and why? Both side

Q.4 Bypass, via duct or raised roads - which are a better alternative? Why? NO

Q.5 Why not the other two choices? Give reasons. Road is already exist & for new bypass new agricultural land have

Q.6 Which option is likely to cause minimum risk of accidents to the human beings? to give for bypass.

Q.7 If bypass, which side?

Q.8 If the widening of the road necessitates dislocation, where would you like to be relocated?

(Area)? No -

Q.9 What form of compensation would you prefer? As per govt. rules and ~~no~~ PAPs should get proper value to it

उत्तर प्रदेश लोक निर्माण विभाग

TA-8427 IND: UTTAR PRADESH MAJOR DISTRICT ROAD INVESTMENT PROGRAM (43574-022)

Public Consultation Format

Place: Gosain Ki SARAY **Date:** 20.02.15

Issue Discussed: Road MAKing

Suggestions: + point :-
① Business encrease,
(2) HOME Development
(3) Electricity.

उत्तर प्रदेश लोक निर्माण विभाग

TA-8427 IND: UTTAR PRADESH MAJOR DISTRICT ROAD INVESTMENT PROGRAM (43574-022)

Public Consultation Format

Place: Laxman Pur **Date:** 20, 12. 15

Issue Discussed:

Suggestions:

possitive Point :-

1 Trafic well egy after Road Maal.

2 Incrse of Land cast.

Negative Point :-

1 Increase No of Exident.

2

Project Name/No.	Annexure:

Community Consultation Attendance Sheet

Project	Kaptaingaon to Nawangia							
District		Taluka			Block/Ward No		GP/MC	
Settlement	[illegible]	PS/Thana			Chainage/Km		Venue	
Date	09/06/[illegible]	Time			Total No. of Participants	Male: 15	Female: 0	Total: 15

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	[illegible]	32		परवा	खेती किसानी		[illegible]
2	मुकुंद रौतिया	52		रौतिया	मजदूरी किसानी		मुकुंद रौतिया
3	सोनू	28		रौतिया	खेती किसानी		सोनू रौतिया
4	अमीर हुसैन	50		राजि	मजदूरी किसानी		अमीर हुसैन
5	रामू	30		चौधरी	मधुरी		रामू
6	पुनीत	28		अहीर	खेती किसानी		पुनीत यादव
7	राजेन्द्र	50		कुशवाहा	खेती किसानी		राजेन्द्र
8	[illegible] विकास	22 18		अग्रहरी	व्यापार होटल		Vikash
9	मुंडेश्वा	23		अमरी	खेती किसानी		[illegible]
10	दिनेश्वरी	30		[illegible]	खेती किसानी		दिनेश्वरी
11	[illegible]	32		विश्वकर्मा	लोहारी		[illegible]
12	[illegible]	20		अनारी	लोहारी		Sankarmukhi Archan
13	सुरेश्वा	45		यादव	खेती किसानी		सुरेश्वा
14	शिवकुमार वर्मा	44		वर्मा	खेती किसानी		शिवकुमार वर्मा
15	विरेन्द्र	35		मुसहर	किसानी		विरेन्द्र

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

	Kapteingang to Nawanghta							
	Kaptaingan	Taluka		Block/Ward No		GP/MC		
	मिर्यौनी	PS/Thana		Chainage/Km		Venue		
	09/06/25	Time		Total No. of Participants	Male	Female	Total	
					19	0	19	

Name	Age	Gender	Caste	Occupation	Contact Details	Signature
रतनसेन दीदि	45		राजपुत	कृषी		रतनसेन दीदि
सुमन्त पाण्डे	32		ब्राह्मण	कृषी		Sumant
हबीबुलला	60		अन्सारी	कृषी		हबीबुलला
सुमेशाम पुत्ता	42		गुप्ता	कृषी		सुमेशाम पुत्ता
बनारसी	45		हरिजन	कृषी		बनारसी
बैचू	65		धोबी	कृषी		बैचू
बलधारी प्रसाद	45		सोनार	कृषी		बलधारी प्रसाद
मारकन्डेय यादव	30		अहिर	कृषि		Markandey Yadav
रामआधार	75		केवट	कृषी		रामआधार
प्रमोद	35		पासवान	कृषी		प्रमोद
लोरिक	23		यादव	कृषी		लोरिक यादव
Dinesh Paswan	25		पासवान	कृषी		Dinesh
गोलु वर्मा	25		~~मल्लाह~~ वर्मा	मोटरसाइकिल		Golu

Project Name/No.	
	Annexure:

Community Consultation Attendance Sheet

Project	Kaptaingay to Nawapur							
District		Taluka			Block/Ward No		GP/MC	
Settlement	मेहुणी	PS/Thana			Chainage/Km		Venue	
Date	09/06/18	Time			Total No. of Participants	Male	Female	Total
						19	0	13

Sl. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
(16)	अनिकार पावरा [देवसिंग अनारसिंग]	65		आदिवासी	खेती		A Pawara
(17)	हरिसिंग	53		आदिवासी	किसान		हरिसिंग
(18)	चायकुंवर	60		आदिवासी	गृहिणी		चायकुंवर पावरा
(19)	महेन्द्र पावरा	35		आदिवासी	कृषि		महेन्द्र पावरा

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

ct	Kaptadungay to Nawangi'a-							
ct	Kushrang	Taluka		Block/Ward No		GP/MC		
ient	Rambag Charchea.	PS/Thana		Chainage/Km		Venue		
	6/06/2015.	Time		Total No. of Participants	Male	Female	Total	
					15	0	15	
o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
	रामानंद उपाध्याय	60		ब्राह्मण	खेती		रामानंद उपाध्याय	
	मनोकर्णी	42		ब्राह्मण	खेती		मनोकर्णी	
	अमरुद्दीन	25		मुस्लीम	खेती		अमरुद्दीन	
	ओमेश्वर	40		राजगोंड	अपने कुटुम्बका		ओमेश्वर	
	शुकरवती	41		राजगोंड	मजदूरी		शुकरवती	
	सतनं	35		राजगोंड	मजदूरी		सतनं	
	बनवारी	55		राजगोंड	खेती		बनवारी	
	शाहिद	25		मुस्लीम	खेती		शाहिद	
	लक्ष्मन	35		राजगोंड	मजदूरी		लक्ष्मन	
	सलामत खान	70		मुस्लीम	खेती		सलामत	
	अलाउद्दीन	35		मुस्लीम	मजदूरी		अलाउद्दीन	
	विष्णु कुमार	24		हिन्दु मंडेला	बेरोजगार			

Project Name/No.	Kaptan gang - Nawanagla	
		Annexure:

Community Consultation Attendance Sheet

ct	Kaptan gang to Nawanagla							
ct	Kushinagar	Taluka		Block/Ward No		GP/MC		
ent	Nawanagla	PS/Thana		Chainage/Km	Km 24.00	Venue		
	06/06/2015	Time	3.30 PM.	Total No. of Participants	Male 20-22	Female	Total	

.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	राजकुमार कुशवाहा	33		पिछड़ी	दुकानदारी		राज कुमार
2	राकेश	34		पिछड़ी	चाय की दुकान		राकेश सिंह
3	परशुराम	30		पिछड़ी	पेपसी दुकान		परशुराम सिंह
4	रमेश गुप्ता	50		पिछड़ी	दुकान		रामआशीष रमेश
5	रामआशीष	53		पिछड़ी	दुकान		रामआशीष
6	सन्तोषभट्टाचार्य	32		पिछड़ी	दुकान		सन्तोष
7	छोटू	50		अनुसूचित	प्रेस धोबी		छोटू
8	छोटेलालगुप्ता	30		पिछड़ी	मोबाइल की दुकान		छोटेलाल
9	सन्तोष	27		पिछड़ी	चौबीस की दुकान		सन्तोष
10	लालमभट्टाचार्या	48		पिछड़ी	चाय की दुकान		लालजी
11	रमेश जायसवाल	47		पिछड़ी	बिसात की दुकान		रामेश्वर
12	~~अनिल~~ दुर्गा तिवारी	55		सामान्य	दुकान		दुर्गा
13	भगवन्त	50		पिछड़ी	साईकिल की दुकान		
14	जन्नी	55		पिछड़ी	सैलून की दुकान		दीपक

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

ct	Kaptaiyagan - Hata - Gauri Bazar - Rudra Pur							
ct	Deoria	Taluka		Block/Ward No		GP/MC		
ent	Chappuali	PS/Thana		Chainage/Km		Venue		
	06/06/2015	Time	3.30 PM.	Total No. of Participants	Male	Female	Total	

Name	Age	Gender	Caste	Occupation	Contact Details	Signature
विजय शंकर	58	—	यादव	खेती		Vijay Shankar Yadav
अशोक	55		यादव	खेती		
अनुज शर्मा	19		शर्मा	पढ़ाई		Anuj Sharma
प्रदीप शर्मा	22		शर्मा	खेती		Pradeep Sharma
[illegible]	45		[illegible]	[illegible]		[illegible]
[illegible]	40		[illegible]	[illegible]		[illegible]
[illegible]	45		[illegible]	[illegible]		[illegible]
[illegible]	55		[illegible]	[illegible]		[illegible]
[illegible]	48		[illegible]	[illegible]		[illegible]
[illegible]	37		[illegible]	[illegible]		[illegible]
[illegible]	80		[illegible]	[illegible]		[illegible]
[illegible]	20		[illegible]	[illegible]		[illegible]
[illegible]	38		[illegible]	[illegible]		[illegible]
[illegible]						

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet

ct	Kaptaingay to Rudrapur							
ct		Taluka			Block/Ward No		GP/MC	
ent		PS/Thana			Chainage/Km		Venue	
		Time			Total No. of Participants	Male	Female	Total
						24	0	24
.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
	[illegible]	51		[illegible]	[illegible]		[illegible]	
	[illegible]	80		[illegible]	[illegible]		[illegible]	
	[illegible]	55		[illegible]	[illegible]		Ram Rashan Prasad	
	[illegible]	45		[illegible]	[illegible]		[illegible]	
	[illegible]	45		[illegible]	[illegible]		[illegible]	
	[illegible]	41		[illegible]	[illegible]		[illegible]	
	[illegible]	35		[illegible]	[illegible]		[illegible]	
	[illegible]	40		[illegible]	[illegible]		[illegible]	
	[illegible]	20		[illegible]	[illegible]		[illegible]	

Project Name/No.	

Community Consultation Attendance Sheet

t	Kaptaingang to Rudrapur						
t	Kushinagar	Taluka		Block/Ward No		GP/MC	
nt	पटरंगा	PS/Thana		Chainage/Km		Venue	
	08/06/15	Time		Total No. of Participants	Male	Female	Total
					10	0	10

	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
	शेमद अली	52	शेख		शिक्षक		शेमद अली
	जुबे अली	30	शेख		राजमिस्त्री		
	रउल	35	शेख		कृषी		
	वहीद अहमद	35	अन्सारी		शिक्षक		
	अलीमुल्लाह सिद्दीकी	55	सिद्दीकी		कृषी		
	अलीमुल्लाह	45	खान		कृषी		
	नवी अहमद	30	शेख सिद्दीकी		कृषी		
	रियाजुद्दीन	65	खान		टीचर		
	अहदुल	55	खान		कृषी		
	अलीमखान	70	खान		कृषी		
	हादीम	26	सिद्दीकी		कृषी		
	वहीद	60	खान		कृषी		
	इब्राहीम	54	खान		पानमुकान		
	अतीकुर रॉय	65	अन्सारी		कृषी		

Project Name/No.		An

Community Consultation Attendance Sheet

ct	Kartaingay to Rudrapur.							
ct		Taluka			Block/Ward No		GP/MC	
ent	-12/3/07/22	PS/Thana			Chainage/Km		Venue	
		Time			Total No. of Participants	Male	Female	Total

o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
	इलाहरसिंग	56	~~पुरुष~~	रावत	कृषी		इलाहरसिंग
	औरंगजेब	60		पठाण	कृषी		- औरंगजेब
	मुजीबुरहसन	35		मुस्लीम	कृषी		- मुजीबुरहसन

Project Name/No.		Annexure:

Community Consultation Attendance Sheet

	Kaptailgaon to Rudrapur.						
	Kushingaon	Taluka		Block/Ward No		GP/MC	
nt	[illegible]	PS/Thana		Chainage/Km		Venue	
	06/06/15	Time		Total No. of Participants	Male: 13	Female: 0	Total: 13

Name	Age	Gender	Caste	Occupation	Contact Details	Signature
[illegible]	44		[illegible]	[illegible]		[illegible]
कैलाश	50		[illegible]	[illegible]		कैलाश
[illegible]	35		[illegible]	[illegible]		[illegible]
[illegible]	21		[illegible]	[illegible]		[illegible]
विनोद	30		[illegible]	[illegible]		विनोद
[illegible]	80		[illegible]	[illegible]		[illegible]
[illegible]	24		[illegible]	[illegible]		[illegible]
[illegible]	50		[illegible]	[illegible]		[illegible]
[illegible]	55		[illegible]	[illegible]		[illegible]
[illegible]	28		[illegible]	[illegible]		[illegible]
[illegible]	22		[illegible]	[illegible]		[illegible]
[illegible]	27		[illegible]	[illegible]		[illegible]
[illegible]	58		[illegible]	[illegible]		[illegible]

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet Unchagaon Kila

ct	Mohanlalganj to Mauranwan to Unnao Marg.							
ct		Taluka			Block/Ward No		GP/MC	
ent		PS/Thana			Chainage/Km		Venue	
	14/06/15	Time			Total No. of Participants	Male	Female	Total
						12	0	12

.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
	सुशील यादव	30				8127 864035	सुशील कुमार यादव
2.	संतोष कुमार	30					
3-	कृष्णा पाल	35				9936 187929	कृष्णा पाल
4-	भीम-प्रकाश	33				—	भीम प्रकाश
5.	रामेश	38				—	—
6.	अशोक कुमार	40				95065 58923	अशोक कुमार
	फुलन लाल	65.				—	
8.	सुशील कुमार	35				98390 75232	सुशील कुमार
9.	भीम-प्रकाश	45				78601 98220.	भीम प्रकाश
10.	उमा. आर सिंह	30			प्रधान	945591 000	
11.	शिव.लाल कुशवाहा	55			प्रधान	945294 8193.	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet Purwa tushrour

ct	Mahanlalganj to Mauraiwah to Unnao Marg.							
ct		Taluka			Block/Ward No		GP/MC	
ent		PS/Thana			Chainage/Km		Venue	
	14/06/15	Time			Total No. of Participants	Male	Female	Total
						13	0	13

.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
	अविलेश	18	M	Gen	मुकुल	-	अविलेश
	रामनाथ	55	M	ST	मुकुल	-	-
	बाबू-लाला	55	M	S.C	मुकुल	-	-
	मोनू-तिवारी	27	M	Gen	मुकुल	979478 3253	मोनू
	अमरेश कुमार	27	M	S.C	कृषि	97940 77112	अमरेश
	कल्लू	28	M	S.C	ड्राइवर	-	-
	अयोध्या	65	M	S.C	कृषि	-	-
	दुर्गेश कुमार	10	M	Gen	छात्र	97948 1468	दुर्गेश कुमार
	राम-शंकर तिवारी	65	M	Gen	मुकुल	-	रामशंकर तिवारी
	जीत बहादुर	30	M	ST	मुकुल	-	जीत बहादुर
	पुत्तीलाल	65	M	S.C	कृषि	-	पुत्तीलाल
	बक्शी-प्रसाद	65	M	ST	मुकुल	-	-
	अमर सिंह माल	72	M	Gen	आटा-चक्की	97945 47636	अमर सिंह माल

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet Mohanlalganj

ct	Mohanlalganj to Unnao marg							
ct		Taluka			Block/Ward No		GP/MC	
ent		PS/Thana			Chainage/Km		Venue	
	15/06/15	Time			Total No. of Participants	Male	Female	Total
						12	0	12

.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
.	लायक लाल	55	M	S.C	दुकान.	9838754300	लायक लाल
.	विकास	29	M	Gen	बिजनेस	8736045500	विकास कुमार
.	मुन्ना	52	M	Gen	बिजनेस	—	मुन्ना
.	कृष्णपालयादव	65	M	Gen	अध्यापक	—	
	बाबू राम	52	M	S.C.	बिजनेस	—	—
	रवि	18	M	S.C	छात्र	7705889530	रवि
.	मो. असलम	37	M	O.B.C.	वी० प० सदस्य	9935916860	
.	सतीश	24	M	S.C	छात्र	9936196502	सतीश
.	सतीश	22	M	Gen	बिजनेस	8058585237	सतीश
.	दीपक	22	M	gen	बिजनेस	9559399707	दीपक
.	प्रेमचन्द्र	40.	M	gen	कृषि	—	

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet कालू खेड़ा

ct	Mohanlalganj to Unnao Marg.							
ct		Taluka			Block/Ward No		GP/MC	
ent		PS/Thana			Chainage/Km		Venue	
	15/06/15	Time			Total No. of Participants	Male	Female	Total
						10	0	10

o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
.	विजय कुमार	28.	M	Gen	ड्राइवर	9893600609	विजय कुमार
.	अमित	29.	M	Gen	ड्राइवर	9450930803	अमित
.	अर्जुन सिंह	22	M	gen.	चाय-वाला	9651199722	अर्जुन
.	मेराज	26.	M	O.B.C	ड्राइवर	-	
.	सतेन्द्र सिंह	28.	M	Gen	गाड़ी-चालक	9005035795	
.	रियाज	27	M	O.B.C	ड्राइवर	9005500992	
.	राजेश	35	M	Gen	ड्राइवर	8601168365	
.	प्रेम-सागर	50.	M	Gen	ड्राइवर	9920949930	
.	रघुराज	20.	M	Gen	ड्राइवर	9577907378	
.	अंकित	18.	M	Gen	ड्राइवर	9455205897	Ankit

Project Name/No.		
		Annexure:

Community Consultation Attendance Sheet मौरावा

ct	Mohanlalganj to Mauwawan to Unnao Hwy							
ct	Unnao	Taluka			Block/Ward No		GP/MC	
ient	Mauwawan	PS/Thana			Chainage/Km		Venue	
	16/06/18	Time			Total No. of Participants	Male	Female	Total
						12	0	12

o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1.	आलम	45	M	O.B.C	बिजनेस	-	आलम
2.	इरशाद आलम	25	M	OBC	बिजनेस	96952 24003	इरशाद आलम
3.	सन्दीप जायसवाल	25	M	gen	बिजनेस	912500 6105	सन्दीप
4.	राजेश	35	M	gen	बिजनेस	945231 6206	राजेश
5.	सुरेश कुमार	28	M	gen	बिजनेस	965124 6598	सुरेश कुमार
6.	प्रमोद कुमार	42	M	gen	बिजनेस	945239 8739	प्रमोद कुमार
7.	शिव कुमार गुप्ता	42	M	gen	बिजनेस	99360 77792	
8.	राजेश कुमार	32	M	gen	बिजनेस	09402 62236	राजेन्द्र
9.	बाबूलाल	62	M	gen	होटल	879448 7704	मनोज
10.	अरुन प्रकाश	65	M	gen	रिटा	—	
11	रामनरेश	65	M	gen	दुकानदार	-	रामनरेश
12.	सुरेश कुमार	35	M	gen	बिजनेस	-	सुरेश कुमार

roject Name/No.		
		Annexure:

Community Consultation Attendance Sheet

ct	UPMDRIP							
ct	Kasganj	Taluka	Sahaswan		Block/Ward No		GP/MC	
ne	Sahaswan	PS/Thana			Chainage/Km		Venue	
		Time			Total No. of Participants	Male	Female	Total

o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
)	Ramveer	52	M		Truck Driver	UP 70 CT 3303	
)	Rajesh	43	M		Truck Driver	UP 57 AC 5433	

roject Name/No.		
		Annexure:

Community Consultation Attendance Sheet

ct	UPMDRIP							
ct	Kasganj	Taluka	Sahawar		Block/Ward No		GP/MC	
ne	Sahawar	PS/Thana			Chainage/Km		Venue	
		Time			Total No. of Participants	Male	Female	Total

o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
)	Ramveer	52	M		Truck Driver	UP 70 CT 3303	
)	Rajesh	43	M		Truck Driver	UP 67 AC 5933	

roject Name/No. UPMDR (Aliganj - Soron Road)

Annexure:

Community Consultation Attendance Sheet

ct	Aliganj - Soron Road							
ct	Kasganj	Taluka	1		Block/Ward No		GP/MC	
ne	Patiyali	PS/Thana			Chainage/Km		Venue	
		Time			Total No. of Participants	Male	Female	Total
						10	0	10

o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
	Sunny	35	M		Worker	Patiyali Village	
	Binesh	48	M			"	
	Rajesh	42	M			"	
	Gangaram	52	M			"	
	Ram prasad	40	M			"	
	Shrinivas	29	M			"	
	Mohammad Nabi	29	M			"	
	Manoj	45	M			"	
	Ravi	54	M			"	
	Kisan	37	M			"	

roject Name/No.		
		Annexure:

Community Consultation Attendance Sheet

ct	Aligarh Sasan Road UPMDR2P							
ct		Taluka		Block/Ward No		GP/MC		
ne	Sasan	PS/Thana		Chainage/Km		Venue		
		Time		Total No. of Participants	Male	Female	Total	
o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
	Rajendra Kr	47	M		Shopowner		राजेन्द्र कुमार	
	Virendra Kr	40	M		"		वीरेन्द्र कुमार	
	Preet	32	M		"		प्रीत	
	Suresh	34	M		Shopkeeper		Suresh	
	Raja	50	M		"		राजा	
	Ramkam	27	M		"		सुनील	
	Sunil	28	M		"		सुनील कुमार	
	Ravi	29	M		"		रवि	
	Kishan	45	M		"		किशन	
	Nagesh	57	M		"		नागेश	
	Devender	34	M		"		Devender	

roject Name/No.		Annexure:

Community Consultation Attendance Sheet

ct	Uttar pradesh Major District Road Improvement Progs.							
ct		Taluka		Block/Ward No		GP/MC		
ne	Nanaunpur	PS/Thana		Chainage/Km		Venue		
		Time		Total No. of Participants	Male	Female	Total	
o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
)	Chobsingh	51	M		Principal			
)	Shiv charan lal	37	M		By profession			
)	Nagendra Kumar	25	M		Self. Emp.			
)	Manmohan Singh	49	M		"		Manmohan singh	
)	Pawan	25	M		"			
)	Bhagwan Singh	28	M		"			
)	Sant Ram	43	M		"		Sant ram	
)	Pushpendra Yadav	30	M		"		Pushpendra yadav	
)	Bhanu Pratap	39	M		"		Bhanu pratap	

roject Name/No.		Annexure:

Community Consultation Attendance Sheet

ct	UPMDRIP							
ct	Kasganj	Taluka			Block/Ward No		GP/MC	
ne	Yakutganj	PS/Thana			Chainage/Km		Venue	
		Time			Total No. of Participants	Male	Female	Total
o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature	
	Satish	40	M		Shopkeepers	Yakutganj	सतीश	
	Shreepal	38	M		Shopowners	"	श्रीपाल	
	Naushad	49	M		"	"	Naushad	
	D. R. Upadhyay	37	M		Shopkeepers	"	6/6/15	
	Raja Babu	35	M		"	"		
	Ram naresh	40	M		"	"	रामनरेश	
	Subash	28	M		"	"		
	Bhanu singh	50	M		"	"	भानुसिंह	
	Dheeraj Pandit	44	M		"	"	धीरज	
	N. Modi	29	M		"	"	N Modi	

roject Name/No.		
		Annexure:

Community Consultation Attendance Sheet

ct	Uttar Pradesh Major District Road Investment Programme							
ct	Kasganj	Taluka			Block/Ward No		GP/MC	
ne	Ganjdundwara	PS/Thana			Chainage/Km		Venue	
		Time			Total No. of Participants	Male	Female	Total

o.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
	Mohammad Rahi	32	M		~~Ganjdundwara~~ Shop owner	Ganjdundwara	
	Jahanzeb	37	M			"	
	Zaheerul	29	M		Auto driver	"	
	Salim	39	M		Stakeholder	"	
	Bablu	24	M		Student	"	Bablu
	Rashid	21	M		Student	"	Rashid
	Shahid	27	M		Stakeholder	"	
	Kamlesh	35	M				Kamlesh
	Rizwan	25	M				
	Naved	30	M				Naved
	Sarfaraz	36	M				

APPENDIX 49A: ENVIRONMENTAL MANAGEMENT PLAN OF NANAU TO DADAU ROAD (MDR 82W)

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
A. Design and Pre-construction Stage								
1. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 14 locations for a length of 8.93 km Roadside drains (both sides together) Lined=14.300 km Unlined= 45.572 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Provision of crash barriers at accident prone areas and high embankments. ▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 ". IRC: SP: 67-2012	Throughout the Stretch Footpath cum drain for a length of 7.150 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridges ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
2. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 14 locations for a length of 8.93 km Roadside drains (both sides together) Lined=14.300 km Unlined= 45.572 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD
3. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS 2009. ▪ Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4. Diversion of Forest Land and Cutting of Trees								
4.1 Forest Diversion	▪ Entire length of project road notified as PF vide Order No. 155 / XIV-331-50 dated 10.02.1960 ▪ Obtain forest Clearance from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation, Net Present Value etc. ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=3639 Additional Plantation of 7278 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change
5. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
6. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	6.1 The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100_% compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC
6.3 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.4 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.5 Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
B. Construction Stage								
1. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1.2 Emission of air pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981(Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
2. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment to be timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during day time and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing ▪ frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Included in civil works cost	Contractor	UPPWD/CSC
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.	As Directed by Engineer	Throughout the Project Corridor Enhancement of water bodies/resources proposed, details as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridge	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 4 locations with maximum length = 74 m **(as Enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.5Deterioration in Surface / Ground water quality due to leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ Water quality shall be monitored as per EMoP ▪ No Storage / Refuelling activity shall be carried out within 25m of a Hand Pump location being used for drinking Purpose. ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatat least more than 1 feet of depth is maintained along the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection.	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
5. Flora and Fauna								
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. ▪ Employment preference to be given to women ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=3639 Additional Plantation near Sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads .	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC
6.2Worker'sHealth in construction camp	▪ The contractor shall prepare its Health, Safety and Environment (SHE) Policy and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
7. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
8. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 -1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 -2001Guidelines for Safety in Construction Zones The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.2 Pedestrian, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children.	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Bank EHS Guidelines. ▪ Contractors to adopt and maintain safe working practices in line with World Banks EHS Guidelines.. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Laws and Policies, World Bank EHS Guidelines, Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC
9. Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
Operation and Maintenance stage								
1. Air Quality								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People.	Included in Environment Monitoring Cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
2. 2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptors as identified in IEE locations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
3. Land and Soil								
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
4. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
5. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
6. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) rules, 1989	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

Appendix 49B: ENVIRONMENT MONITORING PROGRAMME (NANAU - DADON)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent $PM_{10}PM_{2.5}$	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors.(3 Mixed Land Use Major Location , 10 sensitive receptors)	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x 3000 = INR 117,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 1 Severely affected Pond 2 ponds within 15 m of CL 100m U/s and D/s from 4 bridge widening sites over canal	Groundwater: quarterly Monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly for period of one year of construction	Specified in Drinking Water Standards : 2012 for Ground water: and Water Quality Criteria for Surface Water of CPCB Ground Water at Construction camp Quarterly excluding monsoon. The most beneficial use as documented in the environmental baseline of the pond should not be affected.	1x 5000x 3 x 2 =INR 30,000.00 1x5000 x 6= INR 30,000.00 2x5000 x 2x2= INR 40,000.00 8 x 12 x 5000= INR 480000.00	Contractor through approved monitoring agency	UPPWD /CSC
	Operation stage			2 location along the road including Surface water Pond where monitoring was carried out during construction phase (2Locations)	Grab Sample	In operation period Once in the last of first Operation Year	2X5000 x1 =INR10, 000	UPPWD, Division through approved monitoring agency	UPPWD HQ

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000 =INR.30,000.00 13x 2 x12 x 1000=INR 312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000x1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High Embankments and Earther spaces in ROW	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	
Drainage Cross Drainage	Construction stage	Cleaning of lateral Drains	Visual Checks As directed by the	Throughout the Project Corridor	Monthly		Incidental to Work	Contractor'	CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
and Lateral Drains	Operation Stage	and Streams / Nallah's crossing the road	Engineer	Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 1.213 Million (total), 1.139 Million (Construction Phase), 0.074 Million (Operation Phase)									

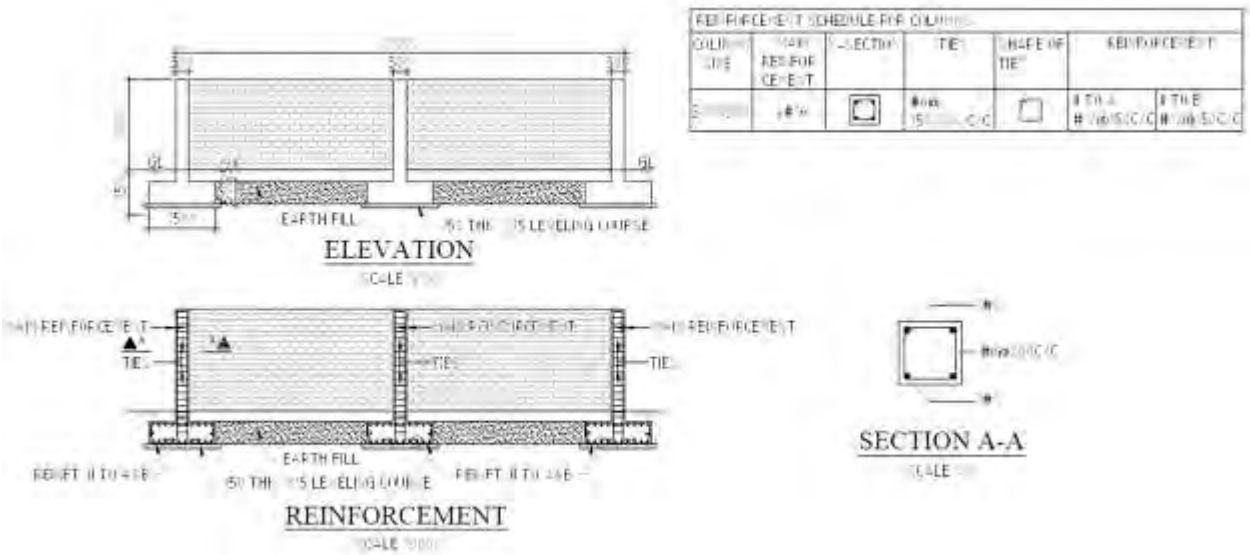
** UPPWD Uttar Pradesh Public Works Department, NPK: , CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

Appendix 49A: PROVISION OF NOISE BARRIER IN NANAU-DADON ROAD

Proposed Locations

S. No.	Existing Chainage (Km)	Features	Village	Side
1	0.110	School	Nanau	RHS
2	0.710	School	Nanau	LHS
3	6.500	School	Sinandarpur	LHS
4	9.100	College	Sinandarpur	LHS
5	14.600	School	Tikta	RHS
6	14.780	School	Tikta	RHS
7	16.650	School	Sihawali	LHS
8	18.400	School	Sihawali	RHS
9	19.500	Community Health Centre	Sihawali	LHS
10	22.000	School	Barauli	RHS
11	26.220	School	Atta	LHS
12	28.900	Inter College	Dadau	LHS
13	28.910	Primary Health Centre	Dadau	RHS
14	29.970	School	Nagla Bhore	RHS

Source: DPR Consultant

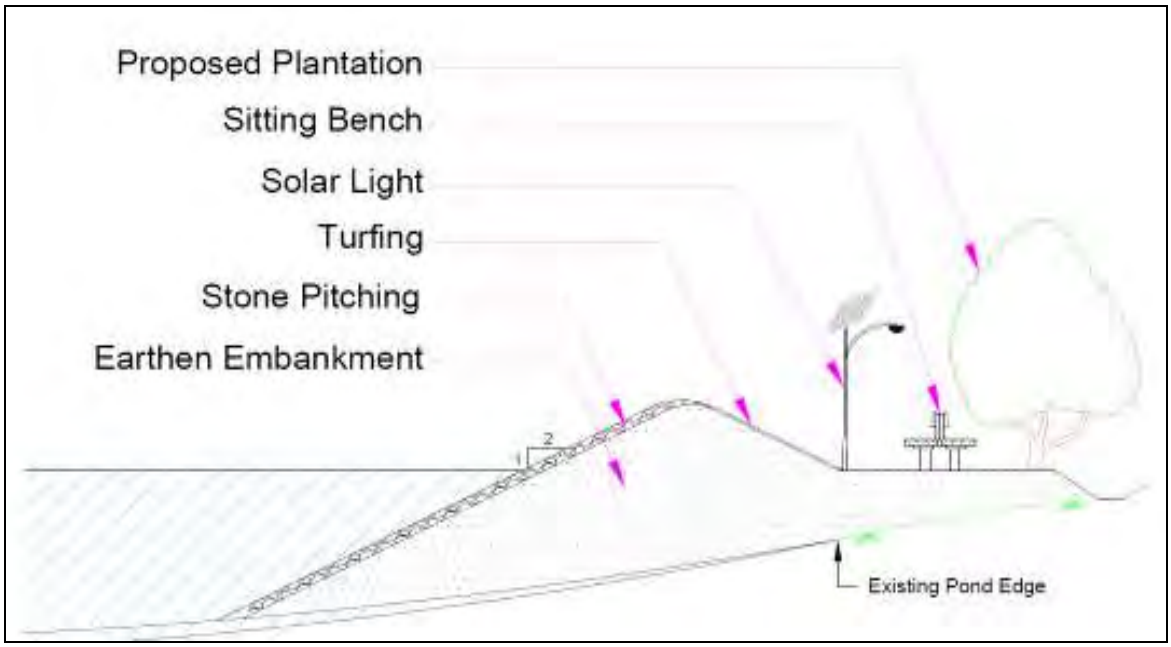


Typical Design for Noise barrier

Appendix 49A: PROVISION OF ENHANCEMENT MEASURES IN NANAU DADON ROAD
Proposed Locations of Ponds

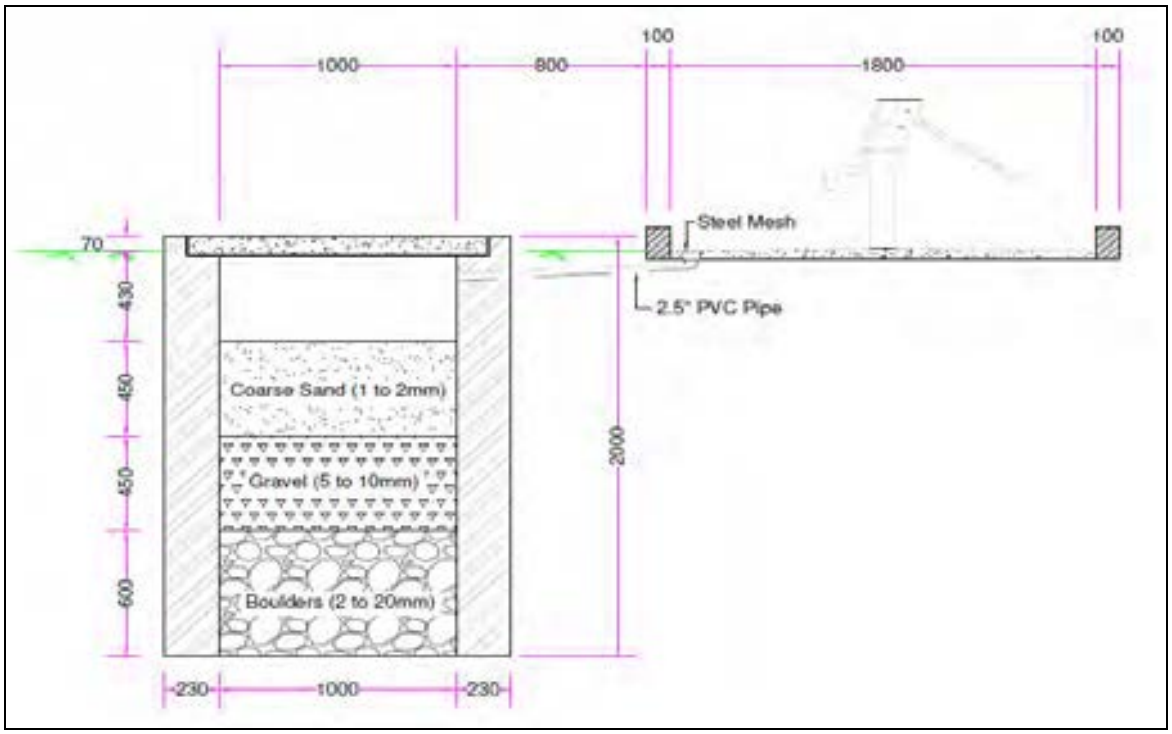
S. No.	Chainage (km)	Side	Distance from Center line(m)
1	15.18	LHS	16

Source: PPTA Consultant



Schematic layout of enhancement measures proposed for Pond

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



TCS of Soak pit for Hand pumps

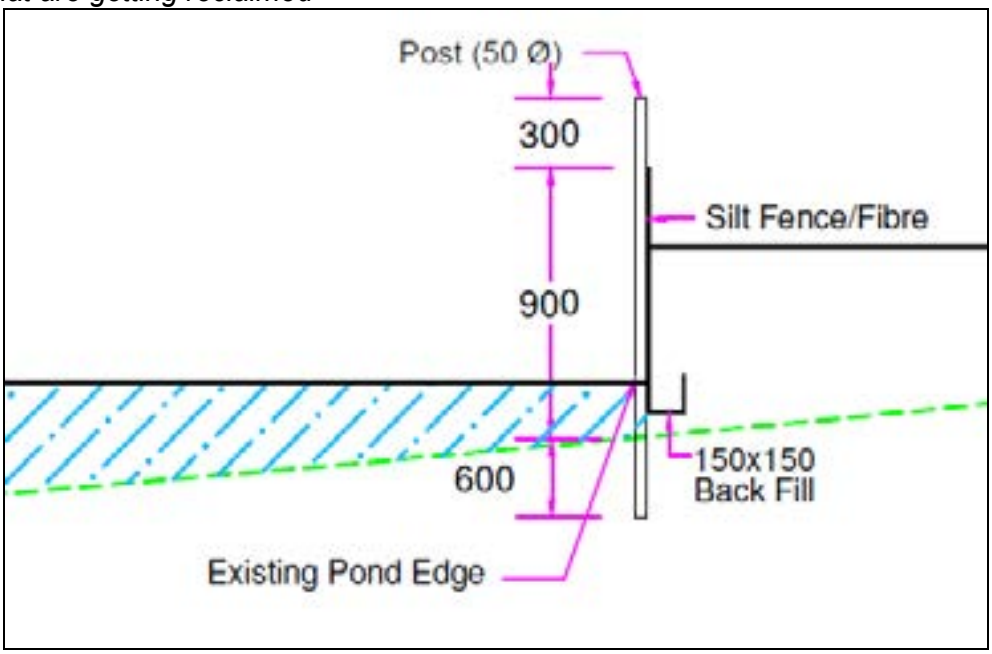
Appendix 49A: PROVISION OF SILT FENCING IN NANAU DADON ROAD

Proposed Locations

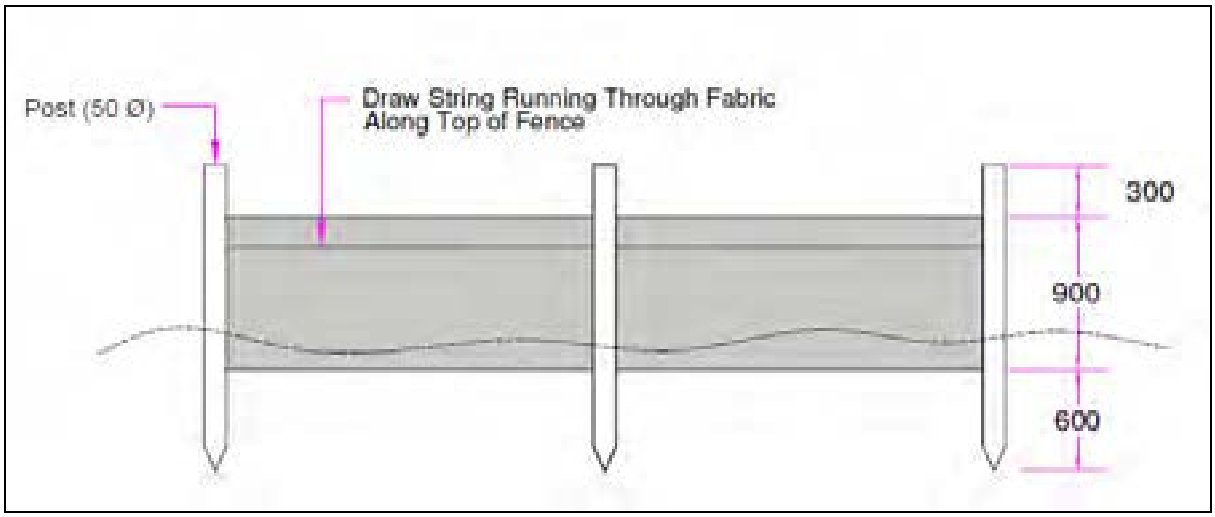
S. No.	Chainage (km)	Side	Distance from Center line (m)
1	0.73	LHS	5*
2	0.8	LHS	10
3	3.78	LHS	10
4	11.1	RHS	8*

Source: PPTA Consultant

** Retaining wall shall be provided if required for stability of road along the waste disposal ponds that are getting reclaimed*



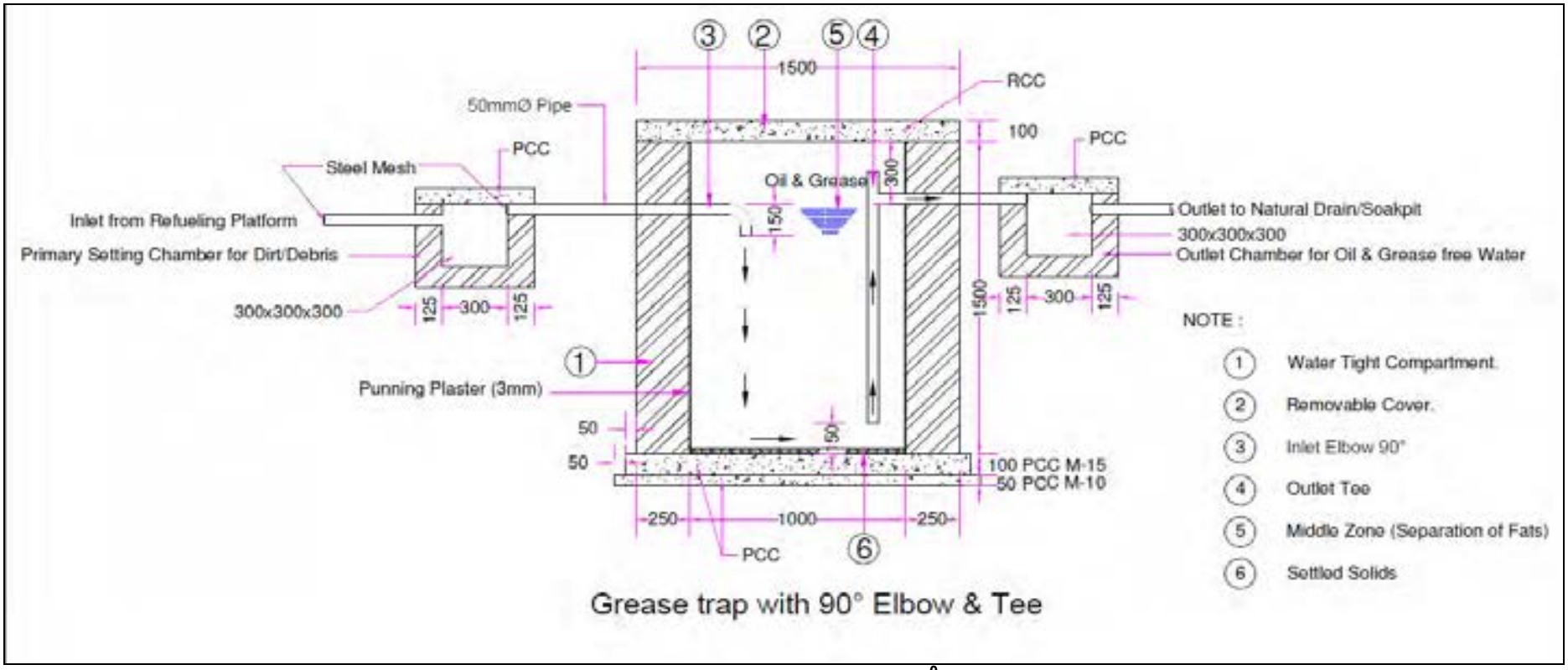
TCS for silt Fencing



Front View of silt Fencing

Appendix 49A: PROVISION OF OIL INTERCEPTORS IN NANAU DADON ROAD

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 50A: ENVIRONMENTAL MANAGEMENT PLAN OF BULANDSHAHAR TO ANOOPSHAHAR ROAD (MDR 58W)

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
D. Design and Pre-construction Stage								
7. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 12 locations for a length of 13.92 km Roadside drains (both sides together) Lined=13.740 km Unlined= 58.500 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Provision of crash barriers at accident prone areas and high embankments. ▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Crash barrier length=148.55 m Footpath cum drain for a length of 6.870 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridge s ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
8. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 12 locations for a length of 13.92 km Roadside drains (both sides together) Lined=13.740 km Unlined= 58.500 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
9. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS 2009. • Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD
10. Cutting of Trees								
4.1 Tree Cutting	▪ Obtain Tree cutting permission from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation etc. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=1557 Additional Plantation of 3114 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change
11. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
12. Other Pre-construction Activities								

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.1 The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	National Policies /Laws, World Bank's EHS Guidelines, Best National and International Practices.	Project Corridor and other allied areas	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC / UPPWD
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100___% compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environmental Cost	Contractor	CSC / UPPWD
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC
6.3 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				
6.4 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.5Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
E. Construction Stage								
10. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD
1.2 Emission of air pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO_2, NO_2, and CO. Status of PUC certificates PT: SO_2 and NO_2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
11. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment to be timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during day time and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
12. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Included in civil works cost	Contractor	UPPWD/CSC
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
▪ Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.	As Directed by Engineer	Throughout the Project Corridor Enhancement measures proposed at locations as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridge	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing and intercepting ditch along with sedimentation pit depending on site-specific conditions shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near pond	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 1 location of maximum length = 39 m **(as Enclosed)** Retaining wall at 1 location of length 54 m **(as enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.5Deterioration in Surface / Ground water quality due to leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ Water quality shall be monitored as per EMoP ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose. ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection. ▪	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Includedin civil works cost	Contractor	UPPWD/CSC
13. Flora and Fauna								
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=1557 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
5.2 Damage of Flora & Fauna	▪ The contractor will display cautionary boards and informatory sign boards during construction at the two locations where Monkeys are found along the road. ▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor For Monkeys specially at two locations along road (km 23.200 to km 23.400 & km 47.00 to km 48.00)	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
14. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC
6.2Worker'sHealth in construction camp	▪ The contractor shall have its Health, Safety and Environment (SHE) Policy and guidelines and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
▪ Management of Construction Waste/Debris								

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
15. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 -1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 -2001Guidelines for Safety in Construction Zones The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals. ▪ The Contractor shall depute Patrols on School crossings during construction period for facilitating the movement of School Children.	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Banks EHS Guidelines. ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Laws and Policies, World Bank EHS Guidelines, Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC
Site restoration and rehabilitation before Contractor's Demobilization								

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
Operation and Maintenance stage								
1. Air Quality								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People.	Included in Environment Monitoring Cost	UPPWD	
2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptors as identified in IEE locations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
9. Land and Soil								

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
10. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
11. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
5.2 Fauna	▪ The contractor will display cautionary boards and informatory sign boards at least 100 m before and after the two locations where Monkeys are found along the road to discourage people from offering food. ▪ Rumble strips shall be provided on either side of road and center of road at km 23.200 and km 47.000 to reduce the speed of vehicles	Project requirement	Monkey zone from km 23.200 to km 23.400 and from km 47.000 to km 48.000	MI: No damage to Fauna PI: No Complaints received	Site observations Discussions with locals	Included in Environment Cost	UPPWD	
12. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws /guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) Rules, 1989	Hazardous Waste (Management & handling) Rules, 1989	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 50B: ENVIRONMENT MONITORING PROGRAMME (BULANDSHAR- ANOOPSHAR)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors.(3 Mixed Land Use Major Location , 10 sensitive receptors	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x3000 = INR 117,000.00	Contractor through approved monitoring agency	CSC
	Operation stage	$PM_{10}PM_{2.5}$		Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp 1 Severely affected Pond 2 ponds within 15 m of CL 100 m U/s and D/s of 2 Bridge re construction site and 06 widening site	Groundwater: quarterly excluding monsoon monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly during period of construction assuming to be one Year	Specified in Drinking Water Standards : 2012 for Ground water and Water Quality Criteria for Surface Water of CPCB The most beneficial use as documented in the environmental baseline of the pond should not be affected. Water Quality Criteria for Surface Water of CPCB	1 x 5000 x 3 x 2 =INR 30,000.00 1 x 5000 x 6= INR 30,000.00 2 x 5000 x 2 x 2= INR 40,000.00 8 x 2 x 12 x 5000=INR 960000.00	Contractor through approved monitoring agency	UPPWD /CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
	Operation stage			2 location along the road including Surface water Pond where monitoring was carried out during construction phase (2 Locations)	Grab Sample	In operation period Once in the last of first Operation Year	2X5000 x1 =INR10,000	UPPWD, Division through approved monitoring agency	UPPWD HQ
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x 3 x 2 x 1000 =INR.30,000.00 13x 2 x12 x 1000=312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000x1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High Embankments and Earther spaces in ROW	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage			Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	HygieneDrainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline and Workers law	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monkeys	Construction Stage	Fatal / Non Fatal		Throughout the stretch	occurrence of accidents			Contractor	CSC
	Operation Stage							UPPWD	
Monitoring Costs: INR 1.693 Million (total), 1.619 Millions (Construction Phase), 0.074 Million (Operation Phase)									

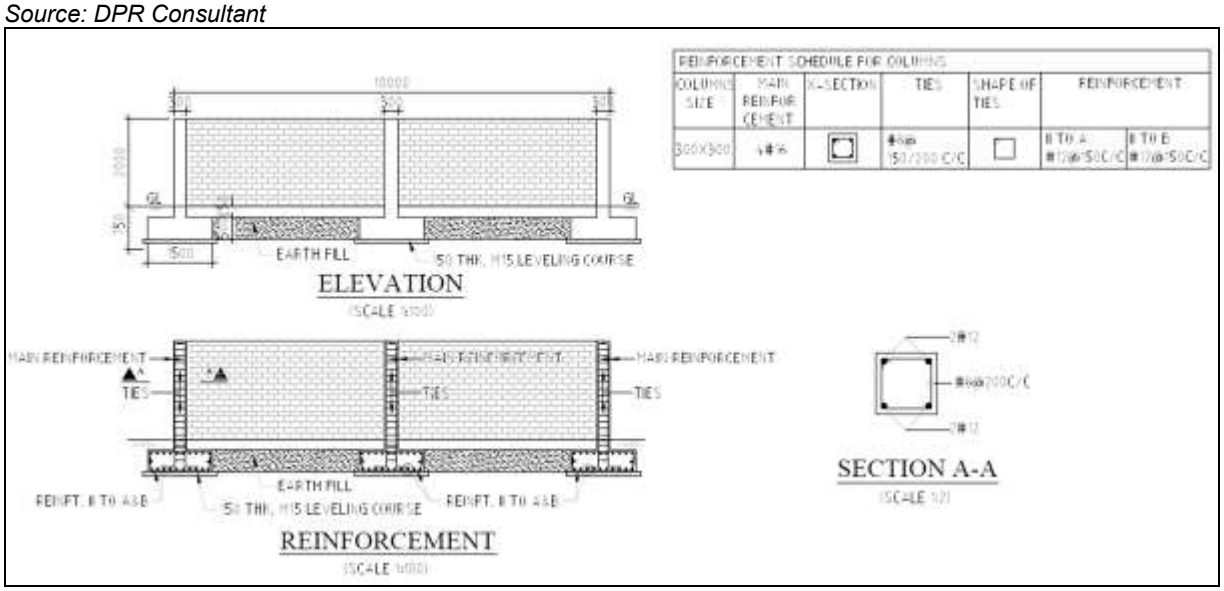
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

APPENDIX 50A: PROVISION OF NOISE BARRIER IN BULANDSHAHAR-ANOOPSHAHAR ROAD

Proposed Locations

Sl. No.	Existing Chainage (Km)	Features	Village	Side
1	20.400	School	Jatwai	LHS
2	24.900	School	Bhipur	RHS
3	31.900	School	Birauli	RHS
4	32.900	College	Hisawati	RHS
5	35.050	School	Aniwasai	LHS
6	38.350	Hospital	Karanpur	RHS
7	38.750	College	Karanpur	LHS
8	43.200	School	Anupshahar	LHS
9	43.650	School	Achalpur	RHS
10	50.960	School	Jirauli	LHS
11	54.750	School	Devi ka Nagla	RHS
12	56.500	School	Naya Baas (Qutubpur)	LHS
13 & 14	56.600	College & School	Bheempur Chowk	RHS

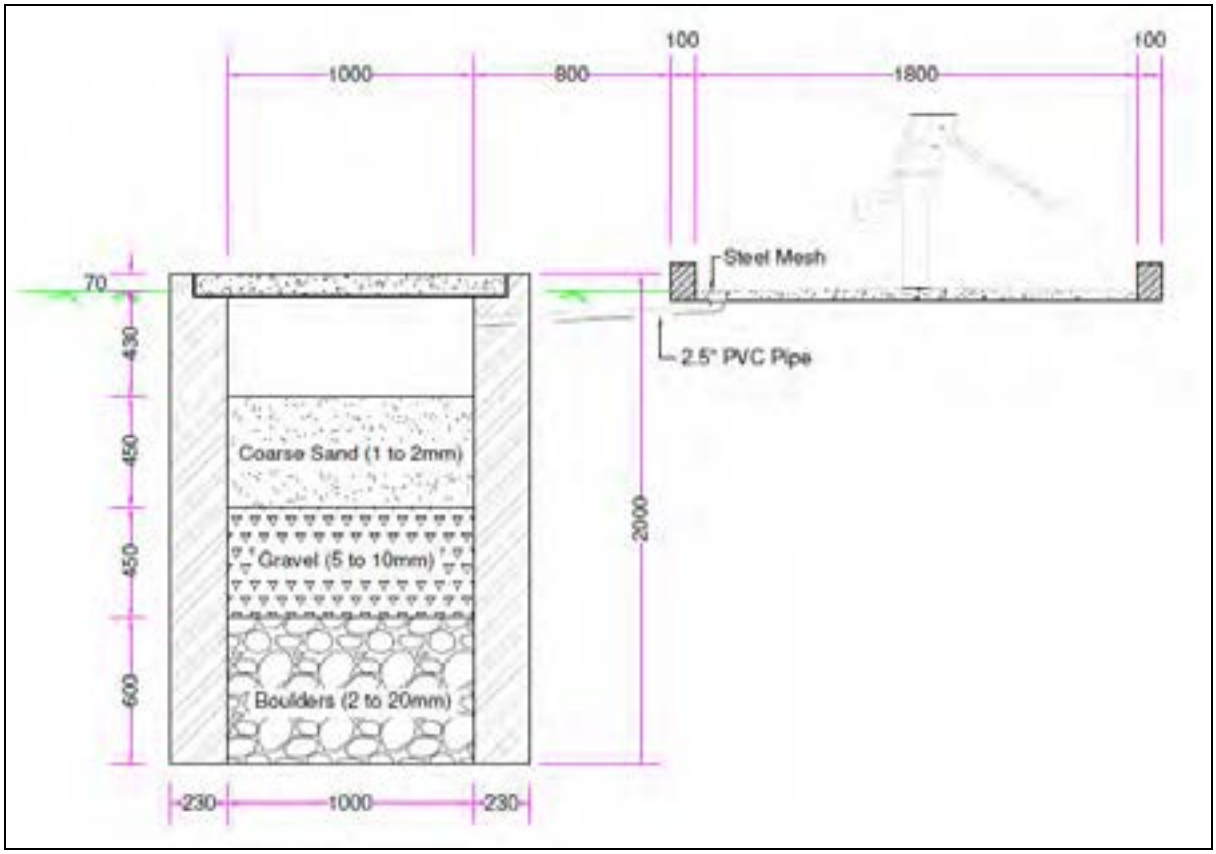
Source: DPR Consultant



Typical Design for Noise barrier

APPENDIX 50A: PROVISION OF ENHANCEMENT MEASURES IN BULANDSHAHAR-ANOOPSHAHAR ROAD

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



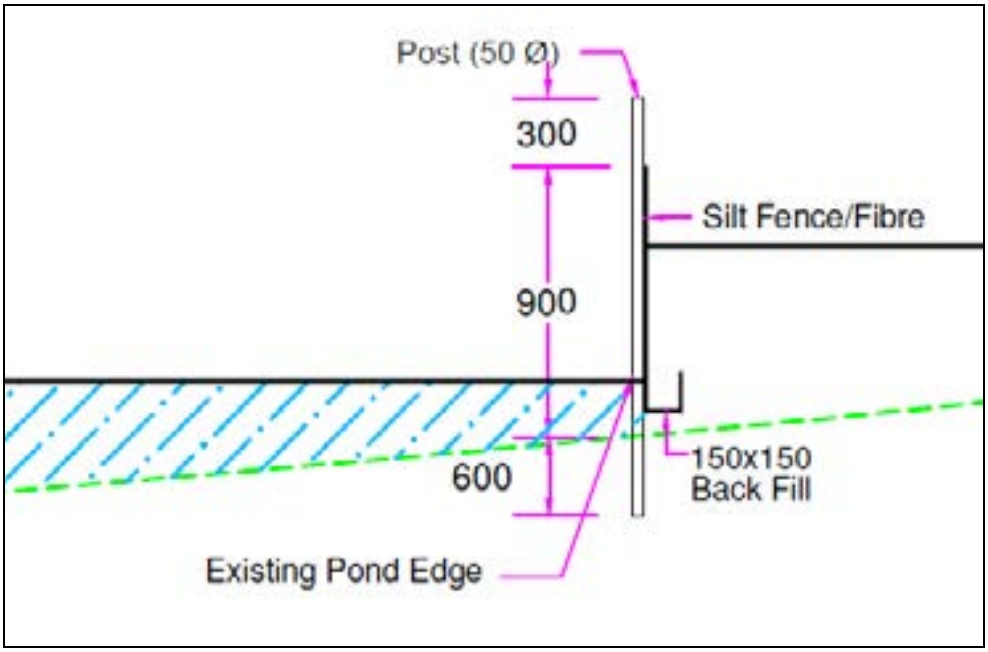
TCS of Soak pit for Hand pumps

APPENDIX 50A: PROVISION OF SILT FENCING IN BULANDSHAHAR-ANOOPSHAHAR ROAD

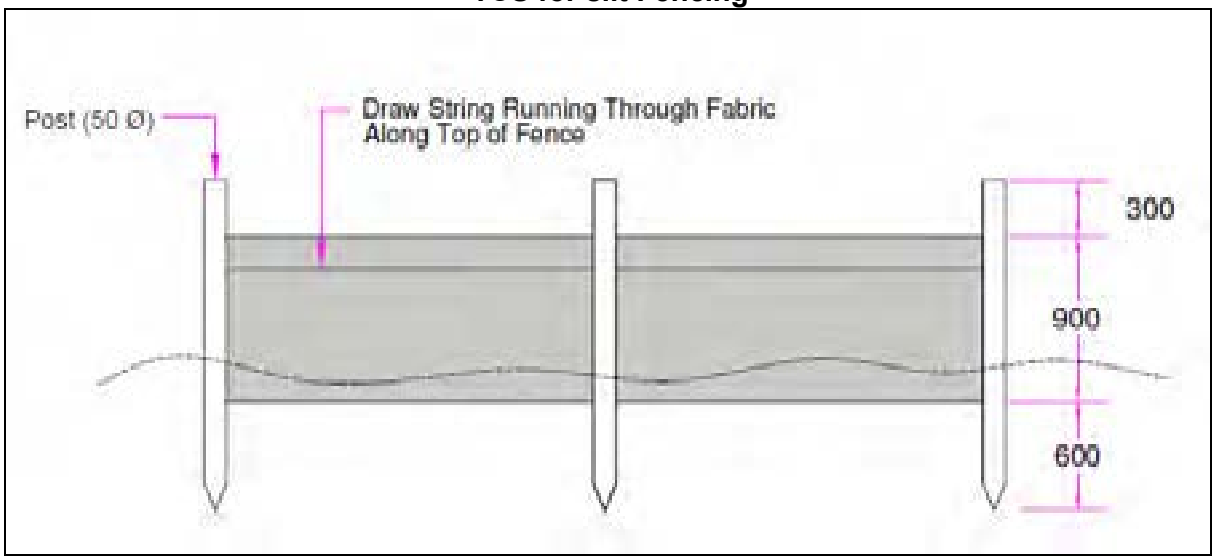
Proposed Locations

Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	20.850	LHS	16

Source: PPTA Consultant



TCS for silt Fencing



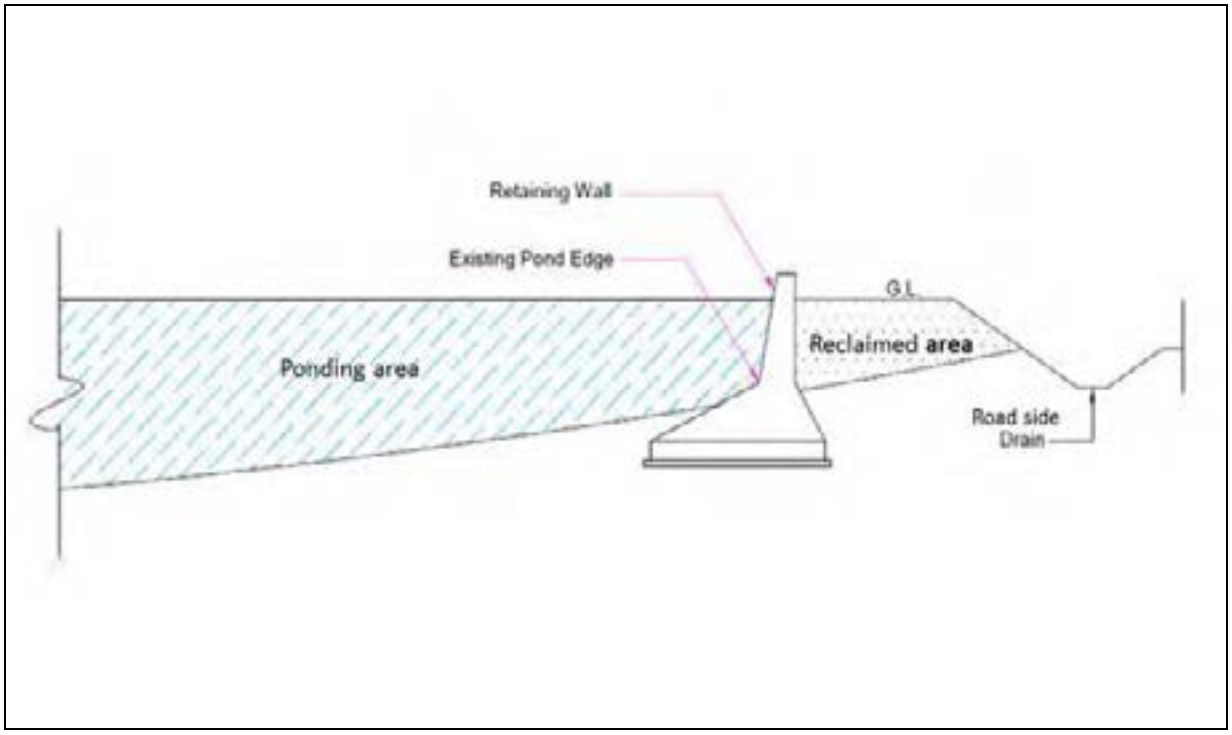
Front View of silt Fencing

APPENDIX 50A: PROVISION OF RETAINING WALL IN BULANDSHAHAR-ANOOPSHAHAR ROAD

Proposed Locations of Ponds

S. No.	Chainage (km)	Side	Distance from Center line(m)
1.	48.050	RHS	5

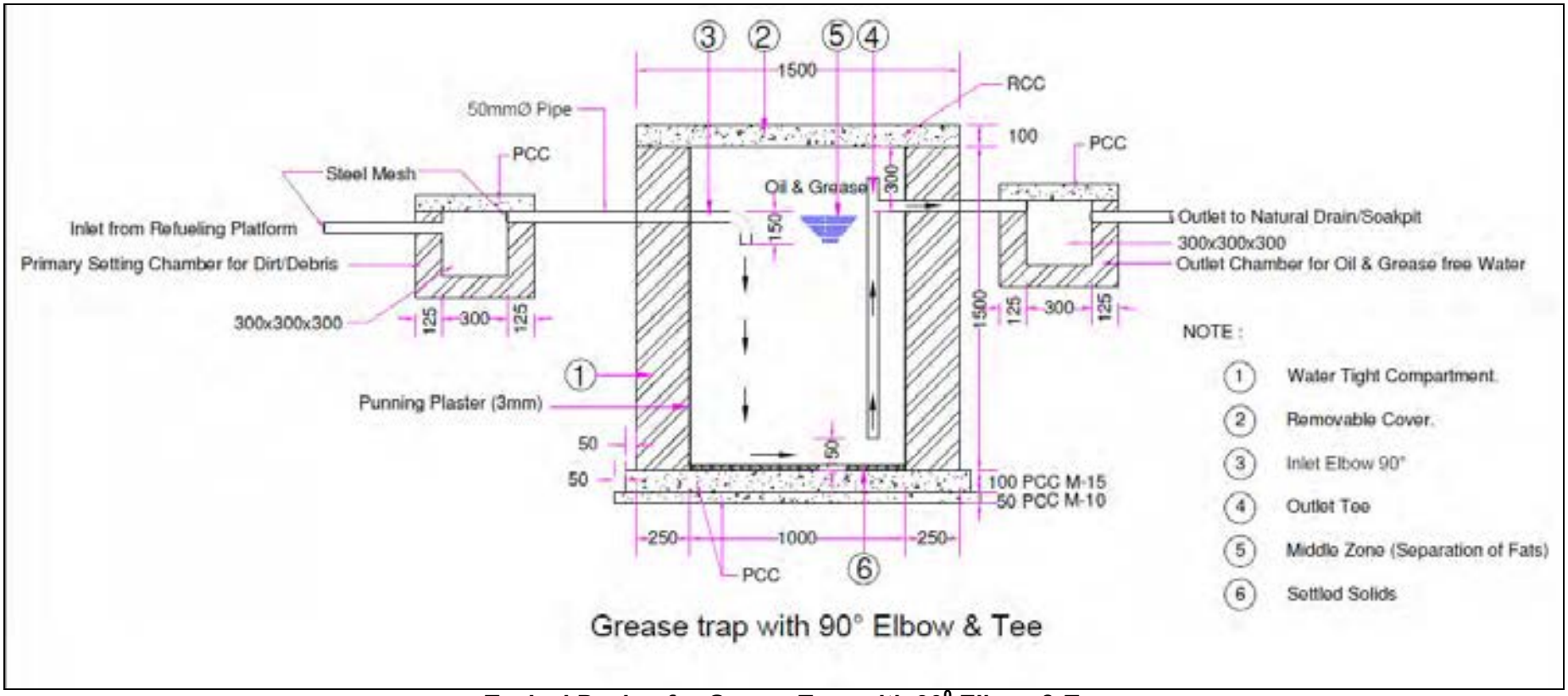
Source: PPTA Consultant



Schematic Diagram for retaining wall

APPENDIX 50A: PROVISION OF OIL INTERCEPTORS IN BULANDSHAHAR-ANOOPSHAHAR ROAD

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 51A: ENVIRONMENTAL MANAGEMENT PLAN OF MUZAFFARNAGAR TO BARAUT ROAD (MDR 135W)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
G. Design and Pre-construction Stage								
13. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 10 locations for a length of 9.444 km Roadside drains (both sides together) Lined=25.067 km Unlined= 93.140 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Provision of crash barriers at accident prone areas and high embankments. ▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Crash barrier length=60.531 m Footpath cum drain for a length of 9.444 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridges ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
14. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 10 locations for a length of 9.444 km Roadside drains (both sides together) Lined=25.067 km Unlined= 93.140 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
15. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB SPS 2009. ▪ Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD
16. Diversion of Forest Land and Cutting of Trees								
4.1 Forest Diversion	▪ Notified protected forest from chainage km 9.000 to km 31.000 vide Order No. 155 / XIV-331-50 dated 10.02.1960 ▪ Obtain forest Clearance from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation, Net Present Value etc. ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=3877 Additional Plantation of 7754 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
17. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
18. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	6.1 The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC /UPPWD
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100_%_compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable, In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.6 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.7 Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
H. Construction Stage								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
17. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD
1.2 Emission of air pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
18. Noise								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment to be timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during day time and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed at sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD
19. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing ▪ frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
20. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.	As Directed by Engineer	Throughout the Project Corridor Enhancement measures proposed at locations as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridge	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing shall be made at water bodies. ▪ Provision of intercepting ditch along with sedimentation pit near water bodies to avoid siltation ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 1 location of maximum length = 161 m **(as Enclosed)** Intercepting ditch (56 m) and small sedimentation pit at 1 location **(as enclosed)** Retaining wall at 3 locations of total length 140 m **(as enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.5Deterioration in Surface / Ground water quality due to Storage of Construction materials and Waste .leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approved disposal site only. ▪ Water quality shall be monitored as per EMoP ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that ▪ mosquito larvae does not get a shelter or protection	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
21. Flora and Fauna								
5.1 Vegetation loss due to site preparation and construction activities	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=3877 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
22. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2 Worker's Health in construction camp	▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
23. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
24. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 -1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 -2001Guidelines for Safety in Construction Zones The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with WB EHS Guidelines ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders,workingplatforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Laws / Policies, World Bank EHS Guidelines, Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC
25. Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
Operation and Maintenance stage								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1. Air Quality								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People.	Included in Environment Monitoring Cost	UPPWD	
2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptors as identified in IEE lo cations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
15. Land and Soil								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
16. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
17. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
18. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) rules, 1989	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 51B: ENVIRONMENT MONITORING PROGRAMME (MUZAFFARNAGR - BARAUT)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of l renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors. (3 Mixed Land Use Major Location , 10 sensitive receptors)	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x 3000 = INR 117,000.00	Contractor through approved monitoring agency	CSC
	Operation stage	$PM_{10}PM_{2.5}$		Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 4 Severely affected Ponds 2 ponds within 15 m of CL 100m U/s and D/s of Site of 2 Bridge Reconstruction over canal	Groundwater: Quarterly excluding monsoon monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly During Construction period of Bridge (Considered as 12 Months)	Specified in Drinking Water Standards : 2012 for Ground water and Water Quality Criteria for Surface Water of CPCB Ground Water at Construction camp. The most beneficial use as documented in the environmental baseline of the pond should not be affected.	1x 5000x 3 x 2 =INR 30,000.00 4x5000 x 6= INR 120,000.00 2x5000 x 2x2= INR 40,000.00 2 x 2 x 12 x5000 =INR 240000.00	Contractor through approved monitoring agency	UPPWD /CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
	Operation stage			5 location along the road including Surface water Pond where monitoring was carried out during construction phase (5 Locations)	Grab Sample	In operation period Once in the last of first Operation Year	5X5000 x1 =INR 25, 000	UPPWD, Division through approved monitoring agency	UPPWD HQ
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000x =INR.30,000.00 13x 2 x12 x 1000= INR 312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000xx1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High Embankments and Earther spaces in ROW	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage			Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	HygieneDrainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt.of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt.of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 1.078 Million (total), 0.989 Million (Construction Phase), 0.089 Million (Operation Phase)									

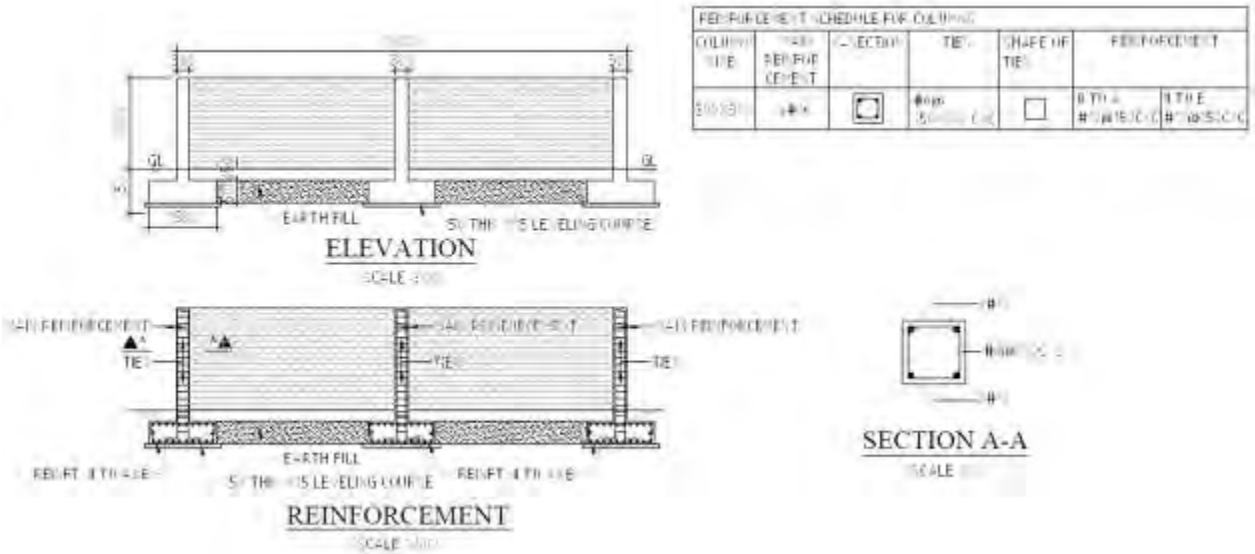
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indin Standard, EMP: Environment Management Plan*

APPENDIX 51A: PROVISION OF NOISE BARRIER IN MUZAFFARNAGR-BARAUT ROAD

Proposed Locations

S. No.	Existing Chainage (Km)	Features	Village	Side
1	3.840	School	Khanjhanpur	RHS
2	7.700	School	Khanjhanpur	LHS
3	10.400	Madarsha	Tawli	RHS
4	15.820	School	Kakda	LHS
5	19.000	College	Shahpur	LHS
6	19.100	College	Shahpur	RHS
7	19.250	School	Shahpur	LHS
8	19.720	School	Shahpur	LHS
9	21.800	College	Shahpur	LHS
10	27.850	School	Bhasana	LHS
11	31.800	School	Budhana	LHS
12	43.000	Primary Health Centre	Daha	LHS
13	45.380	School	Kanhar	LHS
14	52.900	College	Bamnauli	LHS
15	53.990	I.T.I College	Bamnauli	LHS
16	55.920	Primary Health Centre	Bijrol	RHS
17	56.030	College	Bijraul	RHS
18	59.100	School	Baraut	LHS
19	61.280	School	Baraut	LHS
20	61.340	School	Baraut	LHS

Source: DPR Consultant



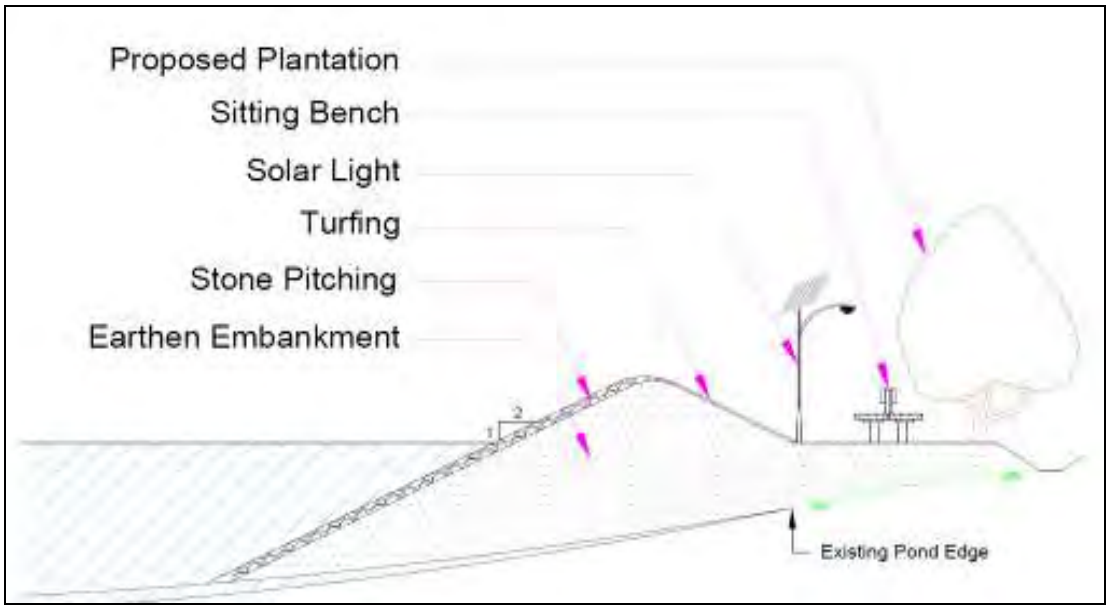
Typical Design for Noise barrier

APPENDIX 51A: PROVISION OF ENHANCEMENT MEASURES IN MUZAFFARNAGR-BARAUT ROAD

Proposed Locations of Ponds

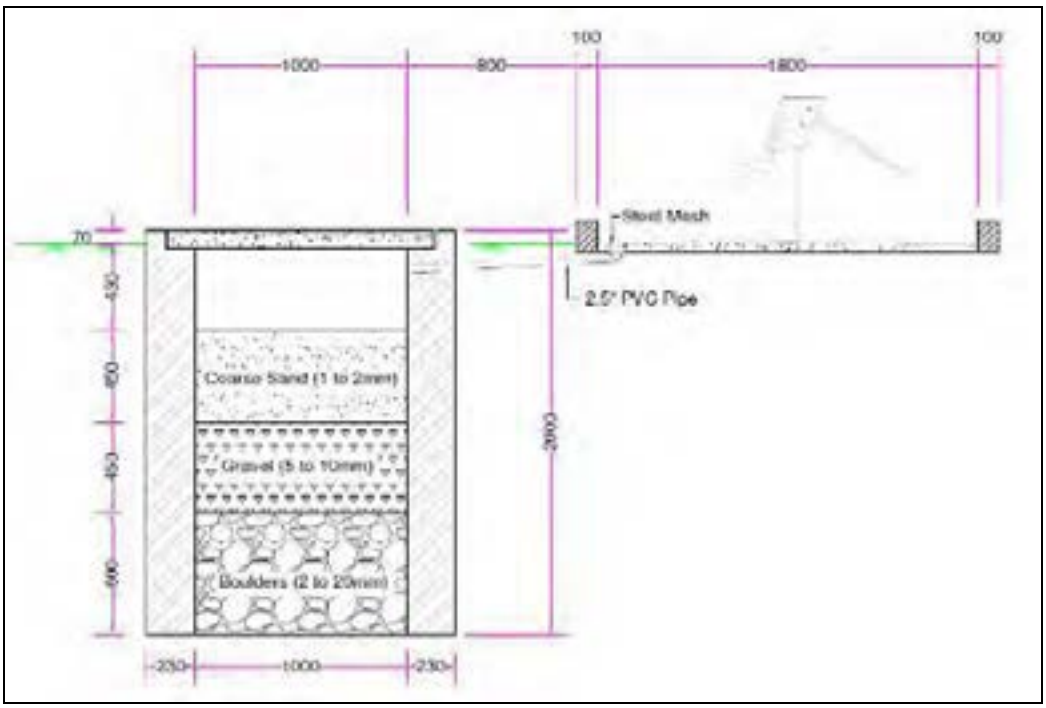
S. No.	Chainage (km)	Side	Distance from Center line(m)
1	9.970	RHS	10

Source: PPTA Consultant



Schematic layout of enhancement measures proposed for Pond

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated

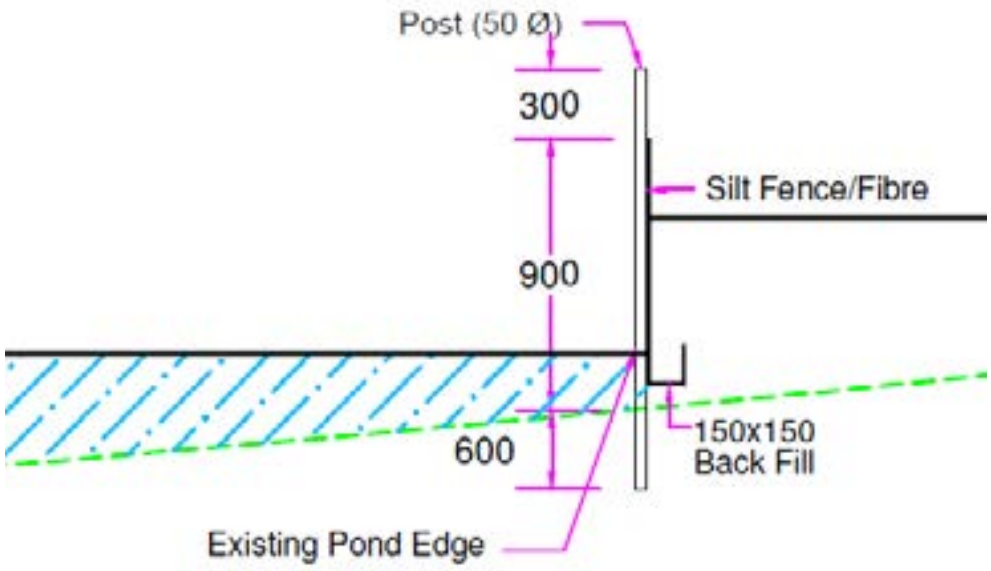


TCS of Soak pit for Hand pumps

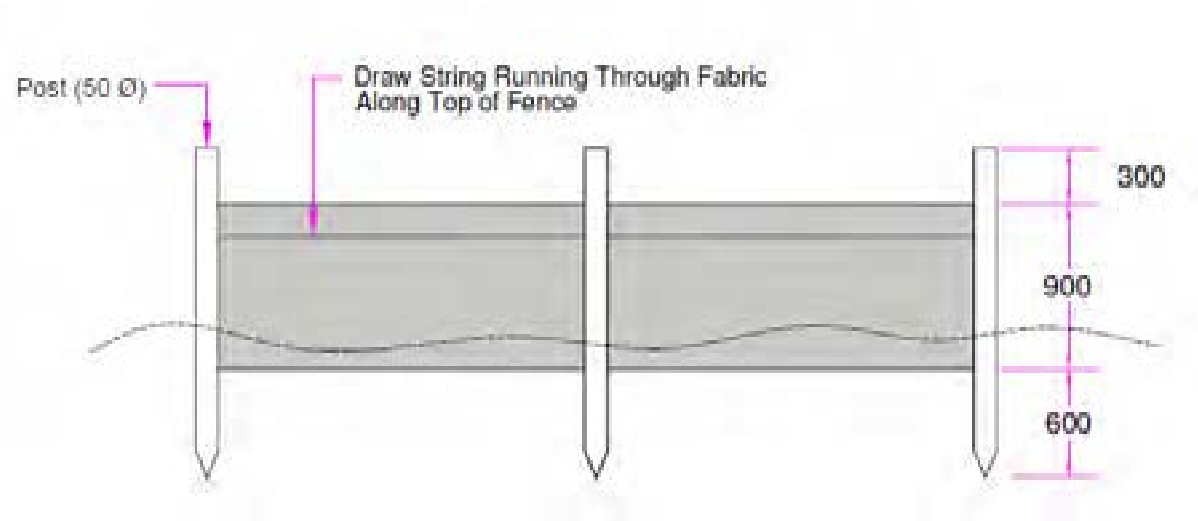
APPENDIX 51A: PROVISION OF SILT FENCING IN MUZAFFARNAGAR-BARAUT ROAD
Proposed Locations

Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	16.770	RHS	6

Source: PPTA Consultant



TCS for silt Fencing



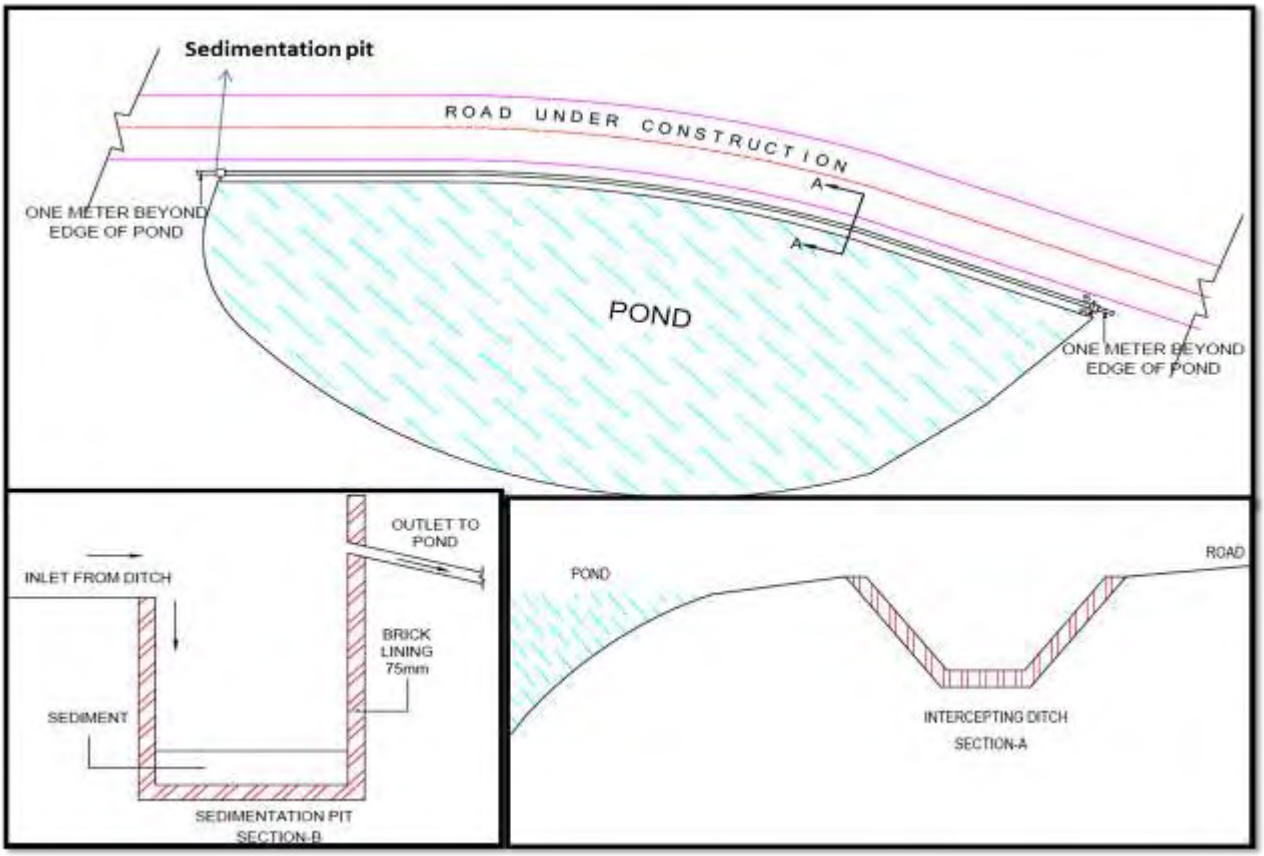
Front View of silt Fencing

APPENDIX 51A: PROVISION OF INTERCEPTING DITCH WITH SEDIMENTATION PIT IN MUZAFFARNAGAR-BARAUT ROAD

Proposed Locations

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	10.230	RHS	12

Source: PPTA Consultant



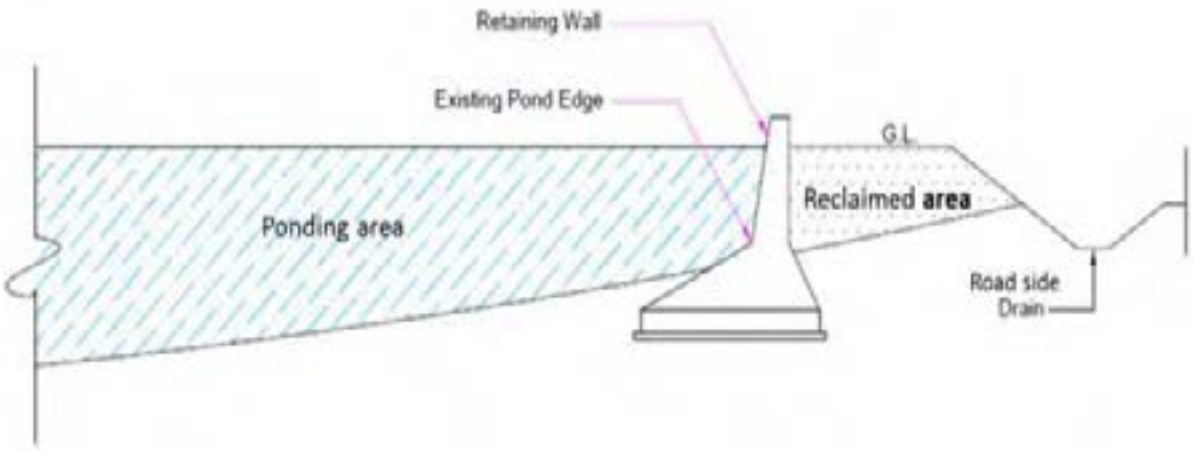
Schematic diagram of intercepting ditch and sedimentation pit

APPENDIX 51A: PROVISION OF RETAINING WALL IN MUZAFFARNAGAR-BARAUT ROAD

Proposed Locations of Ponds

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	25.490	RHS	7
2	45.400	RHS	8
3	61.550	LHS	7

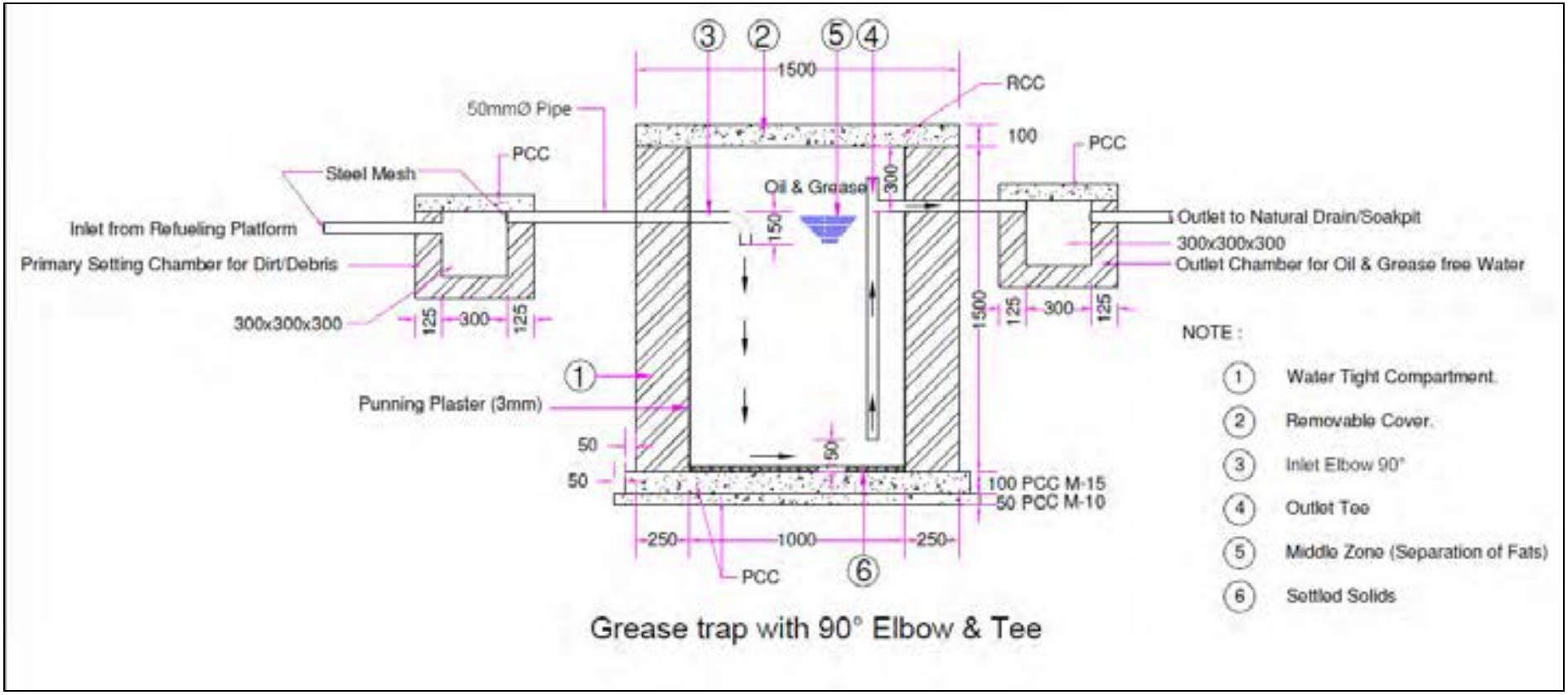
Source: PPTA Consultant



Schematic Diagram for retaining wall

APPENDIX 51A: PROVISION OF OIL INTERCEPTORS IN MUZAFFARNAGAR-BARAUT ROAD

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 52A: ENVIRONMENTAL MANAGEMENT PLAN OF HUSSAINGANJ TO ALIPUR ROAD (MDR 81C)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
J. Design and Pre-construction Stage								
19. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 9 locations for a length of 6.650 km Roadside drains (both sides together) Lined=13.300 km Unlined= 58.05 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Provision of crash barriers at accident prone areas and high embankments. ▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 ". IRC: SP: 67-2012	Throughout the Stretch Footpath cum drain for a length of 6.650 km Crash barriers for a length of 871.694 m	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridges ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
20. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 9 locations for a length of 6.650 km Roadside drains (both sides together) Lined=13.300 km Unlined= 58.05 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	carried out to increase their carrying capacity.							
21. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS 2009. ▪ Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD
22. Diversion of Forest Land and Cutting of Trees								
4.1 Forest Diversion	▪ RoW from Bahera Chowk at km 33.375 to Alipur Jita at km 48.675 is notified as protected forest vide Notification No. 3278/14-2-43/86 dated 7th August, 1986 ▪ Obtain forest Clearance from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation, Net Present Value etc. ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=1719 Additional Plantation of 3438 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD, Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD, Forest department/ Ministry of Environment and Forest and Climate Change
23. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
24. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC /UPPWD
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best	Project Corridor and other allied areas	MI: Compliance of Provision of EHS	Third Party EHS Audit	Environment Cost	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
		National I.nternational Practices, World Bank EHS Guidelines		On site and OFF Site Accidents PT: 100 % compliance of EHS Policy. Zero Accidents	Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People			
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				
6.6 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.			has taken place				
6.7 Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
K. Construction Stage								
26. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/ UP PWD
1.2 Emission of air pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981(Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
27. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment to be timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during day time and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.							
28. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing ▪ frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Included in civil works cost	Contractor	UPPWD/CSC
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
29. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.	As Directed by Engineer	Throughout the Project Corridor Enhancement of water bodies/resources proposed, details as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of site specific Silt fencing and Intercepting ditch with sedimentation pit shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 4 locations and length = 74 m **(as Enclosed)** Retaining wall	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC
4.5Deterioration in Surface / Ground water quality due to leakage from vehicles and equipments and waste from construction camps etc.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies**,** refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	disposal site only. ▪ Water quality shall be monitored as per EMoP ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection							
30. Flora and Fauna								
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Total number of affected trees=1719 Additional Plantation of 3438 trees near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
▪ Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2Worker'sHealth in construction camp	▪ The contractor shall prepare its Health, Safety and Environment (SHE) Policy and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
31. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MORTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
32. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with	Design requirement and IRC: SP: 27 - 1984,Report Containing Recommendation of IRC Regional	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic	Review traffic management plan Field observation of traffic management and safety system Interaction with people	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 -2001Guidelines for Safety The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948		accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	in vehicles using the road			
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Banks EHS Guidelines. ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Laws / Policies, World Bank EHS Guidelines/ Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.			PT: Zero incident of accidents. Zero complaints.				
33. Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
L. Operation and Maintenance stage								
19. **1. Air Quality**								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People.	Included in Environment Monitoring Cost	UPPWD	
20. 2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof	Sensitive receptors as identified in IEE locations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
21. Land and Soil								
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
22. Water resources/Flooding and Inundation								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
▪ Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
23. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) rules, 1989	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 52B: ENVIRONMENT MONITORING PROGRAMME (HUSSAINGANJ- ALIPUR)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors. (3 Mixed Land Use Major Location , 10 sensitive receptors)	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x 3000 = INR 117,000.00	Contractor through approved monitoring agency	CSC
	Operation stage	$PM_{10}PM_{2.5}$		Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 8 Severely affected Ponds 2 ponds within 15 m of CL	Groundwater: Quarterly excluding monsoon Monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years	Specified in Drinking Water Standards : 2012 for Ground water: and Water Quality Criteria for Surface Water of CPCB The most beneficial use as documented in the environmental baseline of the pond should not be affected.	1x 5000x 3 x 2 =INR 30,000.00 8x5000 x 6= INR 240,000.00 2x5000 x 2x2= INR 40,000.00	Contractor through approved monitoring agency	UPPWD /CSC
	Operation stage			9 location along the road including Surface water Pond where monitoring was carried out during construction phase (9 Locations)	Grab Sample	In operation period Once in the last of first Operation Year	9X5000 x1 =INR 45,000	UPPWD, Division through approved monitoring agency	UPPWD HQ

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000x =INR.30,000.00 13x 2 x12 x 1000= INR 312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000xx1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High Embankments and Earthen spaces in ROW	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage			Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 0.978 Million (total), 0.869 Million (Construction Phase), 0.109 Million (Operation Phase)									

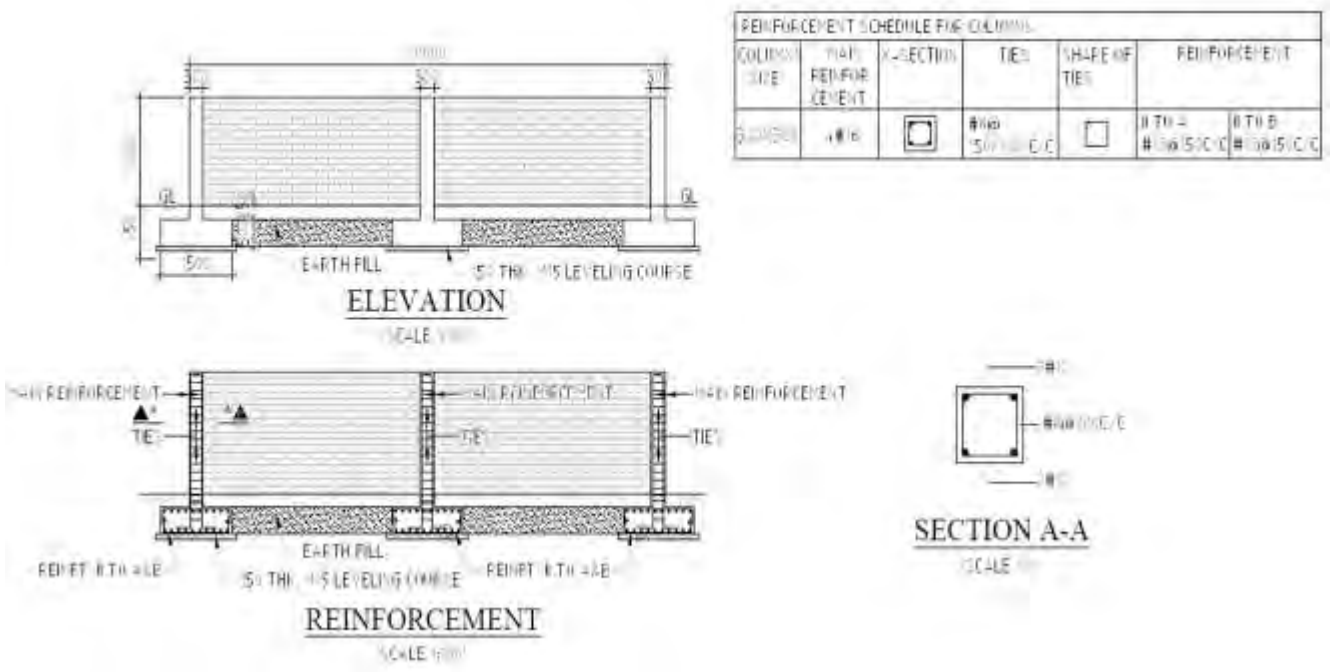
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indin Standard, EMP: Environment Management Plan*

APPENDIX 52A: PROVISION OF NOISE BARRIER IN HUSSAINGANJ-ALIPUR ROAD

Proposed Locations

Sl. No.	ExistingChainage (Km)	Features	Side	Village
1	16.50	School	LHS	Chhiblaha
2	17.10	College	RHS	Chhiblaha
3	17.12	College	RHS	Chhiblaha
4	17.42	School	LHS	Chhiblaha
5	18.90	School	LHS	Paliya Bujurg
6	18.90	School	LHS	Paliya Bujurg
7	20.55	School	LHS	Manapur
8	20.60	College	RHS	Manapur
9	20.61	School	LHS	Manapur
10	22.15	School	RHS	Semra Manapur
11	22.15	College	RHS	Semra Manapur
12	27.40	Hospital	RHS	Hathgaon
13	28.07	College	LHS	Hathgaon
14	29.25	School	RHS	Adhari ka purwa
15	37.14	School	LHS	Sultanpur ghosh
16	37.18	School	RHS	Sultanpur ghosh
17	37.60	Hospital	LHS	Sultanpur ghosh
18	38.50	College	LHS	Sultanpur ghosh
19	41.80	School	RHS	Premnagar
20	41.92	School	RHS	Premnagar

Source: DPR Consultant



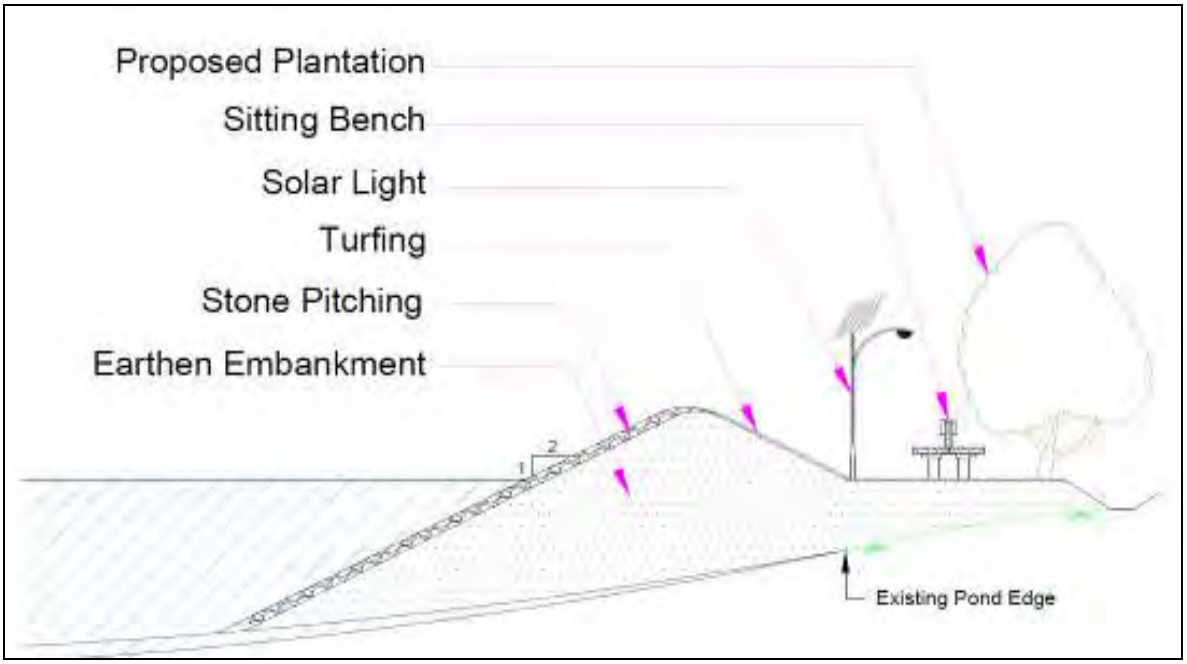
Typical Design for Noise barrier

APPENDIX 52A: PROVISION OF ENHANCEMENT MEASURES IN HUSSAINGANJ-ALIPUR ROAD

Proposed Locations of Ponds

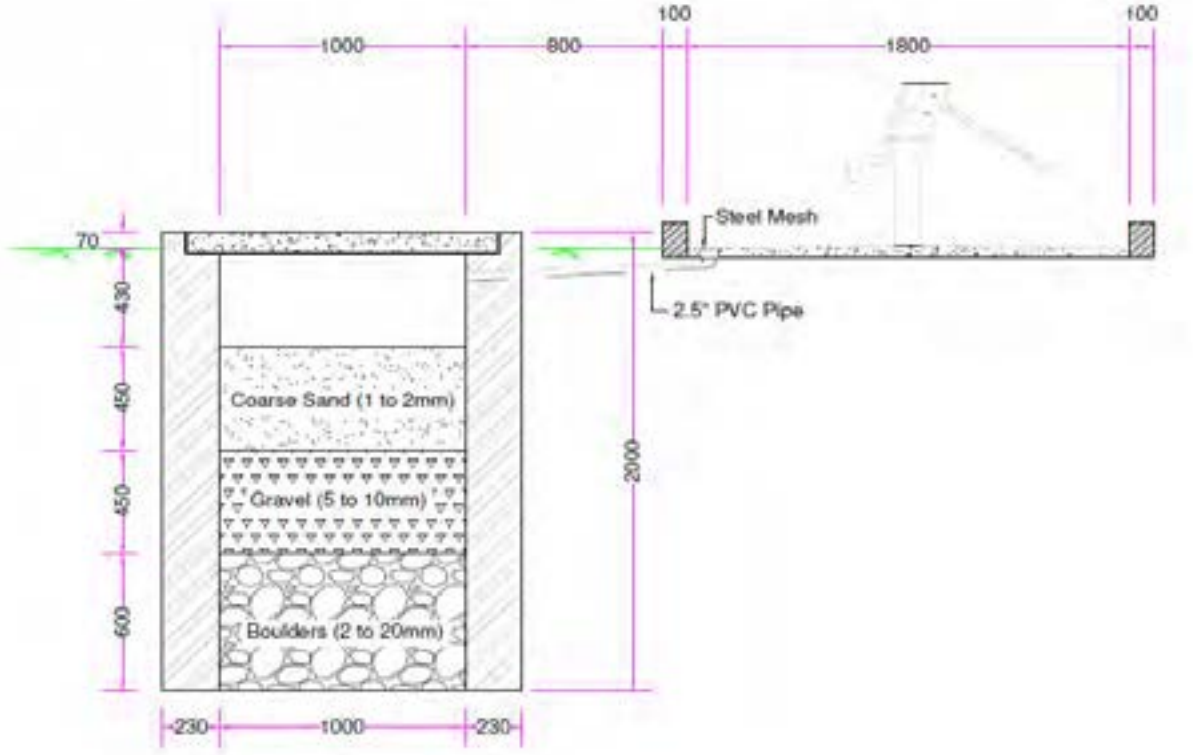
Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	24.100	RHS	15.0

Source: PPTA Consultant



Schematic layout of enhancement measures proposed for Pond

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



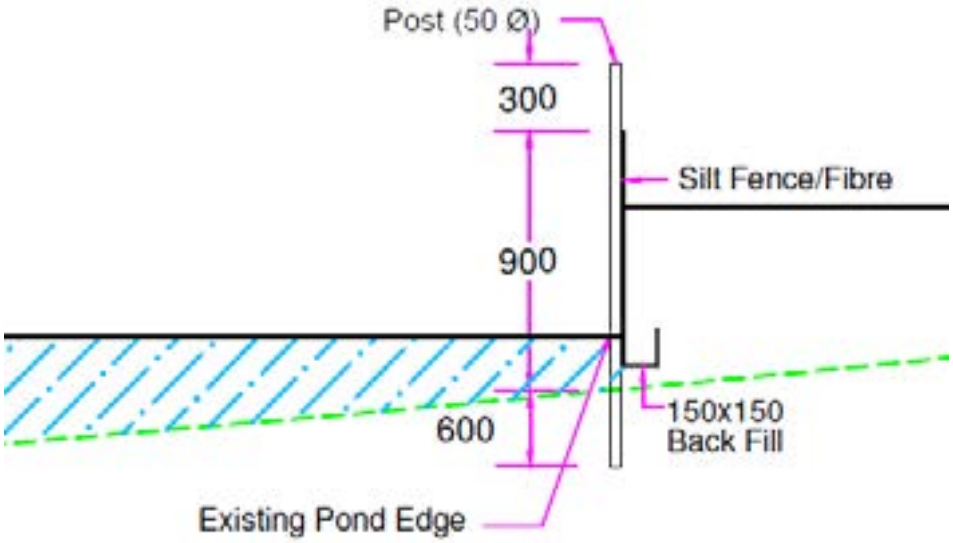
TCS of Soak pit for Hand pumps

APPENDIX 52A: PROVISION OF SILT FENCING IN HUSSAINGANJ-ALIPUR ROAD

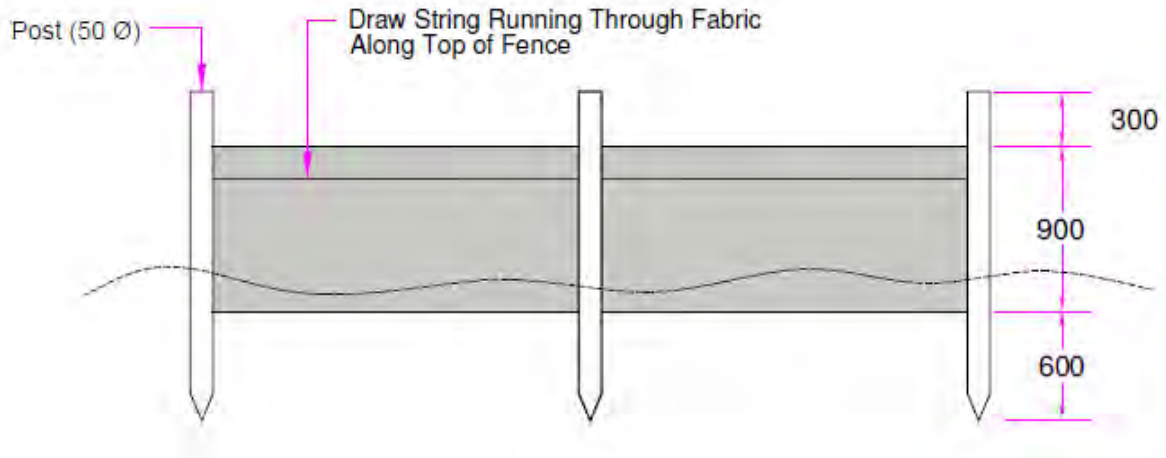
Proposed Locations

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	19.400	LHS	20.0
2	21.050	RHS	10.0
3	23.500	RHS	12.0
4	36.800	LHS	12.0
5	39.100	LHS	20.0
6	46.600	RHS	13.0
7	47.600	LHS	15.0

Source: PPTA Consultant



TCS for silt Fencing



Front View of silt Fencing

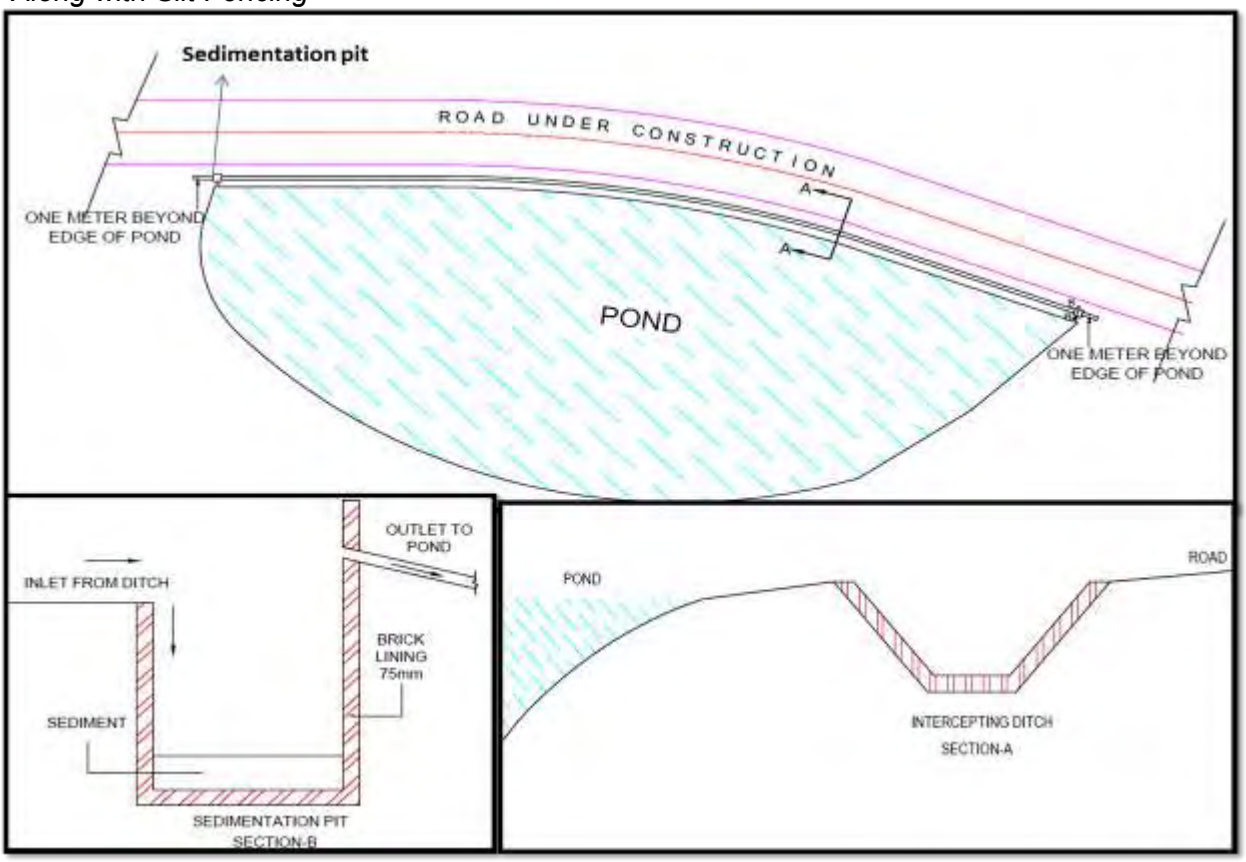
APPENDIX 52A: PROVISION OF INTERCEPTING DITCH AND SEDIMENTATION PIT IN HUSSAINGANJ-ALIPUR ROAD

Proposed Locations*

Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	36.800	LHS	12.0
2	46.600	RHS	13.0
3	47.600	LHS	15.0

Source: PPTA Consultant

**Along with Silt Fencing*



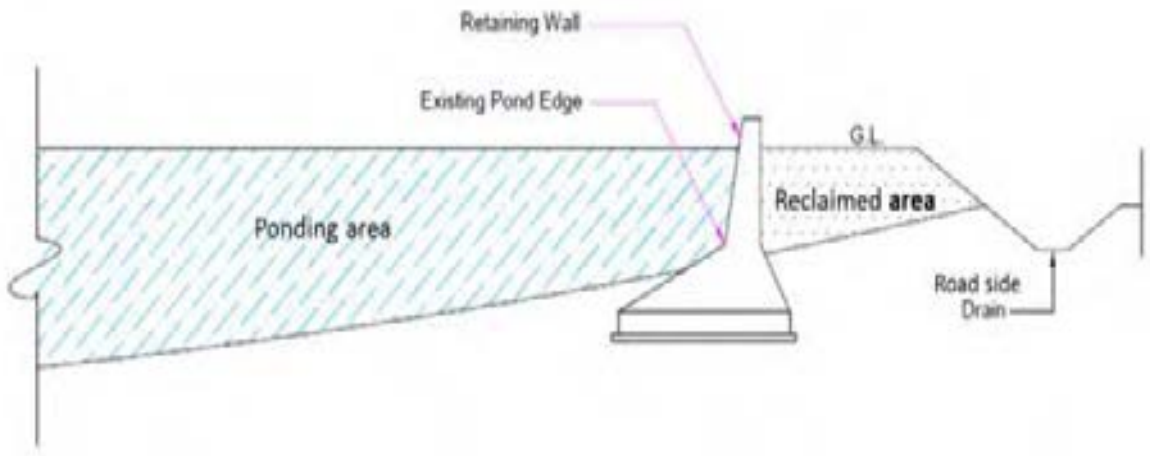
Schematic diagram of intercepting ditch and sedimentation pit

APPENDIX 52A: PROVISION OF RETAINING WALL IN HUSSAINGANJ-ALIPUR ROAD

Proposed Locations of Ponds

Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	13.500	RHS	6.5
2	13.600	LHS	5.0
3	14.900	LHS	3.5
4	16.350	LHS	4.5
5	18.600	LHS	4.0
6	19.000	LHS	6.0
7	23.500	RHS	9.0
8	28.500	RHS	4.5
9	35.800	LHS	8.0

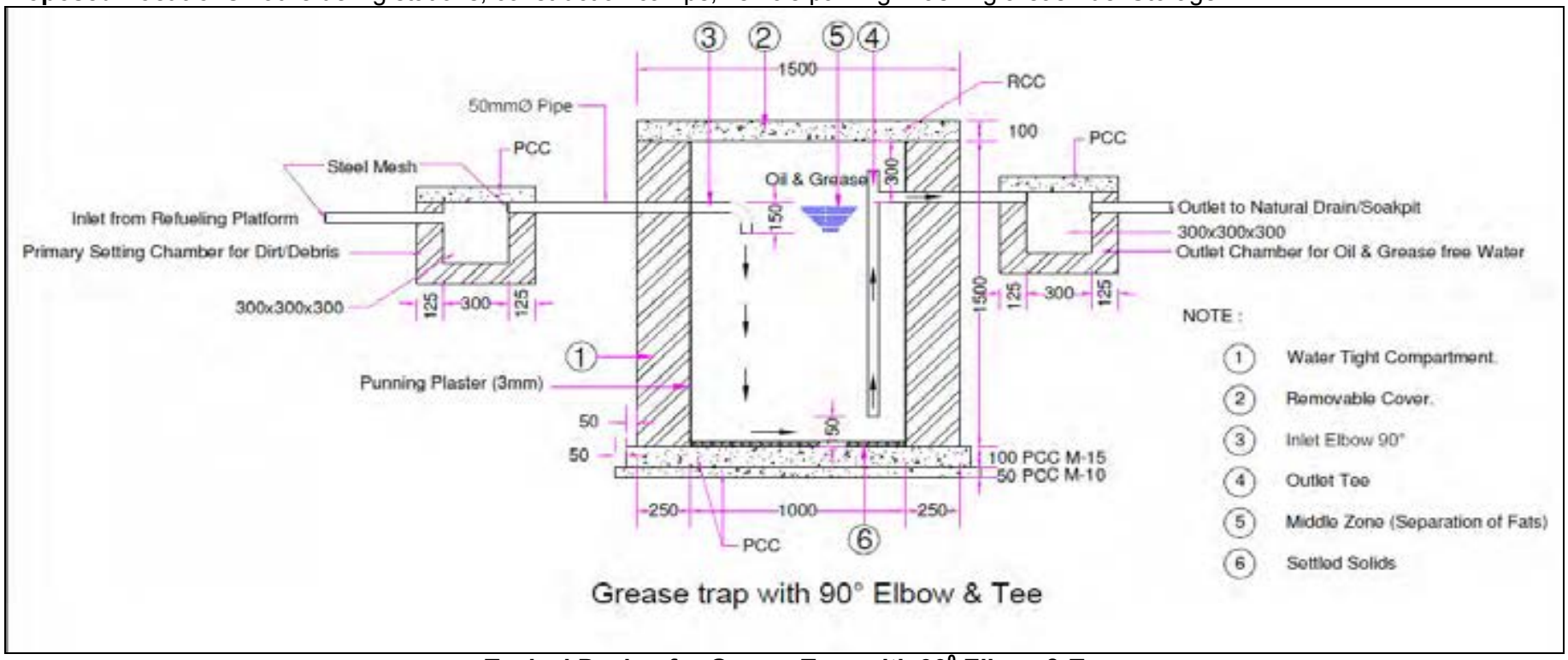
Source: PPTA Consultant



Schematic Diagram for retaining wall

APPENDIX 52A: PROVISION OF OIL INTERCEPTORS IN HUSSAINGANJ-ALIPUR ROAD

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 53A: ENVIRONMENTAL MANAGEMENT PLAN OF HALIYAPUR-KUDEBHAR-BILWAI ROAD (MDR 66E)-KM 0.00 TO KM 49.00 (PACKAGE I)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
M. Design and Pre-construction Stage								
25. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 10 locations for a length of 14.200 km Roadside drains (both sides together) Lined=28.4 km Unlined= 70.144 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Provision of crash barriers at accident prone areas and high embankments. ▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Footpath cum drain for a length of 14.200 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridges ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
26. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 10 locations for a length of 14.200 km Roadside drains (both sides together) Lined=28.4 km Unlined= 70.144 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
27. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB SPS 2009. ▪ Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD
28. Cutting of Trees								
4.1 Tree Cutting	▪ Obtain Tree cutting permission from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation etc. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=3262 Additional Plantation of 6524 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change
29. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
30. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	6.1 The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100___% compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				
6.4 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.5Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
N. Construction Stage								
34. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1.2 Emission of air pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
35. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment to be timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during day time and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD
36. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing ▪ frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
37. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.	As Directed by Engineer	Throughout the Project Corridor Enhancement measures proposed at locations as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standard	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridge	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing and intercepting ditch along with sedimentation pit depending on site-specific conditions shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 6 locations of maximum length = 45 m **(as Enclosed)** Retaining wall at 1 location of length 28 m **(as enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.5Deterioration in Surface/ Ground water quality due to leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Water quality shall be monitored as per EMoP ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Included in civil works cost	Contractor	UPPWD/CSC
38. Flora and Fauna								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=3262 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
39. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2Worker'sHealth in construction camp	▪ The contractor shall have its Health, Safety and Environment (SHE) Policy and guidelines and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
40. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
41. Traffic Management and Safety								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 -1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 -2001Guidelines for Safety in Construction Zones The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Bank EHS Guidelines. ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Laws and Policies, World Bank EHS Guidelines, Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC
42. Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
O. Operation and Maintenance stage								
24. **1. Air Quality**								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People.	Included in Environment Monitoring Cost	UPPWD	
25. 2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptors as identified in IEE locations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
26. Land and Soil								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
27. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
28. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness ▪	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
29. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) Rules, 1989	Hazardous Waste (Management & handling) Rules, 1989	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 53B: ENVIRONMENT MONITORING PROGRAMME (HALIYAPUR – KUREBHAR 01)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent $PM_{10}PM_{2.5}$	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of l renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors. (3 Mixed Land Use Major Location , 10 sensitive receptors)	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x 3000 = INR 117,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 1 Severely affected Pond 2 ponds within 15 m of CL 100m U/s and D/s from 6 bridge widening sites over canal	Groundwater: Quarterly excluding monsoon Monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly for period of one year of construction	Specified in Drinking Water Standards : 2012 for Ground water and Water Quality Criteria for Surface Water of CPCB The most beneficial use as documented in the environmental baseline of the pond should not be affected	1x 5000x 3 x 2 =INR 30,000.00 1x5000 x 6= INR 30,000.00 2x5000 x 2x2= INR 40,000.00 12x 12 x 5000= INR 720000.00	Contractor through approved monitoring agency	UPPWD /CSC
	Operation stage			2 location along the road including Surface water Pond where monitoring was carried out during construction phase (2Locations)	Grab Sample	In operation period Once in the last of first Operation Year	2X5000 x1 =10,000	UPPWD, Division through approved monitoring agency	UPPWD HQ
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000 = INR 30,000.00 13x 2 x12 x 1000=312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000xx1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High Embankments and Earthen spaces in ROW	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage				Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 1.453 Million (total), 1.379 Million (Construction Phase), 0.074 Million (Operation Phase)									

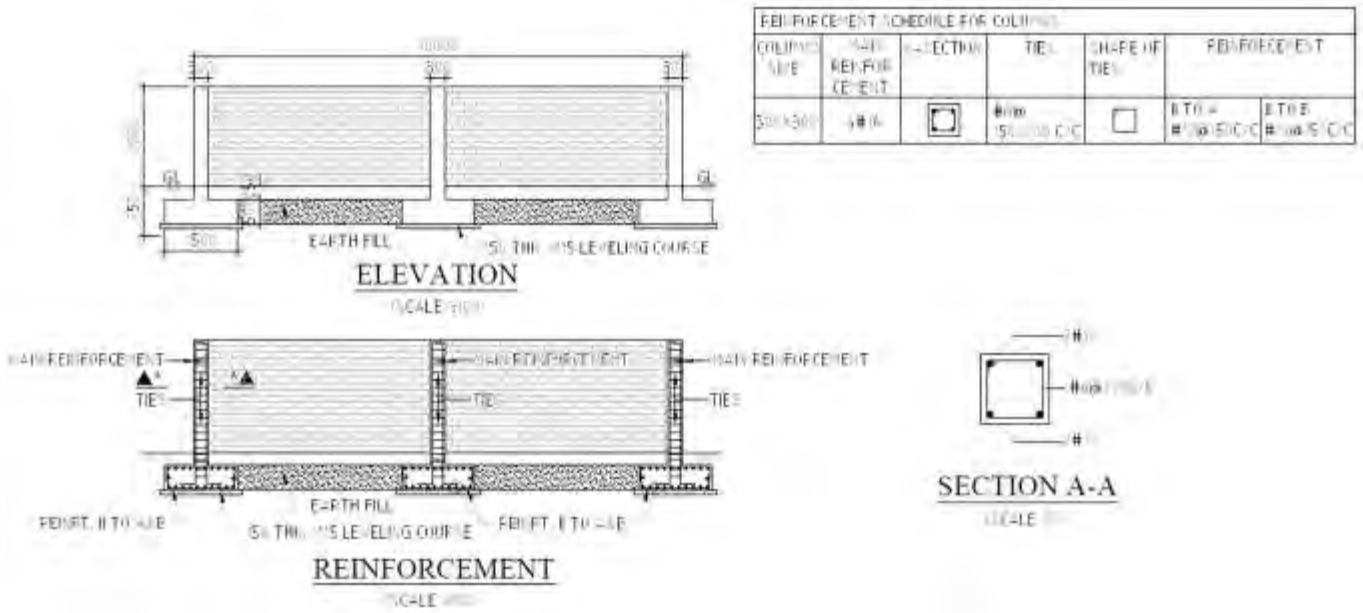
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

APPENDIX 53A: PROVISION OF NOISE BARRIER IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE I)

Proposed Locations

Sl. No.	Existing Chainage (Km)	Features	Village	Side
1	2.050	School	Dobhihara	RHS
2	3.000	School	Bandin House Mukandpur	RHS
3	4.990	School	Bhawani Garh	RHS
4	5.600	School	Rencha	LHS
5	16.050	School	Delhi Bazar	LHS
6	16.150	School	Delhi Bazar	RHS
7	16.150	School	Delhi Bazar	LHS
8	16.400	School	Delhi Bazar	RHS
9	19.300	School	Peero Sariya	LHS
10	22.200	School	Harora Bazra	LHS
11	24.300	School	Shanti Nagar	RHS
12	25.400	School	Dhanpta Ganj	LHS
13	25.650	School	Dhanpta Ganj	LHS
14	26.700	School	Dhanpta Ganj	RHS
15	32.100	School	Tiwaripur	LHS
16	34.300	Inter College	Laxmi Market	LHS
17	36.250	School	Kurdan Gali Bah	LHS
18	37.550	School	Erur	RHS
19	38.800	School	Salim Pur	LHS
20	47.150	School	Bajna	RHS

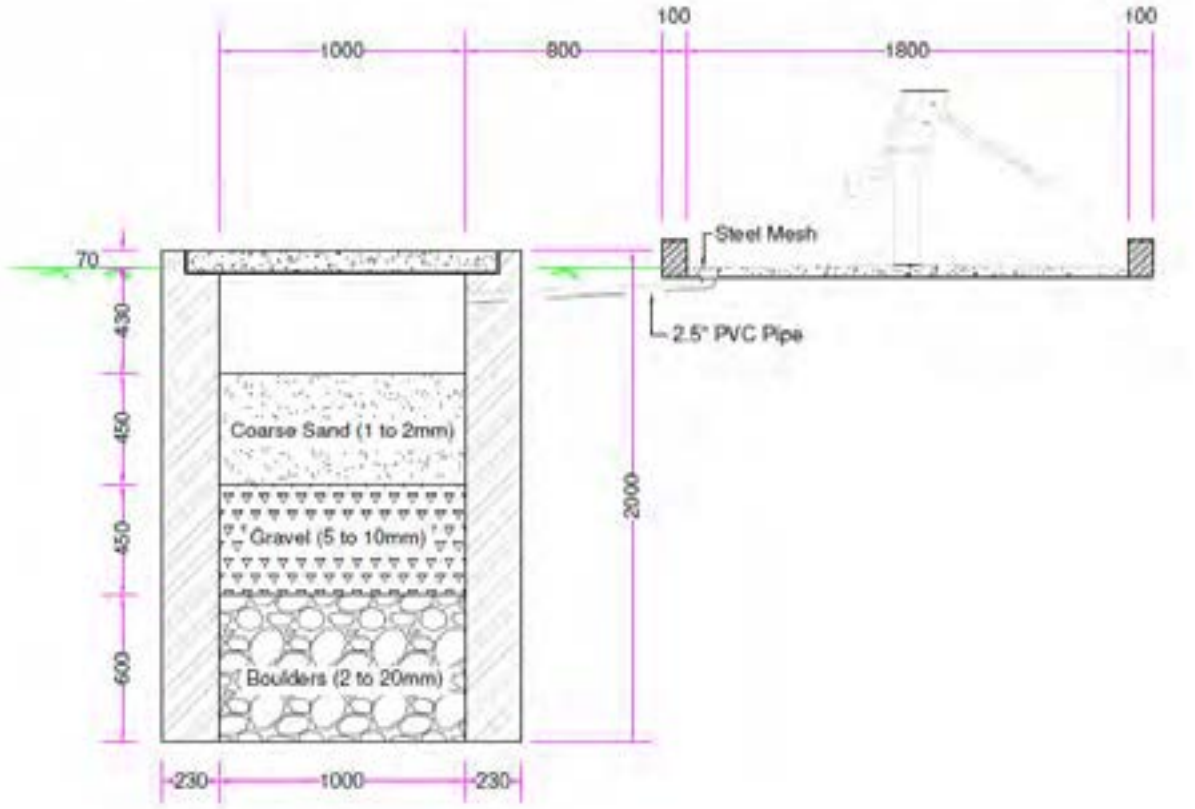
Source: DPR Consultant



Typical Design for Noise barrier

APPENDIX 53A: PROVISION OF ENHANCEMENT MEASURES IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE I)

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



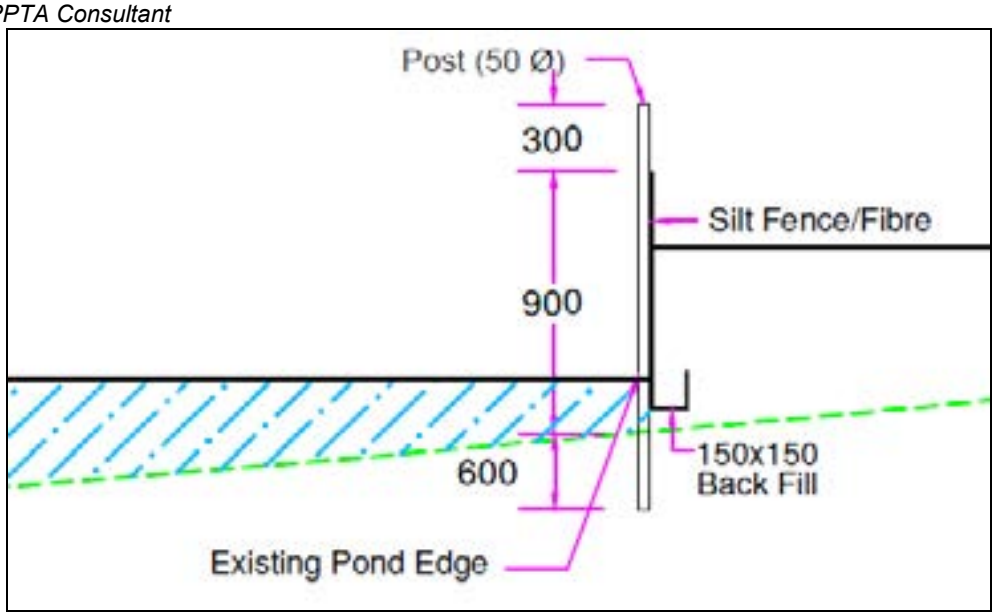
TCS of Soak pit for Hand pumps

APPENDIX 53A: PROVISION OF SILT FENCING IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE I)

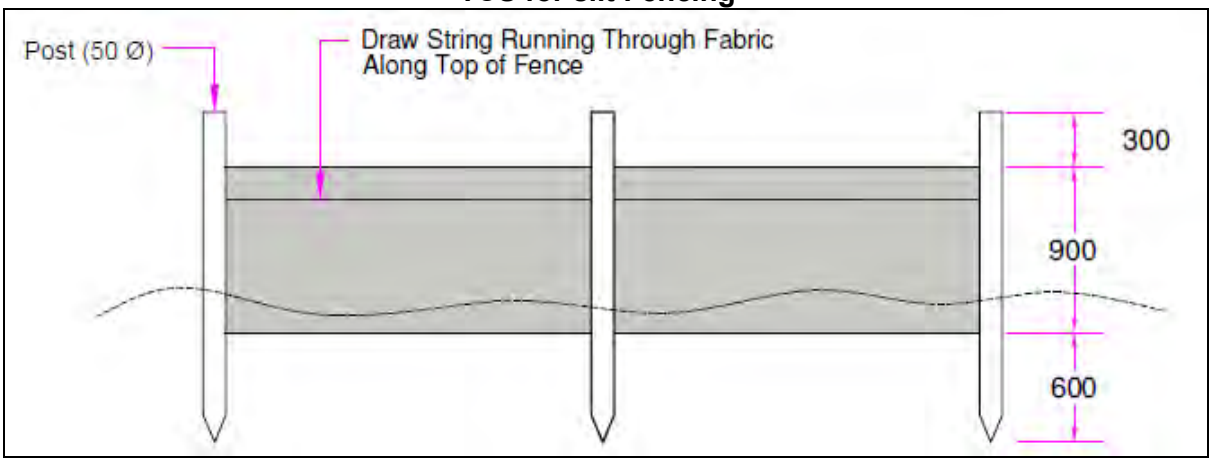
Proposed Locations

Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	1.600	LHS	7
2	19.025	LHS	6.5
3	20.410	RHS	15
4	37.260	LHS	7
5	47.090	LHS	6
6	48.240	RHS	6

Source: PPTA Consultant



TCS for silt Fencing



Front View of silt Fencing

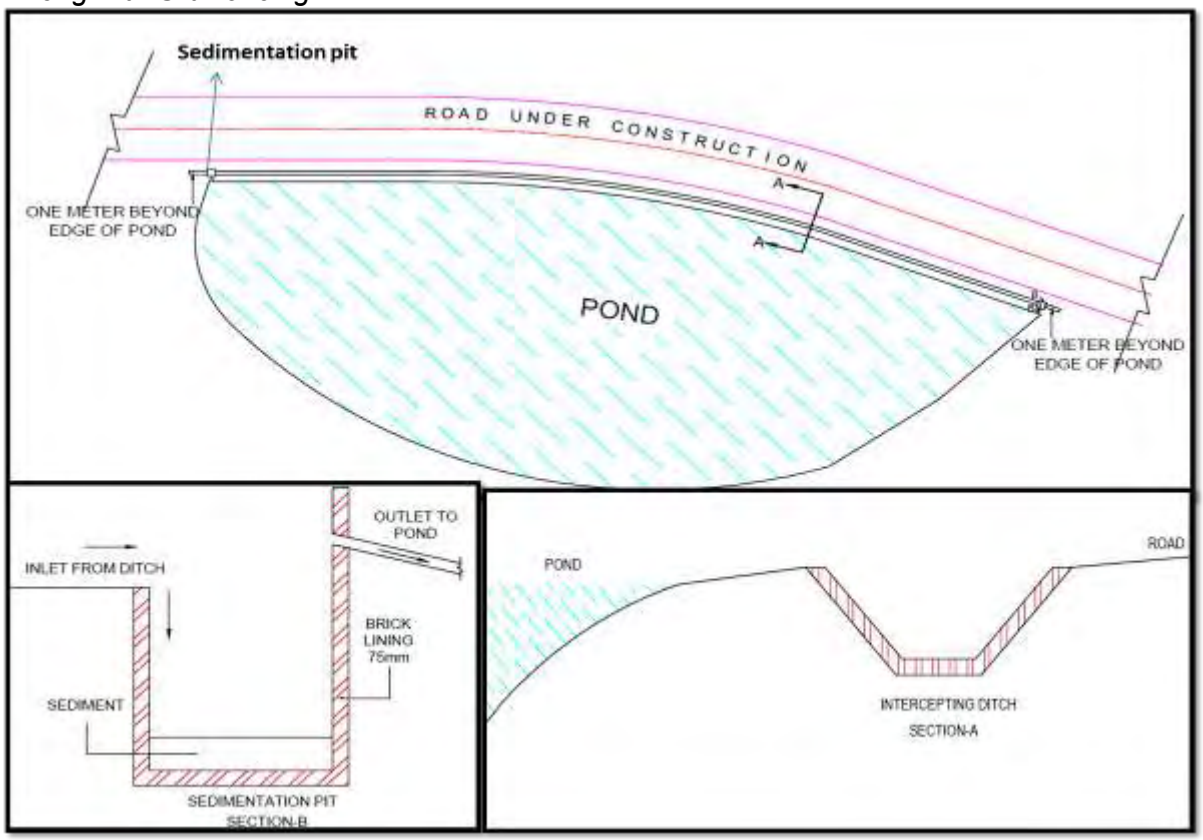
APPENDIX 53A: PROVISION OF INTERCEPTING DITCH AND SEDIMENTATION PIT IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE I)

Proposed Locations

S. No.	Chainage (km)	Side	Distance from Center line (m)
1	14.450	LHS	15
2*	20.410	RHS	15

Source: PPTA Consultant

**Along with Silt Fencing*



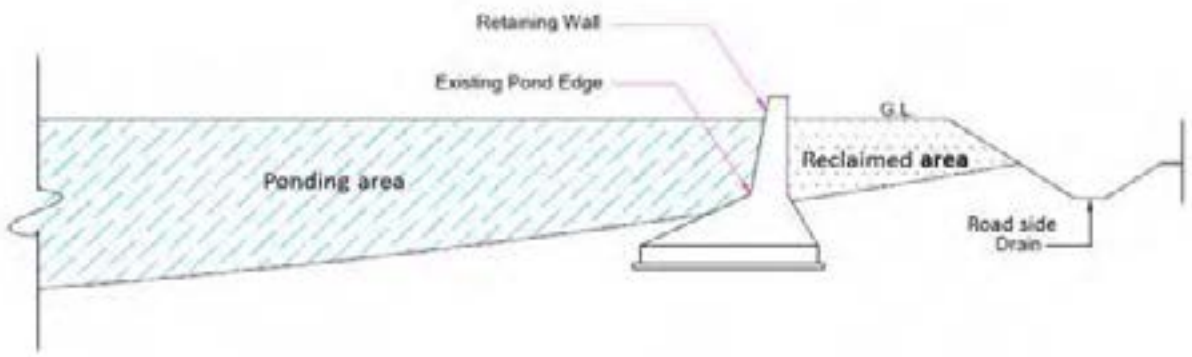
Schematic diagram of intercepting ditch and sedimentation pit

APPENDIX 53A: PROVISION OF RETAINING WALL IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE I)

Proposed Locations of Ponds

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	3.670	RHS	8

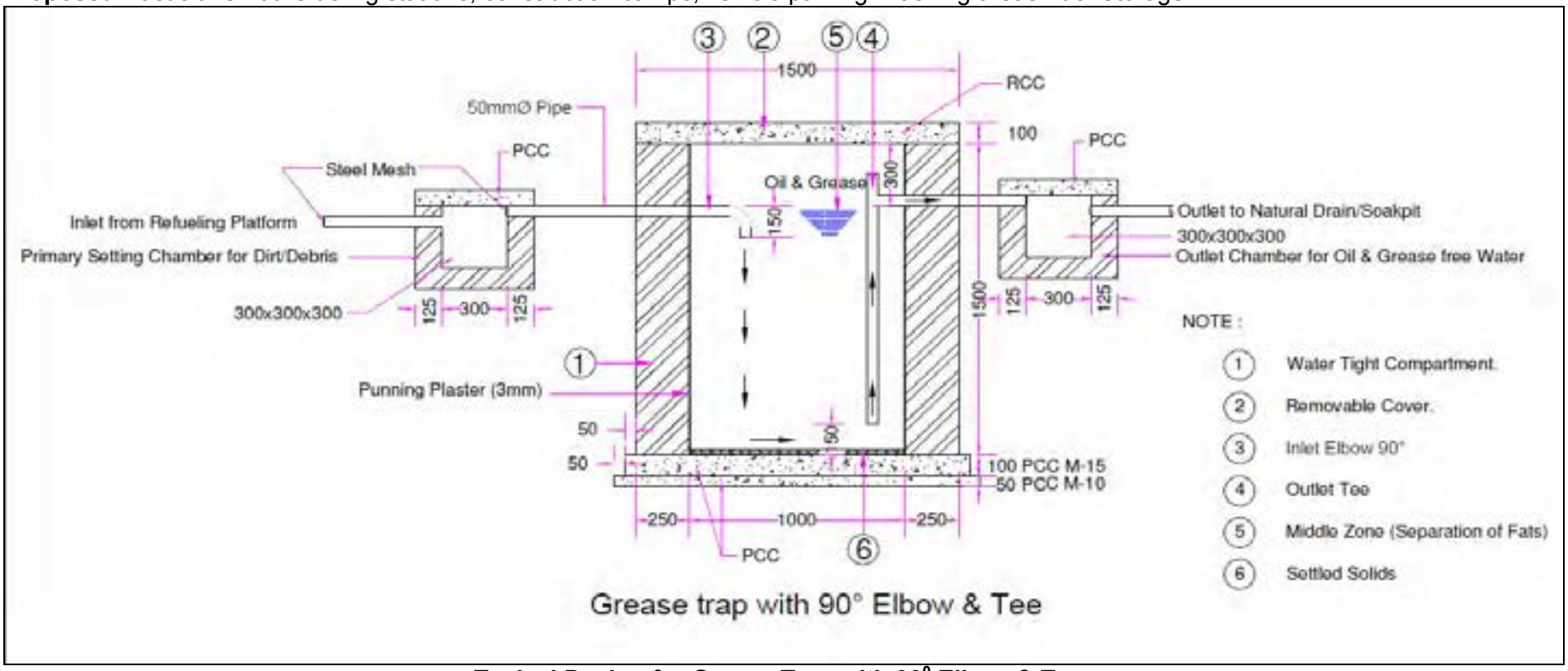
Source: PPTA Consultant



Schematic Diagram for retaining wall

APPENDIX 53A: PROVISION OF OIL INTERCEPTORS IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE I)

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 54A: ENVIRONMENTAL MANAGEMENT PLAN OF HALIYAPUR-KUDEBHAR-BILWAI ROAD (MDR 66E)-KM 49.00 TO KM 102.350 (PACKAGE II)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
P. Design and Pre-construction Stage								
31. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 17 locations for a length of 15.67 km Roadside drains (both sides together) Lined=31.340 km Unlined= 61.372 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Provision of crash barriers at accident prone areas and high embankments. ▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Crash barrier length=1282.633 m Footpath cum drain for a length of 15.670 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridges ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
32. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 17 locations for a length of 15.67 km Roadside drains (both sides together) Lined=31.340 km Unlined= 61.372 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD
33. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS. ▪ Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD
34. Cutting of Trees								
4.1 Tree Cutting	▪ Obtain Tree cutting permission from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation etc. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=3865 Additional Plantation of 7730 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
35. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
36. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	6.1 The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC /UPPWD
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100_%_compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.6 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.7 Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
Q. Construction Stage								
43. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1.2 Emission of air pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO_2, NO_2, and CO. Status of PUC certificates PT: SO_2 and NO_2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
44. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment to be timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during day time and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD
▪ Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
45. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.	As Directed by Engineer	Throughout the Project Corridor Enhancement measures proposed at locations as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridge	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing and intercepting ditch along with sedimentation pit depending on site-specific conditions shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 4 locations of maximum length = 79 m **(as Enclosed)** Retaining wall at 2 locations of length 84 m **(as enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.5Deterioration in Surface/ Ground water quality due to leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Water quality shall be monitored as per EMoP ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
46. Flora and Fauna								
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=3865 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
47. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2Worker'sHealth in construction camp	▪ The contractor shall have its Health, Safety and Environment (SHE) Policy and guidelines and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
48. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
▪ Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 -1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 -2001Guidelines for Safety in Construction Zones The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Banks EHS Guidelines ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Policies / laws, World Bank EHS Guidelines, Best National and International Policy.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
49. Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
R. Operation and Maintenance stage								
30. **1. Air Quality**								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People.	Included in Environment Monitoring Cost	UPPWD	
31. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness ofthe multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptors as identified in IEE locations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
32. Land and Soil								
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
33. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
34. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
35. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) Rules, 1989	Hazardous Waste (Management & handling) Rules, 1989	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 54B: ENVIRONMENT MONITORING PROGRAMME (HALIYAPUR – KUREBHAR 02)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent $PM_{10}PM_{2.5}$	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors. (3 Mixed Land Use Major Location , 10 sensitive receptors	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x 3000 = INR 117,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 3 Severely affected Ponds 2 ponds within 15 m of CL 100m U/s and D/s from 3 bridge widening sites over canal	Groundwater: Quarterly excluding monsoon Monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly for period of one year of construction	Specified in Drinking Water Standards : 2012 for Ground water: and Water Quality Criteria for Surface Water of CPCB The most beneficial use as documented in the environmental baseline of the pond should not be affected.	1x 5000x 3 x 2 =INR 30,000.00 3 x 5000 x 6 = INR 90,000.00 2x5000 x 2x2= INR 40,000.00 6x 12 x 5000= INR 360000.00	Contractor through approved monitoring agency	UPPWD /CSC
	Operation stage			5 locations along the road including 3 Surface water Pond where monitoring was carried out during construction phase (5 Locations)	Grab Sample .	In operation period Once in the last of first Operation Year	5X5000 x1 = 25, 000	UPPWD, Division through approved monitoring agency	UPPWD HQ

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000x =INR.30,000.00 13x 2 x12 x 1000=312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000xx1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High Embankments and Earther spaces in ROW	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage				Once in a year before rainy season		Routine Maintenance	UPPWD	

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
				Built up areas					
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene, Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
		sites.							
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 1.168 Million (total), 1.079 Million (Construction Phase), 0.089 Million (Operation Phase)									

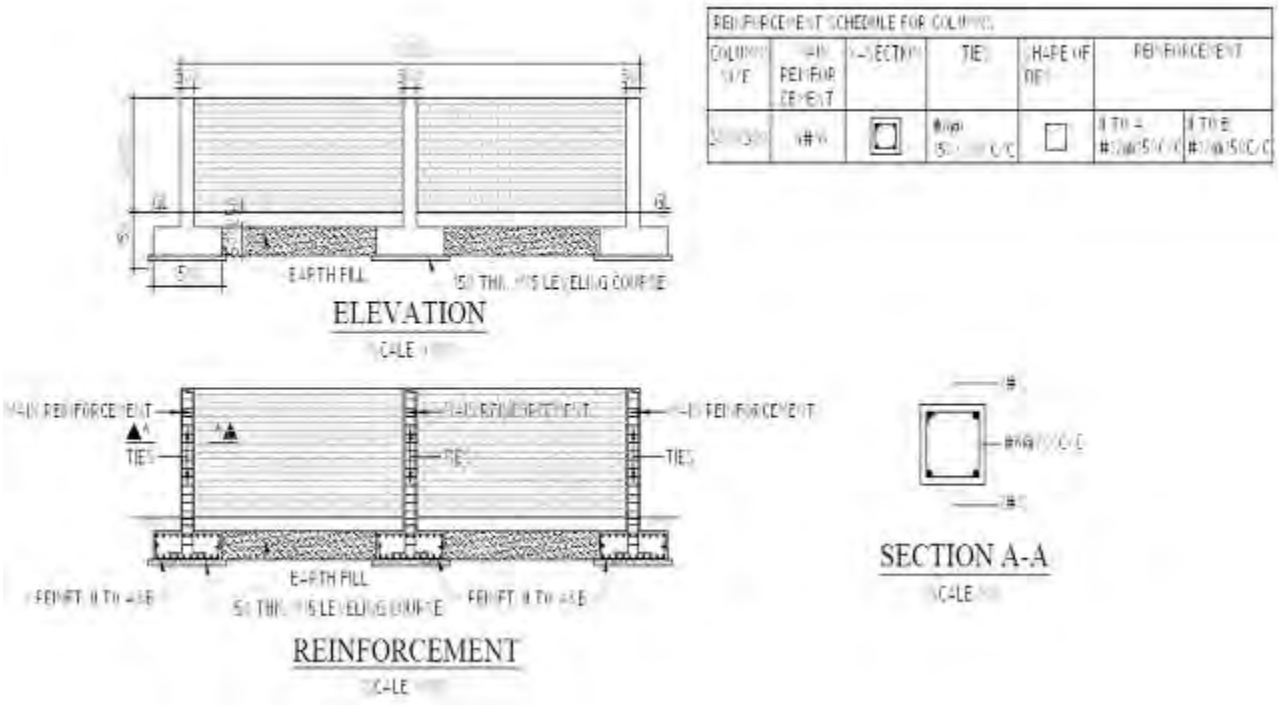
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

APPENDIX 54A: PROVISION OF NOISE BARRIER IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE II)

Proposed Locations

S. No.	Existing Chainage (Km)	Features	Village	Side
1	56.700	School	Semri Bazar	LHS
2	61.360	School	Jamalpur	LHS
3	63.360	School	Sri Ram Naga	RHS
4	65.000	School	Gosai Singhpur	RHS
5	65.200	School	Gosai Singhpur	RHS
6	67.450	School	Sikiya mor	LHS
7	68.800	School	Tajudinpur	LHS
8	70.650	Inter College	Cheete Patti	LHS
9	73.650	School	Bhwangaya	RHS
10	76.750	Community Health Centre	Dostpur	LHS
11	77.300	Hospital	Dostpur	RHS
12	77.400	Angan Wadi	Dostpur	RHS
13	77.600	School	Dostpur	LHS
14	77.800	Hospital	Dostpur	LHS
15	79.350	College	Badholi	RHS
16	79.400	Hospital	Badholi	LHS
17	81.600	School	Kaith Dalalpur	RHS
18	83.850	School	Gonhanapur	LHS
19	84.150	School	Akhand Nagar	RHS
20	88.000	School	Bari Sahijan	LHS
21	91.200	School	Jahirudin pur	LHS
22	92.300	Govt School	Akhand Nagar	LHS
23	96.300	School	Khusmandpur	RHS
24	97.800	College	Khanpur Pillai Dev Nagar	LHS
25	97.820	School	Khanpur Pillai Dev Nagar	LHS
26	99.200	School	Bibiganj	LHS
27	99.350	School	Bibiganj	LHS

Source: DPR Consultant



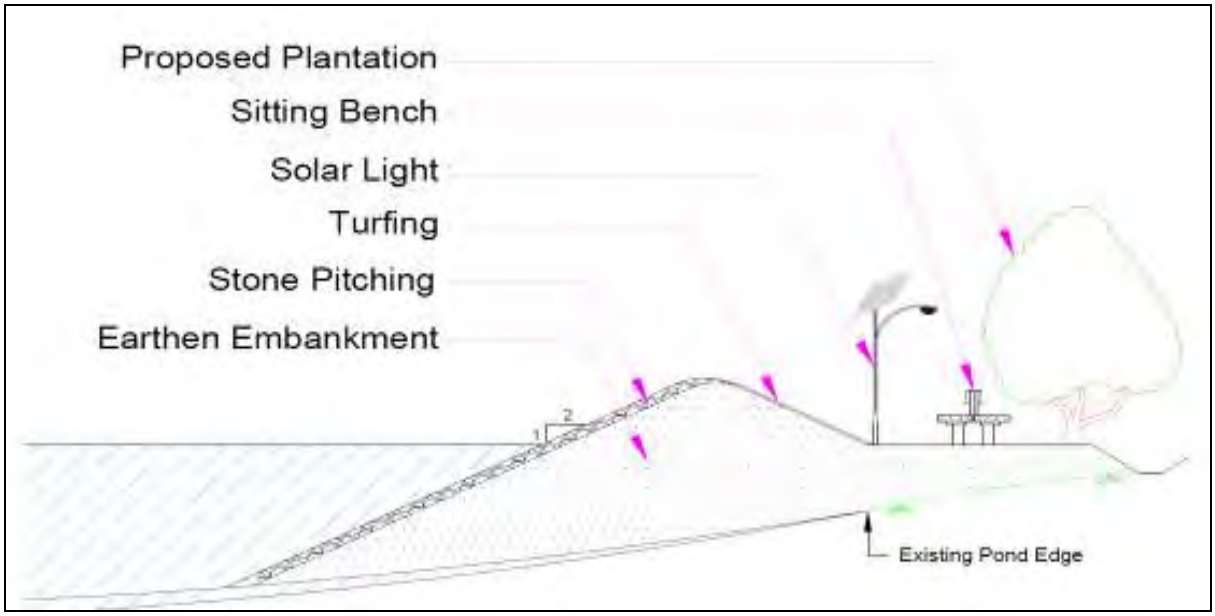
Typical Design for Noise barrier

APPENDIX 54A: PROVISION OF ENHANCEMENT MEASURES IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE II)

Proposed Locations of Ponds

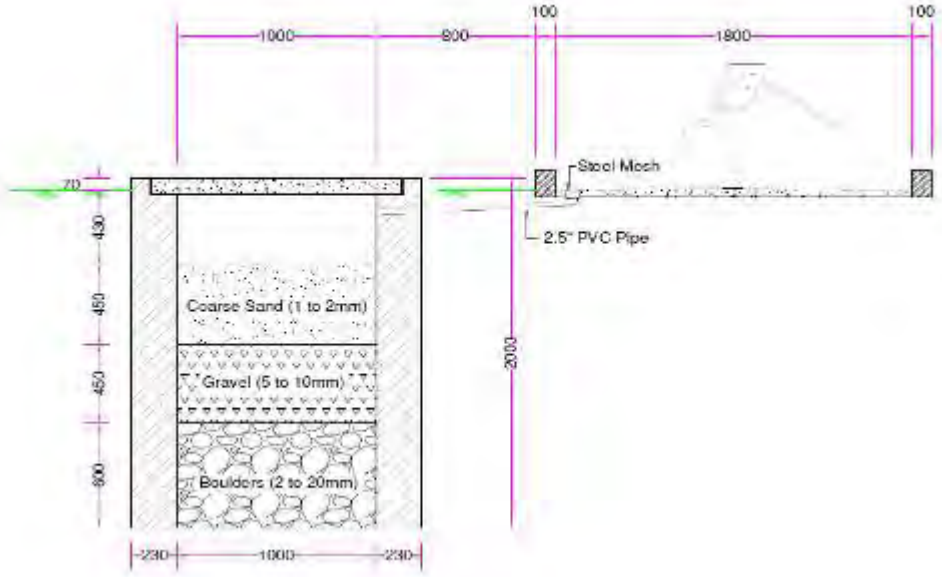
Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	76.500	RHS	15
2	91.400	Both Sides	8

Source: PPTA Consultant



Schematic layout of enhancement measures proposed for Pond

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



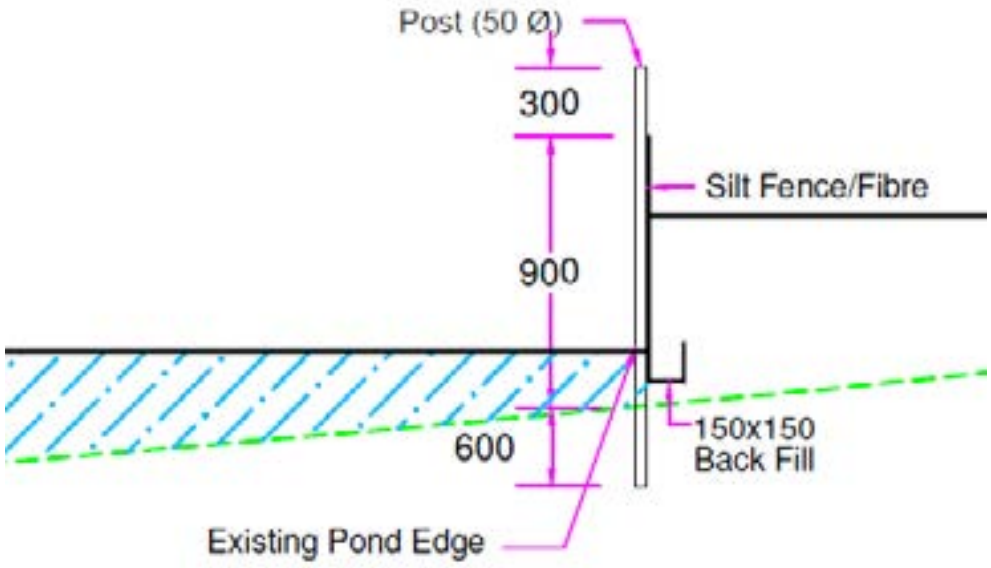
TCS of Soak pit for Hand pumps

APPENDIX 54A: PROVISION OF SILT FENCING IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE II)

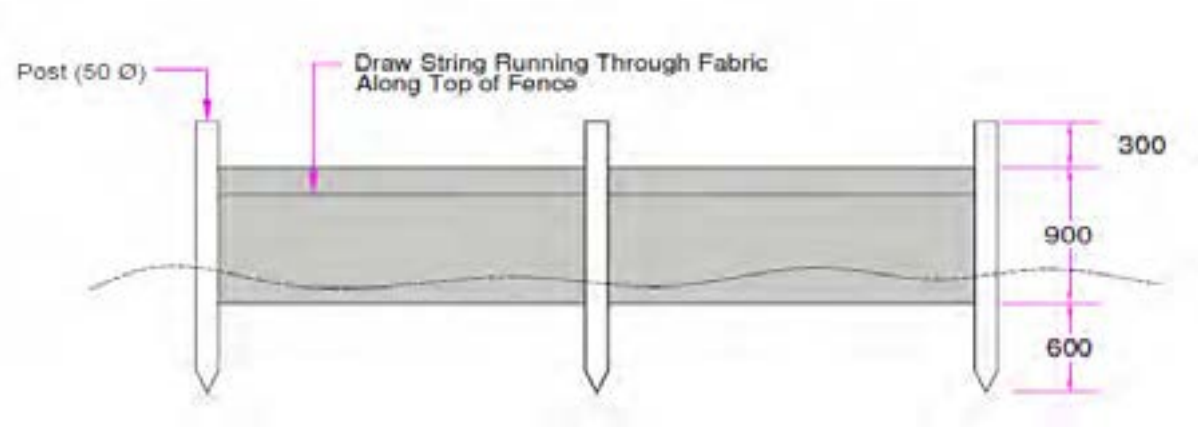
Proposed Locations

Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	58.280	On Both Sides of the Road	5
2	61.730	LHS	6.5
3	68.250	LHS	18
4	77.000	RHS	5

Source: PPTA Consultant



TCS for silt Fencing



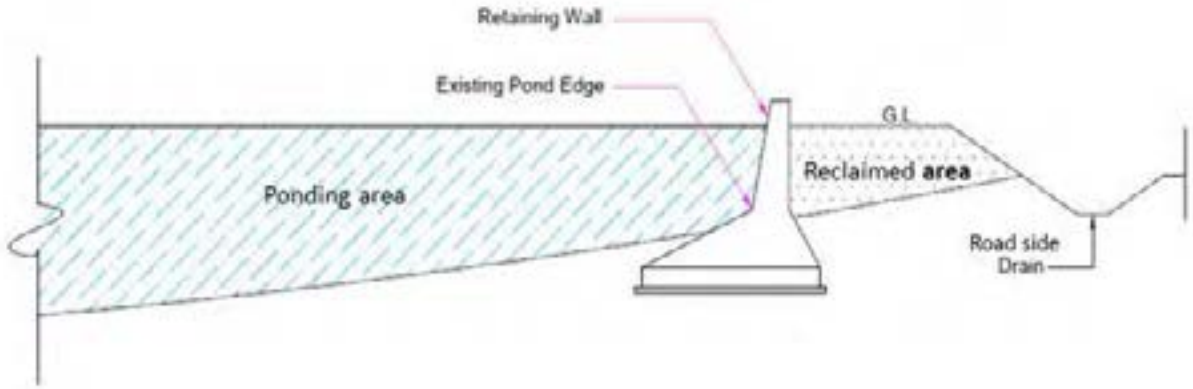
Front View of silt Fencing

APPENDIX 54A: PROVISION OF RETAINING WALL IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE II)

Proposed Locations of Ponds

Sl. No.	Chainage (km)	Side	Distance from Center line(m)
1	62.320	RHS	8
2	90.050	LHS	7

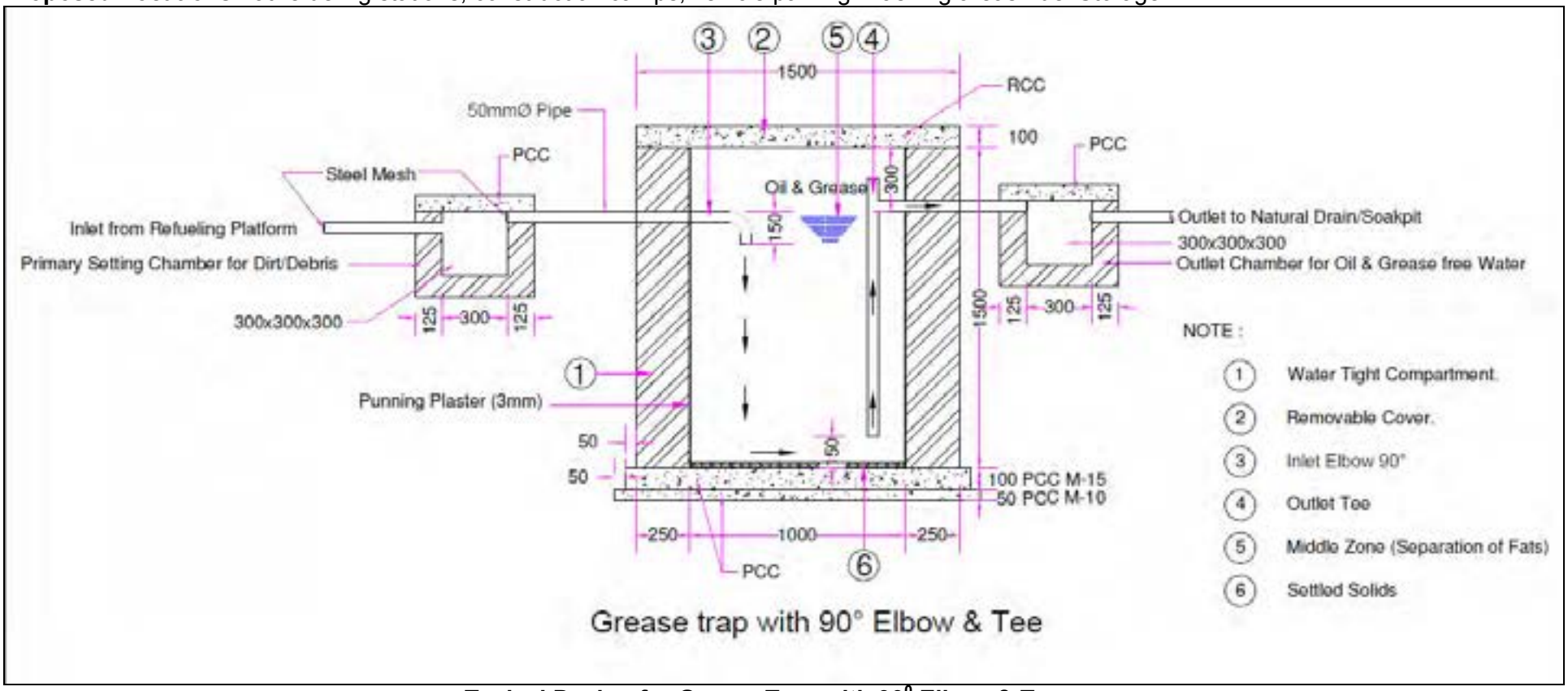
Source: PPTA Consultant



Schematic Diagram for retaining wall

APPENDIX 54A: PROVISION OF OIL INTERCEPTORS IN HALIYAPUR-KUDEBHAR-BILWAI ROAD (PACKAGE II)

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 55A: ENVIRONMENTAL MANAGEMENT PLAN OF KAPTANGANJ TO NAURANGIA TO HATA-PACKAGE I (ODR 24 & MDR 25E)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
S. Design and Pre-construction Stage								
37. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 29 locations for a length of 13.36 km Roadside drains (both sides together) Lined=26.720 km Unlined= 67.160 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Footpath cum drain for a length of 13.36 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridge s ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
38. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 29 locations for a length of 13.36 km Roadside drains (both sides together) Lined=26.720 km Unlined= 67.160 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD
39. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS 2009. • Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework.	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. And ADB's involuntary	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	resettlement policy. Contract Clause for preference to local people during employment.		and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court	people during construction			
40. Cutting of Trees								
4.1 Tree Cutting	▪ Obtain Tree cutting permission from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation etc. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=4846 Additional Plantation of 9692 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change
41. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
42. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC /UPPWD
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100 % compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation							
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				
6.6 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.7 Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
T. Construction Stage								
50. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^{3}Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD
1.2 Emission of air	▪ Regular maintenance of machinery and	The Air (Prevention and	Asphalt mixing plants,	MI: Levels of HC, SO2,	Standards CPCB	Included in civil	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	crushers, DG sets locations	NO_2, and CO. Status of PUC certificates PT: SO_2 and NO_2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	methods Review of monitoring data maintained by contractor	works cost		
51. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment tobe timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during daytime and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD
52. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.			stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.				
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MOR T&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Included in civil works cost	Contractor	UPPWD/CSC
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
53. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as	As Directed by Engineer	Throughout the Project Corridor	MI: Replacement of Hand Pumps/tube wells,	Checking the documents, Site locations, Checking	Utility Shifting Cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.		Enhancement measures proposed at locations as **enclosed**	Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	with Local People			
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing and intercepting ditch along with sedimentation pit depending on site-specific conditions shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 5 locations of maximum length = 100 m **(as Enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC
4.5Deterioration in Surface / Ground water quality due to leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies.	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies**,** refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Includedin civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Water quality shall be monitored as per EMoP ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection							
54. Flora and Fauna								
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=4846 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
55. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC
6.2Worker'sHealth in construction camp	▪ The contractor shall have its Health, Safety and Environment (SHE) Policy and guidelines and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	Control of Pollution) Act,1974 and amendments thereof		PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.				
56. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
57. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 - 1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 - 2001Guidelines for Safety The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected.	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children			people PT: Easy access to schools, temples and public places. Zero complaints				
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Bank EHS Guidelines ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor	National Law / Policies, World Bank EHS Guidelines, Best National / International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC
Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
Operation and Maintenance stage								
1. Air Quality								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation	Included in Environment Monitoring Cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	transport department or installing emission checking equipments				Consultation with Local People.			
2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000an damendments thereof	Sensitive receptor locations as identified in IEE	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
38. Land and Soil								
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
39. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
40. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
41. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) Rules, 1989	Hazardous Waste (Management & handling) Rules, 1989	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 55B: ENVIRONMENT MONITORING PROGRAMME (NAURANGIA - KAPTANGANJ - HATA) - PACKAGE I

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors.(4 Mixed Land Use Major Location , 10 sensitive receptors	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 14x3x 3000 = 1,26,000.00	Contractor through approved monitoring agency	CSC
	Operation stage	$PM_{10}PM_{2.5}$		Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 2 Severely affected Ponds 2 ponds within 15 m of CL 100m U/s and D/s from 5 bridge, reconstruction (01) / widening (04) sites over canal	Groundwater: Quarterly excluding monsoon Monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly for period of one year of construction	Specified in Drinking Water Standards : 2012 for Ground water: and Water Quality Criteria for Surface Water of CPCB The most beneficial use as documented in the environmental baseline of the pond should not be affected.	1x 5000x 3 x 2 =INR 30,000.00 2x5000 x 6= INR 60,000.00 2x5000 x 2x2= INR 40,000.00 5x2x 12 x 5000= INR 6,00,000.00	Contractor through approved monitoring agency	UPPWD /CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
	Operation stage			3 location along the road including 2 Surface water Pond where monitoring was carried out during construction phase (3 Locations)	Grab Sample	In operation period Once in the last of first Operation Year	3X5000 x1 =INR15, 000	UPPWD, Division through approved monitoring agency	UPPWD HQ
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(4 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000 =INR.30,000.00 14x 2 x12 x 1000= INR 3,36,000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000xx1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
		Embankments and Earther spaces in ROW		ROW of project road. High Embankment along the road. All Streams crossing the Project Road					
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage			Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 1.401 Million (total), 1.322 Million (Construction Phase), 0.079 Millions (Operation Phase)									

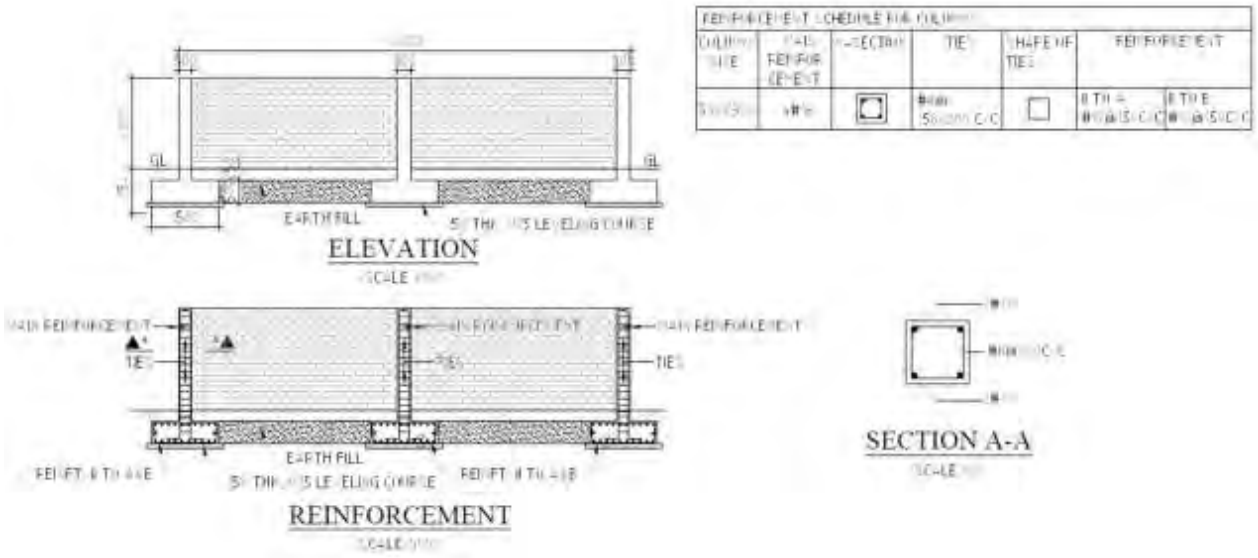
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

APPENDIX 55A: PROVISION OF NOISE BARRIER IN NAURANGIA - KAPTANGANJ - HATA ROAD (Pkg-I)

Proposed Locations

S. No.	Existing Chainage (Km)	Features	Village	Side
KAPTANGANJ – NAURANGIA (ODR 24)				
1	1.350	School	Chilwan Kaptanganj	RHS
2	4.500	School	Hardichapra	RHS
3	6.070	School (Boundary wall likely to be affected)	Khatai Kwrwaniyan	RHS
4	6.900	College	Khatahi	LHS
5	9.660	College	Khatahi	RHS
6	13.840	School	Khanuapra	LHS
7	15.080	School	Pakadiyar Bazar	LHS
8	15.080	School	Pakadiyar Bazar	LHS
9	18.800	School	Khairatiya Shitlapur	LHS
10	21.900	School	Sirsiya	LHS
11	24.000	School	Nauranganj	LHS
KAPTANGANJ – HATA (MDR 25E)				
12	0.800	Hospital	Kaptanganj	LHS
13	0.800	Hospital	Kaptanganj	RHS
14	1.040	School	Kaptanganj	RHS
15	1.100	School	Kaptanganj	RHS
16	5.130	School	Malkuhi	RHS
17	5.350	School	Malkuhi	RHS
18	5.450	Madrasa	Malkuhi	RHS
19	11.900	School	Ghiwahi	LHS
20	13.200	School	Pakdi Madrah	RHS
21	14.980	School	Harpoor Verma	LHS
22	20.400	School	Radhiya-Devrya	LHS
23	18.665	School	Jhanga Bazar	LHS
24	18.350	Hospital	Jhanga	RHS

Source: DPR Consultant



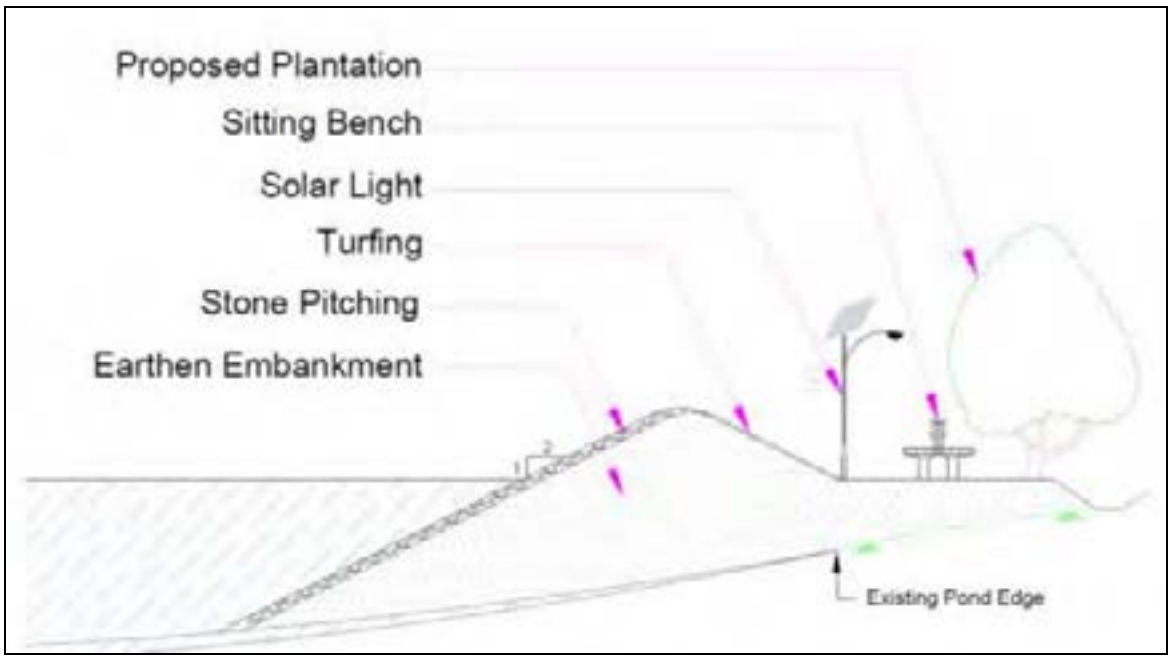
Typical Design for Noise barrier

APPENDIX 55A: PROVISION OF ENHANCEMENT MEASURES IN NAURANGIA - KAPTANGANJ - HATA ROAD (Pkg-I)

Proposed Locations of Ponds

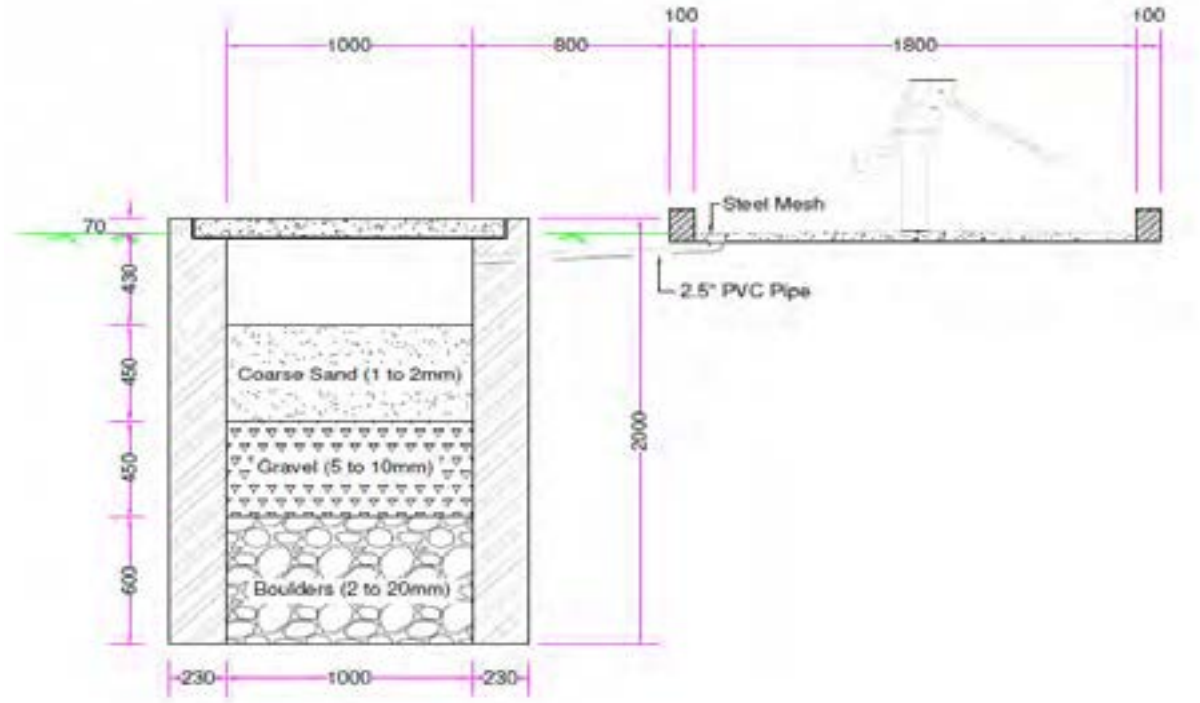
S. No.	Chainage (km)	Side	Distance from Center line(m)
1	17.700	LHS	10.0

Source: PPTA Consultant



Schematic layout of enhancement measures proposed for Pond

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



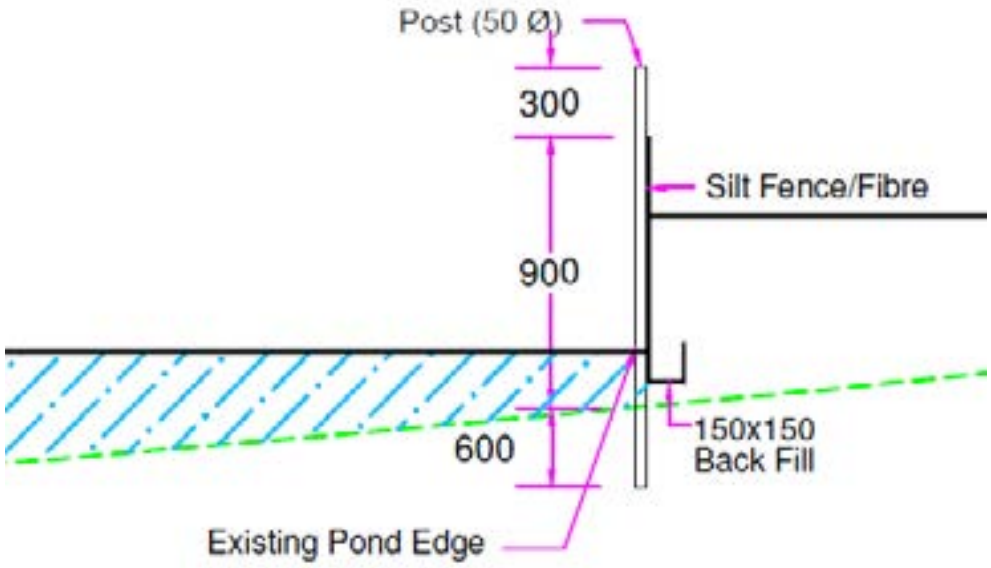
TCS of Soak pit for Hand pumps

APPENDIX 55A: ROVISION OF SILT FENCING IN NAURANGIA - KAPTANGANJ - HATA ROAD (Pkg-I)

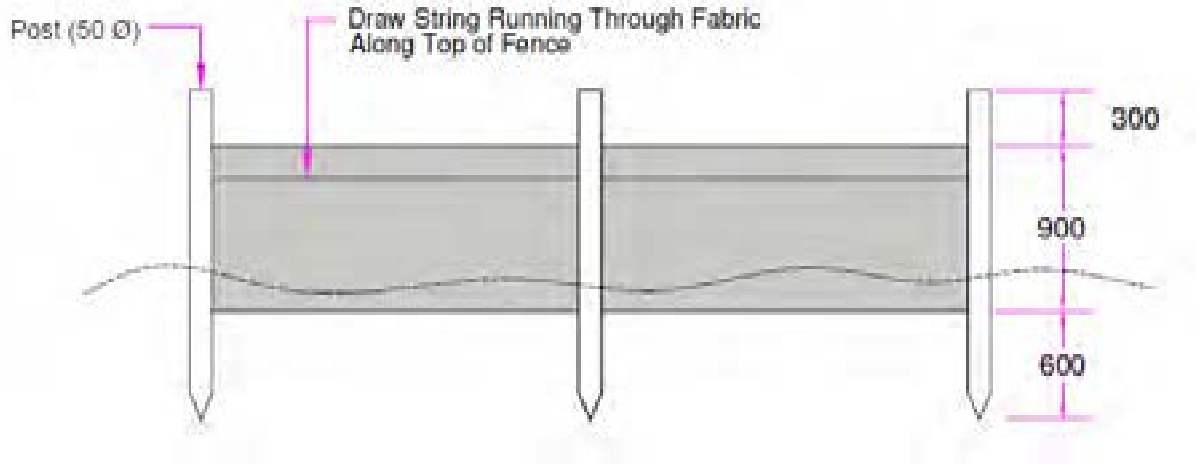
Proposed Locations

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	6+700	Both side	crossing
2	12.400	LHS	10.0
3	16.600	Both Side	crossing
4	16.700	LHS	10.0
5	19.600	RHS	15.0

Source: PPTA Consultant



TCS for silt Fencing



Front View of silt Fencing

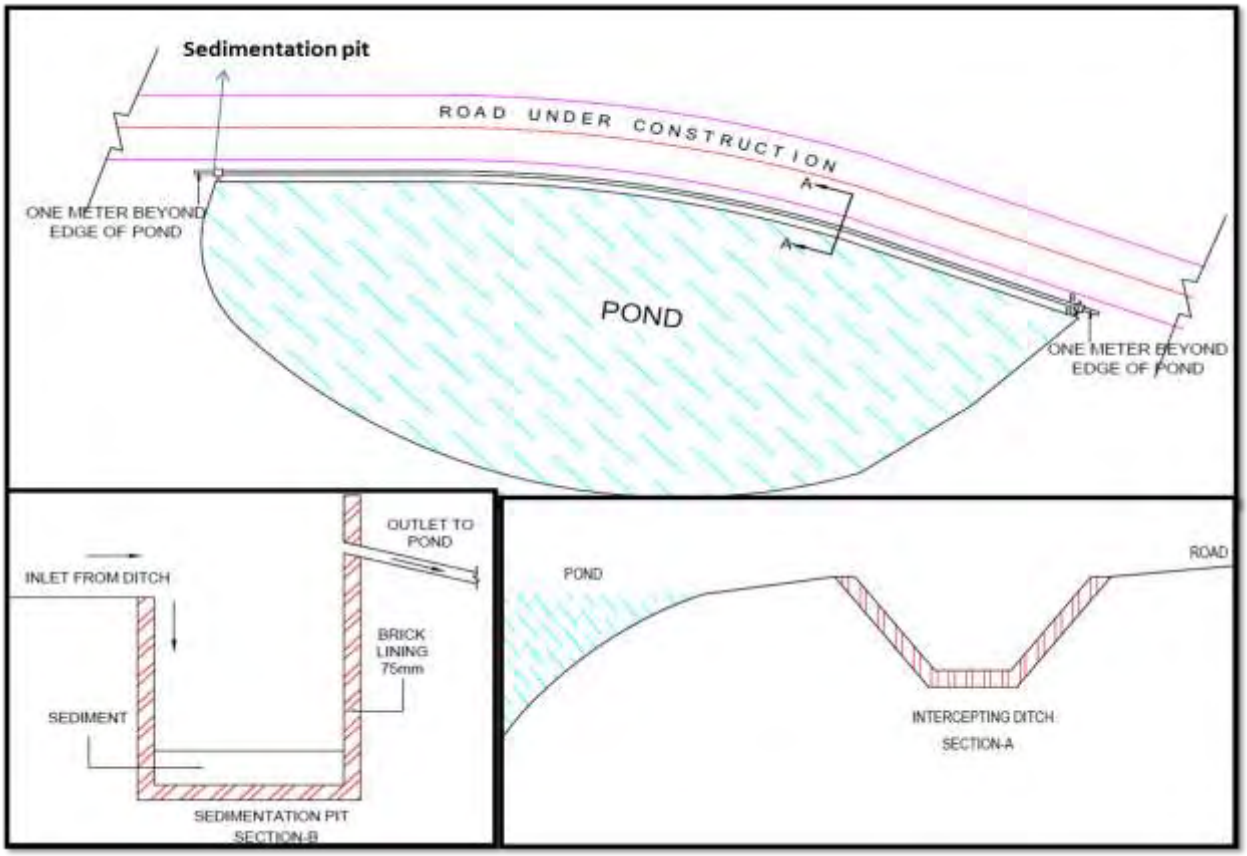
APPENDIX 55A: PROVISION OF INTERCEPTING DITCH AND SEDIMENTATION PIT IN NAURANGIA - KAPTANGANJ - HATA ROAD (Pkg-I)

Proposed Locations

S. No.	Chainage (km)	Side	Distance from Center line(m)
1*	19.600	RHS	15.0

Source: PPTA Consultant

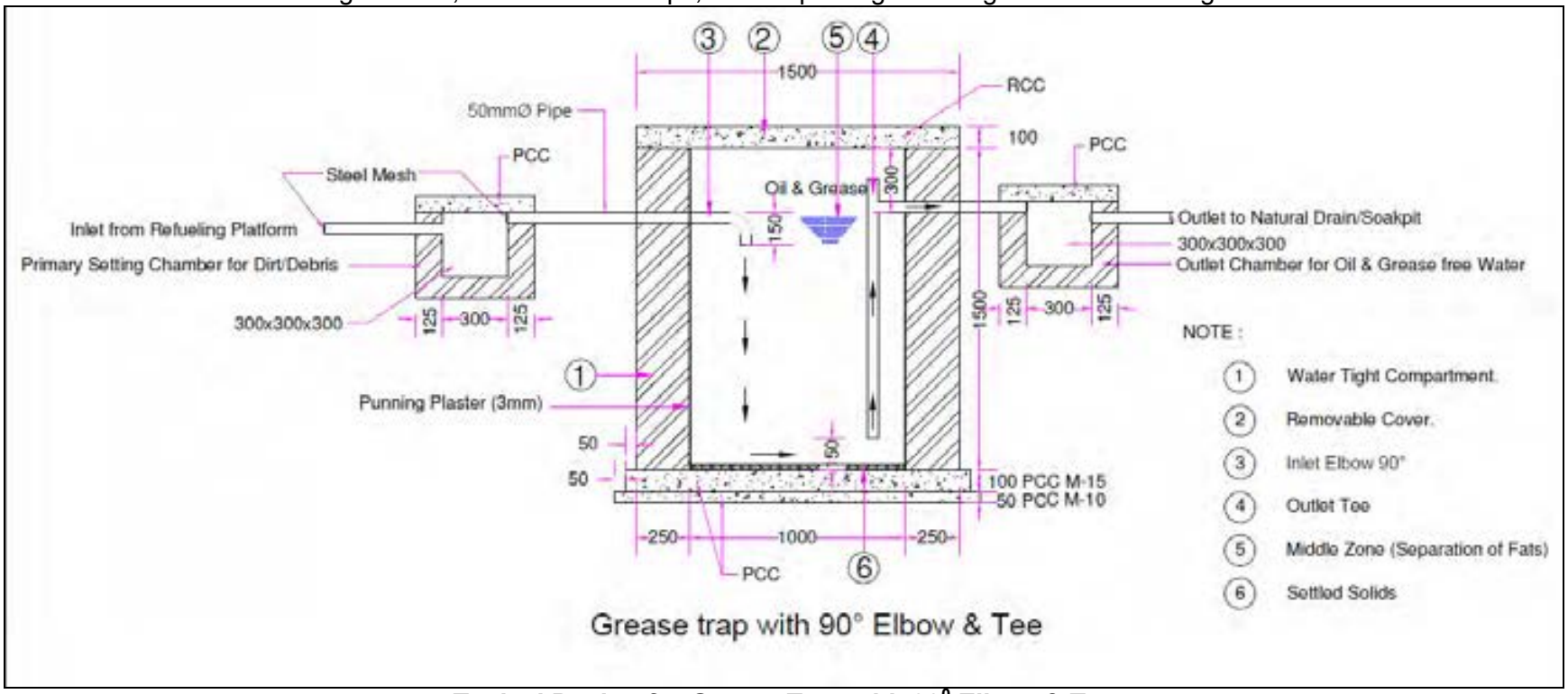
**Along with Silt Fencing*



Schematic diagram of intercepting ditch and sedimentation pit

APPENDIX 55A: PROVISION OF OIL INTERCEPTORS IN NAURANGIA - KAPTANGANJ - HATA ROAD (Pkg-I)

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 56A: ENVIRONMENTAL MANAGEMENT PLAN OF HATA TO RUDRAPUR (MDR 25E) – PACKAGE II

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
V. Design and Pre-construction Stage								
43. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 33 locations for a length of 27.83 km Roadside drains (both sides together) Lined=35.420 km Unlined= 41.880 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Footpath cum drain for a length of 17.71 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridge s ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
44. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 33 locations for a length of 27.83 km Roadside drains (both sides together) Lined=35.420 km Unlined= 41.880 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD
45. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS 2009. • Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	contracts during construction to APs ▪ Constitute GRC as per RP	for preference to local people during employment.		at GRC level. No case referred to arbitrator or court.				
46. Cutting of Trees								
4.1 Tree Cutting	▪ Obtain Tree cutting permission from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation etc. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=4303 Additional Plantation of 8606 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change
47. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
48. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	6.1 The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100___% compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
6.6 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.7 Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
W. Construction Stage								
59. **Air Quality**								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD
1.2 Emission of air pollutants(HC,SO_2,NOX ,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
60. **Noise**								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment tobe timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during daytime and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP. ▪	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD
61. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations Top soil storage area PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion						
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3 MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil	▪ Construction vehicles, machinery, and	Design	Agricultural fields	MI: Location of	Site observation	Included in civil	Contractor	UPPWD/CS

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
and impact on quarry haul roads due to movement of vehicles and equipment	equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	requirement	along the road, Parking areas, Haulage roads and construction yards.	approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land		works cost		C
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
62. **Water Resources**								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area			competent authority. Zero complaints from local people.				
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.	As Directed by Engineer	Throughout the Project Corridor Enhancement measures proposed at locations as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.			record of overtopping/ water logging				
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing and intercepting ditch along with sedimentation pit depending on site-specific conditions shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 6 locations of maximum length = 70 m **(as Enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.5Deterioration in Surface / Ground water quality due to leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Water quality shall be monitored as per EMoP ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Included in civil works cost	Contractor	UPPWD/CSC
63. Flora and Fauna								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=4303 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
64. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
		thereof		PT: Distance of campsite is not less than 500m from listed locations				
6.2Worker'sHealth in construction camp	▪ The contractor shall have its Health, Safety and Environment (SHE) Policy and guidelines and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
65. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
66. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 - 1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 - 1988 Road Safety for Children IRC:SP: 44 - 1994 Highway Safety Code IRC: SP: 55 - 2001Guidelines for Safety The Building and other Construction workers Act 1996	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
		and Cess Act of 1996 Factories Act 1948						
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Bank's EHS guidelines. ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Law /Policies, World Bank's EHS Guidelines, Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC
Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
Operation and Maintenance stage								
1. Air Quality								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with	Included in Environment Monitoring Cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	coordination with transport department or installing emission checking equipments				Local People.			
2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptor locations as identified in IEE.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
44. Land and Soil								
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
45. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
46. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
47. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenanceco st	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Main tenance cost	UPPWD	
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) Rules, 1989	Hazardous Waste (Management & handling) Rules, 1989	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Mai ntenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 56B: ENVIRONMENT MONITORING PROGRAMME (HATA - RUDRAPUR) – PACKAGE II

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors. (3 Mixed Land Use Major Location , 10 sensitive receptors	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x 3000 = INR 1,17,000.00	Contractor through approved monitoring agency	CSC
	Operation stage	$PM_{10}PM_{2.5}$		Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 2 Severely affected Ponds 2 ponds within 15 m of CL 100m U/s and D/s from 2 bridge widening (02) sites over canal	Groundwater: Quarterly excluding monsoon monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly for period of one year of construction	Specified in Drinking Water Standards : 2012 for Ground water: and Water Quality Criteria for Surface Water of CPCB The most beneficial use as documented in the environmental baseline of the pond should not be affected.	1x 5000x 3 x 2 =INR 30,000.00 2x5000 x 6= INR 60,000.00 2x5000 x 2x2= INR 40,000.00 2x2x 12 x 5000= INR 240000.00	Contractor through approved monitoring agency	UPPWD /CSC
	Operation stage			3 location along the road including 2 Surface water Pond where monitoring was carried out during construction phase (3 Locations)	Grab Sample	In operation period Once in the last of first Operation Year	3X5000 x1 =INR15,000	UPPWD, Division through approved monitoring agency	UPPWD HQ

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000 =INR 30,000.00 13x 2 x12 x 1000= INR 312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000xx1= 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water Silt load in ponds Loose Soil in High Embankments and Earther spaces in ROW	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage				Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage			Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 1.008 Million (total), 0.929 Million (Construction Phase), 0.079 Million (Operation Phase)									

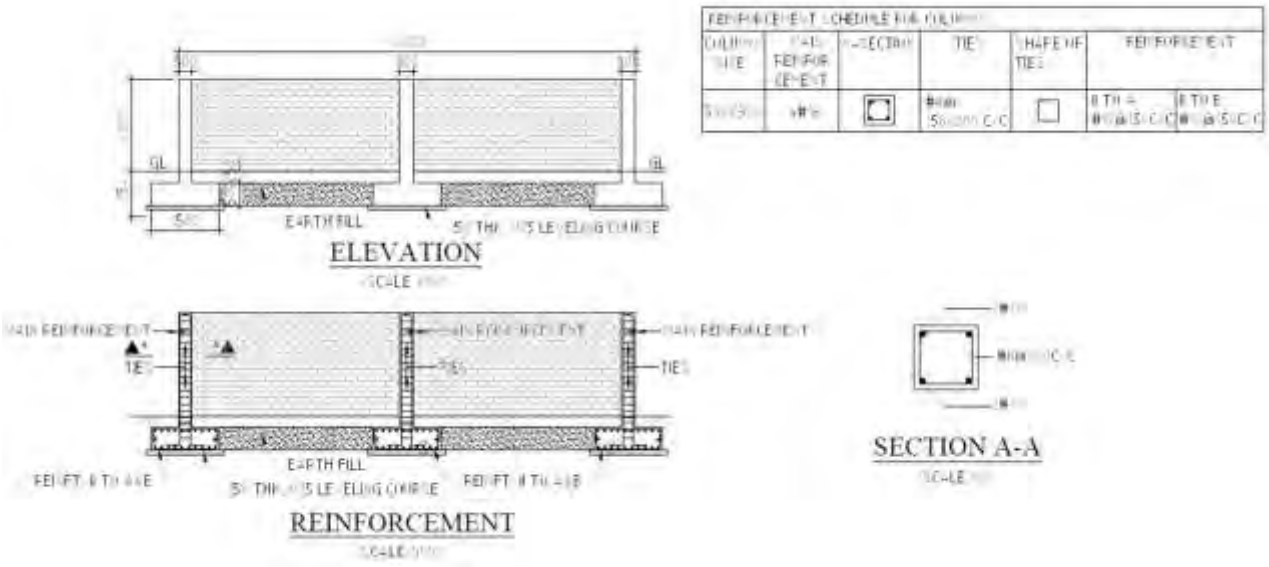
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

APPENDIX 56A: PROVISION OF NOISE BARRIER IN HATA TO RUDRAPUR MARG (Pkg – II)

Proposed Locations

S. No.	Existing Chainage (Km)	Features	Village	Side
1	25.770	School	Gopalpur	RHS
2	26.000	School	Modraha	LHS
3	28.310	School	Balua	LHS
4	28.400	School	Balua	LHS
5	29.250	School	Devkali	LHS
6	29.750	School	Devkali	RHS
7	31.320	School	Vakilaganj	LHS
8	33.500	School	Balchara	LHS
9	33.800	Hospital	Balchara	RHS
10	34.263	School	Cheerchari Balchara	LHS
11	35.750	School	Dumari Bishnupura	LHS
12	37.500	School	Kakamal	LHS
13	37.820	Hospital	Pacholiya	LHS
14	38.800	School	Dhamar Vioshwari	RHS
15	39.750	College	Rampur	LHS
16	40.000	Hospital	Gauri Bazar	LHS
17	40.012	School	Gauri Bazar	RHS
18	43.845	School	Patharhat	LHS
19	44.150	School	Indupur	LHS
20	44.480	College	Indupur	RHS
21	47.350	School	Pananchara	LHS
22	49.590	School	Balkunda	RHS
23	49.900	School	Banaspati Bazar	LHS
24	50.550	School	Ramlakshman	RHS
25	50.600	School	Ramlakshman	LHS
26	51.000	Hospital	Ramlakshman	LHS
27	52.400	School	Laxmipur	RHS

Source: DPR Consultant



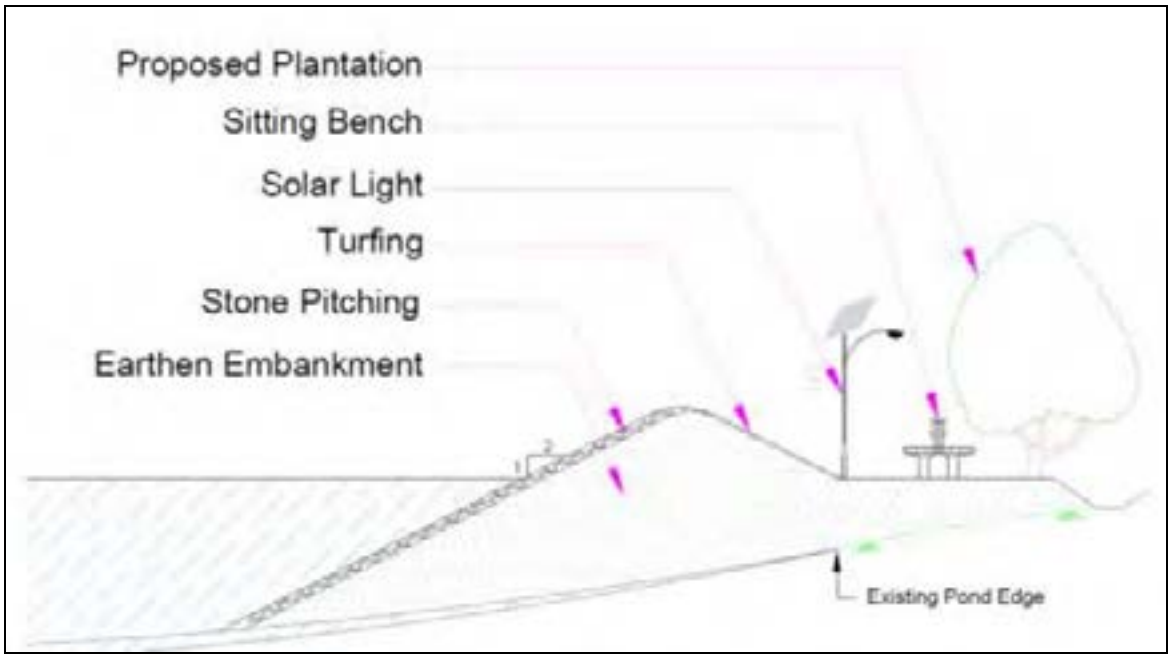
Typical Design for Noise barrier

APPENDIX 56A: PROVISION OF ENHANCEMENT MEASURES IN HATA TO RUDRAPUR **ROAD (Pkg II)**

Proposed Locations of Ponds

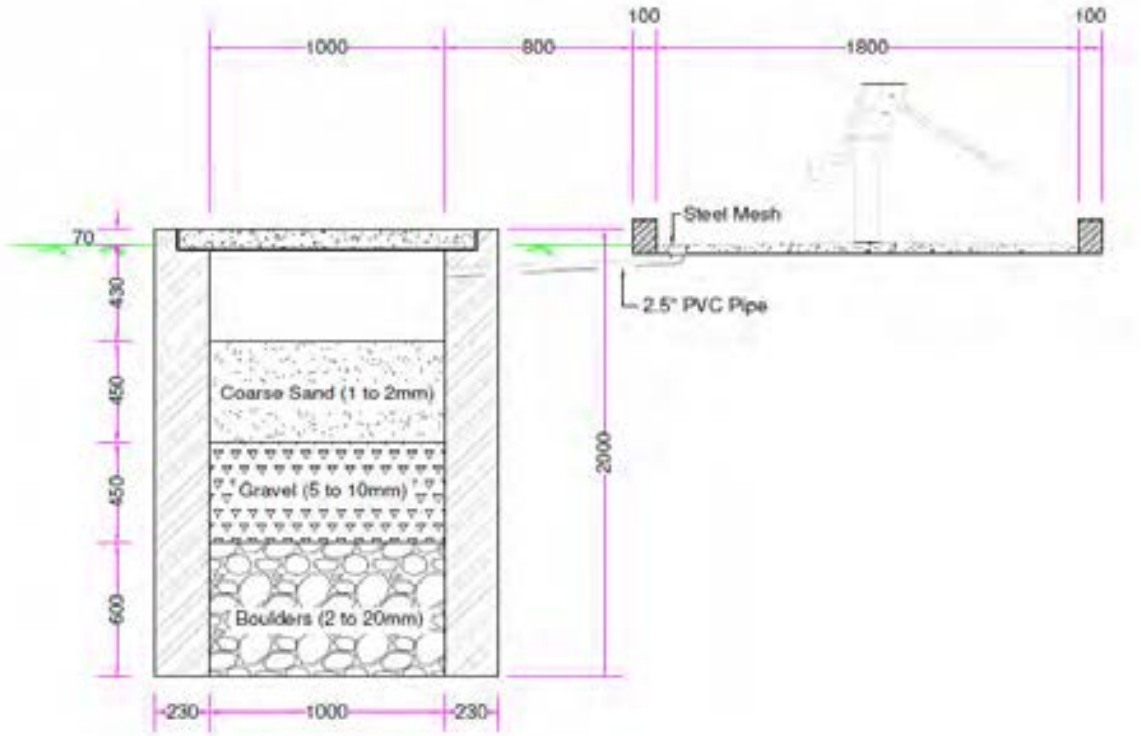
S. No.	Chainage (km)	Side	Distance from Center line(m)
1	58.500	RHS	30.000

Source: PPTA Consultant



Schematic layout of enhancement measures proposed for Pond

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



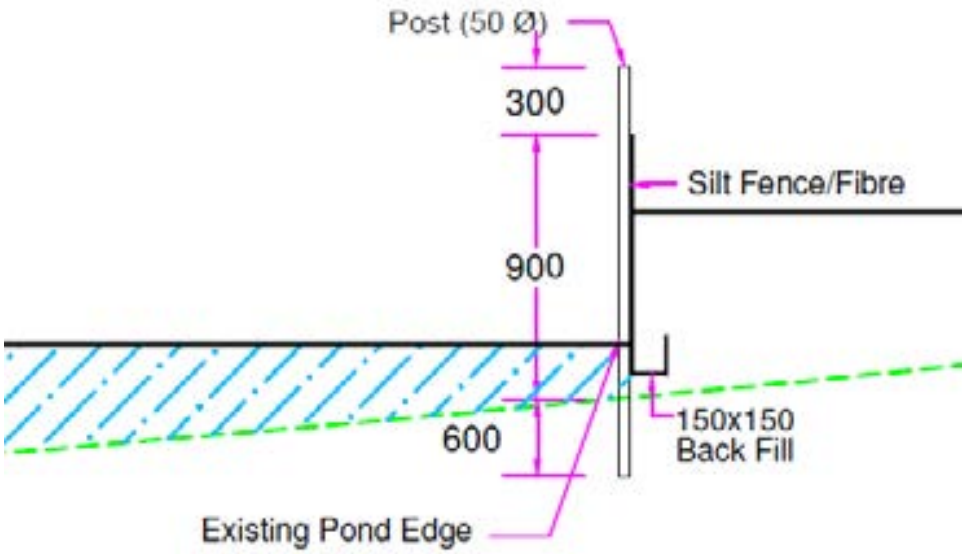
TCS of Soak pit for Hand pumps

APPENDIX 56A: PROVISION OF SILT FENCING IN HATA TO RUDRAPUR **MARG (Pkg II)**

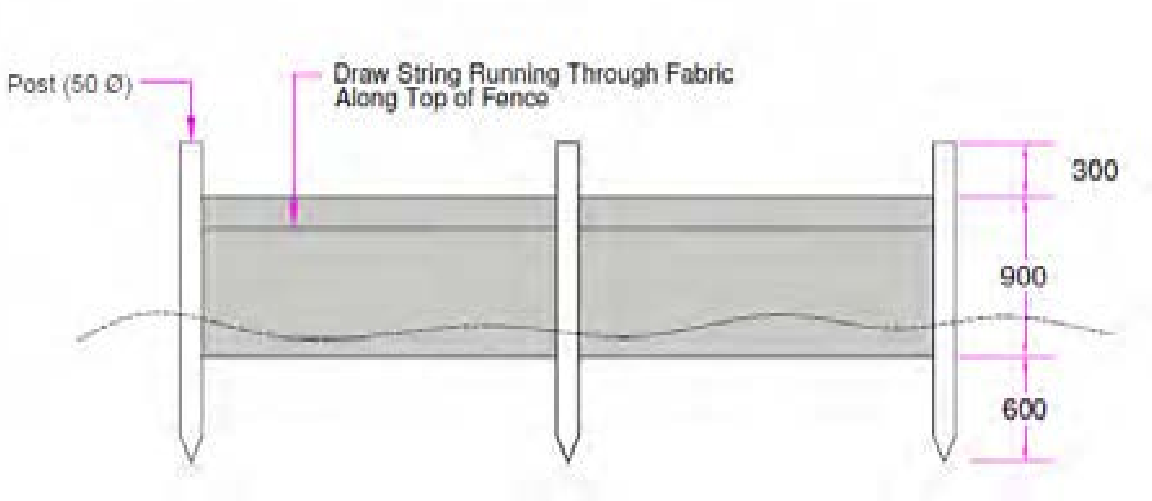
Proposed Locations

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	24.100	RHS	15.0
2	32.100	LHS	10.0
3	45.900	RHS	15.000
4	55.700	RHS	15.000
5	56.400	crossing	crossing
6	59.700	LHS	20.000

Source: PPTA Consultant



TCS for silt Fencing



Front View of silt Fencing

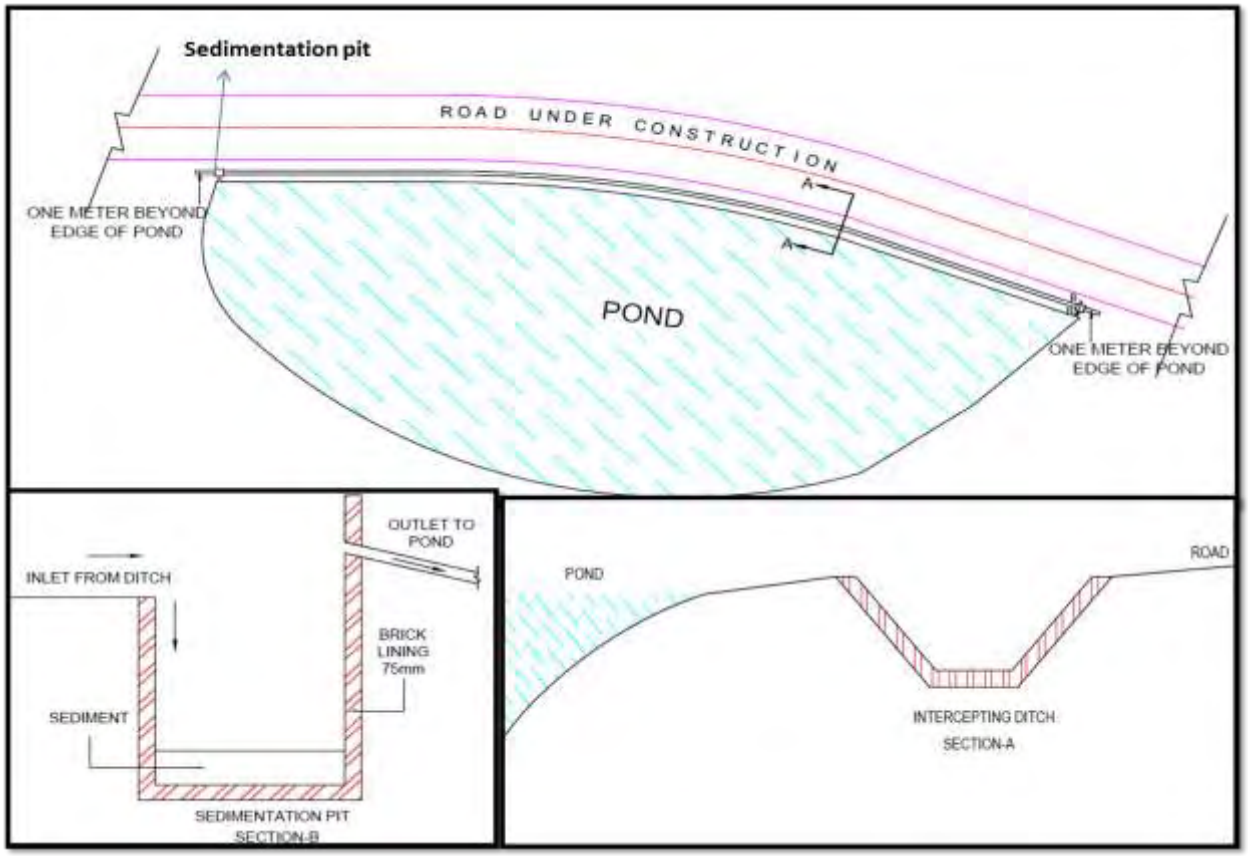
APPENDIX 56A: PROVISION OF INTERCEPTING DITCH AND SEDIMENTATION PIT IN HATA TO RUDRAPUR MARG (Pkg II)

Proposed Locations*

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	24.100	RHS	15.0
2	45.900	RHS	15.000
3	55.700	RHS	15.000

Source: PPTA Consultant

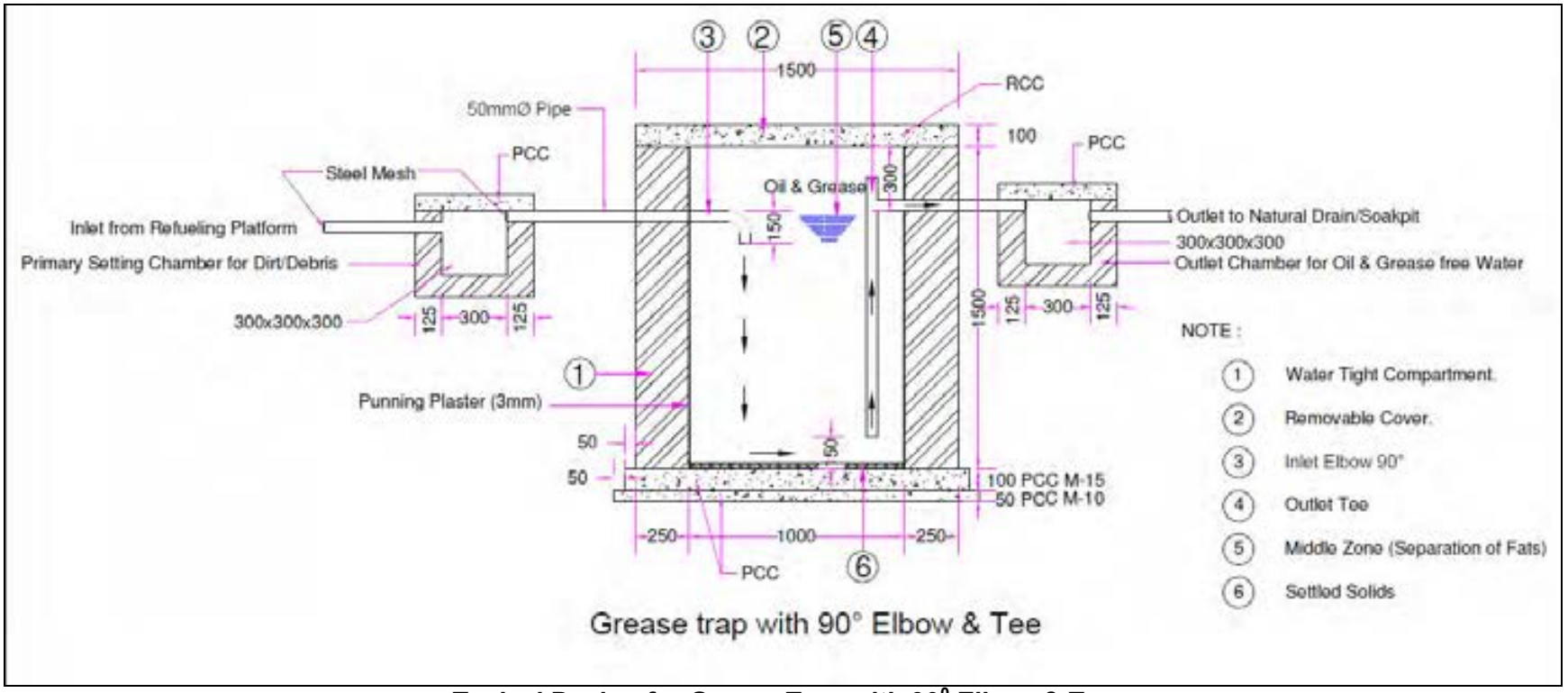
**Along with Silt Fencing*



Schematic diagram of intercepting ditch and sedimentation pit

APPENDIX 56A: PROVISION OF OIL INTERCEPTORS IN HATA TO RUDRAPUR **MARG (Pkg II)**

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 57A: ENVIRONMENTAL MANAGEMENT PLAN OF MOHANLALGANJ TO MAURAWAN UNNAO MARG (MDR 52C)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
Y. Design and Pre-construction Stage								
49. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 10 locations for a length of 10.20 km Roadside drains (both sides together) Lined=20.40 km Unlined= 87.83 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Footpath cum drain for a length of 10.20 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridge s ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
50. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for	Entire stretch. Embankment raised at 10 locations for a length of 10.20 km Roadside drains (both	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges shall be carried out to increase their carrying capacity.	Rigid Pavements	sides together) Lined=20.40 km Unlined= 87.83 km	of bridges PT: Design and numbers are in accordance with site needs				
51. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS 2009. • Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD
52. Diversion of Forest Land and Cutting of Trees								
4.1 Forest Diversion	▪ 0.8 km from start point of the project road is notified as Protected Forest ▪ Obtain forest Clearance from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation, Net Present Value etc. ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=4426 Additional Plantation of 8852 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change
53. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Shifting of Hand Pumps			be 0. Effective and timely notification. Minimal time for utility shifting				
54. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of CEMP. No complaint from local Prople and Notice from Authorities.	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC /UPPWD
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100 % compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions ▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC	Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines		Payment of Royalty,				
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				
6.6 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.7Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
Z. Construction Stage								
68. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level<	Standards CPCB methods Observations Public consultation Review of	Includedin civil works cost	Contractor	CSC/ UP PWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted to daytime only	Motor and Vehicle Act 1988		100 ug/m^3Number of complaints should be 0.	monitoring data maintained by contractor			
1.2 Emission of air pollutants(HC,SO_2,NOX,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO_2, NO_2, and CO. Status of PUC certificates PT: SO_2 and NO_2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
69. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment tobe timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during daytime and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP.	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD
70. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion.	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas	MI: Borrow pit locations Top soil storage area	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use		etc.	PT: Zero complaints or disputes registered against contractor by land owner				
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing frames, drystone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3 MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil and	▪ Construction vehicles, machinery, and equipment	Design	Agricultural fields	MI: Location of	Site observation	Included in civil	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
impact on quarry haul roads due to movement of vehicles and equipment	to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions	requirement	along the road, Parking areas, Haulage roads and construction yards.	approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land		works cost		
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
71. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water	▪ Wherever digging is undertaken, the banks of	As Directed by	Throughout the	MI: Replacement of	Checking the	Utility Shifting	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
bodies/water sources	water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed. ▪	Engineer	Project Corridor Enhancement measures proposed at locations as **enclosed**	Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	documents, Site locations, Checking with Local People	Cost		
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. ▪ Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing and intercepting ditch along with sedimentation pit depending on site-specific conditions shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway Silt Fencing at 16 locations of maximum length = 70 m **(as Enclosed)** Retaining wall at 4 locations of length 116 m **(as enclosed)**	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities.	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds			Surface water quality tests confirm to turbidity and TSS limit				
4.5Deterioration in Surface / Ground water quality due to leakage from vehicles and equipments and waste from construction camps.	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Water quality shall be monitored as per EMoP ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps as per detail **enclosed**	MI: Water quality of ponds, streams, rivers and other water bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	Conduction of water quality tests as per the monitoring plan Field observation	Included in civil works cost	Contractor	UPPWD/CSC
72. Flora and Fauna								

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Regular maintenance of all trees planted. ▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Controlled use of pesticides/ fertilizers	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=4426 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC
5.2 Damage of Flora & Fauna	▪ The contractor will display cautionary boards and informatory sign boards during construction where migratory birds are found from Nawabganj bird Sanctuary in Baknai Badaila Jheel ▪ Hot mix plant/ construction camp shall not be located within 1000m of the road stretch from km 46.900 to 47.500 especially during breeding period in the winter season from November to February. ▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor For Migratory Birds specially at Baknai badaila Jheel along road (km 46.900 to km 47.500)	PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
73. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
		thereof		PT: Distance of campsite is not less than 500m from listed locations				
6.2Worker'sHealth in construction camp	▪ The contractor shall have its Health, Safety and Environment (SHE) Policy and guidelines and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC
74. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.			all dumping sites available with contractor or CSC				
75. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. ▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.	Design requirement and IRC: SP: 27 - 1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 - 2001Guidelines for Safety in Construction Zones The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Banks EHS Guidelines. ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical	National laws /Policies , World Banks EHS guidelines, Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.			accidents. Zero or minor non-fatal accidents.				
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic. ▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC
Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
. Operation and Maintenance stage								
1. Air Quality								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried	Environmental Protection Act, 1986; The Air (Prevention and	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2)	Review of Audit Report of Tree Plantation.	Included in Environment Monitoring Cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Control of Pollution) Act, 1981 Environment Monitoring Plan		PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People.			
2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road.	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptors as identified in IEE locations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	
50. Land and Soil								
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
51. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
52. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
				90% tree survival or Guidelines of Forest Dept.				
5.2 Fauna	▪ The contractor will display cautionary boards and informatory sign boards at least 100 m before and after Baknai Badaila jheel from km 46.900 to km 47.500 to discourage people from hunting. ▪ To avoid glare during night along bird sensitive region (km 46.900 to 47.500) road side streem plantation shall be done in two tiers of small and medium trees in vacant land of PWD as per availability.	Project requirement	Migratory birds zone (km 46.900 to 47.500)	MI: No damage to Fauna PI: No Complaints received	Site observations Discussions with locals	Included in Environment Cost	UPPWD	
53. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material ▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) Rules, 1989	Hazardous Waste (Management & handling) Rules, 1989	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	UPPWD	

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 57B: ENVIRONMENT MONITORING PROGRAMME (MOHANLALGANJ- MAURAWAN)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent PM_{10} $PM_{2.5}$	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors. (3 Mixed Land Use Major Location , 10 sensitive receptors)	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 13x3x 3000 = INR 117,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 =INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp. 6 Severely affected Ponds 2 ponds within 15 m of CL 500m Upstream and Downstream of Proposed New Bridges site at River Sai and Canal. 100m u/s and d/s of bridge reconstruction (01) and widening (2) site over canals	Groundwater: Quarterly excluding monsoon Monthly monitoring for continuous six months at the time of construction adjoining the pond Surface Water Quality of Pond Six Monthly for two years Monthly assuming construction period as one year.	Specified in Drinking Water Standards : 2012 for Ground water: and Water Quality Criteria for Surface Water of CPCB The most beneficial use as documented in the environmental baseline of the pond should not be affected.	1x 5000x 3 x 2 =INR 30,000.00 6x5000 x 6= I 180,000.00 2x5000 x 2x2= INR 40,000.00 2x2x12x5000 = 240000.00 3x2 x12x5000= 360000.00	Contractor through approved monitoring agency	UPPWD /CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
	Operation stage			9 location along the road including 6 Surface water Pond , Upstream and Down stream of Sai River where monitoring was carried out during construction phase (9 Locations)	Grab Sample	In operation period Once in the last of first Operation Year	9X5000 x1 =45,000	UPPWD, Division through approved monitoring agency	UPPWD HQ
Benthic flora and fauna	Construction Stage	Benthic Flora and Fauna, including Plankton , Phytoplankton, Zooplankton, Macrophytes, Fishes		500m upstream and 500m downstream of bridge site		Six Monthly during construction Period including once before the start of work.	4 x2 x 10000=80000		
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(3 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000x = 30,000.00 13x 2 x12 x 1000=312000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000xx1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water	Visual Checks	Through the Project Corridor especially at River banks,	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
	Operation Stage	Silt load in ponds Loose Soil in High Embankments and Earther spaces in ROW		bridge locations and river training structures All ponds within 20 m of ROW of project road. High Embankment along the road. All Streams crossing the Project Road	Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage			Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Poaching of Avifauna	Construction Stage	As given in EMP	As Directed by Engineer	Through the Project Corridor especially from km 22.00 to km 54.100	Construction Phase	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 1.598 Million (total), 1.489 Million (Construction Phase), 0.109 Million (Operation Phase)									

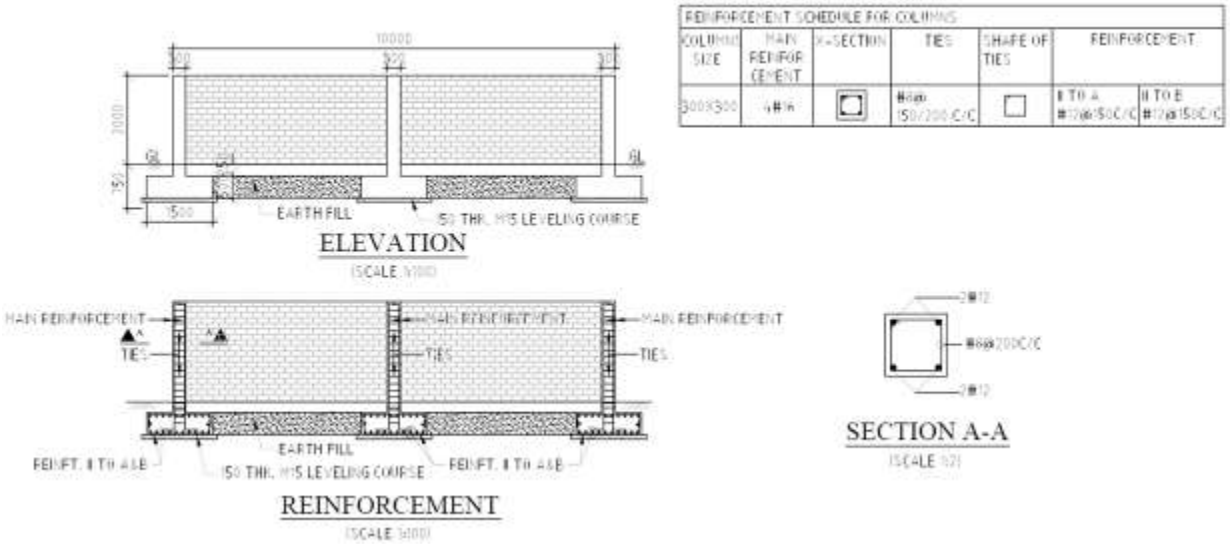
** UPPWD Uttar Pradesh Public Works Department, NPK:, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

APPENDIX 57A: PROVISION OF NOISE BARRIER IN MOHANLALGANJ TO MAURAWAN UNNAO MARG

Proposed Locations

S. No.	Existing Chainage (Km)	Features	Village	Side
1	0.300	School	Mohanlalganj	RHS
2	4.100	Community Health Centre	Dhanwara	LHS
3	18.600	School	Kalu Khera	LHS
4	24.600	School	Bhawaniganj	LHS
5	25.700	Private Doctor shop	Khudra	LHS
6	26.750	Hospital	Khudra	LHS
7	28.250	School	Sagauli	RHS
8	28.550	School	Sagauli	RHS
9	30.870	School	Sagauli	RHS
10	31.150	Clinic	Sagauli	RHS
11	31.350	School	Maurawan	RHS
12	31.550	Pathology lab	Maurawan	LHS
13	33.750	Private Doctor shop	Muraita	LHS
14	36.650	School	Patan Nagar	LHS
15	38.150	School	Tusraur	RHS
16	43.050	Community Health Centre	Purwa	LHS
17	43.450	Clinic	Purwa	LHS
18	47.400	School	Bhwangaya	RHS

Source: DPR Consultant



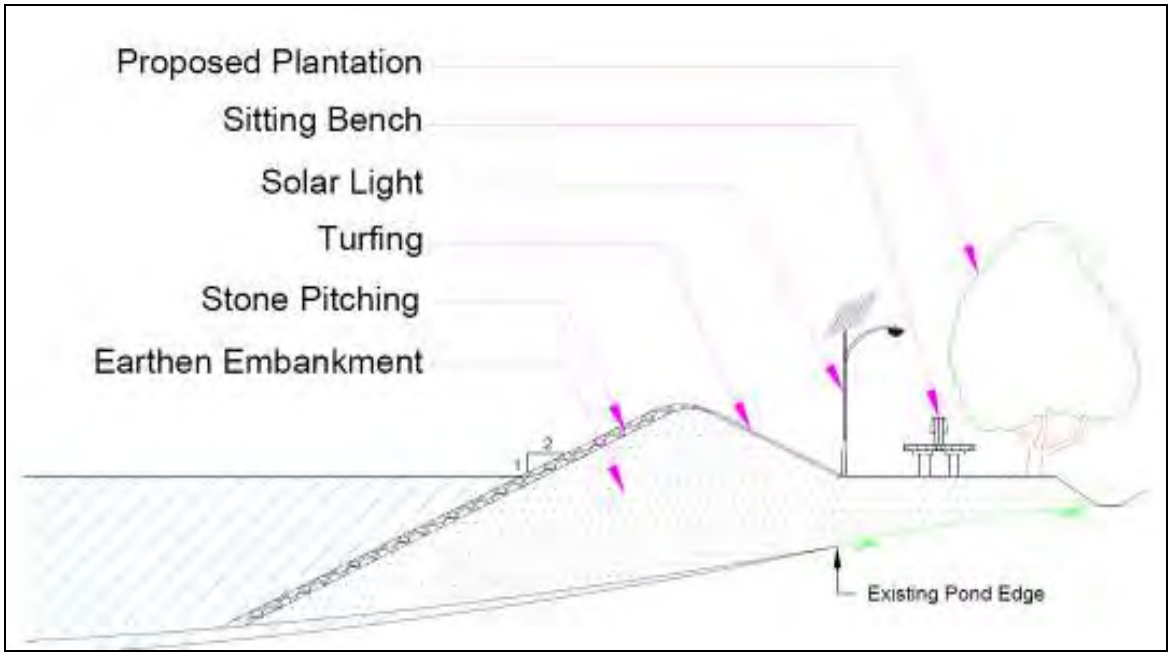
Typical Design for Noise barrier

APPENDIX 57A: PROVISION OF ENHANCEMENT MEASURES IN MOHANLALGANJ TO MAURAWAN UNNAO MARG

Proposed Locations of Ponds

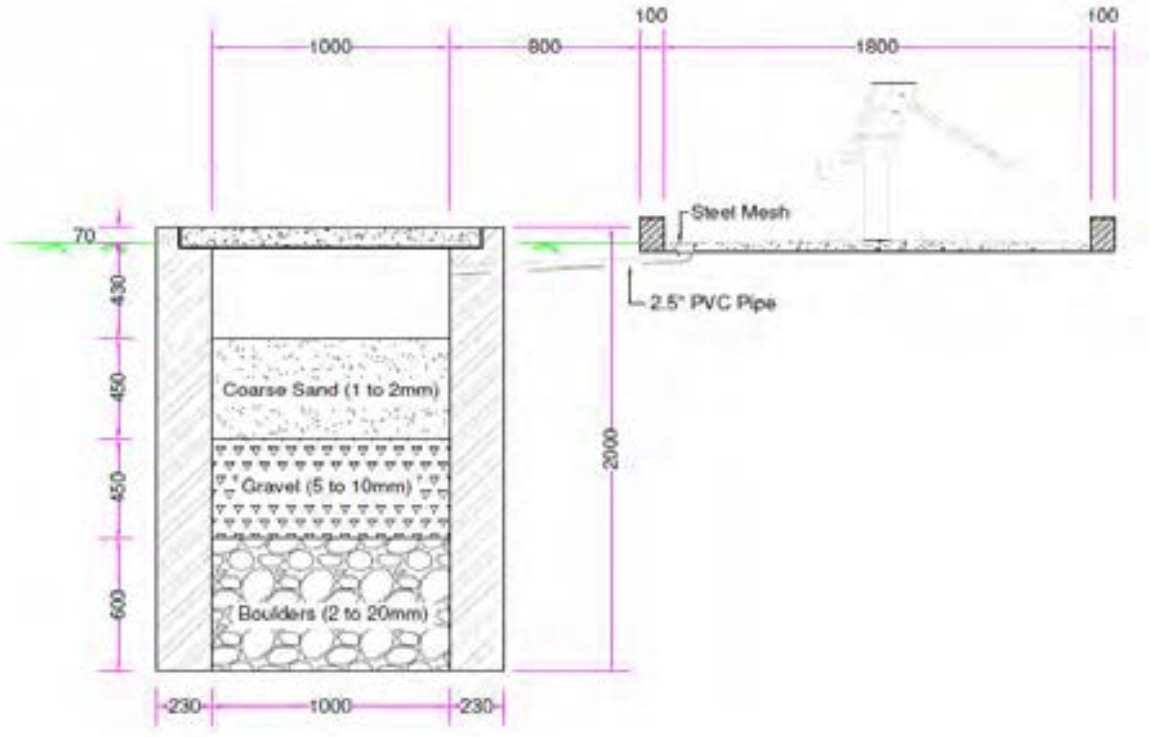
S. No.	Chainage (km)	Side	Distance from Center line(m)
1	45.000	RHS	15
2	47.400	RHS	25

Source: PPTA Consultant



Schematic layout of enhancement measures proposed for Pond

Proposed Locations of Hand pumps – Wherever Hand pumps will be relocated



TCS of Soak pit for Hand pumps

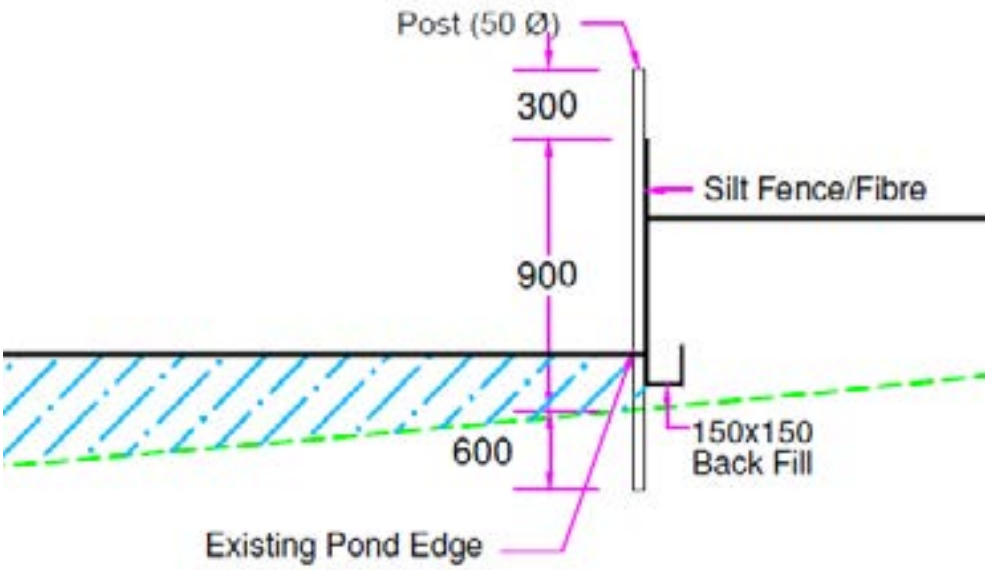
APPENDIX 57A: PROVISION OF SILT FENCING IN MOHANLALGANJ TO MAURAWAN UNNAO MARG **ROAD**

Proposed Locations

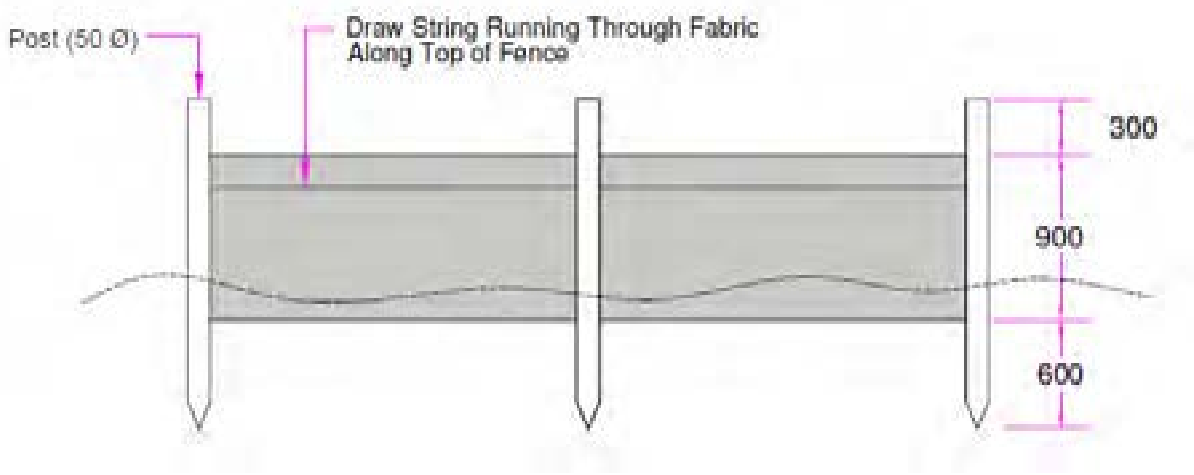
S. No.	Chainage (km)	Side	Distance from Center line(m)
1	0.280*	LHS	9
2	6.800	crossing	crossing
3	7.800	RHS	10
4	7.850	LHS	10
5	8.000*	RHS	5
6	8.050*	Both side	7
7	8.300	LHS	8
8	15.200	LHS	12
9	17.200	RHS	15
10	17.800	RHS	15
11	28.300	LHS	10
12	32.300	LHS	10
13	33.700	crossing	crossing
14	49.000	LHS	15
15	49.200	RHS	15

Source: PPTA Consultant

**Retaining wall shall be provided if required for stability of road along the ponds that are getting reclaimed*



TCS for silt Fencing



Front View of silt Fencing

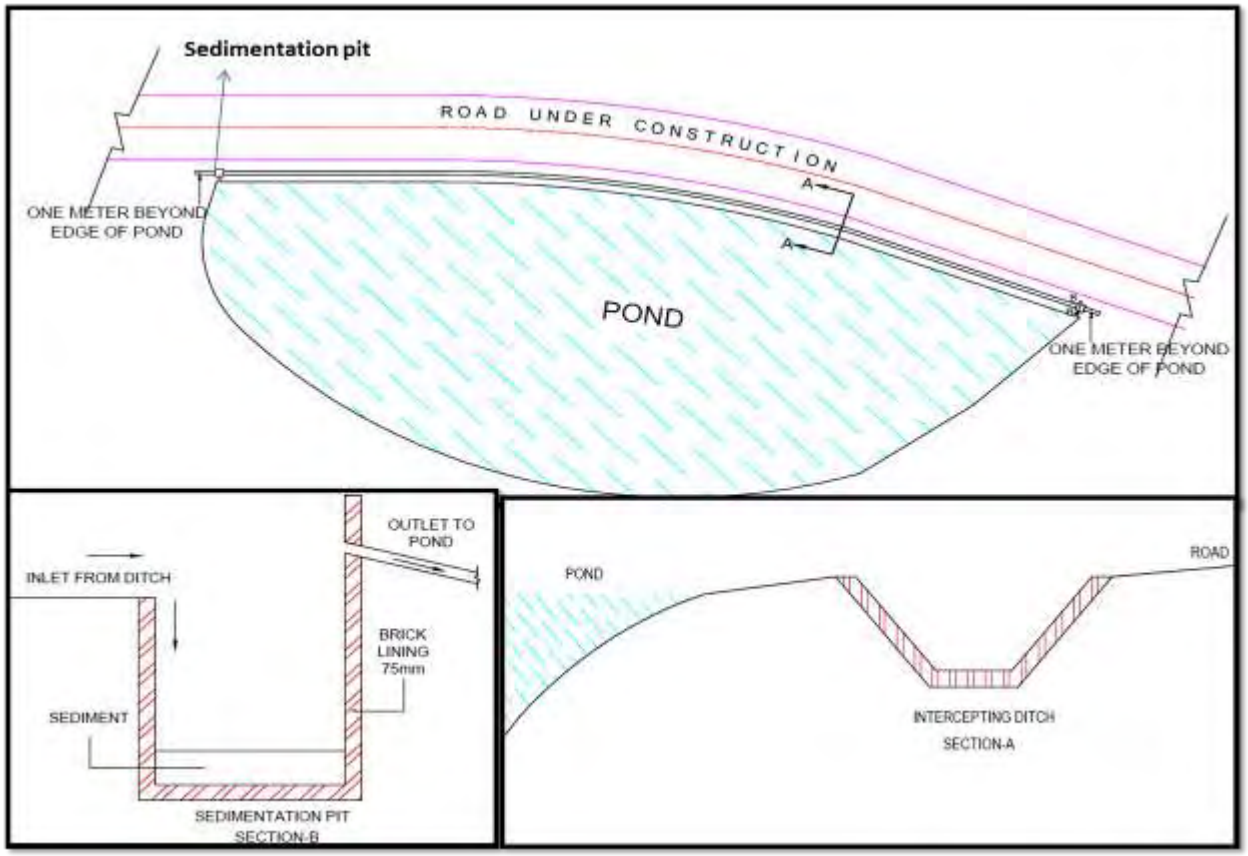
APPENDIX 57A: PROVISION OF INTERCEPTING DITCH AND SEDIMENTATION PIT IN MOHANLALGANJ TO MAURAWAN UNNAO MARG

Proposed Locations

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	2.48	LHS	11
2	15.200*	LHS	12
3	17.200*	RHS	15
4	17.800*	RHS	15
5	18.500	RHS	15
6	18.670	LHS	15
7	19.920	LHS	15
8	24.000	RHS	20
9	44.800	RHS	12
10	49.000*	LHS	15
11	49.200*	RHS	15

Source: PPTA Consultant

**Along with Silt Fencing*



Schematic diagram of intercepting ditch and sedimentation pit

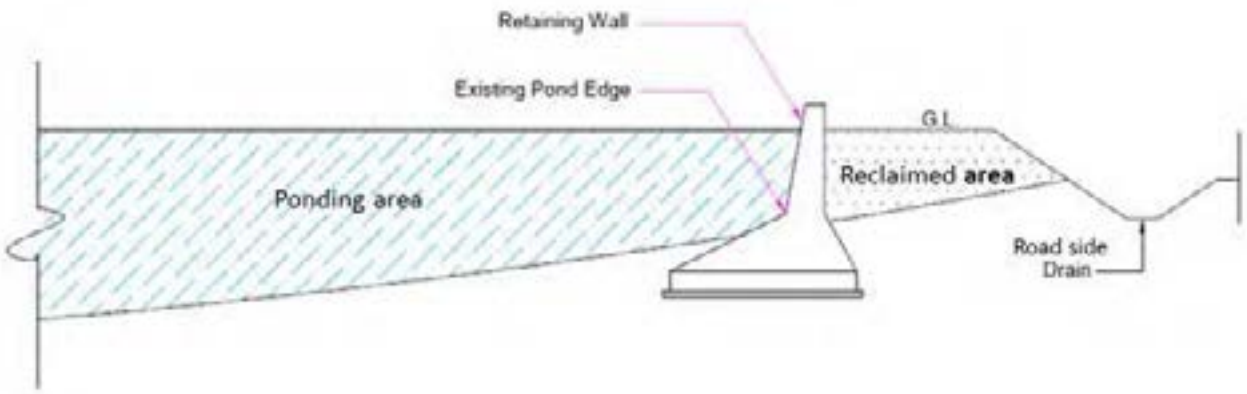
APPENDIX 57A: PROVISION OF RETAINING WALL

MOHANLALGANJ TO MAURAWAN UNNAO MARG

Proposed Locations of Ponds

S. No.	Chainage (km)	Side	Distance from Center line(m)
1	8.300	RHS	8
2	8.600	LHS	8
3	31.200	LHS	8
4	32.900	RHS	7

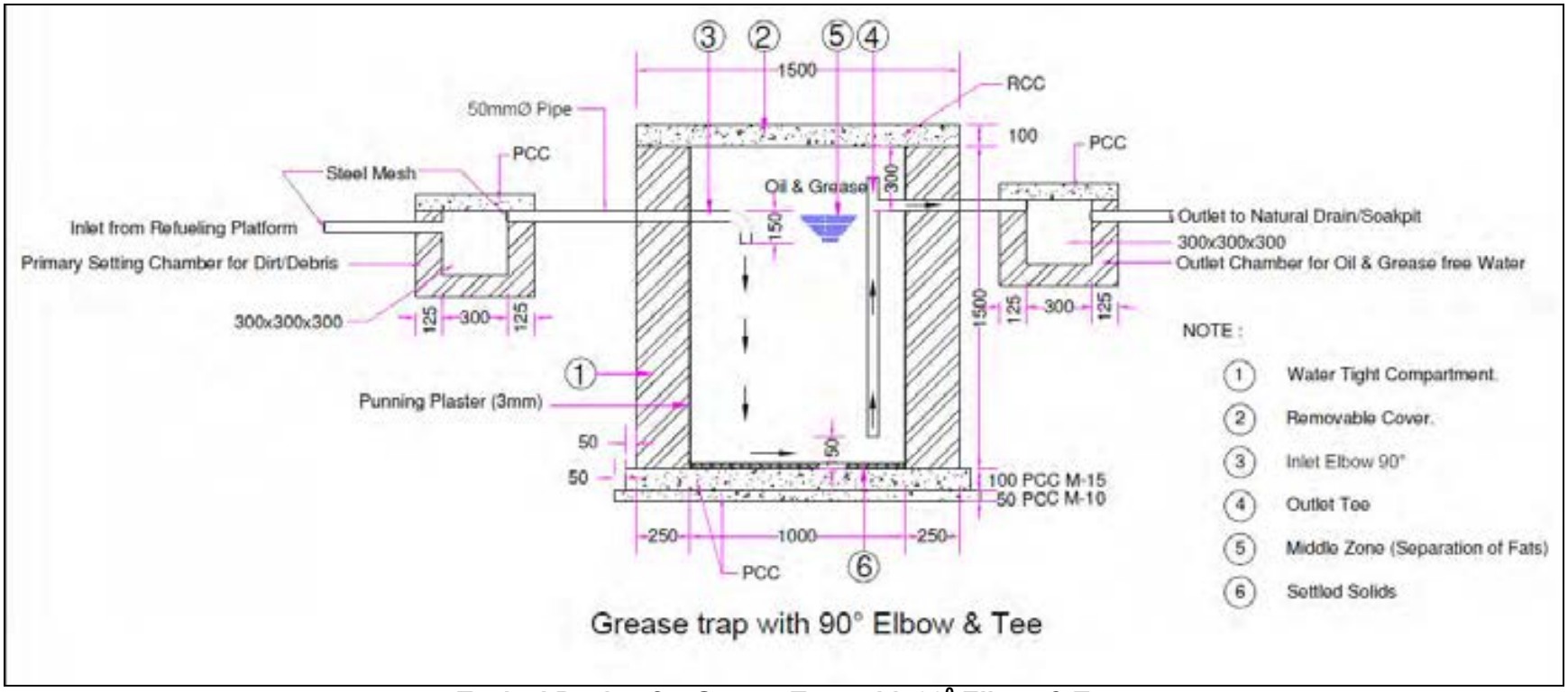
Source: PPTA Consultant



Schematic Diagram for retaining wall

APPENDIX 57A: PROVISION OF OIL INTERCEPTORS IN MOHANLALGANJ TO MAURAWAN UNNAO MARG

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 58A: ENVIRONMENTAL MANAGEMENT PLAN OF ALIGANJ TO SORON MARG (MDR 45W)

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
BB. Design and Pre-construction Stage								
55. Alignment								
1.1 Pavement damage and inadequate drainage provisions in habitat areas	▪ Soaked CBR value of sub grade is recommended to be 12 %. ▪ Overloading to be checked ▪ Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused ▪ Provision of adequate no. of cross drainage structures. ▪ Increase (vent and height) in waterway of existing structures. ▪ Roadside drains have been proposed with suitable outfalls.	Design requirement	Entire stretch Embankment raised at 25 locations for a length of 10.052 km Roadside drains (both sides together) Lined=20.104 km Unlined= 50.906 km	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	PPTA / UPPWD
1.2 Safety along the proposed alignment	▪ Rumble strips in habitat areas, schools, junction and curves to regulate speed. ▪ Provision of retro-reflective warning sign boards near school, hospital, religious places and forests ▪ Provision of sidewalks in the built-up sections, on both sides. ▪ Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc.	Design requirement IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	Throughout the Stretch Footpath cum drain for a length of 10.052 km	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultants and PPTA consultants	Design Consultant	UPPWD
	▪ Pedestrian crosswalks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation. ▪ Safety kerb at all bridge s ▪ Horizontal and vertical geometry as per IRC Specification ▪ Zebra crossing with informatory warning sign. On approach to school, warning sign with footways and speed limit sign ▪ Street Lighting in built-up sections							
56. Natural Hazards								
2.1 Flooding/Water-Logging	▪ Provision of adequate number of CD structures. Additional culverts have been proposed. ▪ All CD structures designed for 50 years HFL return period and bridges designed for 100 years HFL return period ▪ Water ways of bridges and culverts have been increased. All pipe Culverts shall be reconstructed with 1200mm dia pipe. ▪ 1m wide Rectangular Covered Drains shall be Constructed in Built Up Area and 1.8m Wide Unlined Drains shall be Constructed in Rural Areas. ▪ Embankment height shall be raised and Profile of the road shall be increased in built up areas. ▪ Improvement in existing culverts/ Bridges	IRC: 75 and MORT&H guidelines for Design of High Embankments. IRC Guidelines for Rigid Pavements	Entire stretch. Embankment raised at 25 locations for a length of 10.052 km Roadside drains (both sides together) Lined=20.104 km Unlined= 50.906 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Engineering Cost	DPR Consultant	PPTA /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	shall be carried out to increase their carrying capacity.							
57. Loss of Land and Assets								
3.1 livelihood loss to affected persons	▪ Road improvement work to be accommodated within available ROW to the extent possible. ▪ Social Impact Assessment and Resettlement Plan to be undertaken as per National Policy and ADB's SPS 2009. • Complete all necessary land and property acquisition procedures prior to the commencement of civil work. ▪ Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. ▪ Compensation and assistance as per project Resettlement Plan ▪ Income restoration as per RP ▪ Preference in employment and petty contracts during construction to APs ▪ Constitute GRC as per RP	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013. and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator or court.	Check LA records; design drawings vs land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	UPPWD and implementing NGO	UPPWD
58. Cutting of Trees								
4.1 Tree Cutting	▪ Obtain Tree cutting permission from forest department Prior to Start of Work ▪ Payment of Statuary Charges to CAMPA Fund which includes cost of Compensatory Afforestation etc. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Provision for additional compensatory plantation in the ratio of 1: 2 through Contractor	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=6377 Additional Plantation of 12754 trees near sensitive receptors, river banks, borrow areas	MI: Budget amount allocated for additional plantation and Compensatory afforestation PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate,	Check budget provision for compensatory afforestation and additional plantation.	Environment Cost	Design consultants , UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change	UPPWD ,Forest department/ Ministry of Environment and Forest and Climate Change
59. Shifting of Utilities								
5.1 Disruption of utility services to local community	▪ All telephone and electrical poles/wires and underground cables should be shifted before start of construction ▪ Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services ▪ Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any ▪ Shifting of Hand Pumps	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Engineering Cost	UPPWD /utility company	CSC / UPPWD
60. Other Pre-construction Activities								
6.1 Prevention and Pollution Control	6.1 The Contractor shall develop Comprehensive Environment Management Plan(CEMP) in line with National laws and Policies, World Bank EHS Guidelines, National and International best Practices and more stringent of all referred shall form part of CEMP except Air Quality Standards prior to Start of Work and get it	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas.	MI: Compliance of Provisions of CEMP., No. of Complaints from local people, Notices from Authorities, PT: Zero deviation from Provision of	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent	Environment Cost	Contractor	CSC /UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	approved from CSC which shall also include Pollution Prevention Control , Use of PPE, Management of land fill sites opened by Contractor, which may include Consent of Community, Peripheral Fencing of Site along with lightening arrangement, Disposal and Use of Construction related Waste etc.			CEMP. No complaint from local Prople and Notice from Authorities.	Compliance Report of CEMP by CSC Interaction with local People			
6.2 Environment Health Safety Policy (EHS)	The Contractor shall develop EHS Policy for the Project which shall be approved by CSC.	National Laws / Policies, Best National I.nternational Practices, World Bank EHS Guidelines	Project Corridor and other allied areas	MI: Compliance of Provision of EHS On site and OFF Site Accidents PT: 100___% compliance of EHS Policy. Zero Accidents	Third Party EHS Audit Self Monthly Audit Report of Contractor. Independent Compliance Report of CEMP by CSC Interaction with local People	Environment Cost	Contractor	CSC/UPPWD
6.3 Crushers, hot mix plants and Batching Plants Location	▪ Hot mix plants and batching plants will be sited at least 1000 m away from settlements, agricultural operations or any commercial establishments preferably in the downwind direction in lines with UPPCB Siting Guidelines. ▪ The Contractor shall submit a detailed lay-out plan for all such sites and get it approved by the Engineer on advice of Environmental Expert of CSC prior to their establishment. ▪ Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and required Consent/NOC to be obtained before initiation of plant's establishment /operation	UPPCB Guidelines	Hot Mix Plants, Batching Plants	MT: Compliance of Requirement of UPPCB Guidelines PT: Consent is available with contractor before establishment and Operation	Checking Compliance of Consents issued from the UPPCB	Incidental to work	Contractor	CSC / UPPWD
6.4 Borrow Areas	▪ Borrow areas finalized by the contractor shall be approved by the Engineer on advice of Environmental Expert of CSC ▪ Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents from Dept. of Mines, U.P ▪ Borrow areas shall be opened in Agricultural land if inevitable , In all such cases Top Soil Shall be stripped to a depth of 150cm and reused wherever reqd. like on slopes of High Embankments where grassing shall be done ▪ The contractor will not start borrowing of earth until the formal agreement is signed between land owner and Contractor, Permission from SEIAA and Department of mines ▪ Also obtain EC from SEIAA before opening any new borrow area and comply the conditions of same. ▪ Comply to EC conditions	MoRT&H Specifications. Conditions of Agreement with the owner and Contractor Conditions Stipulated in EC issued by SEIAA UP Conditions Stipulated by the Department of Mines while giving permission Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	All Borrow Area locations	MT: Compliance of Conditions of Environment Clearance, Agreement between Owner of land and Contractor and Department of Mines. PT: 100% Compliances of Conditions including Payment of Royalty,	Checking Compliance of Conditions	Engineering Cost	Contractor	CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Planning of haul roads for accessing borrow materials shall be undertaken during this stage ▪ The haul roads shall be routed to avoid agricultural areas as far as possible and approved by Engineer on advice of Environmental Expert of CSC							
6.5 Quarry	▪ The Contractor shall identify the new quarries or among the quarries identified by the DPR Consultant for procurement of material, Collect the copies of Consents / NoC's and Submit them to the Engineer for approval. ▪ Only those quarries shall be approved by the Engineer which has got all applicable Permits with them.	Applicable Environment Laws including EIA Notifications 2006 and Subsequent A As directed by the Engineer	Quarries Approved by the Engineer	MI: Existence of licenses for all quarry areas from which materials are being sourced PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit				
6.6 Arrangement of Temporary Land for Construction Camp/Labor Camps Locations-Selection, Design and Lay-out	▪ Contractor shall identify the Temporary land Sites for Construction / Labor Camp on Non Agricultural Land, if inevitable than only Agricultural land shall be identified away from settlements to avoid Conflict with local people. ▪ In case of Agricultural Land is approved, top soil to the depth of 150 cm shall be stripped and Stored for restoration of Sites. ▪ The Finalized identied sites shall be approved by the Engineer. After approval of Sites, Contractor shall get approved the draft agreement to be executed with the owner of the Site in line with prevailing laws by the Engineer and Submit the copy of agreement to CSC. ▪ Contractor shall prepare a lay out plan for Construction / Labor Camp and get it approved by the Engineer.	Prevalent Laws of Land	Identified Sites	MI: Compliance of Existing Prevalent Laws PT: No Violation of Law has taken place	Checking Compliance	Incidental to Work	Contractor	CSC /UPPWD
6.7 Orientation of Implementing Agency and Contractors	▪ The CSC shall organize orientation and training sessions before start of construction of the project which shall involve PWD Engineers at HQ and Project Road Execution level, Engineers of CSC and designated Engineers of Contractor	Environment Safeguards	Project HQ	MI: Compliance of Orientation Schedule given in IEE. PT: 100%, Attendance	Checking Compliance with IEE	Environment Cost	CSC	PWD HQ
CC. Construction Stage								
77. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	▪ Transport, loading and unloading of loose and fine materials through covered vehicles. ▪ Paved approach roads. ▪ Storage areas to be located downwind of the habitation area. ▪ Water spraying on earthworks, unpaved haulage roads and encapsulation of dust prone areas by erection of screen/barriers. ▪ Provision of PPEs to workers. ▪ The unloading of materials at construction sites in /close to settlements will be restricted	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust PT: PM10 level< 100 ug/m^3Number of complaints should be 0.	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Includedin civil works cost	Contractor	CSC/ UP PWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	to daytime only							
1.2 Emission of air pollutants(HC,SO_2,NO_X,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	▪ Regular maintenance of machinery and equipment. ▪ Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement. ▪ Only crushers licensed by the PCB shall be used ▪ Hot mix plant will be fitted with dust extraction units ▪ DG sets with stacks of adequate height and use of low sulphur diesel as fuel. ▪ LPG should be used as fuel source in construction camps instead of wood ▪ Ambient air quality monitoring as per EMoP ▪ PUC Certificates for all vehicles/ equipment/ machinery used for the project will be submitted to Engineer ▪ Contractor to prepare traffic management and dust suppression plan duly approved by Engineer	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m^3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Included in civil works cost	Contractor	CSC/UPPWD
78. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	▪ All plants and equipment used in construction shall strictly conform to the CPCB noise standards ▪ All equipment tobe timely serviced and properly maintained. ▪ Construction equipment and machinery to be fitted with silencers and maintained properly. ▪ Only IS approved equipment shall be used for construction activities. ▪ Timing of noisy construction activities shall be done during daytime and weekends near schools ▪ Implement noisy operations intermittently to reduce the total noise generated ▪ Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. ▪ Restrict noisy construction activities near sensitive receptors. ▪ Provision of noise barriers to the suggested locations of select schools/ health centers ▪ Honking restrictions near sensitive areas ▪ PPEs to workers ▪ Noise monitoring as per EMoP	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations. Noise barrier proposed to sensitive locations **as enclosed**	MI: day and night Noise levels. Number of complaints from local people PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	CSC/UPPWD
79. Land and Soil								
3.1 Land use Change and Loss of productive/topsoil	▪ Non-agricultural areas to be used as borrow areas to the extent possible. ▪ If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation	Project requirement	Throughout the project section and borrow areas Land identified for	MI: Borrow pit locations Top soil storage area	Review borrow area plan, site visits	Included in civil works cost	Contractor	CSC/ UPPWD

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	to protect soil erosion. ▪ Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use		camp, storage areas etc.	PT: Zero complaints or disputes registered against contractor by land owner				
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	▪ Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees. ▪ Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. ▪ The earth stockpiles to be provided with gentle slopes to prevent soil erosion.	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Included in civil works cost	Design consultant and Contractor,	CSC/ UPPWD
3.3 Borrow area management	▪ Depths of borrow pits to be regulated and sides not steeper than 25%. ▪ Topsoil to be stockpiled and protected for use at the rehabilitation stage. ▪ Transportation of earth materials through covered vehicles. ▪ Follow IRC recommended practice for borrow pits (IRC 10: 1961) and Clause 305.2.2.2 of MORTH specifications for identification of location, its operation and rehabilitation ▪ Borrow pits along the road shall be discouraged ▪ Borrow areas not to be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m ▪ Small drains shall be cut through the ridges to facilitate drainage ▪ To the extent borrow areas shall be sited away from habitated areas. Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with Community or landowner.	IRC Guidelines on borrow areas and for quarries(Environmental protection Act and Rules,1986; Water Act, Air Act)+ Clause 305.2.2.2 of Section 300 of MORTH Earthwork, Erosion Control and Drainage Guidelines	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people. PT: No case of non-compliance to conditions stipulated by SEIAA/ Dept. of Mines in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations Compare site conditions with EC conditions by SEIAA/ Conditions of Dept. of Mines	Included in civil works cost	Contractor	CSC/UPPWD
3.4 Quarry Operations	▪ In case New Quarry is proposed to be opened then all approvals shall be taken by the Contractor, prior to start of work. ▪ The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the same for approval to the Engineer. ▪ The quarry operations will be undertaken within the rules and regulations in force	ClauseNo.111.3MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses Existence of a quarry redevelopment plan PT: Quarry license is valid.: No case of non-compliance to consent /permit conditions and air quality meets the prescribed limit	Checking Compliances of Conditions.	Included in civil works cost	Contractor	UPPWD/CSC
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	▪ Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. ▪ Approach roads/haulage roads shall be designed along the barren and hard soil area	Design requirement	Agricultural fields along the road, Parking areas, Haulage roads and construction yards.	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or	Site observation	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	to reduce the compaction. ▪ Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. ▪ Land taken for construction camp and other temporary facility shall be restored to its original conditions			land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land				
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	▪ Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. ▪ Fuel storage and refueling sites to be kept away from drainage channels. ▪ ▪ Unusable debris shall be dumped in ditches and low lying areas. ▪ To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. ▪ Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors ▪ Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. ▪ Bituminous wastes will be disposed off in an identified landfill site approved by the State Pollution Control Board	Design requirement	Fuelling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	UPPWD/CSC
80. Water Resources								
4.1 Sourcing of water during Construction	▪ The contractor will submit a list of source/s from where water will be used during entire construction period and get it approved by Engineer on advice of Environmental Expert of CSC ▪ The Contractor will source the requirement of water preferably from ground water but requisite permission shall be obtained for abstraction of it from Central Ground Water Authority. ▪ Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. ▪ Water intensive activities not to be undertaken during summer season. ▪ Provision of water harvesting structure to augment groundwater condition in the area	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from local people.	Checking of Permissions Talk to local people	Included in civil works cost	Contractor	UPPWD/CSC
4.2 loss of water bodies/water sources	▪ Wherever digging is undertaken, the banks of water bodies will be protected by means of berms etc. as designed or as approved by the Engineer. ▪ Any wells, ponds, and tube wells incidentally lost will be replaced immediately. The location and siting of the replaced source will be as such, as directed by the Engineer. ▪ Execution of enhancement measures at	As Directed by Engineer	Throughout the Project Corridor Enhancement measures proposed at locations as **enclosed**	MI: Replacement of Hand Pumps/tube wells, Restoration of Capacity of Pond PT:100% Replacement, 100% Capacity Restoration	Checking the documents, Site locations, Checking with Local People	Utility Shifting Cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	identified water sources will be as per specific drawing as approved by the Engineer in consultation with Environmental Expert of CSC ▪ Capacity of Ponds shall be maintained by either increasing the depth of pond or increasing the area that will be reclaimed.							
4.2 Disposal of water during construction	▪ Provisions shall be made to connect roadside drains with existing nearby natural drains. ▪ The contactor will take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system ▪ Construction works will be avoided close to the streams or water bodies during monsoon ▪ All waste water is to be disposed of in the manner that is acceptable to the State Pollution Control Board in environment Friendly manner. ▪ The Environmental Expert of CSC will certify that all liquid wastes disposed of from the sites meet the discharge standards	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridge works The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	Throughout the Project Corridor	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area. PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	UPPWD/CSC
4.3 Alteration in surface water hydrology	▪ Existing drainage system to be maintained and further enhanced. ▪ Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. Road level shall be raised above HFL level wherever road level is lesser than HFL. ▪ Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be brought back to its original course immediately after construction.	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridge	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents Site observation	Included in civil works cost	Contractor	UPPWD/CSC
4.4 Siltation in water bodies due to construction activities/earthwork	▪ Embankmentslopes to be modified suitably to restrict the soil debris entering water bodies. ▪ Provision of Silt fencing and intercepting ditch along with sedimentation pit depending on site-specific conditions shall be made at water bodies. ▪ Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. ▪ Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. ▪ Retaining walls at water bodies /ponds to avoid siltation near ponds	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks Worldwidebest practices	Near all water bodies/ waterway	MI: Presence/absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation Checking of Water Quality Monitoring Results	Included in civil works cost and Environment Cost	Contractor	UPPWD /CSC
4.5Deterioration in Surface / Ground water quality due to leakage from vehicles	▪ No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and	The Water (Prevention and Control of Pollution) Act, 1974and amendments thereof.	Water bodies, refueling stations, construction camps	MI: Water quality of ponds, streams, rivers and other water	Conduction of water quality tests as per the	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
and equipments and waste from construction camps.	lubricants. ▪ The storage area and refueling stations shall be roofed and rainwater drained separately. The area will shall have impermeable be paved floor that shall and drainedbe drained separately to a storage chamber with atleast 10% more volumetric capacity than expected volume of runoff. The storage chamber shall be connected to anoil/grease interceptor prior to final disposal. ▪ All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. ▪ All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors ▪ Construction camp to be sited away from water bodies. ▪ Wastes must be collected, stored and taken to approve disposal site only. ▪ No Storage or refueling activity will take place within 25 m of Hand Pump being used for drinking Purpose ▪ Water quality shall be monitored as per EMoP ▪ Plantation of shrubs or marginal vegetation along thebank of ponds shall be done to trap any sediment entering the pond so as to help improve water quality in long term subject to availability of space ▪ It shall also be ensured that mosquitoes do not breed, by encouraging fish breeding and managing depth and slope so thatatleast more than 1 feet of depth is maintainedalong the margins. More importantly, regular cleaning of weeds, grasses and debris shall be done from along the margins of the ponds so that mosquito larvae does not get a shelter or protection		as per detail **enclosed**	bodies in project Presence of oil floating in water bodies in project area PT: Surface water quality meets freshwater quality standards prescribed by CPCB	monitoring plan Field observation			
81. Flora and Fauna								
5.1 Vegetation loss due to site preparation and construction activities and	▪ Restrict tree cutting upto toe line considering safety to road users. ▪ Roadside trees to be removed with prior approval of competent authority. ▪ Mandatory compensatory plantation at 1:3 basis to be done by Forestry Department ▪ Additional compensatory plantation 1:2 as per the IRC guidelines to be carried out by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to be given to women ▪ Additional plantation near sensitive receptors, river banks to minimize noise & air pollution, and to check erosion. ▪ Regular maintenance of all trees planted.	Forest Conservation Act 1980 + IRCSP:21and IRCSP:66	Throughout project corridor Estimated No. of affected trees=6377 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted. PT: Survival Rates of Trees to be 90% or in accordance with Dept. of Forest Guidelines	Review of relevant documents – tree cutting permit, Additional compensatory plantation Audit Reports Field observations	Environment Cost	Forest Department / Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Provision of LPG in construction camp as fuel source to avoid tree cutting. ▪ Plantation of trees on both sides of the road where technically feasible. ▪ Controlled use of pesticides/ fertilizers							
5.2 Damage of Flora & Fauna	▪ The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna including fishing in any water body and hunting of any animal ▪ ▪ If any wild animal is found near the construction site the Contractor will immediately inform the Engineer and on advice of Environmental expert of CSC will report to the nearby forest office ▪ The construction work will be so timed to avoid the breeding season of faunal habitat found near the project road ▪ Regular Sprinkling of water to be carried out to suppress dust generation to avoid deposition of dust on leaves of Plants	As Directed by Engineer	Along the Project Corridor	MI: No damage to Flora and Fauna PI: No Complaints received	Checking the records of Contractor Site observations Discussions with locals	No Cost Involved	Contractor	UPPWD/CSC
82. Construction/Labor Camps								
6.1 Impact associated with location	▪ All camps should be established with approval of Engineer. Camps should be sited at least 500m away from habitations, Forests, water bodies, important roads.	Design Requirement The Water(Prevention and Control of Pollution)Act,1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is not less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost		UPPWD/CSC
6.2 Worker'sHealth in construction camp	▪ The contractor shall have its Health, Safety and Environment (SHE) Policy and guidelines and get it approved by CSC ▪ The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by Engineer. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner. ▪ Adequate potable water and sanitary latrines with septic tanks with soak pits shall be provided. ▪ Preventive medical care facilities in camp. ▪ Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. ▪ The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. ▪ No alcoholic liquor or prohibited drugs will be	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act,1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Review of Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	imported to, sell, give and barter to the workers of host community. ▪ Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.							
83. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	▪ Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies ▪ Dumping sites must be having adequate capacity equal to the amount of debris generated. ▪ Public perception and consent from the village Panchayats has to be obtained before finalizing the location. ▪ The dumping Sites Finalized by the Contractor shall be approved by the Engineer	Design Requirement and MORT&H guidelines	At all Dumping Sites	MI: Location of dumping sites Number of public complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor	UPPWD/CSC
7.2 Reuse and disposal of construction and dismantled waste	▪ The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. ▪ All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ▪ Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. ▪ Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site ▪ .	MORT&H guidelines	Throughout the project corridor	MI: Percentage of reuse of existing surface material Method and location of disposal site of construction debris PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records Field observation Interaction with local people Contractor records	Included in civil works cost.	Contractor	UPPWD/CSC
84. Traffic Management and Safety								
8.1 Management of existing traffic and safety	▪ Temporary traffic diversion shall be planned by the contractor and approved by the 'Engineer'. ▪ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP 55 document'. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed.	Design requirement and IRC: SP: 27 -1984,Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) IRC:SP: 44 -1994 Highway Safety Code IRC: SP: 55 -2001Guidelines for Safety in Construction Zones The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948	Throughout the project corridor especially at intersections.	MI: Traffic management plan. Presence/ absence of safety signs, clear traffic demarcations, flag men etc. on site. Complaints from road users. Number of traffic accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations	Review traffic management plan Field observation of traffic management and safety system Interaction with people in vehicles using the road	Included in civil works cost.	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Restriction of construction activity to only one side of the existing road. ▪ The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". ▪ ▪ Use of adequate signages to ensure traffic management and safety. Conduct of regular safety audition safety measures.			on site				
8.2 Pedestrians, animal movement	▪ Temporary access and diversion, with proper drainage facilities. ▪ Access to the schools, temples and other public places must be maintained when construction takes place near them. ▪ Fencing wherever cattle movement is expected. ▪ Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals ▪ The Contractor shall depute patrols at crossings of School Sites to facilitate the Movement of School Children	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people PT: Easy access to schools, temples and public places. Zero complaints	Field observation Interaction with local people	Included in civil works cost.	Contractor	CSC /UPPWD
8.3 Safety of Workers and accident risk from construction activities	▪ Provision of PPEs to workers in line with World Banks EHS guidelines. ▪ Contractors to adopt and maintain safe working practices. ▪ Usage of fluorescent and retro reflectory signage, in local language at the construction sites ▪ Training to workers on safety procedures and precautions. ▪ Mandatory appointment of safety officer. ▪ The contractor will take all required precautions to prevent danger from electrical equipment ▪ All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. ▪ Provision of a readily available first aid unit including an adequate supply of dressing materials. ▪ The contractor will not employ any person below the age of 18 years ▪ Use of hazardous material should be minimized and/or restricted. ▪ Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or ▪ Accident Prevention Officer must be appointed by the contractor.	National Policies / Acts, World Banks EHS guidelines, Best National and International Practices.	Construction sites	MI: Availability of Safety gears to workers Safety signage Training records on safety Number of safety related accidents PT: Zero fatal accidents. Zero or minor non-fatal accidents.	Site observation Review records on safety training and accidents Safety Audits Interact with construction workers	Included in civil works cost	Contractor	CSC/ UPPWD
8.4 Accident risk to local community	▪ Restrict access to construction sites only to authorized personnel. ▪ Physical separation must be provided for movement of vehicular and human traffic.	Same as above	Construction sites	MI: Safety signs and their location Incidents of accidents	Site inspection Consultation with local people	Included in civil works cost	Contractor	UPPWD/CSC

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ Adequate informatory/safety signs, hoardings written in English and local language must be provided for safe traffic movement ▪ Provision of temporary diversions and awareness to locals before opening new construction fronts.			Complaints from local people PT: Zero incident of accidents. Zero complaints.				
Site restoration and rehabilitation before Contractor's Demobilization								
9.1 Clean-up Operations, Restoration and Rehabilitation	▪ Contractor will prepare site restoration plans, which will be approved by the 'Engineer'. ▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Engineer and handed over to the owner ▪ All the opened borrow areas will be rehabilitated and 'Engineer' will certify	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp sites, construction sites and borrow areas. Presence/absence of construction material/debris after completion of construction works on construction site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation Interaction with locals Issue completion certificate after restoration of all sites are found satisfactory	Included in civil works cost.	Contractor	UPPWD /CSC
. Operation and Maintenance stage								
1. Air Quality								
1.1 Air pollution due to vehicular movement	▪ Roadside tree plantations shall be maintained. ▪ Regular maintenance of the road will be done to ensure good surface condition ▪ Ambient air quality monitoring to be carried out as per EMoP. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. ▪ Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption. ▪ Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981 Environment Monitoring Plan	Throughout the Corridor	MI: Ambient air quality (PM10,PM2.5 CO,SO2 NO2) PT: Levels are within the permissible limits or at least equal to or below baseline levels given in the IEE report	Review of Audit Report of Tree Plantation. Review of Ambient Air Quality Monitoring Results. Visual Observation Consultation with Local People	Included in Environment Monitoring Cost	UPPWD	
2. Noise								
2.1 Noise due to movement of traffic	▪ Effective traffic management and good riding conditions shall be maintained ▪ Speed limitation to 20 km/hour and honking restrictions near sensitive receptors ▪ Construction of noise barriers near sensitive receptors with consent of local community ▪ The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed. ▪ Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while	Noise Pollution(Regulation and Control)Rules,2000andamendments thereof	Sensitive receptors as identified in IEE lo cations.	MI: Noise levels PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Environment Monitoring Cost	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	constructing a building near road.							
56. Land and Soil								
3.1 Soil erosion at embankment during heavy rainfall.	▪ Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. ▪ Necessary measures to be followed wherever there are failures	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	On site observation	Included in Operation/ Maintenancecost	UPPWD	
57. Water resources/Flooding and Inundation								
4.1 Siltation	▪ Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	Included in Operation/Maintenance cost	UPPWD	
4.2 Water logging due to blockage of drains, culverts or streams	▪ Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams. ▪ Monitoring of water borne diseases due to stagnant water bodies	Project requirement	Near surface Water bodies	MI: Presence/ absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation Consultation with local People	Included in Operation/Maintenance cost	UPPWD	
58. Flora								
5.1 Vegetation	▪ Planted trees, shrubs, and grasses to be properly maintained. ▪ The tree survival audit to be conducted at least once in a year to assess the effectiveness	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 90% tree survival or Guidelines of Forest Dept.	Records and field observations. Information from Forestry Department	Operation/ Maintenance Cost	UPPWD	
59. Maintenance of Right of Way and Safety								
6.1 Accident Risk due to uncontrolled growth of vegetation	▪ Efforts shall be made to make shoulder completely clear of vegetation. ▪ Regular maintenance of plantation along the roadside ▪ No invasive plantation near the road.	Project requirement	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/ Maintenancecost	UPPWD	
6.2 Accident risks associated with traffic movement.	▪ Traffic control measures, including speed limits, will be enforced strictly through Traffic Police. ▪ Further encroachment of squatters within the ROW will be prevented. ▪ No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law ▪ Ascertain all safety provisions provided are sufficient and if not then remedial action to be immediately taken.	IRC:SP:55 Central Motor Vehicles Rules, 1989 and amendments thereof	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records Site observations Consultation with Communities	Included in operation/Maintenance cost	UPPWD	
6.3.Transport of Dangerous Goods	▪ Existence of spill prevention and control and emergency responsive system ▪ Emergency plan for vehicles carrying hazardous material	Hazardous Waste (Management & handling) Rules, 1989	Throughout the project stretch	MI: Status of emergency system – whether operational or not	Review of spill prevention and emergency response plan	Included in operation/Maintenance cost.	UPPWD	

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	▪ All vehicles carrying hazardous substance shall display prominently what they are carrying in accordance with Hazardous Waste (Management & handling) Rules, 1989			PT: Fully functional emergency system	Spill accident records			

EA: Executing Agency-UPPWD,EO: Environmental Officer, IRC: Indian Road Congress, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, UPPCB: Uttar Pradesh Pollution Control Board

APPENDIX 58B: ENVIRONMENT MONITORING PROGRAMME (ALIGANJ - SORON)

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
Air Quality	Construction stage	As specified by SPCB in Consent $PM_{10}PM_{2.5}$	High volume sampler to be located 50 m from the selected locations in the downwind direction. Methods Specified by CPCB	Hotmix Plant (1No), Batching Plant (1 No), Construction Camp (1No) as part of I renewal of consent to operate. Active construction fronts where habitation are located including sensitive receptors. (4 Mixed Land Use Major Location , 10 sensitive receptors)	HMP, BP, and Camp based on SPCB standards. Along habitation, PM10 and PM2.5 at least monthly during peak summer months and max. three times monthly at each location when road front is not yet paved.	Ambient Air quality standard by CPCB	HMP, BP, and Camp site monitoring part of permit application cost. Active construction front: 14x3x 3000 = INR 126,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			Along the road where monitoring was carried out during Construction phase truly representative of the area (3 Locations)	24 hr continuous, Quarterly in a year excluding monsoon for a period of one year		3x3000x3x1 = INR 27,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Water Quality	Construction stage	Parameters specified in Drinking Water Standards 100500 : 2012 for Ground water: (and Water Quality Criteria forSurface Water of CpCB	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camp.	Groundwater: Quarterly excluding monsoon	Specified in Drinking Water Standards : 2012 for Ground water:	1x 5000x 3 x 2 = INR 30,000.00	Contractor through approved monitoring agency	UPPWD /CSC
	Operation stage			1 location along the road	Grab Sample	In operation period Once in the last of first Operation Year	1X5000 x1 = INR 5,000	UPPWD, Division through approved monitoring agency	UPPWD HQ
Noise levels	Construction stage	Leq(day), Leq(Night) Equivalent Instant Noise levels in dB (A) for Construction Equipment	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968Using Noise level meter	Hot mix Plant (1No), Batching Plant (1 No), Construction Camp (1No), Construction equipment (2 Nos) Active construction fronts where habitation are located including sensitive receptors.(4 mixed land use major locations, 10 sensitive receptors)	24 hr continuous quarterly for two years except monsoon. (Thrice a Year) Instant Noise Levels for Construction Equipment. Once in Quarter. Bi-weekly on sensitive receptors/ construction fronts for period of three months.	THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000, Construction Equipment as specified in Part 'E',Schedule-VI of Environment(Protection)Rules, 1986	5x3x2x1000 = INR 30,000.00 14x 2 x12 x 1000= INR 336000.00	Contractor through approved monitoring agency	UPPWD/CSC
	Operation stage			At three locations along the road truly representative of area where monitoring was carried out during construction phase. (3 Locations)	24 hr continuous quarterly for one year except monsoon. (Thrice a Year		3x3000x3X1 = INR 27000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Quality	Construction Stage	Oil and grease and Heavy Metals Compaction of agricultural land and access roads	Standard Methods Visual	Construction Camp, Dumping and HMP sites, 2 locations in agricultural field adjacent to Road.	Grab Sample Six Monthly	ICAR standards	5x5000x2x2= INR 100,000.00	Contractor through approved monitoring agency	CSC
	Operation stage			2 locations adjacent to Road	Once at the end of First Year of Operation		2x5000x1= INR 10,000.00	UPPWD, Division through approved monitoring agency	UPPWD HQ
Soil Erosion	Construction Stage	Turbidity in Storm water	Visual Checks	Through the Project Corridor especially at River banks, bridge locations and river training structures All ponds within 20 m of ROW of project road.	Monthly	Visual Checks	Included in Engineering Cost	Contractor	CSC
	Operation Stage	Silt load in ponds Loose Soil in High Embankments and			Quarterly	Visual Checks	Routine Engineering Work	UPPWD, Division	

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Approximate cost (INR)	Implementation	Supervision
		Earthen spaces in ROW		High Embankment along the road. All Streams crossing the Project Road					
Drainage Cross Drainage and Lateral Drains	Construction stage	Cleaning of lateral Drains and Streams / Nallah's crossing the road	Visual Checks As directed by the Engineer	Throughout the Project Corridor Major Bridge, Minor Bridges 'Culverts and lateral drains Lateral Drains especially in Built up areas	Monthly		Incidental to Work	Contractor'	CSC
	Operation Stage				Once in a year before rainy season		Routine Maintenance	UPPWD	
Borrow Areas	Construction Stage	Specified in EMP, Contract Agreement between owner of land and Contractor Conditions Stipulated by Agency giving clearance pertaining to Opening of Borrow Area Borrow Area Operation Closure and Rehabilitation of Borrow Area	Visual / MoRT&H Guidelines and Guidelines given in EMP. Clauses of Contract Agreement between owner of land and Contractor THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Borrow areas to be opened Borrow areas in operation Closure and Rehabilitation of Borrow area	Once in a month	IRC guidelines + EMP+ Compliance conditions of SEIAA + THE MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2015	Incidental to work	Contractor	CSC
Haul Roads	Construction Stage	Condition of Road	Visual	Earthern roads used for Haulage of Material	Monthly	-	Incidental to work	Contractor	CSC
Construction and Labour Camp	Construction stage	Hygiene Drainage, Septic Tanks, Daily Wages & Hours as per state labour norms, Medical Facilities Etc. Restoration of Temporary Sites	Audit	Construction and Labour Camp	Quarterly during construction period	Guidelines given in EMP Indian & State Labour Norms./ Applicable laws	Part of the regular monitoring	CSC	UPPWD
Dumping Sites	Construction Stage	Given in EMP for Opening , Operation and Closure of Site	As Directed by Engineer	Dumping Site	Monthly	As Directed by Engineer	Incidental to Work	Contractor	CSC
Tree Plantation	Construction Stage	Surveillance monitoring of trees felling Plantation of trees as per approved plan.		Throughout the Project Section	During site clearance in construction phase	Forest Dept. Govt. of UP	Shall be paid to Forest Department at the time of Forest Clearance	Forest Dept. Govt. of UP	
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Guidelines of Forest Department				
Road accident & Worker Accidents	Construction Stage	Type and cause of accidents on Road & Construction sites.	As per IRC Guideline	Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	Construction Phase		Part of the regular monitoring	CSC	UPPWD
	Operation stage	Type and cause of accidents on Road		Throughout the stretch	occurrence of accidents	-	-	UPPWD with support from local police	
Monitoring Costs: INR 0.691 Million (total), 0.622 Million (Construction Phase), 0.069 Million (Operation Phase)									

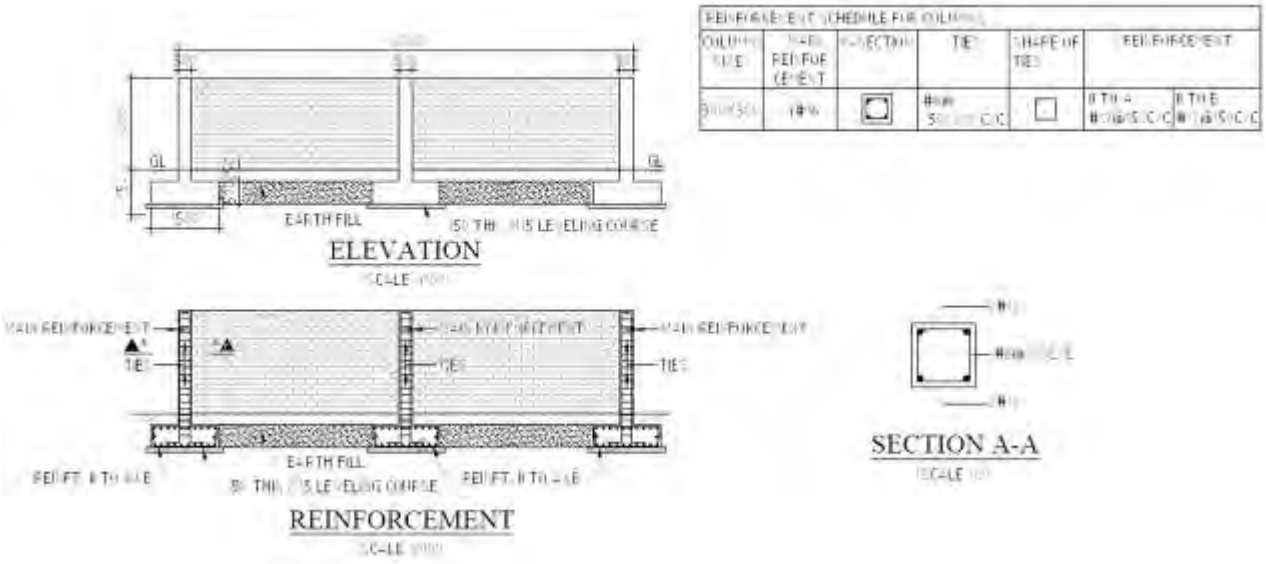
** UPPWD Uttar Pradesh Public Works Department, CSC: Construction Supervision Consultant, Approved Monitoring Agency; Agency Approved by MoEF&CC, UPPCB, Accredited by NABL, ICAR: Indian Council of Agricultural Research, IRC: Indian Road Congress, SEIAA: State Environmental Impact Assessment Authority, CPCB: Central Pollution Control Board, IS: Indian Standard, EMP: Environment Management Plan*

APPENDIX 58A: PROVISION OF NOISE BARRIER IN ALIGANJ-SORON MARG

Proposed Locations

S. No.	Existing Chainage (Km)	Features	Village	Side
1	30+970	School	Alipur Dadar	LHS
2	35+600	School	Ganj dundwara	LHS
3	46+300	Inter College	Sahawar	RHS
4	47+910	School	Sahawar	RHS
5	48+900	Inter College	Sahawar	LHS
6	54+250	School	Yakutganj	RHS
7	59+200	Junior high School	Humaupur	LHS

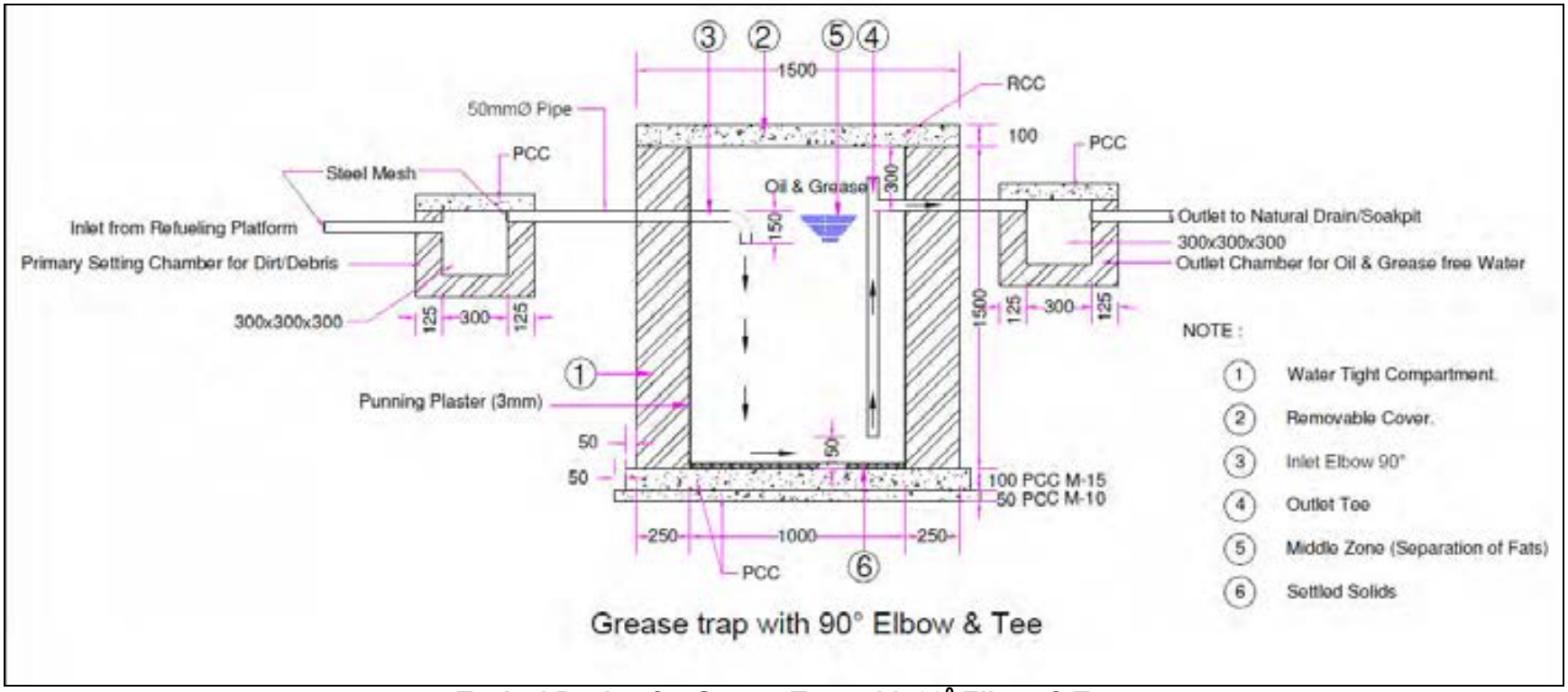
Source: DPR Consultant



Typical Design for Noise barrier

APPENDIX 58A: PROVISION OF OIL INTERCEPTORS IN ALIGANJ-SORON MARG

Proposed Locations - at refueling stations, construction camps, vehicle parking /washing areas/Fuel Storage



Typical Design for Grease Trap with 90^0 Elbow & Tee

APPENDIX 59: NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS), 2009

Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial Areas Residential, Rural & other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO_2) ,µg/m^3	Annual *	50	20	Improved West and Geake Ultraviolet Fluorescence
	24 hours**	80	80	
Nitrogen Dioxide (NO_2) ,µg/m^3	Annual *	40	30	Modified Jacob & Hochheiser (Na-Arsenite) Chemiluminescence
	24 hours**	80	80	
Particulate Matter (size less than 10 µm)or PM10,µg/m^3	Annual *	60	60	Gravimetric TOEM Beta Attenuation
	24 hours**	100	100	
Particulate Matter (size less than 2.5 µm)or PM2.5,µg/m^3	Annual *	40	40	Gravimetric TOEM Beta Attenuation
	24 hours**	60	60	
Ozone (O3) µg/m^3	8 hours **	100	100	UV Photometric Chemical Method Chemiluminescence
	1 hours**	180	180	
Lead (Pb) µg/m^3	Annual *	0.50	0.50	ASS/ICP Method after sampling using EPM 2000 or equivalent filter paper ED-XRF using Teflon filter
	24 hours**	1.0	1.0	
Carbon Monoxide (CO) mg/m^3	8 hours**	2.0	2.0	Non Dispersive Infra Red (NDIR) spectroscopy
	1 hour**	4.0	4.0	
Ammonia (NH_3) µg/m^3	Annual *	100	100	Chemiluminescence Indophenol blue method
	24 hours**	400	400	
Benzene (C_6H_6) µg/m^3	Annual *	5.0	5.0	Gas chromatography based continuous analyzer Adsorption and Desorption followed by GC analysis

Pollutants	Time Weighted Average	Concentration in Ambient Air		
		Industrial Areas Residential, Rural & other Areas	Ecologically Sensitive Area (Notified by Central Government)	Methods of Measurement
Benzo (a) Pyrene (BaP)- particulate phase only ng/m^3	Annual *	1.0	1.0	Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m^3	Annual *	6.0	6.0	ASS/ICP Method after sampling using EPM 2000 or equivalent filter paper
Nickel(Ni), ng/m^3	Annual *	20	20	ASS/ICP Method after sampling using EPM 2000 or equivalent filter paper

Source: Central Pollution Control Board

** Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals*

*** 24 hourly or 8 hourly or 01hourly monitored values, as applicable, shall be complied with 98% of the time in a year, . 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.*

APPENDIX 60: SURFACE WATER QUALITY CRITERIA

Sl. No.	Designated Best Use	Class of Water	Criteria
1	Drinking Water source (with conventional treatment)	A	• Total Coliforms MPN/100 ml shall be 50 or less • pH between 6.5 to 8.5 • Dissolved Oxygen 6 mg / 1 or more • Biological Oxygen demand (BOD) 5 days 200C, 2 mg/1 or less
2	Outdoor bathing (organized)	B	• Total Coliforms MPN/100 ml shall be 500 or less • pH between 6.5 to 8.5 • Dissolved Oxygen 5 mg / 1 or more • Biological Oxygen demand (BOD) 5 days 200C 3 mg/1 or less
3	Drinking Water source (without conventional treatment)	C	• Total Coliforms MPN/100 ml shall be 5000 or less • pH between 6 to 9 • Dissolved Oxygen 4 mg / 1 or more • Biological Oxygen demand (BOD) 5 days 200C 3 mg/1 or less
4	Propagation of Wildlife	D	• pH between 6.5 to 8.5 for fisheries • Dissolved Oxygen 4 mg / 1 or more • Free Ammonia (as N) 1.2 mg/1 or less
5	Irrigation, Industrial Cooling, Controlled Waste	E	• pH between 6.0 to 8.5 • Electrical Conductivity at 250C µmhos/cm Max. 2250 • Sodium absorption ratio Max. 26 • Boron, Max.2 mg/1

Source: Central Pollution Control Board

APPENDIX 61: INDIAN STANDARD DRINKING WATER SPECIFICATION: IS 10500:1991

Sl. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the absence of alternate source	Methods of Test (Ref. To IS)	Remarks
Essential Characteristics						
1	Colour, Hazen Units, Max.	5	Above 5, consumer acceptance decreases	25	3025 (Part 4) 1983	Extended to 25 only if toxic substances, in absence of alternate sources.
2	Odour	Un-objectionable	-	-	3025 (Parts 5):1984	a. Test cold and when heated b. Test at several dilution
3	Taste	Agreeable	-	-	3025 (Part 8):1984	Test to be conducted only after safety has been established.
4	Turbidity NTU, Max.	5	Above 5, consumer acceptance decreases	10	3025 (Part 7):1984	-
5	pH value	6.5 to 8.5	Beyond this range the water will not affect the mucous membrane and/or water supply system	No relaxation	3025 (Part 11):1984	-
6	Total hardness (as $CaCo_3$) MG/1, Max	300	Encrustation in water supply structures an adverse effect on domestic use.	600	3025 (Part 21):1983	-
7	Iron (as Fe) mg/a, Max	0.3	Beyond this limit taste/appearance are affected has adverse on domestic uses and water supply structures and promotes iron bacteria	1	3025 (Part 21):1983	-

Sl. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the absence of alternate source	Methods of Test (Ref. To IS)	Remarks
8	Chlorides (as Cl)mg/1, Max	250	Beyond this limit, taste corrosion and oalatibility are affected	1000	3025 (Part 32) 1988	-
9	Residual, free chloride, mg/1, Min	0.2			3025 (Part 26) 1986	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection infection is required, it should be Min 0.5 mg/1.
Desirable Characteristics						
1	Dissolved solids mg/1, Max	500	Beyond the palatability decreases and may cause gastro intestinal irritation.	2000	3025 (Part 16) 1986	-
2	Calcium (as Ca) mg/1, Max	75	Encrustation in water supply structure and adverse effects on domestic use	200	3025 (Part 40) 1986	-
3	Magnesium (a Mg) mg/1, Max	30	Encrustation to water supply structures and adverse effects on domestic use.	1.5	16, 33, 34 of IS 3025: 1964	-
4	Copper (as Cu) mg/1 Max	0.05	Beyond taste, discoloration and corrosion of pipes, fitting and utensils will be caused beyond this.	0.3	35 of 3025: 1964	-

Sl. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the absence of alternate source	Methods of Test (Ref. To IS)	Remarks
5	Manganese (as Mn) mg.1, Max		Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures.	0.3	35 of 3025 1964	-
6	Sulphate (as 200 So_2), mg/1, Max	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present.	400	3025 (part 24) 1986	May be extended up to 400 provided (as Mg) does not exceed 30.
7	Nitrate (as No_2) mg/a, Max	45	Beyond this methamoglobunemia takes place.	100	3025 (part 34) 1988	To be tested when pollution is suspected
8	Fluoride (as F) mg/1, Max	1	Fluride may be kept as low as possible. High fluoride may cause fluorosis.	1.5	23 of 3025 1964	To be tested when pollution is suspected
9	Phenolic compounds (as C_6H_5OH) mg/1, Max	0.001	Beyond this it may cause objectionable taste and odour	0.002	54 of 3025 1964	To be tested when pollution is suspected
10	Mercury (as Cd) mg/1, Max	0.001	Beyond this the water becomes toxic	No relaxation	(see note) Mercury ion analyses	To be tested when pollution is suspected
11	Cadmium (as Cd), mg/1, Max	0.01	Beyond this the water becomes toxic	No relaxation	(See note)	To be tested when pollution is suspected
12	Selenium, (as Se) mg/1, Max	0.01	Beyond this the water becomes toxic	No relaxation	28 of 3025 1964	To be tested when pollution is suspected
13	Arsenic (as) mg/1, max	0.05	Beyond this the water becomes toxic	No relaxation	3025 (Part 37) 1988	To be tested when pollution is suspected

Sl. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the absence of alternate source	Methods of Test (Ref. To IS)	Remarks
14	Cyanide (as CN) mg/1 Max	0.05	Beyond this the water becomes toxic	No relaxation	3025 (Part 27) 1988	To be tested when pollution is suspected
15	Lead (as Pb), mg/1, Max	0.05	Beyond this the water becomes toxic	No relaxation	(See note)	To be tested when pollution is suspected
16	Zinc (as zn) mg/1, Max	5	Beyond this limit it can cause astringent taste and an opalescence taste and an opalescence in water	15	39 of 3025 1964	To be tested when pollution is suspected
17	Anionic detergents (as MBAS) mg/a, Max	0.2	Beyond this it can cause a light froth in water	1	Methylene-blue extraction method	To be tested when pollution is suspected
18	Chromium (as Cr^{6}+ mg1, Max)	0.05	May be carcinogenic above this limit	No relaxation	38 of 3025: 1964	To be tested when pollution is suspected
19	Polynuclear aromatic hydra carbons (as PAH) g/1, Max	-	May be carcinogenic above this limit	-	-	-
20	Mineral oil mg/1, Max	0.01	Beyond this limit undesirable taste and odour after chlorination take place.	0.03	Gas Chromatographic emtho	-
21	Pesticides mg/1, Max	Absent	Toxic	0.001	-	-
22	Radioactive materials				58 3025:01964	-
23	a) Alpha emitters bq/1, Max	-	-	0.1	-	-

Sl. No	Substance or Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the absence of alternate source	Methods of Test (Ref. To IS)	Remarks
24	Beta emitters pci/1, Max	-	-	1	-	-
25	Aluminuium (as Al) mg/1, Max	200	Beyond this limit taste becomes unpleasant	600	13 of 3025: 1964	-
26	Aluminuium (as Al) mg/1, Max	0.03	Cumulate effect is reported to cause dementia	0.2	31 of 3025: 1964	-
27	Boron mg/1, Max	1	-	5	29 of 3029: 1964	-

Source: Indian Standard Drinking Water Specification-IS 10500, 1991

APPENDIX 62: AMBIENT AIR QUALITY STANDARDS IN RESPECT OF NOISE

Sl. No.	Area Code	Category of Zone	Leq*** in dB (A)	
			*Day	**Night
1	A	Industrial	75	70
2	B	Commercial	65	55
3	C	Residential	55	45
4	D	Silence Zone	50	40

Source – CPCB, The Noise Pollution (Regulation and Control) Rules, 2000

Note: - 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.

2. Night time shall mean from 10.00 p.m. to 6.00 a.m.

3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority

4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level

APPENDIX 63: EMP BUDGET

Item No.	Component	Description	Unit	Unit cost (INR)	NANAU – DADAU (MDR 82 W)		BULANDSHAR ANOOPSHAR (MDR 58W)		MUZAFFARNAGAR BARAUT (MDR 135W)		HALIYAPUR - KUREBHAR –BILWAI (MDR 66E) PkgI		HALIYAPUR - KUREBHAR –BILWAI (MDR 66E) PkgII		HUSSAINGANJ - ALIPUR MARG (MDR 81 C)		NAURANGIA-KAPTANGANJ-HATA (ODR 24 & MDR 25E)-Pkg I		HATA-RUDRAPUR (MDR 25E) - Pkg II		MOHANLALGAJ-MAURAWAN-UNNAO MARG (MDR-52C)		ALIGANJ TO SORON MARG (MDR 45W)	
					Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)
A	**Construction Stage**																							
1	**Mitigation Cost**																							
1.1	Trees	Compensatory afforestation @ 1:3 as per state norms in compliance with Statuary Requirement and maintenance.	No	1000	10917	10917000	4671	4671000	11631	11631000	9786	9786000	11595	11595000	5157	5157000	14538	14538000	12909	12909000	13278	13278000	19131	19131000
		Additional Compensatory Afforestation in the ratio of 1:2 and maintenance	No	1000	7278	7278000	3114	3114000	7754	7754000	6524	6524000	7730	7730000	3438	3438000	9692	9692000	8606	8606000	8852	8852000	12754	12754000
1.2	Forests	Payment of Net Present Value (NPV) to Forestry Department for diversion of forest land	Ha	920000	38	34960000	0	0	20	18400000	0	0	0	0	20	18400000	0	0	0	0	0.756	695520	0	0
1.3	Water Quality	Oil interceptor at vehicle parking /washing areas/Fuel Storage	No	See Note 1	5	143750	5	141250	10	225000	7	197750	7	197750	7	189000	7	208250	5	148750	6	160500	5	143750
		Provision for Silt fencing along waterbodies	m	29750	74	2201500	39	1160250	161	4789750	45	1338750	79	2350250	44	1309000	100	2975000	70	2082500	150	4462500	0	0
		Intercepting ditch & small sedimentation chamber along ponds	No	10000	0	0	0	0	1	10000	2	20000	0	0	3	30000	1	10000	3	30000	11	110000	0	0
		Construction of drains	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1.4	Water Resources	Retaining wall along the ponds	m	See Note 2	0	0	54	2446038	140	4906440	28	1157744	84	3473232	170	6860180	0	0	0	0	116	4914340	0	0
		Relocation of affected hand pumps, wells etc.	Covered in RAP Budget		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1.4	Air Quality	Dust Management with sprinkling of water	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1.5	Noise Quality	Construction of Noise Barrier at Noise Sensitive Locations using brick masonry work upto a height of total 2m above ground level	m	See Note 3	560	5023200	602	5489036	1099	8532636	588.5	5056392	1493.5	12832152	882	7521696	942.5	8231795	693	6052662	558	3811140	220	1973400
1.6	Solid waste Disposal	Disposal of Sewage and other wastes from the construction yard and labour camps as per directions of the Environmental Specialist of CSC	LS per month	15000.00	24	360000	24	360000	24	360000	24	360000	24	360000	24	360000	24	360000	24	360000	24	360000	24	360000
1.7	Soil erosion Control measure	Slope stabilization through Stone pitching	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		Providing and laying of embankment slopes, and other locations with grass sods all complete	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		Providing Toe wall (PCC M-15)	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1.8	Safety	Miscellaneous informatory signs and others	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Item No.	Component	Description	Unit	Unit cost (INR)	NANAU – DADAU (MDR 82 W)		BULANDSHAR ANOOPSHAR (MDR 58W)		MUZAFFARNAGAR BARAUT (MDR 135W)		HALIYAPUR - KUREBHAR –BILWAI (MDR 66E) Pkgl		HALIYAPUR - KUREBHAR –BILWAI (MDR 66E) PkgII		HUSSAINGANJ - ALIPUR MARG (MDR 81 C)		NAURANGIA-KAPTANGANJ-HATA (ODR 24 & MDR 25E)-Pkg I		HATA-RUDRAPUR (MDR 25E) - Pkg II		MOHANLALGAJ-MAURAWAN-UNNAO MARG (MDR-52C)		ALIGANJ TO SORON MARG (MDR 45W)	
					Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)	Quantity	Cost (INR)
		Enhancement of Junctions	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1.9	Cultural properties	Relocation of cultural properties	Covered in RAP Budget		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1.10	Wildlife conservation	Warning Sign Boards	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		Informatory sign boards (big)	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		Rumble Strips	Covered in engineering Cost		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2	**Enhancement Cost**																							
2.1	Enhancement Sites	Enhancement of stagnant water bodies (embankment, deepening, cleaning, sitting bench, solar lighting, landscaping etc.)	LS	1000000	1	1000000	0	0	1	1000000	0	0	2	2000000	1	1000000	1	1000000	1	1000000	2	2000000	0	0
		Enhancement of hand pumps (soak pits etc.)	LS	5000.00	72	360000	76	380000	69	345000	207	1035000	164	820000	134	670000	270	1350000	194	970000	141	705000	122	610000
3	**Monitoring Cost**																							
A.	Construction Stage	Monitoring of Air quality, water quality, noise level, soil quality, benthic flora /fauna and avifauna	LS	See Appendix 1B to 10B		1139000		1619000		989000		1379000		1079000		869000		1322000		929000		1489000		622000
B.	Operation Stage		LS			74000		74000		89000		74000		89000		109000		79000		79000		109000		69000
4	**Environmental Awareness during Construction Stage**																							
4.1	Environmental Awareness	Environmental Training, Continued Interaction with Public	LS			300000.00		300000.00		300000.00		300000.00		300000.00		300000.00		300000.00		300000.00		500000.00		300000.00
		TOTAL (1+2+3+4)				63756450		19754574		59331826		27228636		42826384		46212876		40066045.00		33466912		41447000		35963150.00
		Contingency @ 5 %				3187822.5		987728.7		2966591.3		1361431.8		2141319.2		2310643.8		2003302.25		1673345.6		2072350		1798157.5
		TOTAL FOR ROAD (INR)				66944272.50		20742302.70		62298417.30		28590067.80		44967703.20		48523519.80		42069347.25		35140257.60		43519350.00		37761307.50
		TOTAL FOR ROAD IN MILLION (INR)				66.94		20.74		62.30		28.59		44.97		48.52		42.07		35.14		43.52		37.76
		GRAND TOTAL IN MILLION (INR)				**401.97**																		

Note 1- Unit cost of Oil interceptor @Rs per number is 28750 for ND- MDR 82W; Rs 28250 for BA-MDR 58W; Rs 22500 for MB-MDR 135W;27000 for HA-MDR 81C; Rs 28250 for HK- MDR66E; Rs 29750 for KN-ODR24 &KV -MDR25E; Rs 28,750 for AS-MDR45W; Rs 26750 for MM-MDR52C.

Note 2-Unit cost of retaining wall @Rs per running meter is 45297 for BA-MDR 58W; Rs.35046 for MB-MDR135W; Rs.41348 for HK-MDR 66E; Rs 40354 for HA-MDR 81C; Rs 42365 for MM -MDR 52C.

Note 3- Unit cost of Noise barrier @ Rs per running meter is Rs 8970 for ND-MDR 82 W;Rs 9118 for BA-MDR 58W, Rs 7764 for MB-MDR 135W, Rs 8528 for HA-MDR 81C; Rs 8592 for HK-MDR 66E; Rs 8734 for KN-ODR 24 & KV MDR 25E;Rs 8970 for AS-MDR 45W ; Rs. 6830 for MM-MDR 52C

Source: PPTA Consultant