Initial Environmental Examination

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India: Rajasthan Secondary Towns Development Sector Project – Additional Financing (PART A)

Jodhpur Storm Water Drainage

Prepared by Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Limited-External Aided Project (RUDSICO-EAP) for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 16 February 2023)

Currency unit	–	Indian rupee (₹)
₹1.00	=	$ 0.01
$1.00	=	₹ 82.76

ABBREVIATIONS

ADB	–	Asian Development Bank
BOCW	–	Building and other Construction Workers
CLC	–	City Level Committee
CPCB	–	Central Pollution Control Board
DPR	–	Detailed Project Report
EHS	–	Environmental Health and Safety
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
IEE	–	Initial Environmental Examination
IFC	–	International Finance Corporation
MOEFCC	–	Ministry of Environment, Forest and Climate Change
PHED	–	Public Health Engineering Department
PIU	–	Project Implementation Unit
PMU	–	Project Management Unit
PWD	–	Public Works Department
REA	–	Rapid Environmental Assessment
ROW	–	Right-Of-Way
RSPCB	–	Rajasthan State Pollution Control Board
RSTDSP	–	Rajasthan Secondary Towns Development Sector Project
RUDSICO-EAP	–	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Limited-Externally Aided Projects
RUDSICO	–	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation
ULB	–	Urban Local Body
WHO	–	World Health Organization

WEIGHTS AND MEASURES

m^3	–	cubic meter
dB	–	decibels
^oC	–	degree centigrade
dia	–	diameter
kg	–	kilogram
kl	–	kiloliter
km	–	kilometer
kmph	–	kilometer per hour
KLD	–	kiloliters per day
ha	–	hectare
HP	–	horsepower
LPCD	–	liters per capita per day

lps	–	liters per second
m	–	meter
mg	–	milligram
mm	–	millimeter
MCM	–	million cubic meter
MLD	–	million liters per day
km^2	–	square kilometer

NOTE

In this report, "$" refers to United States dollars.

CONTENTS

APPENDICES

Appendix C1 – C25 – common appendices, attached separately, provide statutory standards, guidelines, reporting templates etc. are applicable to all subproject IEEs

EXECUTIVE SUMMARY

ADB approved a loan for the Rajasthan Secondary Towns Development Sector Project (RSTDSP, Loan 3972: IND) in September 2020. This is currently under implementation and will close by May 2028. The additional financing (the project) will expand the improved access to WSS services in at least ten urban local bodies (ULBs), benefiting 1.2 million people. Important value addition of the proposed project to the ongoing project is that it will provide innovative solutions to address climate change to respond to the growing climate risks and vulnerability and also to improve livability and prosperity through enhancing natural and/or built heritage at least ten ULBs in Rajasthan, benefiting 1.0 million people. The overall project is aligned with the following impacts: (i) access to potable, affordable, reliable, equitable, environmentally sustainable drinking water supply in all urban areas of Rajasthan improved, (ii) health status of urban population, especially the poor and under-privileged improved, and (iii) productivity, livability and prosperity for the citizens in Rajasthan cities and towns enhanced. Reflecting the additional measures to enhance climate resilience and heritage-sensitive urban development of the project, impact statement (iii) was added; the outcome statement is modified as quality, reliability, equity, and sustainability of urban assets and services in project towns of Rajasthan improved; and additional output was also added, resulting in four outputs.

Jodhpur is one of the project towns, and improvement of storm water drainage system in Jodhpur is proposed under the RSTDSP-AF. Following are the proposed components:

- **Storm Water Drainage**. (i) Construction of new box and open type drain - Drain No 1, Bhairav Nagar Nala from Shobhawato ki Dhani to Jojari River via Pal Gaon, Tanawada, Ghinado ki Dhani and Salawas Road (ii) Construction of new box type drain Nala No 2, Saran Nagar/ RTO Nala: 7 km from Ganesh Nagar, Banar Road to Jojari River via Saran Nagar ROB.

Screening and Categorization. assessment of potential impacts. Jodhpur Town storm water drainage subproject is classified as environmental category B per ADB's Safeguard Policy Statement (SPS), 2009, and accordingly this initial environmental examination (IEE) assesses the environmental impacts and provides mitigation and monitoring measures to ensure that there are no significant impacts as a result of the subproject. As per the Government of India environmental impact assessment (EIA) Notification, 2006, this subproject does not require EIA study or environmental clearance.

Description of the Environment. Subproject components are in Jodhpur City and in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at the proposed subproject sites. Jodhpur is the second largest city of Rajasthan. It is located in the lower middle of the Thar Desert in western Rajasthan. Jodhpur is an historic city, most notable attractions are Mehrangarh Fort which overlooks the city, Umaid Bhawan Palace, Jaswant Thada, and the Ghanta Ghar, or Clock Tower. There are several other places of interest in and around the town. However, none of heritage areas are located close to the drains proposed for improvement. Mehrangarh fort which is about 5 km from nearest project site. The subproject sites are located in existing road right of way (RoW) and government-owned lands. The existing storm water drainage system in Jodhpur comprises of about 13 major drains with Jojari River as the ultimate carrier. Jojari River which is a seasonal river. There are no environmentally sensitive areas in and around the alignments. There are however 274 trees of local species which may be affected as these are in the alignment Nearest protected area is Gudha Vishnoiyan Conservation Reserve, which is about 10-12 km southeast of the city.

Potential Environmental Impacts and Mitigation measures. In this draft IEE, negative impacts were identified in relation to location, design, construction and operation of the improved infrastructure. Environmental impacts as being due to the project design or location were not significant as various measures are already included in site planning and preliminary design. No impacts on forests or archaeological resources envisaged. Discharge of wastewater into open drains may deteriorate the drain water quality and receiving water bodies. Sewerage system is also being improved in the city in uncovered areas. Temporary measures suggested to avoid any disturbance / damage to old/heritage buildings during construction of drains.

Potential impacts during construction are considered significant but temporary and are common impacts of construction in urban areas, and there are well developed methods to mitigate the same. All construction activities will be confined to the selected sites and the interference with the general public and community around is minimal. In these works, the temporary negative impacts arise mainly from construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupational health and safety (OHS) aspects. Construction works will be conducted along public roads in an urban area congested with people, activities and traffic. Therefore, these works may have adverse, but temporary impacts arising mainly from the disturbance of residents, businesses and traffic due to construction work; safety risk to workers, public and nearby buildings due to deep trench excavations in the road; access impediment to houses and business, disposal of large quantities of construction waste etc.

Environmental Management. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels, along with the delegation of responsibility to appropriate agency. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning and scheduling of drainage works to minimize public inconvenience; (ii) measures to avoid impacts on heritage building and chance find procedures (iii) barricading, dust suppression and noise control measures; (iv) traffic management measures for works along the roads and for hauling activities; (v) occupational and community health and safety, labour welfare, (vi) provision of walkways and planks over trenches to ensure access will not be impeded; (vii) reuse of excavated materials to extent possible, (viii) spill and sediment control measures to avoid water and soil pollution, etc.,. EMP will guide the environmentally-sound construction of the subproject. EMP includes a monitoring program to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries. A copy of the updated EMP/ site environmental management plan (SEMP) shall be kept on-site during the construction period at all times. The EMP will be included in bids and contracts, and implementation shall be binding on contractors.

Implementation Arrangements. The executing and implementing agencies will remain unchanged from the current project, which are Government of Rajasthan's Local Self Government Department (LSGD) and Rajasthan Urban Drinking Water, Sewerage and Infrastructure Corporation (RUDSICO), respectively. The AF project retains the project management unit (PMU) at the implementing agency, as well as the two Zonal Offices in Jaipur and Jodhpur. Project implementation units (PIUs) have been established in project towns. A total of eight PIUs will manage 18 ULBs under the AF Project. Consultants will support the PMU and PIUs. Project Officer (Environment) at PMU and Safeguard and Safety Officer at each of the PIUs will be responsible for environment management and monitoring activities and will be supported by Safeguard support staff from Supervision Consultant, town staff/team and Environment Safeguard Specialist of Supervision Consultants. Contractor personnel will also include an Environment, Health and Safety (EHS) Engineer in the project construction team.

Consultation, Disclosure and Grievance Redress. The stakeholders were involved in developing the IEE. Informal and formal consultation are conducted with local population of the area at 11 places along with proposed alignment with about 99 persons (79 male and 20 females) from December 2021 to February 2022. A City Level Committee (CLC) was held and CLC has appreciated and approved the subproject. The IEE will be made available at public locations; this draft IEE will be disclosed to a wider audience via the ADB and RUDSICO websites. Consultation process will continue during project implementation. A grievance redress mechanism (GRM) will be established to redress public grievances.

Monitoring and Reporting. The PMU, PIU and consultants will be responsible for monitoring and reporting. During construction, results from internal monitoring by the DBO contractor will be reflected in their monthly EMP implementation reports to the PIU. PIU with the assistance of CMSC, will monitor the compliance of contractor, prepare a quarterly environmental monitoring report (QEMR) and submit to PMU. The PMU will oversee the implementation and compliance and will submit semi-annual environmental monitoring reports (SEMR) to ADB. SEMRs will be disclosed on ADB and RUDSICO websites.

Conclusions. The proposed project is unlikely to cause significant adverse impacts, and potential impacts are mainly due to construction and can be mitigated or minimized to acceptable levels through measures included in the EMP. The citizens of the Jodhpur will be the major beneficiaries of this subproject. Improved drainage system will result in the better environmental conditions of city, improved public health particularly reduction in waterborne and infectious diseases, reduce risk of groundwater contamination. both the drains will help to safely discharge the drain water into Jojri river which is currently ponding at residential area and on National Highway. People would spend less on healthcare and lose fewer working days due to illness, so their economic status, as well as their overall health should also improve

Based on the findings of the IEE, the classification of the project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006). As per primary survey a total 296 trees may be required to cut. At stage of project planning higher side of tree cutting is taken as 300 for assessment of compensatory plantation to be adopted in the project. As per RUDSICO-EAP policy compensatory plantation in the ratio of 1:3 will be required therefore total 900 tree plantations are being suggested for compensatory plantations. During detail survey contractor will be required to confirm the presence of trees on the alignment of drains, which will be required to cut for construction works.

I. INTRODUCTION

A. Rajasthan Secondary Town Development Section Project – Additional Financing

1. Sector Project (RSTDSP, Loan 3972: IND) from its regular ordinary capital resources on 25 September 2020 and became effective on 4 January 2021. The closing date of the current project is 31 May 2028. This project is on track and has performed well consistently since the first quarter of 2021. Under this project, water supply systems are being improved in eight urban local body (ULB) towns (Output 1), and sanitation systems in 13 ULBs (Output 2). During the implementation, an additional 13 ULBs were added to the project for fecal sludge and septage management system development. Under Output 3, capacity building and training activities on sustainable and resilient water supply and sanitation (WSS) operations, hygiene, gender equality and social inclusion conducted.

2. The additional financing (the project) will expand the improved access to WSS services in at least ten urban local bodies (ULBs), benefiting 1.2 million people. Important value addition of the proposed project to the ongoing project is that it will provide innovative solutions to address climate change to respond to the growing climate risks and vulnerability and also to improve livability and prosperity through enhancing natural and/or built heritage at least ten ULBs in Rajasthan, benefiting 1.0 million people. The overall project is aligned with the following impacts: (i) access to potable, affordable, reliable, equitable, environmentally sustainable drinking water supply in all urban areas of Rajasthan improved, (ii) health status of urban population, especially the poor and under-privileged improved, and (iii) productivity, livability and prosperity for the citizens in Rajasthan cities and towns enhanced. Reflecting the additional measures to enhance climate resilience and heritage-sensitive urban development of the project, impact statement (iii) was added; the outcome statement is modified as quality, reliability, equity, and sustainability of urban assets and services in project towns of Rajasthan improved; and additional output was also added, resulting in four outputs.

(i) **Output 1: Resilient water supply systems developed or improved.** By 2028, the project will (i) At least 1,300 km of water supply pipelines will be commissioned through a district-metered area approach for effective non-revenue water (NRW) management, (ii) at least 79,000 households will be connected to an improved water supply system, including at least 95% below poverty line households, with 100% functional meters allowing for the introduction of volumetric billing, (iii) three new water treatment plants (WTPs) will be commissioned with a total capacity of at least 24 million liters per day (mld).

(ii) **Output 2: Resilient and inclusive sanitation systems developed or improved.** By 2028, (i) at least 500 km of sewers will be constructed; (ii) seven sewage treatment plants (STPs) with co-treatment of wastewater and fecal sludge and with a total capacity of at least 30 mld will be commissioned and one existing STP with 10 mld capacity will be upgraded to meet current effluent standards; and (iii) at least 54,000 new household connections (including at least 95% below poverty line households) to the sewer system will be installed.

(iii) **Output 3: Urban assets to enhance climate resilience and heritage living developed or improved.** By 2028, (i) at least 50 km of drainage networks will be constructed in five ULBs; (ii) at least five either kunds or baories rehabilitated and/or reconstructed in three ULBs that were heritage structures built for drainage, rainwater harvesting, and reuse, but currently are not properly functioning; (iii) five water parks rehabilitated in one ULB to enhance water retention and storage capacity and/or to improve people's well-being, both residents and visitors; and (iv)

at least four heritage structures are refurbished in five ULBs to improve the living environment and attract more tourists.

(iv) **Output 4: Institutional and human capacities strengthened for sustainable service delivery, gender equality, and improved public health**.

3. The executing and implementing agencies will remain unchanged. GOR's Local Self Government Department (LSGD) is executing agency and the Rajasthan Urban Drinking Water, Sewerage and Infrastructure Corporation (RUDSICO) is implementing agency.

4. **Jodhpur Drainage subproject.** This is one of the subprojects proposed under RSTDSP-AF. It will improve water supply and sewerage systems in the town.

B. Purpose of Initial Environmental Examination Report

5. Per ADB's Safeguards Policy Statement, 2009, ADB requires the consideration of environmental issues in all aspects of the Bank's operations. Using rapid environmental assessment (REA) checklist (Appendix 1), subproject is unlikely to cause significant adverse impacts, and classified as category B and per ADB SPS requirements this IEE is conducted. **)**

C. Scope of IEE

6. The subproject will be implemented under the design-build-operate (DBO) modality. Thus, this IEE is based on the preliminary project design report. The IEE is conducted mainly based on field reconnaissance surveys and secondary sources of information. Stakeholder consultation was an integral part of the IEE. This IEE will be updated during the detailed design to reflect changes and submitted to ADB for approval. IEE will be further updated during implementation if there are any changes in project scope, design or sites updates will supersede the earlier version.

D. Report Structure

7. This Report contains the following sections:

(i) Executive summary;
(ii) Introduction;
(iii) Description of the project;
(iv) Analysis of alternatives;
(v) Policy, legal and administrative framework;
(vi) Description of the environment;
(vii) Anticipated environmental impacts and mitigation measures;
(viii) Public consultation and information disclosure;
(ix) Grievance redress mechanism;
(x) Environmental management plan; and
(xi) Conclusions and recommendations.

II. DESCRIPTION OF PROJECT

A. Project Area

8. **Jodhpur Town:** The city of Jodhpur was founded in 1456 A.D. by Rao Jodha. Jodhpur, the past capital of Rathore clan of Rajputs is an oasis in the desert. The city itself is in complete

contrast to the surrounding country both in sudden appearance of hills and ridges and the presence of a large number of water bodies.

9. Jodhpur is the second largest city of Rajasthan. It is located in the lower middle of the Thar Desert of Western Rajasthan and is about 280 Km from Indo-Pak border and is situated at $26^0$18'North latitude and $73^0$01'East longitude. It has an altitude of 242 meters above MSL at Railway Station with Fort and old city being much higher i.e., 367.83 meters and between 245 to 325 meters. The outer city area lies between to 210-255 meters above MSL.

10. The city which originally had about 5.0 Sq Km area within the city wall, covered more than 50 Sq Km in 1972 and presently expanded to some 281 Sq Km with a potential to grow in about 321 Sq Km by the year 2023. Expansion of city towards the North and West is restricted because of hill ranges and in South-East due to defence establishments.

B. Existing Conditions of the Town

1. Water Supply

11. The major source of drinking water for Jodhpur is PHED water supply which is connected from Kayalana Lake. The Public Health Engineering Department (PHED) takes care of the water supply in the town. The present water supply capacity in the town is 110-120 liters per capita per day. The quality of the water supply at Jodhpur has been tested periodically and the recent test results show that it is of acceptable quality as per drinking water specifications, IS 10500 (2012).

2. Sewerage

12. At present, Jodhpur city having existing sewerage, but it does not cover entire city and adjoining new settlement areas. Presently, the wastewater from kitchens and bathrooms is discharged into existing drains. Open defecation is not uncommon. Most of the residential buildings, commercial buildings, and educational institutions have on-site septic tanks. Untreated wastewater and septic tank effluent that is discharged into existing Nala is accumulated in the low-lying areas in the outskirts of the town. Indiscriminate solid waste disposal is prevalent in the town. Low lying areas are filled with wastewater and solid waste. In the absence of a safe collection and disposal system for sewage, the people of Jodhpur city are facing unhealthy and unhygienic environmental conditions therefore public representatives are also demanding facilities of sewerage system on priority basis. The connectivity to proposed drains will be restricted to storm water drains only and local body will ensure that no industrial wastewater and sewerage enter in to proposed drains.

3. Existing Drainage System of Jodhpur

13. The existing storm water drainage system in Jodhpur comprises of about 13 Major drains with Jojari River as the ultimate carrier. The city has a natural system of surface drainage, comprising primary drains (naturally established channels), secondary drains (mostly artificial drains) and tertiary drains (mostly roadside drains). The entire city drains towards Jojari River which is an non perennial river and flows from north-east to south - west of the city. Jodhpur city for the purpose of storm water drainage system, depending upon the natural surface topography is divided into four master drainage districts, namely Pal, Punjala, Jhalamand and Industrial Zone. The Primary drains or "Nalas" are 4 to 15 m wide with 1.2 to 4 m depths at various stretches. The following table depicts the list of major drains and their approximate length.

Table 1: Details of Existing Drains in Jodhpur

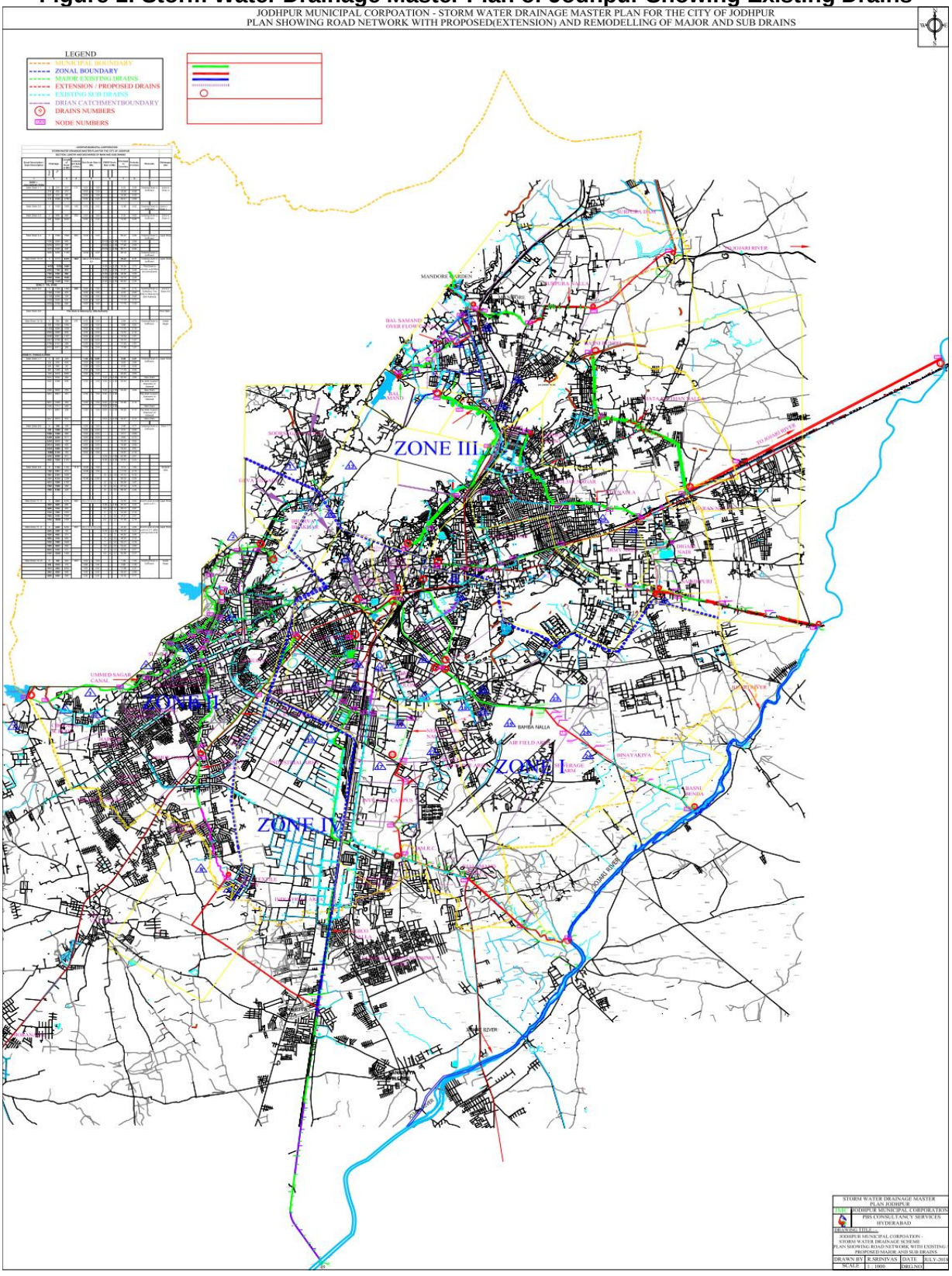
Drain No.	Drain Flow Path	Existing Length in Km
1.	From Soor Sagar -Chandna Bhakar-Kamla Nehru Nagar- Lal Pulia – Chopasini Housing Board – Khema Kuan – Ambika Nagar- Sobhawaton Ki Dhani	6.8
2.	From Uday Mandir – Baldev Mirdha Circle- Paota Circle - Rasala Road – Prithvipura – Cantonment at Jaipur road-Digari Saran Village - Army Area -Jojari River)	5.27
3.	Drain from Krishi Mandi – Bhadwasia – Vishwakarma Nagar- Vidya Nagar - RTO Office - Gulab Nagar-Sirkariya Beri)	4.135
4.	Basni Bund – Mataka Than -Central Academy - khokhariya – Jojari	4.6
5.	Sojati Gate – Anand cinema- Old powerhouse- Central Jail – Shiv Mandir-Ratanada	2.26
6.	From Balsamand overflow – Sanghvi School (Mandore Road)- Mandavato Ki School- Phool bagh to Surpura Tank- Jojari	2.75
7.	Bhakat Sagar- (Nehru Park)- Medical College – MDM Hospital- Section-7 - Bhagat Ki Kothi – Mahaveer Nagar- Polytechnic college -Golf course - Air Force Area.	4.47
8.	Takht Sagar Hills - Meera Colony - Guron Ka Talab – Joshi Colony - ChandnaBhakar- Suthla Village – Jwala Vihar-Ummaid Sagar – Housing Board – Kheme Ka Kua – Shobhawaton ki Dhani	6.4
9.	Balsamand -Janta Colony -Indira Colony –Mirasi colony -Bagar - Gulab Sagar	5.45
Total		**42.135**

14. The existing storm water drainage system in Jodhpur comprises of about 13 Major drains with Jojari River as the ultimate carrier. The city has a natural system of surface drainage, comprising primary drains (naturally established channels), secondary drains (mostly artificial drains) and tertiary drains (mostly roadside drains). The entire city drains towards Jojari River which is an non perennial river and flows from north-east to south-west of the city. Most of the Drains of the towns are of Pucca nature.

15. The present drain (Bhairav Nagar Nala) exists from Soor Sagar (near Radha-Saomi Satsang) – Chandna Bhakar-Kamla Nehru Nagar- Lal Pulia -Chopasini Housing Board-KhemaKuan- Ambika Nagar-Sobhawaton Ki Dhani. This drain is one of the major drain existing in Jodhpur town. The drain starts from Soornagar (near Radhasaomi Satsang) and passes through Chandana Bhakar, Kamala Nehru Nagar, Lal Pulia, Chopsini Housing Board, Khema Kuan, Ambikanagar and Shobhawaton Ki Dhani. The total length of drain is 8.20 km. The section of the existing drain varies from 6.0 x 1.20mt to 15.0 x 1.20 mt. Major portion of the drain is silted up and Periodic cleaning is required. Figure 1 below shows the drainage master plan of Jodhpur. Drains proposed in this subproject starts from end point of existing drains.

16. The storm water drainage system will be designed to carries only the storm water. The sewerage system of town will cater to domestic wate water. No industrial wastewater will be allowed into these drains.

Figure 1: Storm Water Drainage Master Plan of Jodhpur Showing Existing Drains



C. Need of the Subproject

1. Bhairav Nagar Nala

17. The catchment of existing Bhairav Nala originates from Takht Sagar hill areas in upstream of Shobawato ki Dhani, where drain terminates into plain area. The total catchment is 7.10 km2 and length of the longest stream is 6.5085 km. the highest contour level is at RL 255 m at foot of the hills and 231 m at Shobawato ki Dhani, where drain terminates into plain area. There is no well-defined drain beyond Shobawato ki Dhani. The well-defined drain existed only upto Shobawato ki Dhani, after that the drain has not well define cross section and water spread into the surrounding fields. The water is stagnating over the year and flooding during the monsoon. So, to mitigate the problems of stagnating water, a new structured drain till Jojari river is proposed in this project. Therefore, planning of proper drain is necessary to safely discharge the drain water, as development of Jodhpur city taking palace in this area.

18. The drain is terminated abruptly past Shobhawato ki Dhani and causes flooding in large residential areas in rainy season. The water flowing around the year gets stagnated at this tail end at Shobhawatoki Dhani. To mitigate the problems of stagnating water and to prevent flooding during rainy season a well define drain has been planned from Shobawato ki Dhani to final disposal point in Jojari river. The box type close drain and rectangular trough open drain is planned from Ashok nagar, Murli Nagar, near Ashapurna enclave, Central academy school, Sangariya by pass road, Salawas road and finally ending at Jojari river with total length of 13.10 km.

2. Saran Nagar/ RTO Nala

19. The extension of existing drain (from Krishi Mandi - Bhadwasia -Vishwakarma Nagar - Vidya Nagar - RTO Office - Gulab Nagar - Sirkariya Beri) upto Jojari river consider under this project, which does not have well define cross section and results in spreading of water into the surrounding fields and neighboring colonies. To mitigate the problems of stagnating water a structured box type closed drain till Jojari river has been proposed. The proposed RTO Nala has two “Y” shaped branches one branch starts from Sarahan Nagar, passes through Krishi Mandi, Kargil Shahid Park and another is extension of Krishi Mandi/ existing RTO Nala & Mata Ka Than Nala to Saran Nagar Flyover, passes through Nandri and the finally disposed in in Jojari river with total length of 7.03 km

D. Proposed Drainage works in Jodhpur

20. Works proposed under the subproject are:

(i) Construction of new box and open type drain – Nala (Drain) No 1: Bhairav Nagar Nala from Shobhawato ki Dhani to Jojari River via Pal Gaon, Tanawada, Ghinado ki Dhani and Salawas Road 13.10 km; and

(ii) Construction of new box type drain – Nala (Drain) No 2: Saran Nagar Nala/ RTO Nala: 7 km from Ganesh Nagar, Banar Road to Jojari River via Saran Nagar ROB. [NOC is already given by Jodhpur Development Authority). NOC from National Highway Authority is also given for proposed construction of drains of Saran Nagar Nala (**Appendix 5**). Details of works are listed in Table 2, 2A and 2B. Both are newly proposed drains and start point of these drains are end point of existing drains with waterlogged low laying area. The depth of drains varies from1.2 mt to 4 mt. GL.]

Table 2: Proposed Works of Drainage in Jodhpur

S.N.	Proposed works and location	Description of works
1)	**Nala No 1:** Bhairav Nagar Nala from Shobhawato ki Dhani to Jojari River via Pal Gaon, Tanawada, Ghinado ki Dhani and Salawas Road **Length: 13.10 km**	• Construction of Box/trough Nala in RCC from Shobhawato ki dhani to Jojari river via Pal Gaon, Tanawada, Ghinado ki Dhani and Salawas Road. • Box Section length- 5.5 km • Trough Section length- 7.6 km
2)	**Nala No 2:** Saran Nagar Nala: 7 km from Ganesh Nagar, Banar Road to Jojari River via Saran Nagar ROB **Length: 7.03 km**	Construction of Box type drains From Mata ka Than to Saran Nagar fly over and up to Jojari river **Box section – Entire section**

Table 2A: Chainage wise details of Bhairav Nagar Nala

S.N.	Chainage		Length	Road Condition (BT/WBM/ RCC/ Kachcha)	Size	Box/ Open	Provision for entry of local Nala adjoining flow	Remarks
	From	To						
1.	0	1220	1220	Kachcha village road	6 m width X depth 1.62 m	Open	0 CH start of Bhairav Nala drain	Box type drains will be laid within road and road crossings and open drains will be aligned along the roads
2.	1220	2945	1725	Kachcha village road	6 m width X depth 1.85m	Box	Joining of proposed drain between parallel railway line and surrounding catchment	
3.	2945	3330	385	Kachcha village road	6 m width X depth 2.07 m	Open	Joining of proposed drain between parallel railway line and surrounding catchment	
4.	3330	7083	3753	Kachcha village road	6 m width X depth 2.07 m to 2.24m	Box	Joining of proposed drain between parallel railway line and surrounding catchment	
5.	7083	8698	1615	BT road, Jodhpur salawas raod of PWD but drain is aligned on shoulder in existing row	6 m width X depth 2.24m to 2.59	Open	Jodhpur salawas road PWD	
6.	8698	13102	4404	BT road, Jodhpur Salawas raod of PWD but drain is	6 m width X depth 2.59 to 3.032	Open	Jodhpur Salawas road PWD	

S.N.	Chainage		Length	Road Condition (BT/WBM/ RCC/ Kachcha)	Size	Box/ Open	Provision for entry of local Nala adjoining flow	Remarks
	From	To						
				aligned on shoulder in existing row				

Table 2B: Chainage wise details of Saran Nagar Nala (RTO Nala)

S. No.	Chainage		Length	Road Condition (BT/WBM/ RCC/ Kachcha)	Size (in m)	Box/ Open	Provision for entry of local Nala adjoining flow	Remarks
	From	To						
1.	0	520	520	RCC	2.2X1.5 (0-520)	Box	Join in drain near Saran Nagar fly over	Drain-1 Mata ka Than Box type drains will be laid within ROW of road
2.	0	1300	1300	BT	5X1.5 (0-750), 5X2 (750-1300)	Box	Join in drain near Saran Nagar fly over	Drain-2, 3 (drain 8-8 to Saran Nagar fly over to Jojari river Box type drains will be laid within ROW of road
3.	0	5310	5310	RCC (0-330), BT (330-5310)	5X2 (0-1200), 6.5X2 (1200-5310)	Box	Saran Nagar fly over	Drain 4-5 Saran Nagar flyover to Jojari river Box type drains will be laid within ROW of road

21. Subproject is proposed for implementation under work contract, wherein which the successful bidder will validate design of the proposed drainage systems and components during Service Improvement Plan (SIP) preparation (within three months of contract award) as per updated /changed scope of works/project locations (if any). For any change in detailed design, IEE report shall be revised and submitted to ADB for clearance. Cleared revised IEE report shall be provided to the contractor. Contractor will also conduct environmental monitoring of baseline conditions of air, noise, water and soil and the same will be reflected in the revised IEE to be prepared during SIP Period. This IEE is revisable document and can be revised anytime during project implementation if there is any considerable change in scope of works, change in location of component, change in cost due to addition or subtraction of components etc. which can change the environmental impacts. Revised IEE shall supersede the earlier version of IEE and shall be contractually applicable to the contractor after approval from RUDSICO-EAP and ADB. Map of proposed drains in Jodhpur are shown in Figure 2.

Figure 2: Map showing Proposed Drains (RTO Nala and Bhairav Nala)

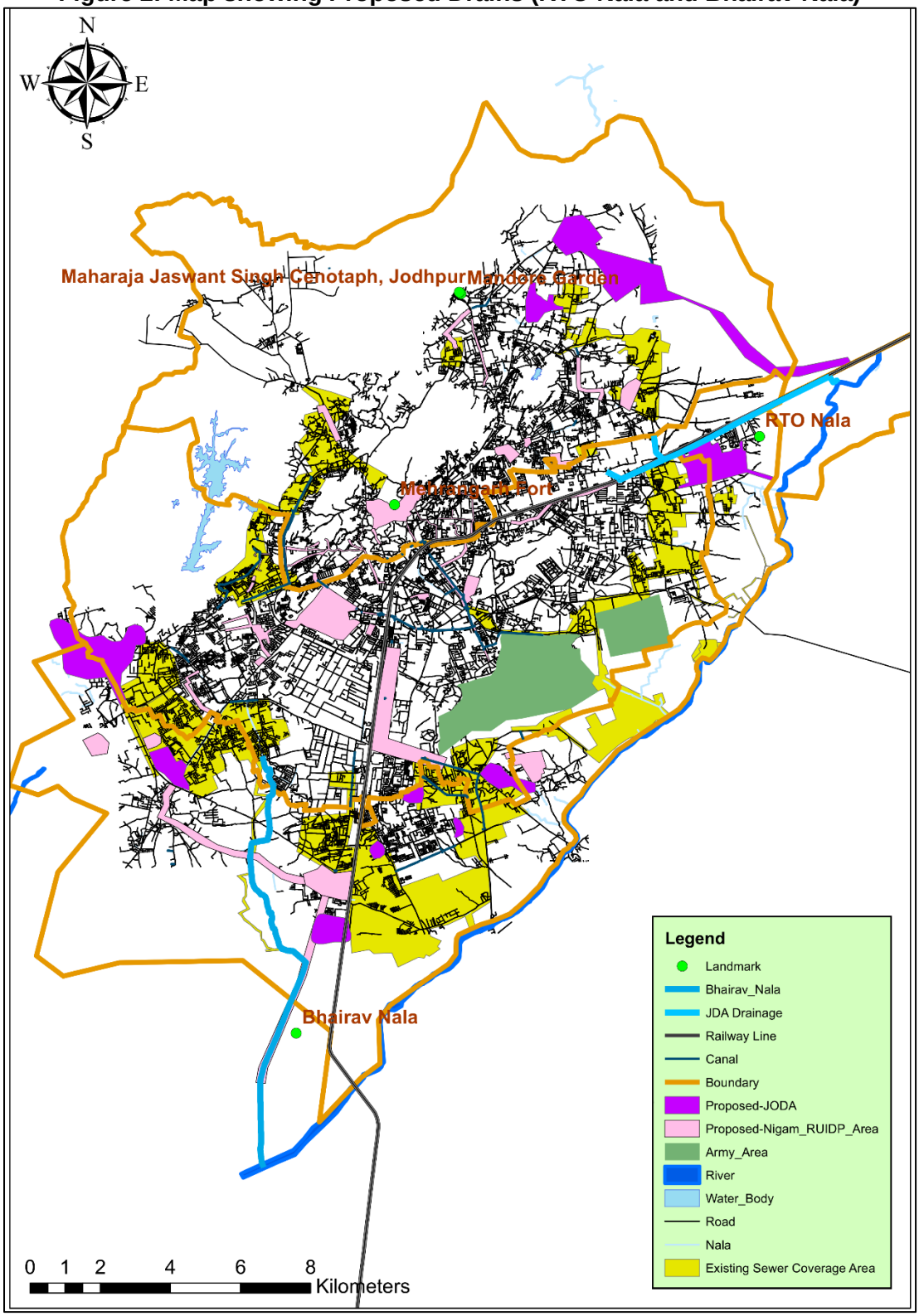
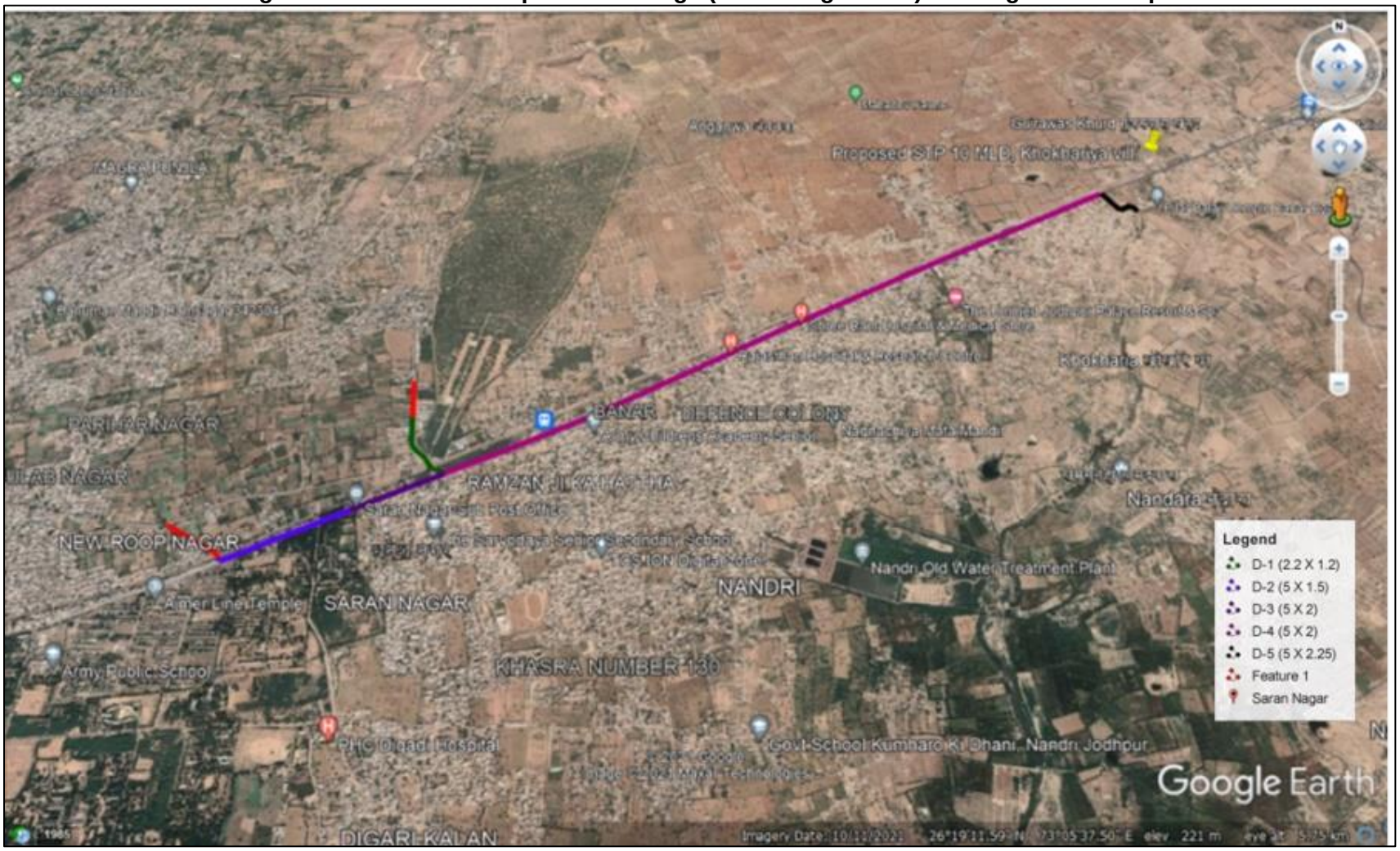
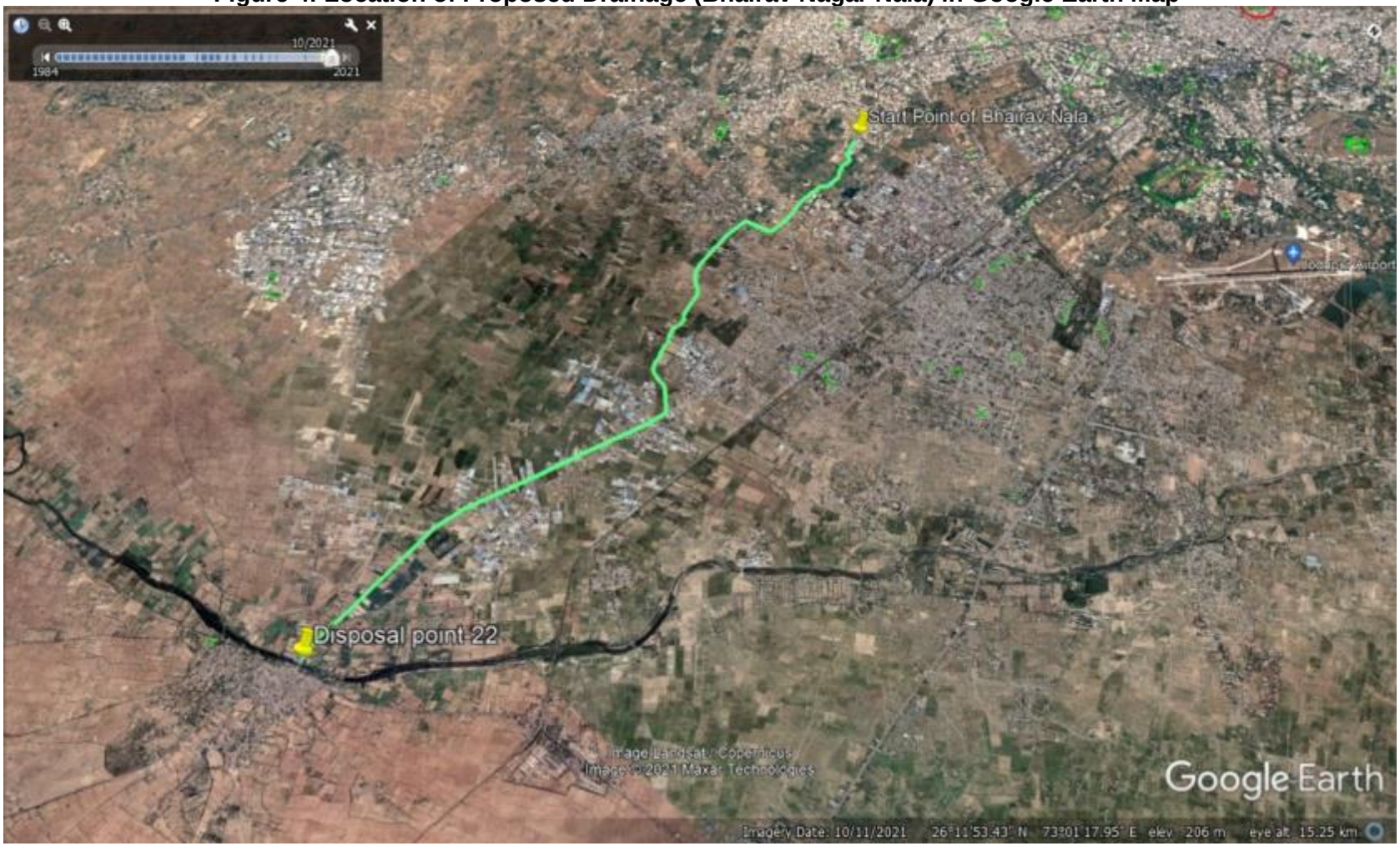


Figure 3: Location of Proposed Drainage (Saran Nagar Nala) in Google Earth Map



Note- In Legend 'D' is Drain number (as per Table-2) and Feature 1 is existing drain

Figure 4: Location of Proposed Drainage (Bhairav Nagar Nala) in Google Earth Map



(Proposed alignment of Bhairav Nala in green line)

Figure 5: Layout of Proposed Barrel Section from Shobhavato ki Dhani to Jojari River

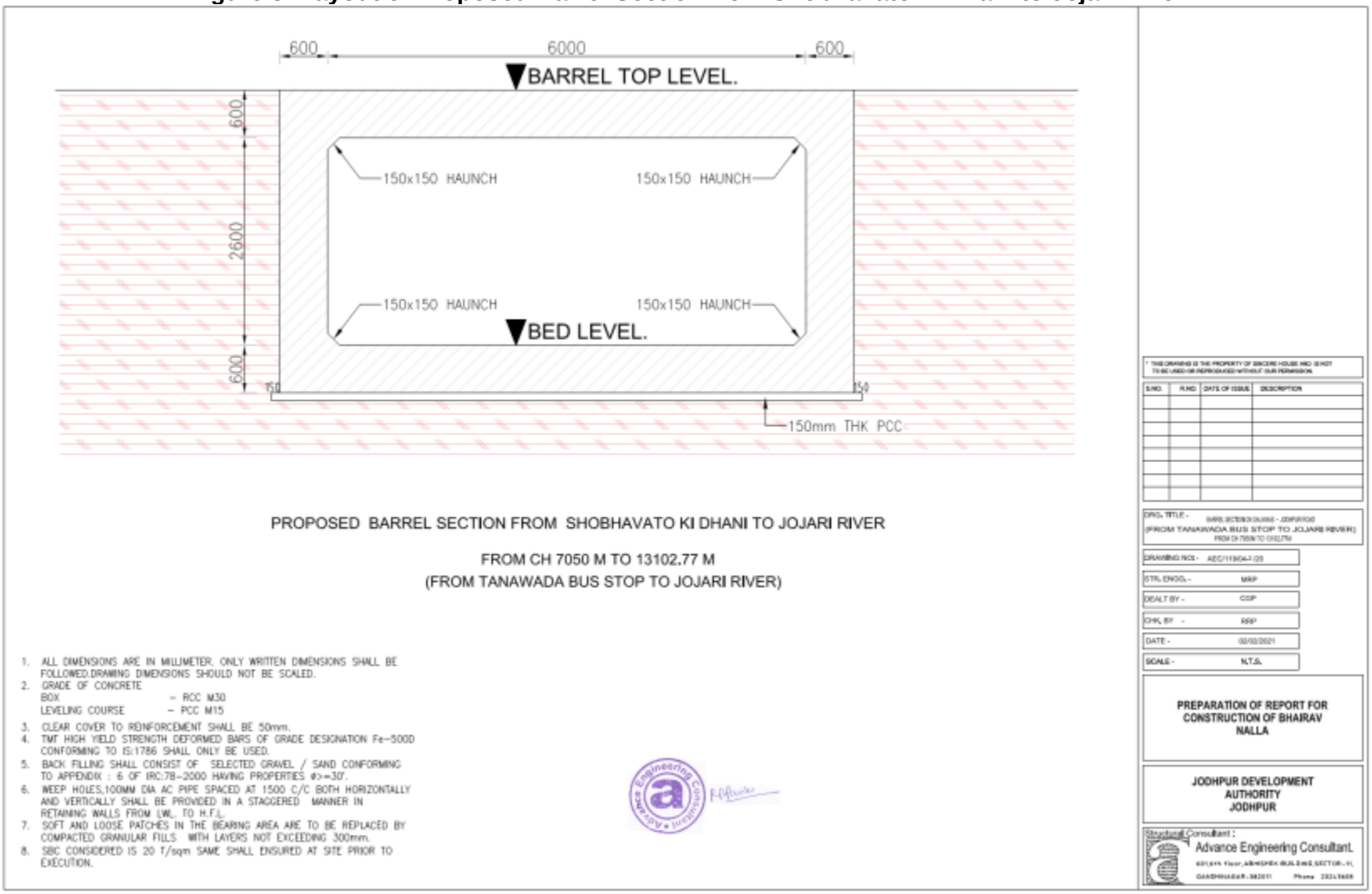


Figure 6: Layout of Typical Detail of Open Drain (U Through Section)

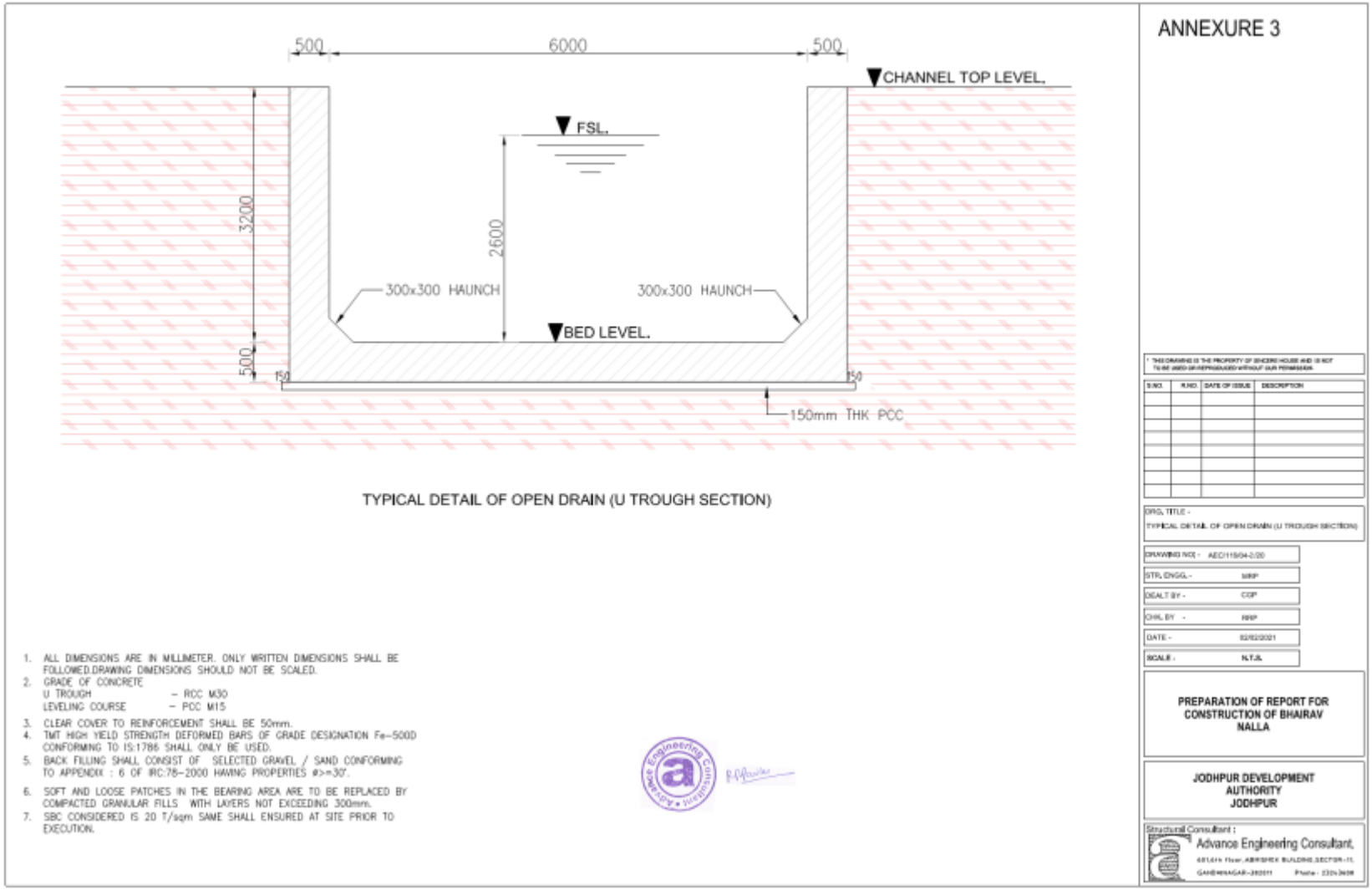
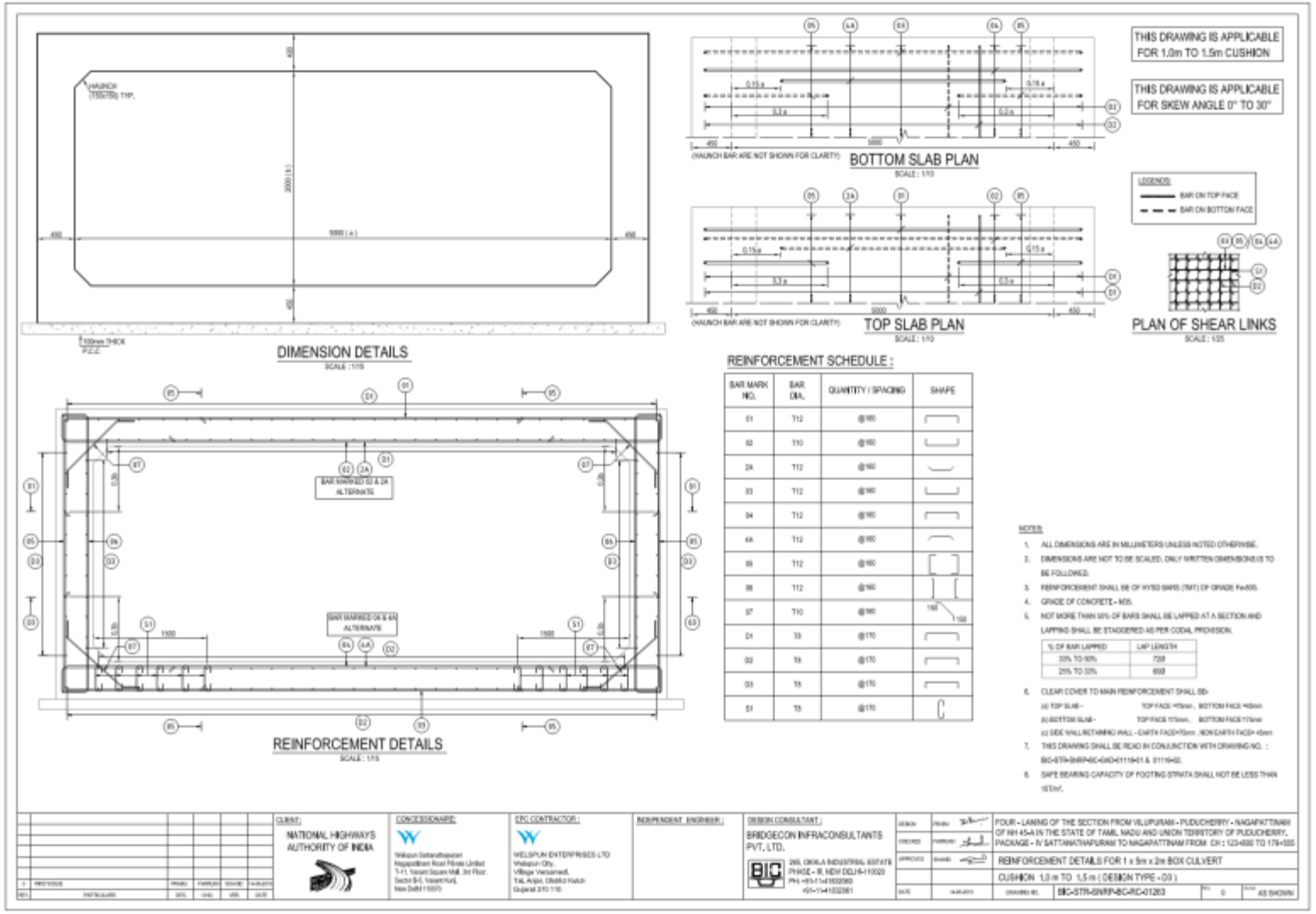


Figure 7: Typical Details of Box Culvert



E. Subproject Benefits

22. The subproject is primarily designed to improve environmental quality and living conditions of Jodhpur city through provision of drainage improvement works. The existing drain of Bhairav Nala exists upto Shobawato ki Dhani, after that the drain have not well define cross section and water spread into the surrounding fields. Likewise Saran Nagar Nala starts from the outlet of Basni Bund and runs through Punjla -Mata ka than and ends before Saran Nagar ROB, hence disposal of the Mata ka than Nala to Jojari river is necessary Therefore, through proper planning of both the drains will help to safely discharge the drain water in to river and improve the drainage system of city of Jodhpur.

F. Implementation Schedule

23. The project is After the completion of preliminary designs, bids are invited in August 2022 for the subproject. After evaluation of Bids work may be awarded to successful bidder up to March/April 2023. Project duration is for survey, investigation, inspection & construction within is 24 months. After completion of construction and commissioning, both the drainage works shall be handed over to Jodhpur Development Authority, who will operate and maintain both the drains.

III. ANALYSIS OF ALTERNATIVES

24. The ADB SPS, 2009 requires an analysis of project alternatives to determine the best method of achieving project objectives (which is safely collecting and disposing the water from two major drain, in Jodhpur Town, in this case) while minimizing environmental impacts. Alternative analysis provides opportunity to integrate environmental considerations into early stages of project (i.e., pre-feasibility or feasibility study), so that adverse environmental impacts can be avoided or minimized by various alternatives. It also provides opportunity to study various options vis a vis costs, provides a logical base, via transparent process, assist in decision making, gaining public support and ultimately in project approvals and timely implementation.

25. The proposed drainage subproject component in Jodhpur includes strengthening of two major drains of Jodhpur city, for safe collection and disposal of water from these drains into River Jojari. Descriptions of various alternatives considered for proposed components are presented in the following Table 3.

Table 3: Analysis of Alternatives

Type of alternative	'No project' / 'with project' alternative
1	**No project alternative** Low depressed areas in Jodhpur town are submerged during heavy rainfall due to improper drainage system, leakage in underground pipelines, and blockage of road during monsoon season Bhairav Nala is terminated abruptly past Shobhawato ki Dhani and causes flooding in large residential areas in rainy season. The water flowing around the year gets stagnated at this tail end at Shobhawatoki Dhani. The extension of existing Saran Nagar (from Krishi Mandi - Bhadwasia -Vishwakarma Nagar - Vidya Nagar - RTO Office - Gulab Nagar - Sirkariya Beri) upto Jojari river consider under this project, which does not have well define cross section and results in spreading of water into the surrounding fields and neighbouring colonies.

	Excess problem is created near the low laying area during monsoon season due to heavy rainfall. Living conditions due to lack of proper drainage system, and sewerage, are poor, unhealthy and unhygienic. Lack of proper infrastructure is also causing environmental pollution, overall poor quality of life. Poor environmental quality affects the urban poor more. The project intends to provide following benefits to the people residing in the sub-project area, and the "no project" alternative will deprive people of these benefits: • better public health particularly reduction in waterborne and infectious diseases; • improvement in quality of water bodies due to disposal of storm water • newly constructed drainage systems will cater to not only runoff from roads but also the runoff of complete catchment area, which is causing flooding and overflow in the current scenario **With project alternative** The proposed sub-projects will support the ongoing efforts of the Government of Rajasthan (the government) towards improving storm water drainage and sewerage systems. The project is expected to increase operational efficiency, improve service delivery, and result in a positive impact on health and quality of life for the residents of project towns in the state. Drainage system of Jodhpur will be improved. Water submergence problems will be controlled at Low depressed areas through improvement in storm water drainage system, replacement of old pumping system & underground pipe lines, proposed new pipeline with high pumping capacity. Water born dieses will be controlled due to pumping out the stagnant storm water. During construction period some temporary degradation of air quality due to emission from hot mix plant, stone crusher, generator and other machinery will occur. Machinery will cause noise pollution and construction spills, wastes, degraded materials will cause deterioration of soil quality and surface water. But all these have short term impacts and proper mitigation measures will be taken through EMP. Overall, the 'with project alternative' will bring about improved public health and living environment that will contribute to improved quality of life in the municipality area. Improved sanitation and drainage systems will create an enabling environment for local economic development and improved social services that communities within the sphere of influence of the municipality will benefit from, thus, contributing to the overall economic development of the region.
2	**Project Locations (alignment)**
Description of alternatives	*Location (alignment) of Bhairav Nagar Nala*- The catchment of Bhairav Nala originates from Takht Sagar hill areas in upstream of Shobawato ki Dhani, where drain terminates into plain area. The total catchment is 7.10 km^2 and length of the longest stream is 6.5085 km. the highest contour level is at RL 255 m at foot of the hills and 231 m at Shobawato ki Dhani, where drain terminates into plain area. There is no well-defined drain beyond Shobawato ki Dhani. The water is stagnating over the year and flooding during the monsoon. So, to mitigate the problems of stagnating water, structured drain till Jojari river is to be provided.

	The ROW of drain considered is according to available roadway width. The Box and open both type of drains are proposed from Shobawato ki Dhani to confluence point with Salawas- Jodhpur road of total length 7050 m. Open type drain is proposed parallel to Salawas-Jodhpur road upto Jojari river in a length of 6053 m. The box width adopted is 6 m and water depth of 2.6 m. Therefore, open drain is proposed in existing ROW of Salawas Jodhpur road. The alignment from chainage 0 to 7050 is mostly on open area and kuchha/ BT road with road cutting required for road crossing and highway crossing after 7050 to end point, alignment is along the Salawas road BT road and not required road cutting as it proposed along the road within ROW. The slope of the drain worked out is 1:350 from Shobawato ki Dhani to discharging point in Jojari river. The close box type culvert or open through 6 m x 2.6 m is proposed from ch. 0.0 m to 13102.77 m from Shobawato ki Dhani to Jojari river. The close box type structure is proposed all along the alignment from Shobawatoko ki Dhani to Jojari river due to restricted ROW of existing road available at this location and properties located abutting to the road. The alignment of drain and adopting box type drain cross section along the existing village road the land acquisitions in village area Shobawato ki Dhani, Pal and Tanawad is avoided. The cost of Land Acquisition is avoided by aligning proposed drain cross section on existing village road from Shobawatoko ki Dhani to Jodhpur Salawas road and rest of the alignment is proposed parallel to the existing ROW of Jodhpur Salawas road upto Jojari river. *Location (alignment) of Saran Nagar Nala up to Jojari River*- The entire city drains towards Jojari River which is an non perennial river and flows from north-east to south-west of the city. As per the Topography of terrain and existing major drains and also keeping in view of their flow direction and ultimate disposal, Drain 8-8 (from Krishi Mandi - Bhadwasia Vishwakarma Nagar - Vidya Nagar - RTO Office - Gulab Nagar - Sirkariya Beri), Drain 11 -11 (Basni Bund - Mata ka Than - Central Academy - khokhariya – Jojari) and Drain 7-7 – (From Uday Mandir - Baldev Mirdha Circle - Paota Circle - Rasala Road - Prithvipura - Cantonment at Jaipur road Digari Saran Village - Army Area - Jojari River) are connected with each other and disposal of these drains at Jhojhari River. Jojari River is the major outfall boundary for the city of Jodhpur. It flows from North-East side of Jodhpur city to South – West direction and receives not only polluted overflow from city but also solid waste dumped into it. The river Jojari is the sole outlet for all of Jodhpur city's storm water. The alignment of major storm water drains under each drainage zones are identified based on the topography and sloping of Drainage area. To the maximum extent, the alignments are proposed along the existing road network only to avoid any land acquisition. Therefore, proposed alignments of both the drains are selected based on available ROW and govt. lands, and no project alternative selected.

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy

26. ADB SPS Requires that during the design, construction, and operation of the project necessary compliance to all applicable laws and international conventions / treaties along with pollution prevention and control technologies and practices consistent with international good practice, are ensured.

27. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

(i) **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment (EIA) is required.
(ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE) is required.
(iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
(iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI.

28. The environmental impacts of Jodhpur Drainage subproject have been identified and assessed as part of the planning and design process. An environmental assessment using ADB's REA checklist for Urban Development (see **Appendix 1**) was conducted, and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus, this IEE has been prepared in accordance with ADB SPS's requirements for environment category B projects.

29. **Environmental Management Plan.** An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

30. **Environmental Audit of Existing Facilities.** ADB SPS, 2009 requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

31. **Public Disclosure.** The IEE will be put in an accessible place (e.g., local government offices, libraries, community centres, etc.), and a summary translated into local language for the project affected people and other stakeholders. The following safeguard documents will be put up in ADB's website so that the affected people, other stakeholders, and the public can provide meaningful inputs into the project design and implementation:

(i) For environmental category A projects, a draft EIA report at least 120 days before Board consideration;
(ii) Final or updated EIA and/or IEE upon receipt; and
(iii) Environmental monitoring reports submitted by the PMU during project implementation upon receipt.

32. **Consultation and Participation.** ADB SPS, 2009 require borrower to conduct meaningful consultation[1] with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

33. **Grievance Redress Mechanism.** ADB SPS, 2009 require borrowers to establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints, and grievances about the subproject's performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

34. **Monitoring and Reporting.** Borrower shall monitor, measure and document the implementation progress of the EMP. If necessary, the borrower shall identify the necessary corrective actions, and reflect them in a corrective action plan. Borrower shall prepare and submit to ADB semi-annual environmental monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis until ADB issues a project completion report.

35. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, ADB SPS, 2009 requires the borrower to update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

36. **Occupational Health and Safety.** ADB SPS, 2009 requires the borrower[2] to ensure that workers[3] are provided with a safe and healthy working environment, taking into account risks inherent to the sector and specific classes of hazards in the subproject work areas, including physical, chemical, biological, and radiological hazards. Borrower shall take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of

[1] Per ADB SPS, 2009, meaningful consultation means a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle 1; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

[2] In case where responsibility is delegated to subproject contractors during construction phase, borrower shall ensure that the responsibilities on occupational health and safety are included in the contract documents.

[3] Including nonemployee workers engaged by the borrower/client through contractors or other intermediaries to work on project sites or perform work directly related to the project's core functions.

work, including: (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

37. **Community Health and Safety.** ADB SPS, 2009 requires the borrower to identify and assess risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the subproject, and shall establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

38. **Physical Cultural Resources.** Borrower is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. ADB SPS, 2009 requires that such resources likely to be affected by the subproject are identified, and qualified and experienced experts assess the subproject's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process. When the proposed location of a subproject component is in areas where physical cultural resources are expected to be found as determined during the environmental assessment process, chance finds procedures shall be included in the EMP.

39. **ADB SPS International Best Practice Requirements**. ADB SPS, 2009 requires that, during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety (EHS) Guidelines. (IFC's General EHS Guidelines[4] and Sector Specific [Water and Sanitation] Guidelines[5]). These standards contain performance levels and measures that are normally acceptable and applicable to projects. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

B. National Laws

40. The implementation of the subprojects will be governed by Government of India and State of Rajasthan and other applicable environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize or mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether applicable international, national, state or municipal or local. Key standards include those related to drinking water quality, air quality, effluent discharge, and protected areas. Compliance is required in all stages of the

[4] https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

[5] https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

subprojects including design, construction, and operation and maintenance.

41. **Environmental assessment.** The Government of India EIA Notification of 2006 (replacing the EIA Notification of 1994) sets out the requirement for environmental assessment in India. This states that environmental clearance is required for specified activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts.

42. **Category A** projects require environmental clearance from the central Ministry of Environment, Forests and Climate Change (MOEFCC). The proponent is required to provide preliminary details of the project in the prescribed manner with all requisite details, after which an Expert Appraisal Committee (EAC) of the MOEFCC prepares comprehensive terms of reference (TOR) for the EIA study. On completion of the study and review of the report by the EAC, MOEFCC considers the recommendation of the EAC and provides the environmental clearance if appropriate.

43. **Category B** projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study) and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the environmental clearance based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A, if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

44. None of the components of this Drainage subproject falls under the ambit of the EIA Notification 2006, and therefore EIA Study or environmental clearance is not required for the subproject.

45. **Applicable environmental regulations.** Besides EIA Notification 2006, there are various other acts, rules, policies and regulations currently in force in India that deal with environmental issues that could apply to infrastructure development. The specific regulatory compliance requirements of the subproject are shown in Table 4.

C. Environmental Regulatory Compliance

46. **Table 4** presents a summary of environmental regulations and mandatory requirements applicable to Jodhpur Drainage subproject.

Table 4: Applicable Environmental Regulations

Law	Description	Requirement	Relevance to Subproject Phase
National Environment Policy (NEP), 2006.	NEP is a comprehensive guiding document in India for all environmental conservation programs and legislations by Central, State and Local Government. The dominant theme of this policy is to promote betterment of	Subproject should adhere to NEP principle of “enhancing and conservation of environmental resources and abatement of pollution”.	All phases of subproject

Law	Description	Requirement	Relevance to Subproject Phase
	livelihoods without compromising or degrading the environmental resources. The policy also advocates collaboration method of different stakeholders to harness potential resources and strengthen environmental management.		
Rajasthan State Environment Policy, 2010 And Rajasthan Environment Mission and Climate Change Agenda for Rajasthan (2010-14)	Follows the National Environment Policy, 2006 and core objectives and policies are: -Conserve and enhance environmental resources; assure environmental sustainability of key economic sectors; and improve environmental governance and capacity building - it recommends specific strategies and actions to address the key environmental issues: water resources, desertification and land degradation, forest and biodiversity, air quality, climate change: adoption and mitigation, mining, industry, tourism, energy, urban development, etc. - Establishment of Environment Mission under the chairpersonship of the Chief Minister and a Steering Committee under the chairpersonship of Chief Secretary, Government of Rajasthan Tasks force set up for six key areas	Subproject implementation should adhere to the policy aims of: conservation and enhancement of environmental resources, integration of environmental concerns into projects/plans, and capacity building in environmental management. Under water sector, major concerns, as the policy notes, are huge water losses and wastage, declining water availability, pollution. Relevant recommendations for the project include control of losses, integrated water resources management, control of raw water pollution, reuse and recycling. Avoid/minimize use of forest lands. With reference to climate change adoption and mitigation following should be considered in the project: (i) diminishing flows in surface water bodies, and groundwater depletion, and revival traditional water bodies as water sources (lakes/tanks); (ii) equal stress on demand side management in water; and (iii) minimize energy use - design energy efficiency systems.	All phases of subproject
EIA Notification,2006	Projects indicated in the schedule of this notification require EIA study and environmental clearance.	None of the subproject components of this subproject falls under the ambit of the notification; no EIA study or environmental clearance required	-

Law	Description	Requirement	Relevance to Subproject Phase
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments (1987)	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Control of water pollution is achieved through administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quantity and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the subproject having the potential to generate sewage or trade effluent will come under its purview. Such projects have to obtain Consent to establish (CTE) under Section 25 of the Act from Rajasthan State Pollution Control Board (RSPCB) before starting implementation and Consent to Operate (CTO) before commissioning.	Subproject components does not require consent under this Act	Not applicable
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards. The projects having potential to emit air pollutants into the atmosphere have to obtain CTE and CTO under Section 21 of the Act from RSPCB. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	The following will require CTE and CTO from RSPCB: (i) Diesel generators (more than 15 KVA); (ii) Batching Plant hot mix plants; and (iii) stone crushers, if installed for construction. All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RSPCB website (http://environment.rajasthan.gov.in) If ready mix concrete and hot mix bitumen is procured from third party, contractor has to ensure that the plants, from	Construction and operation

Law	Description	Requirement	Relevance to Subproject Phase
		where material is being purchased is having CTE/CTO and copy should be collected from third party and submitted in PIU	
Biodiversity Act of 2002	This Act primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	Not Applicable	-
Wildlife Protection Act, 1972 and amendment 1991	This overarching Act provides protection to wild animals, birds, plants and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo authority, tiger conservation authority, penalty clauses and other important regulations.	Gudha Vishnoia Conservation Reserve is situated in Jodhpur at approx. 10 Km aerial distance from municipal boundary of Jodhpur. None of the components of the subproject are located near or within the protected Area. Therefore, this act is not applicable.	Not Applicable
Forest (Conservation) Act, 1980	The Forest (Conservation) Act prohibits the use of forest land for non-forest purposes without the approval of Ministry of Environment Forests & Climate Change (MoEFCC), Government of India	Not applicable; none of the components of the subproject are located in forest.	Not Applicable
Environmental (Protection) Act, 1986 amended in 1991 and the following rules/notifications:	This is an “umbrella” legislation that empowers the Central Government to take all necessary measures to protect and improve the quality of the environment and prevent, control and abate environmental pollution. Empowers central government to enact various rules to regulate environmental pollution, including standards for quality of air, water, noise, soil; discharge standards or allowable concentration limits for environmental pollutants, handling of hazardous substances, locating/prohibiting industries, etc.,	There are rules / notifications that have been brought out under this Act, which are relevant to the subproject, and are listed below	Construction and operation
Environmental Standards	Emissions and discharges from the facilities to be created or	**Appendix C-2** provides ambient air quality standards;	Construction and operation

Law	Description	Requirement	Relevance to Subproject Phase
(ambient and discharge).	refurbished or augmented shall comply with the notified standards	**Appendix C-5** provides emission limits for vehicle exhaust and **Appendix C-3** provides emission limits of DG sets and **Appendix C-4** provided emission stack height requirements for diesel generators	
Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010.	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	**Appendix C-6** provides applicable noise standards	Construction and operation
Solid Waste Management Rules 2016	Responsibility of Solid Waste Generator segregate and store the waste generated in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste pickers or waste collectors as per the direction or notification by the local authorities from time to time; store separately construction and demolition waste, as and when generated, in his own premises and shall dispose off as per the Construction and Demolition Waste Management Rules, 2016; (iii) No waste generator shall throw, burn or burry the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.	Contractor to follow all the rules during construction works	Construction and operation
Construction and Demolition Waste Management Rules 2016	(i) Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities (ii) Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains (iii) Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit	Disposal site shall be identified and allotted by Municipal Corporation/Jodhpur Development Authority after mobilization of contractor (during SIP period) and can't be mentioned at this time. Contractor to follow all the rules during construction works. Sludge or any material if classified as hazardous waste / material is to be handled and	Construction

Law	Description	Requirement	Relevance to Subproject Phase
	waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodelling work, (iv) Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal / reuse of C & D Waste. (v) Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar, (vi) Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;	disposed according to this Rules	
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016,	Responsibilities of the occupier for management of hazardous and other wastes.- (1) For the management of hazardous and other wastes, an occupier shall follow the following steps, namely:- (a) prevention; (b) minimization; (c) reuse, (d) recycling; (e) recovery, utilization including co-processing; (f) safe disposal. (2) The occupier shall be responsible for safe and environmentally sound management of hazardous and other wastes. (3) The hazardous and other wastes generated in the establishment of an occupier shall be sent or sold to an authorized actual user or shall be disposed of in an authorized disposal facility. (4) The hazardous and other wastes shall be transported from an occupier's establishment to an authorized actual user or to an authorized disposal facility in accordance with the provisions of these	Contractor to comply all the requirements of this Act during construction works.	Construction and operation

Law	Description	Requirement	Relevance to Subproject Phase
	rules. (5) The occupier who intends to get its hazardous and other wastes treated and disposed of by the operator of a treatment, storage and disposal facility shall give to the operator of that facility, such specific information as may be needed for safe storage and disposal. (6) The occupier shall take all the steps while managing hazardous and other wastes to- 6 (a) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; and (b) provide persons working in the site with appropriate training, equipment and the information necessary to ensure their safety.		
Wetlands (Conservation and Management) Rules, 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	Not applicable as subprojects components are not located in or near to designated wetland area.	Not applicable
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010.	The Act designates areas within 100 meters (m) of the "protected monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI).	Mandore Fort is ASI protected monument in Jodhpur but none of the project area falls under prohibited (100 mts) or regulated (100-200 mts) areas of this fort No other ASI Monuments falls under impact area of any of the component of this project. (List of ASI Protected Monuments and map showing 300 mtr area around them are attached in **Appendix 2)**	Not applicable
The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961; the Rajasthan	Any construction/excavation work in the 'protected area' (as declared by GoR under the Act) requires prior permission of Department of Archaeology & Museums	There are many state protected monuments in the Jodhpur district and few of them are located in Jodhpur city areas such as- Mehrangarh Fort, Prachin Mahal, Cenotaph, Ravan ki Chawri etc.	Not applicable

Law	Description	Requirement	Relevance to Subproject Phase
Monuments, Archaeological Sites and Antiquities (amendment) Act 2007	-Application under the Rules shall be submitted to Director, State Archaeological Department, at least 3 months prior to the work. Department provides conditional permission, including time for completion, procedures to be followed during the work and for chance finds.	None of project components falls within the protected areas of any of the state protected monuments. (List of State Protected Monuments and map showing 300 mtr area around them are attached in **Appendix 2**)	
The Building and Other Construction Workers (BOCW) Act 1996 and Rajasthan Building and Construction Workers Rules 2009	**Employer shall-** • Provide and maintain, at suitable point, sufficient quantity of wholesome drinking water, such point shall be at least 6 meters away from any washing areas, urinals or toilets • Provide sufficient urinals and latrines at convenient place, easily accessible by workers • Provide free of charge, temporary living accommodations near to work sites with separate cooking place, bathing and lavatory facilities and restore the site as preconditions after completing the construction works • Provide crèche with proper accommodation, ventilation, lighting, cleanliness and sanitation if more than fifty female workers are engaged • Provide first aid facilities in all construction sites **For safety of workers employer shall provide-** • Safe access to site and workplace • Safety in demolition works • Safety in use of explosives • Safety in operation of transporting equipment and appoint competent person to drive or operate such vehicles and equipment	Contractors are required to follow all the provisions of BOCW Act and Rajasthan BOCW Rules. Salient features of Rajasthan BOCW Rules are- Chapter III, section 17- Registration of establishments Chapter VIII, section 61- Hours of works, intervals or rest and spread over, overtime Section 62- weekly rest Section 63- night shift Section 67- registers of workers Section 68- Muster roll, wages register Section 70- latrine and urinal facilities Chapter XI- Safety and Health Section 78- fire protection Section 79- emergency action plan Section 80- fencing of motors Section 81- lifting and carrying of weight Section 82- H&S policy Section 83- dangerous and harmful environment Section 84- Overhead protection Section 88- eye protection Section 89- PPEs Section 90- electrical hazards Section 97- use of safety helmets and shoes Chapter XIII-lifting appliances and gears Chapter XV- transport and earth moving equipment Chapter XVI- concrete works Chapter XVII- demolition works Chapter XVIII-Excavation and tunneling	Construction

Law	Description	Requirement	Relevance to Subproject Phase
	• Safety in lifting appliance, hoist and lifting gears • Adequate and suitable lighting to every workplace and approach • Prevention of inhalation of dust, smoke, fumes, gases during construction works and provide adequate ventilation in workplace and confined space • Safety in material handling and stacking/un stacking • Safeguarding the machinery with fly-wheel of moving parts • Safe handling and use of plants operated by compressed air • Fire safety • Limit of weight to be lifted by workers individually • Safety in electric wires, apparatus, tools and equipment • Provide safety net, safety sheet, safety belts while working at height (more than 1.6 mtrs as per OSHA) • Providing scaffolding, ladders and stairs, lifting appliances, chains and accessories where required • Safety in pile works, concrete works, hot asphalt, tar, insulation, demolition works, excavation, underground construction and handling materials • Provide and maintain medical facilities for workers • Any other matters for the safety and health of workers	Chapter XX- ladders and step ladders Chapter XXII- structural frame and formworks Chapter XXIV- medical facilities and first aid box	
Contract Labor (Regulation and Abolition) Act, 1970;	Provides for welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal	• Applicable to all construction works in the subproject • Principle employer (RUDSICO-EAP) to obtain Certificate of Registration from	Construction and operation

Law	Description	Requirement	Relevance to Subproject Phase
The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor. The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.,	Department of I, as principle employer • Contractor to obtain license from designated labor officer • Contractor shall register with Labor Department, if Inter-state migrant workmen are engaged • Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc., **Appendix C-12** provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.	
The Child Labour (Prohibition and Regulation) Act, 1986	Prohibits employment of children below 14 years of age in certain occupations and processes Employment of child labor is prohibited in building and construction Industry.	No child labour should be employed	Construction and operation
Minimum Wages Act, 1948	Minimum wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads and runways are scheduled employment.	Applicable to all construction works in the project All construction workers should be paid not less than the prescribed minimum wage	Construction and operation
Workmen Compensation Act, 1923	Provides for compensation in case of injury by accident arising out of and during the course of employment.	Compensation for workers in case of injury by accident	Construction and operation
Equal Remuneration Act, 1979	Provides for payment of equal wages for work of equal nature to male and female workers and not for making discrimination against female employees in the matters of transfers, training and promotions etc.	Equal wages for work of equal nature to male and female workers	Construction and operation
Rajasthan Forest Act, 1953 and Rajasthan Forest Rules, 1962	This Act makes the basis for declaration of Reserved Forests, constitution of village forest committees,	Not applicable; none of the components / alignment are in reserved or community forest areas.	Construction

Law	Description	Requirement	Relevance to Subproject Phase
	management of reserved forests and penalties and procedures.		
International conventions and treaties			
Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	There are no Ramsar sites in or near Jodhpur. Not applicable to Jodhpur drainage subproject.	Not applicable
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973	India is a signatory of this convention which aims to control international commercial trade in endangered species	Not applicable in this project as no endangered species of wild fauna and flora is found in project locations.	-
Montreal Protocol 1992	India is a signatory of this convention which aims to reduction in the consumption and production of ozone-depleting substances (ODS), while recognizing differences in a nation's responsibilities. Ozone depleting substances are divided in two groups Chlorofluorocarbons (CFCs) and Hydrochlorofluoro carbons (HCFCs)	Not applicable in this project as no ODS are involved in construction works	Not applicable
Basel Convention on Trans-boundary Movement of Hazardous Wastes, 1989	India is a signatory of this convention which aims to reduce trans-boundary movement and creation of hazardous wastes	Contractor to follow the provisions of Hazardous Waste Rules 2016 for storage, handling, transport and disposal of hazardous waste emerged during construction works. Under this Convention, asbestos or asbestos waste in the form of dust and fibers is classified as hazardous waste.	Not applicable
Convention on Migratory Species	CMS, also known as Bonn convention, was adopted in	Not applicable to this project as no migratory species of wild	Not applicable

Law	Description	Requirement	Relevance to Subproject Phase
of Wild Animals (CMS), 1979 (Bonn convention)	1979 and entered into force on 1 November 1983, which recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international cooperation are listed in Appendix II, and CMS encourages the Range States to conclude global or regional agreements.	animals are reported in the project areas.	

47. **Clearances / permissions to be obtained prior to start of construction**. **Table 5** shows the list of clearances/permissions required for project construction. This list is indicative and the contractor should ascertain the requirements prior to start of the construction, and obtain all necessary clearances/permission prior to start of construction.

Table 5: Clearances and permissions required for Construction activities

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
1	Land for project activity	Allotment and approval for specific land use from Jodhpur Development Authority	Municipal Corporation/Jodhpur Development Authority
2	Establishment of construction camps	Allotment and approval for specific land use	Contractor
3	Tree Cutting	State forest department/Revenue (Tehsildar)	PIU
4	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from RSPCB	Contractor
5	Storage, handling and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules. 2016 Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989 from RSPCB	Contractor

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
6	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor
7	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
8	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
9	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
10	Use of Railways ROW for construction area/ crossing	Indian Railways	PIU
11	Use of highway ROW for construction area/ crossing	National Highway Authority of India- NOC is already taken (refer **Appendix 4**)	PIU

48. PMU will be overall responsible for supervision in getting all clearances and provide details to ADB through semi-annual report. PMU will ensure all necessary regulatory clearances and approvals are obtained prior to commencement of works. Respective PIUs, with support of project consultants and contractors, are responsible for obtaining the clearances/permits and ensuring conditions/specifications/provisions are incorporated in the subproject design, costs, and implementation. The PIUs shall report to PMU the status of compliance to clearances/permits as part of the regular progress reporting.

V. DESCRIPTION OF ENVIRONMENT

A. Physical Environment

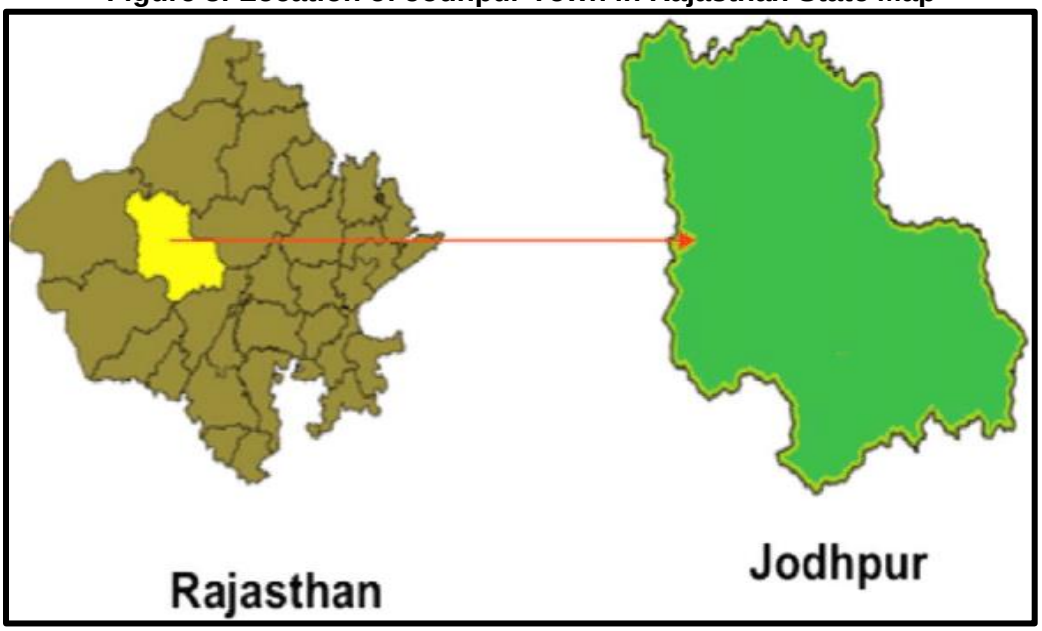
1. Location, Area & Connectivity

49. The city of Jodhpur was founded in 1456 A.D. by Rao Jodha. Jodhpur, the past capital of Rathore clan of Rajputs is an oasis in the desert. The city itself is in complete contrast to the surrounding country both in sudden appearance of hills and ridges and the presence of a large number of water bodies.

50. Jodhpur is the second largest city of Rajasthan. It is located in the lower middle of the Thar Desert of Western Rajasthan and is about 280 Km from Indo-Pak border and is situated at $26^0$18'North latitude and $73^0$01'East longitude. It has an altitude of 242 meters above MSL at Railway Station with Fort and old city being much higher i.e., 367.83 meters and between 245 to 325 meters. The outer city area lies between to 210-255 meters above MSL.

51. The city which originally had about 5.0 Sq Km area within the city wall, covered more than 50 Sq Km in 1972 and presently expanded to some 281 Sq Km with a potential to grow in about 321 Sq Km by the year 2023. Expansion of city towards the north and west is restricted because of hill ranges and in south-east due to defence establishments. Location of Jodhpur town in Rajasthan State map is shown in **Figure 8**.

Figure 8: Location of Jodhpur Town in Rajasthan State Map



2. Topography, Soils and Geology

52. ***Topography:*** The topography of Jodhpur city is greatly influenced by the underlying geological formations that consist of several flat-topped sandstone and Rhyolite hills that run in north-east to south-west direction. A continuous high ridge of Rhyolite separates the Kailana and Takhat Sagar lakes from the rest of the area. At places, the Rhyolite hills are capped by a few meters thick sandstone.

53. The mean sea level at Railway station is 242 msl while the fort and walled city is much higher, lies between 245 to 310 MSL. The outer city lies between 210 to 250 MSL contours. The hills with naturally developed drainage system ultimately drain into Jojari River which flows from north-east to south-west of the city. It is a non-perennial river. There are extensive stone quarries to the northwest of city. Land to the north-east and south-west mostly consists of plain terrain.

54. ***Soils:*** The geologists classify the soil of Jodhpur mainly as sandy and loamy. Bajra (Pearl millet) is the major crop in Jodhpur, especially in Kharif season. As Jodhpur is blessed with excellent groundwater in many areas, Rabi, pulses, wheat and various spices like dhania, jeera and red chilly are grown here. Red chilli, onion and garlic are the main crops here. Guar is also widely cultivated in Jodhpur. Sandstone and limestone are the important minerals of Jodhpur district. Fawn and red colored sandstone are found in abundance in the district. Building stones, stone slabs and flagstones are also mined in the district on a regular basis. The other minerals available here include quartz, clays of various colors and dolomite.

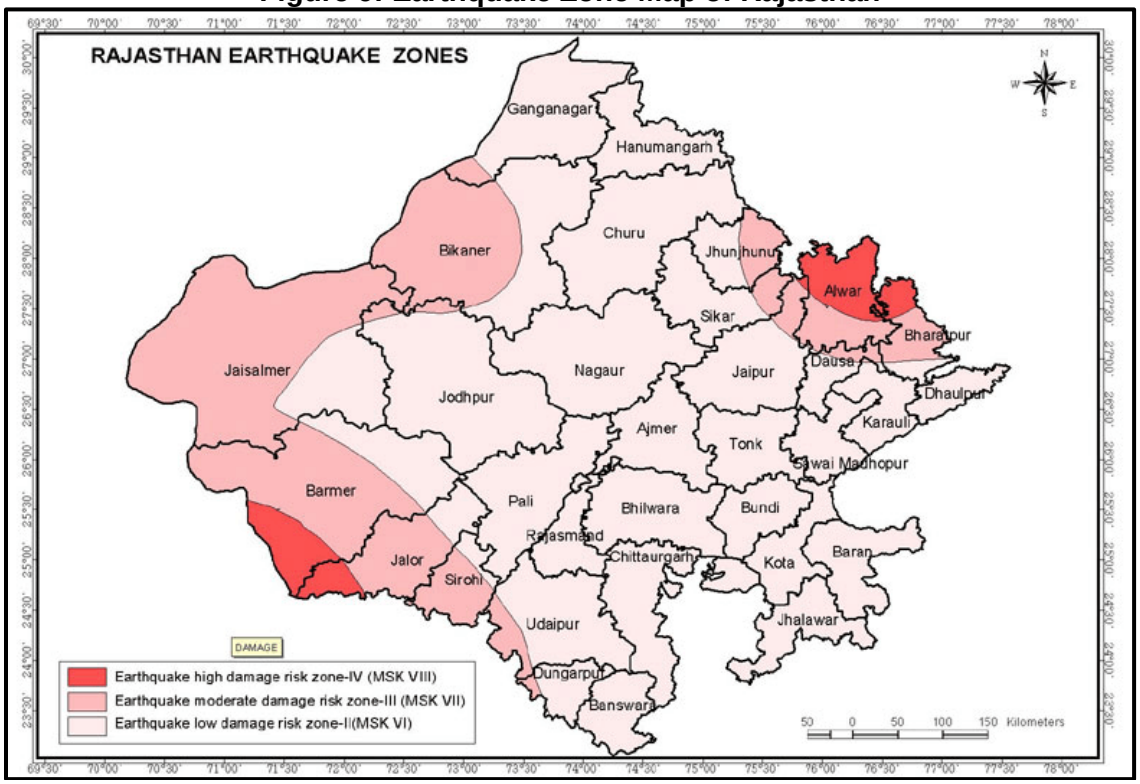
55. ***Geology:*** The area in and around Jodhpur comprises of variety of rock types ranging from Proterozoic bedrock to recent alluvium and desert sand. Pale proterozoic deformed meta sendiments of Aravali super group form the basement. This unit is followed by 745 million year old intrusive and extrusive rocks of Malani igneous suite, overlain in turn by rocks of the Maiwar Super group, its lower part comprising of the Sonia shale formation and Girbhakar sand stone formation of the Jodhpur group.

56. The surrounding flat terrain is occupied recent alluvium and desert sands of the Thar. Most of the city and surrounding area show outcrops of Malani Volcanic i.e., Rhyolite flows, Byroclain welded tuffs, Volcanic breccias and Pyroclastics. However, Mehran Garh Fort and the Umed Palace have their foundation on sand stone of Jodhpur group.

3. Seismology

57. Many parts of the Indian subcontinent have historically high seismicity. Seven catastrophic earthquakes of magnitude greater than 8 (Richter scale) have occurred in the western, northern and eastern parts of India and adjacent countries in the past 100 years. Approx. 59 % of the land area of India is liable to seismic hazard damage. In India, seismic zones are divided into four zones i.e. V, IV, III and II. As per the seismic zoning map of India, Jodhpur Town falls under the Zone II, which is the lowest earthquake risk zone in India. This zone is termed as “low damage risk zone”. Hence the risk of earthquake at the proposed sites is minimal and so the site is safe. Earthquake Zone Map of Rajasthan is shown in **Figure 9.**

Figure 9: Earthquake Zone Map of Rajasthan



4. Climatic Conditions

58. The climate of Jodhpur city is characterized by extreme dryness, wide range and extremes of temperature and fitful and uncertain rainfall. The winter season is from November to March and is followed by summer from April to June. The period from July to mid-September forms the South-West monsoon season and mid-September to October is the post-monsoon season. Temperature rises rapidly after March & June is the hottest month with mean daily maximum at 41.6^{0}C. The summer months are intensely hot with scorching winds. The maximum temperature occasionally exceeds 47^{0}C. Peak maximum temperature recorded during summer is 48.9^{0}C. After mid-July temperature drops appreciably. The secondary maximum in day temperature is attained in

October after withdrawal of the south-west monsoon. January is the coldest month, when mean daily minimum temperature recorded is 2.2^0C. The mean monthly temperature varies from 26^0C to 41^0C in summer and 9^0C to 31^0C in winter the maximum & minimum temperatures ever recorded is Jodhpur in 48.9^0C in the summer and 2.2^0C in the Winter. The annual evaporation is very high, of the order 3048 mm, which is about 8.7 times the average annual rainfall. Evaporation at Kailana Lake, Jodhpur was measured during 1932-37 by Mr F.F. Fergusson the then Executive Engineer, Public Works Department Jodhpur state and was estimated as 2540 mm (100") per year. The relative humidity varies from 45% to 82% in the mornings and 15% to 50% in the evening. Prevailing wind directions are from the South-West to North-West during the summer months and from north – east to south-west in the winter. The mean monthly wind speed varies from 7-17 Km/hour.

59. **Rainfall: The** climate of Jodhpur is generally hot and arid but with a rainy season from late June to September. Although the average rainfall is around 360 millimetres (14 inch), it is extraordinarily variable. The temperature varies from 49 degrees in summer to 1 degree in winter. The Sandstorm (andhi) is a spectacle for people from other regions of India. The rainy days are limited to a maximum of 15 in a year. Temperatures are extreme throughout the period from March to October, except when monsoonal rain produces thick clouds to lower it slightly. During these periods of heavy rain, however, the generally low humidity rises, and this adds to the normal discomfort from the heat.

5. Surface Water

60. Jodhpur City is situated partly along the foot of hills and partly in the plains formed by weathering of rhyolites and sandstone. Major part of the old city lies on the piedmont zone. City is bounded by the hills in the north and west directions. The hills of rhyolites rising to an elevation of 395 m above mean sea level mark the prominent elevated landmark feature in the western part of the area. Topographic lowering of the plain area to the extent of 180 m above msl occurs in the south-eastern part of the area. The area is devoid of perennial drainage. Jojari river is an ephemeral stream in the area which flow in response to monsoon rainfall. The city sewerage is directed to Jojari through various drains. Balsamand, Kaylana, Takhatsagar, Ummedsagar, Ranisar, Padamsar, Lalsagar, Gulabsagar and Fatehsagar are notable water reservoirs in and around the city.

61. **'Jojari River'** originates from the southern part of Nagaur near village Pudlu in Rajasthan. Flowing from Jodhpur, this river enters Barmer in the south-west and then joins the Luni River near Siwana. The length of this river is 150 km. It is the longest river among the tributaries of Luni. The Jojari River running west of the Luni River is a stream of the ancient Saraswati River, which joins the Luni River near Siwana. Luni River meet. The Jojari is the only tributary that merges to the right-bank of the river while other 10 tributaries reach its left bank. All the tributaries of Luni except Jojari originates from the Aravalli hill. The Luni River finally dissipates into the wastes of the northeastern part the Rann of Kachchh (Kutch) in Gujarat.

6. Groundwater

62. There is a large variation in chemical quality of ground water in the district depending on the characteristics of water bearing formation, movement of ground water, depth to water levels etc. It is seen that in shallow ground water zone, the electrical conductance varies generally from 570 ms/cm at 250C at Balarwa to 10210 ms/cm at 250C at Raron ki dhani. Highly mineralized ground water occurs in Rann area. The ground water in southern, southeastern, and southwestern parts of the district is saline. In Bap block, northern and western parts have brackish

ground water. The electrical conductance is less than 3000ms/cm at 250 C in major part of the district. In the central part of the district where sandstone forms th aquifer, electrical conductance generally varied from less than 1000 to 2000 ms/cm at 250 C.

7. Air Quality

63. Jodhpur being located in dry arid zone coupled with dust storms, especially during summer months, the particulate matter in ambient air is high. Traffic on the roads and winds are the main source of dust generation. Ambient air quality in Rajasthan is monitored by Rajasthan State Pollution Control Board (RSPCB). As presented in the following table, annual average concertation of gases like NO2 and SO2 are within both national standards and WHO guideline values, while particulate matter concentration (PM10) is high.

64. The contractor is required to conduct ambient air quality of Jodhpur in the pre-construction phase to establish the baseline at project sites, and will continue periodic monitoring as per the environmental management plan.

Table 5A: Ambient air quality of Jodhpur (annual average)

Yes	PM10 (μg/m3)	NO2 (μg/m3)	SO2 (μg/m3)
2022	139	29.04	6.16
2021	149	16.25	3.24
2020	135	24.43	5.02
2019	188	23.76	6.65
2018	252	25	6.88
2017	203	22.96	6.3
2016	154	23.46	5.55
2015	133	23.93	5.96
Standards			
NAAQS (annual)	60	40	50
WHO guidelines (annual)	20	40	20

Monitoring location: DIC office, Jodhpur
NO2 = Nitrogen Dioxide
NAAQS = National ambient air quality standards
PM10 = Particulate Matter size less than 10um or
SO2 = Sulphur Dioxide
WHO = World Health Organization
Source: RSPCB

65. **Noise Quality.** Noise level quality of Jodhpur is not available, and contractor is required to conduct baseline noise level monitoring of Jodhpur at selected project sites in the pre-construction phase and will update in IEE report.

B. Ecological Resources

66. **Forest, flora and fauna:** Jodhpur District has rich flora and fauna. The recorded forest area of the district is 98 sq.km which is 0.43% of the district's geographical area The forests include mainly teak. The wildlife includes a large variety of wild animals like leopard, chinkara, etc. Common birds in the region are fowl, partridge, black drongo, grey shrike, green bee-eater, bulbul, parrot etc. Even though Jodhpur has an arid climate, one can see forests in a rather negligible percentage of the total land of the district. But the sandy soil allows only scrub and thorny bushes of vegetation to grow in these forests. Kumat, Kair, Khejri, Jal Khara, Bir and Pilu etc are the main species of trees in these forests. The fruit bearing trees like pomegranates and guavas are also grown here. Animals from the wild cat and jackal specimens are commonly found in the area. You can also find the birds like Baya, parrot, koyal, Jungle crow, bulbul, house sparrow, sand grouse, kite, grey partridge, little egrit and common quail in Jodhpur.

67. **Gudha Vishnoia Conservation Reserve.** This is small area of 2.32 sq. km. notified by Govt. Of Rajasthan on dtd. 15.12.2011 as Gudha Vishnoia conservation reserve. This conservation reserve is at approximately 10 km aerial distance from the municipal boundary of Jodhpur. Chinkara, Black Buck, Wild boar, blue bulls, desert Fox, Indian Jackal, Migratory Birds, local bird species are the major animal species found in this reserve No any project activity or site will have impact on this conservation reserve..

C. Economic Development

1. Land use

68. Jodhpur Master Plan provides land use details of Jodhpur town. Out of total 16326 acre area, 60.73 % is developed urban area. Rest of the land is under reserved area, open land, forest land, hilly area and water body. Details of the land use is provided in **Table 6** below.

Table 6: Existing Land Use of Jodhpur

S. No.	Land Use	Area (in Acres)	Percentage of Developed area (%)	Percentage of Urban area (%)
1	Residential	8325	50.99	30.97
2	Business	442	2.71	1.64
3	Industrial	1968	12.06	7.32
4	Govt. / Semi Govt.	348	2.13	1.29
5	Recreation	1133	6.94	4.22
6	Public and Semi Public	2018	12.36	7.51
7	Transport, roads and Recirculation	2092	12.81	7.78
	Developed Area	**16326**	**100.00**	**60.73**
8	Reserved area	4040		15.03

S. No.	Land Use	Area (in Acres)	Percentage of Developed area (%)	Percentage of Urban area (%)
9	Open land	4120		15.33
10	Forest area	405		1.51
11	Hilly Area	1870		6.96
12	Water body	119		0.44
	Total Urban area	**26880**	**-**	**100.00**

*Source: Master Plan Jodhpur 2011-2031

2. Commerce, Industry & Agriculture

69. The industrial development in Jodhpur has led to the economic growth of the city. Jodhpur is the third largest industrialized district of the Rajasthan state. The Handicraft industry has been the largest industry in the city. Many workers are in manufacturing of motor parts, textiles, metal utensils, bicycles and ink, handloom and sport goods. Lot of cottage industries are involved in manufacturing of glass bangles, cutlery, carpet, marble products and traditional items of tourist interests such as Tie and Die textile products. There were 6806 industrial units in 2000, which are increased to 6983 in the year 2001. Total area under industrial use in 2001 was 1968 acres which is 12.62% of the developed area. RIICO have developed different industrial areas in Jodhpur like Basani, Boronada, Mandore, Bhagat ki Kothi and Pal.

D. Socio Cultural Resources

1. Demography

70. As per Census of India, Jodhpur had a population of 1,033,918 in 2011, consisting of approximately 52.62 males and approximately 47.38 percent females. The average literacy rate is 80.56 percent, approximately 88.42 percent for males and 73.93 percent for females. Approximately 12.24 percent of the population is under six years of age. Jodhpur city is governed by a Municipal Corporation which comes under Jodhpur Urban Agglomeration.

71. The Jodhpur Urban/Metropolitan area includes Jodhpur, Kuri Bhagtasani, Mandore Industrial Area, Nandri, Pal Village and Sangariya. Its urban/metropolitan population is 1,137,815 of which 599,332 are males and 538,483 are females. With the inclusion of 395 villages in Jodhpur city in the month of February 2021 by JoDA, the new population count for the city is 2,330,000 and is expected to grow by 33.04% over the next decade. In the year 2031 population of Jodhpur city is expected to be more than 3.1 million. The population of Jodhpur city after expansion of city borders is 2,330,000.

2. History, Culture and Tourism

72. The Jodhpur city was founded in 1459 by Rao Jodha, a Rajput chief of the Rathore clan. Jodha succeeded in conquering the surrounding territory and thus founded a kingdom which came to be known as Marwar. As Jodha hailed from the nearby town of Mandore, that town initially served as the capital of this state; however, Jodhpur soon took over that role, even during the lifetime of Jodha. The city was located on the strategic road linking Delhi to Gujarat. This enabled it to profit from a flourishing trade in opium, copper, silk, sandalwood, dates, and other tradeable goods.

73. Jodhpur has culturally been known by the name of Jodhana by the locals. The city is famous for its food and its popularity can be judged by the fact that one can find sweet shops named "Jodhpur Sweets" in many cities throughout India. Being at the onshore of Thar Desert, life has been influenced by ways of select nomadic tribes (so-called "gypsy" groups – Banjare in Hindi – have settled in some parts of the city). Jodhpur has distinct cultural identity through its food and is famous for its Mirchi Bada and Mawa Kachori.

74. Jodhpur's most notable attractions are Mehrangarh Fort which overlooks upon the city, the blue bylanes of the old city are also an attraction, Umaid Bhawan Palace, Jaswant Thada, and the Ghanta Ghar, or Clock Tower. Tourists are also within proximity to Mandore Garden, Kaylana Lake and Garden, Balsamand Lake, Machia Biological Park, Rao Jodha Desert Rock Park, Ratanada Ganesh Temple, Toorji Ka Jhalra, Sardar Samand Lake and Palace, Masooria Hills, Veer Durgadas Smarak (monument, park, and museum) and Bhim Bhadak Cave. Other attractions of people are at markets of food, antique items, traditional clothes and traditional shoes (also called Jodhpuri Mojari) held in Jodhpur. Table 7 below provides the distance of nearest proposed project components and protected sites in Jodhpur. Appendix 2 provides list of all state protected monuments in Jodhpur district.

Table 7: Distance of Protected Monuments (within Municipal Limit of Jodhpur) and Gudha Vishnoia Conservation Reserve from proposed major components in Jodhpur Drainage works

S. No.	Name of protected monument	Approx. Aerial Distance of Saran Nagar Nala from Protected sites	Approx. Aerial Distance of Bhairav Nagar Nala from Protected sites
1	Mandore Fort (ASI Protected)	7.2 km	14.1 km
2	Cenotaph of Maharaja Jaswant Singh (State protected)	7.25 km	14.15 km
3	Cenotaphes at Panch Kunda (State protected)	7.58 km	14.3 km
4	Mehrangarh Fort (State Protected)	5.74 km	7.84 km
5	Gudha Vishnoia Conservation Reserve	11.8 km	18.4 km

E. Environmental Settings of Investment Program Component Sites

75. Site environmental features of all subproject sites and photographs are presented in the following **Table 8**. Photographs showing the proposed components are given in **Appendix 4**.

Table 8: Environmental Features of Proposed Alignment

S. N.	Chainage (m)	Existing land Use	Environmental Features	Photos
A. Bhairav Nagar Nala (Start point 26°14'0.67"N and 72°59'4.97"E, Disposal Point- 26° 7'39.74"N and 72°59'6.15"E)				

1	0-500	Existing Earthen Drain is present in Ashok Nagar/ Murli Nagar	❖ Earthen open drain is covered by Arandi (castor oil plant). ❖ Right hand side is open land and used mainly for agricultural and left hand side area is habitation of Ashok Nagar and Murli Nagar	
2	500-750	Open land/ drain	❖ No plantation is observed except some Babool (Prosopis juliflora) plantation on this land. ❖ Blackish water in running condition is observed	
3	750-900	Water Logged Area	❖ Water logged condition due to stagnant drain water. ❖ Babool (Prosopis juliflora) plantation is present	
4	900-1220	Open vacant land	❖ Wire fencing and agriculture fields are observed along the alignment of proposed drain.	
5	1220-1325	Existing Kachhcha Rasta	❖ In RHS side open area and in LHS side Neem, Babool (Prosopis juliflora) plants are present	

6	1325-1725	Kachhcha Rasta through open vacant land	❖ Open vacant land where no plantation is observed on proposed route.	
7	1725-1775	Kachhcha Rasta in Open vacant govt. land	❖ Open land Area where no tree maybe impacted	
8	1775-1790	4-lane local colony BT road crossing.	❖ 3 nos. Neem trees may be impacted	
9	1790-1950	Open space behind the Ashapuram Enclave	❖ Along the proposed alignment on the left side 130 m long boundary wall of Ashapuram Enclave society is present ❖ In the proposed drainage alignment One Rohida tree, 9nos. Babool (Prosopis juliflora) and 3 nos. Neem are coming and may be impacted	
11	1950-1975	BT Road Crossing	❖ BT road surface will be excavated for proposed Nala	

12	1975 to 2180	Kachhcha Rasta in Plotting Area	❖ No tree will be impacted. ❖ In LHS side Boundary wall of plots and RHS side open area is present.	
13	2180-2240	4-lane NH Road crossing	❖ BT road surface will be excavated for proposed Nala .	
14	2240-2545	25 Feet Road proposed along open vacant land	❖ Open vacant land where 3 nos. Khejri, 2 nos. Desi Babul (*Acacia sps*), and One Babool (*Prosopis juliflora*) trees may be impacted.	
15	2545-2560	Single BT Road crossing	❖ Single lane BT road surface will be excavated for proposed Nala	
16	2560-33400	Plotting area along Single BT and gravel road	❖ The proposed drainage alignment is passing in right side of gravel road where some semi-pucca houses and plot boundary walls are present. ❖ 05 nos. Neem Trees and 02 nos. Pipal will be impacted.	

<table>
<tr>
<td></td>
<td>2700-2750</td>
<td>Road along Central Academy School</td>
<td>❖ Noise Sensitive Area of Central Academy (School) in RHS of Existing Road</td>
<td>  </td>
</tr>
<tr>
<td>17</td>
<td>3380-3400</td>
<td>Sangariya Bypass 2-lane BT Road Crossing</td>
<td>❖ BT road surface will be excavated for proposed Nala .</td>
<td>  </td>
</tr>
<tr>
<td>18</td>
<td>3400-6300</td>
<td>Single gravel road</td>
<td>❖ Proposed Alignment is passing along the existing gravel road. Various types and number of trees standing on fields may be impacted.
❖ Trees which may be impacted are :
<table>
<tr><td>Neem</td><td>119</td></tr>
<tr><td>Prosopis Julifolra</td><td>5</td></tr>
<tr><td>Pipal</td><td>5</td></tr>
<tr><td>Khari Badam</td><td>1</td></tr>
<tr><td>Khejri</td><td>15</td></tr>
<tr><td>Rohida</td><td>1</td></tr>
<tr><td>Babul</td><td>1</td></tr>
<tr><td>Jal</td><td>16</td></tr>
<tr><td>Ber</td><td>1</td></tr>
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<td>  </td>
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<tr>
<td>19</td>
<td>6300-6600</td>
<td>Open vacant land</td>
<td>❖ Open vacant land where 2 nos. Khejri trees will be impacted</td>
<td>  </td>
</tr>
</table>

<table>
<tr><td>20</td><td>6600-7050</td><td>Single gravel road in plotting area</td><td>❖ Radha Swami Temple is situated in right hand side of proposed alignment
❖ 2 nos. Khejri Trees will be impacted</td><td>  </td></tr>
<tr><td></td><td>7050-</td><td>Open space alone 2-lane Salawas BT Road</td><td>Shops near Tanavada Pantha meaket area and few trees in open space along the existing Salawas 2-lane BT Road.</td><td>  </td></tr>
<tr><td>21</td><td rowspan="3">7050 to Jojari River</td><td rowspan="3">Along the Salawas 2-lane BT Road</td><td>Under Ground gas pipeline along the road in right side in proposed drainage route</td><td>  </td></tr>
<tr><td>23</td><td>Electrical line and poles along the Salawas Road in right side in the proposed drainage alignment</td><td>  </td></tr>
<tr><td>23</td><td>Various trees along the Salawas road in RHS may be impacted. Details are:<table><tr><td>Neem</td><td>60</td></tr><tr><td>Julifolra</td><td>1</td></tr><tr><td>Pipal</td><td>1</td></tr><tr><td>Khari Badam</td><td>1</td></tr><tr><td>Khejri</td><td>12</td></tr><tr><td>Babul</td><td>15</td></tr></table></td><td>  </td></tr>
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				Jal 2 Ber 6 Siras 1	
24	Jojari River at end point	Near the Salawas	Jojari river near the Salawas is crossing the Salawas road and at this point proposed drainage Nala will be discharged into the river		
B. Saran Nagar Nala (Mata Ki Than to Jojari River) Start Point- 26°18'15.64"N and 73° 4'35.21"E, End Point- 26°19'45.74"N, 73° 7'56.21"E)					
(i) Ext. of Krishi Mandi/RTO Nala upto Saran Nagar Flyover (Benad Road) : 0.0 to 1300m					
1	0.0 to 1300	Opening existing Krishi Mandi/RTO Nala	At the start point of proposed drain near RTO office existing drain discharge water in open area and at this point two nos. existing drain discharge their storm water.		
2		Buildings and Open space along the NH -112 in LHS	High voltage electrical line in the proposed route of drainage alignment.		
3			❖ Habitation along the NH in LHS		

4		Road side vacant space	❖ Baba Ram Dev Temple in LHS which having 7 m distance from road edge.	
5		Road side vacant space	❖ Small temple on road edge in Kargil Sahid park	
6		Road side vacant space	❖ 75m long and 25 m wide Kargil Shahid Park along the road edge.	
7		Road side vacant space	❖ Shiv Temple in LHS along the proposed drainage Nala alignment in LHS of road and its having 8 m distance from road edge.	
(i) Ext. of Mata Ka Than upto Saran Nagar Flyover : 0.0m to 510m				
8	0.0 to 510	In LHS side flyover and RHS agriculture fields/vacant/lands are observed.	❖ No storm water is observed at the end of existing Pucca drain Near the Mata Ka Than.	

9		In right side Shops and Police station are observed	❖ High tension electrical line pole is existed on the proposed drainage alignment near the Police Thana of Math ka Than, Therefore at this place alignment will be minor shifted on service lane of Saran Nagar Veer Tejaji Flyover.	
10			❖ At the Saran Nagar Veer Tejaji Flyover, proposed alignment is crossing the railway line and after the flyover it join the RTO to Saran Nagar drain and after joining it will passing along the Benad Road (NH-112)	
(ii) Ext. of Krishi Mandi/RTO Nala & Mata Ka Than Nala from Saran Nagar Flyover to Disposal Point 0.0 to 5210m				
11	0.0 to 300 m	Boundary Wall	❖ In left side Boundary wall and right side fly over. Proposed drainage alignment is passing on the service lane so during the construction CC road surface will be removed	
12	350 to 1400m	Market Area	❖ High tension electrical line and poles are observed along the proposed drainage alignment.	
13	350 to 1300m	Market Area	❖ Ramjan Ji Hatha Market area along the proposed drainage route alignment.	

14	930m	Roadside Temple	❖ Small Shiv temple is observed in the proposed drainage route alignment. It's having 4m distance from road edge in left side of road.	
15	1400 to 1500m	Market Area	❖ Nandri village market area on both side of NH-112.	
16	1850	Commercial / Residential area and institutions	❖ Rajasthan Hospital in left side of road and the proposed drainage route alignment.	
17	2350m		❖ Sri Ram Hospital in left side of road and the proposed drainage route alignment.	
18	3130		❖ Sagar Hospital in left side of road and the proposed drainage route alignment.	

19	4800		❖ Kings Hospital in left side of road and the proposed drainage route alignment.	
20	4800	Road side	❖ NH-112 road crossing	
21	5220	Jojari river	❖ Proposed drainage route alignment ends at Jojari River Bank	

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

76. Potential environmental impacts of the proposed infrastructure components are presented in this section. Mitigation measures to minimize/mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to reduce the impact.

77. Screening of potential environmental impacts are categorized into four categories considering subproject phases: location impacts and design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

(i) **Location impacts** include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.
(ii) **Design impacts** include impacts arising from Investment Program design, including technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.
(iii) **Pre-construction impacts** include impacts which are anticipated during construction works but planning are required for proposed mitigation measures before start of construction works i.e. during SIP period such as taking consents from various departments, planning for construction and workers camps, deployment of safety officer, arrangement of required barricades and caution boards etc.
(iv) **Construction impacts** include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
(v) **O&M impacts** include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and occupational health and safety issues.

78. Screening of environmental impacts has been based on the impact magnitude (negligible/moderate/severe - in the order of increasing degree) and impact duration (temporary/permanent).

79. This section of the IEE reviews possible project-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analyzed during pre-construction, construction, and operational stages in the context of the project's area of influence. The ADB Rapid Environmental Assessment Checklist has been used to screen the project for environmental impacts and to determine the scope of the IEE.

80. In the case of this project (i) most of the individual elements are relatively small and involve straight forward construction and operation, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in an urban area, will not cause direct impact on biodiversity values. The project will be in properties held by the local government body (Jaipur Development Authority/Municipal Corporation) and access to the project location is through public rights-of-way and existing roads

hence, land acquisition and encroachment on private property will not occur. Appendix 6 provides Integrated Biodiversity Assessment Report (IBAT analysis) for Jodhpur.

81. **Locations impacts of Proposed Drains (Bhairav Nagar Nala and Saran Nagar Nala):** Proposed drain will traverse along different city roads within ROW and vacant government lands at many places. There are many residences, agricultural lands, utilities, road crossings, trees present in the alignment of proposed drain. As the drain alignment is proposed in existing ROW of roads and other government lands, no land acquisition will be anticipated. About 296 trees may be impacted for proposed works as there are many plants grown on the available ROW of roads along which drain works are proposed. Presence of electrical utilities is also major location impacts, for which detail survey will be required by contractor before start of construction works. During construction works some temporary disturbance are expected and mitigation measures will be required to minimize these impacts. These works will require advance permission from concerned authority for utility shifting, tree cutting, road cutting and traffic diversion etc.

82. **Tree cutting at project sites.** As per preliminary survey, it is accessed that a 296 number of trees may be affected due to proposed drain works along Bhairav Nala as there are presence of trees of various species and ages along the proposed alignments and lands. List of trees present in the alignment of proposed drains (Bhairav Nagar Nala) is given below and no tree cutting is required for alignment of RTO Nala.-

Table 9: List of trees which may be affected due to Proposed Works

Chainage/ Species	**1775-1790**	**1790-1950**	**2240-2545**	**2560-33400**	**3400-6300**	**6300-6600**	**6600-7050**	**7050 to Jojari River**	**Total**
Neem *(Azadirachta indica)*	3	3		5	119			60	**190**
Julifolra *(Prosopis juliflora)*		9	1		5			1	**16**
Pipal *(Ficus religiosa)*				2	5			1	**8**
Khari Badam (*Terminalia catappa)*					1			1	**2**
Khejri *(Prosopis cineraria)*			3		15	2	2	12	**34**
Babul *(Acacia nilotica)*			2		1			15	**18**
Jal *(Salvadora persica)*					16			2	**18**
Ber *(Ziziphus mauritiana)*					1			6	**7**
Siras *(Albizzia lebbek)*								1	**1**
Rohida *(Tecomella undulata)*		1			1				**2**
Total	**3**	**13**	**6**	**7**	**164**	**2**	**2**	**99**	**296**

83. There are several shrubs (like Vilayati Babool (*Prosophis Juliflora)* , Ber (*Ziziphus sps.*), Mandar (*Calotropis gigantea*) and small trees (having less than 25 cm girth) on vacant lands/ROW on the alignment of proposed drains, which grow commonly on vacant lands and therefore not considered in preliminary survey.

84. As per this list total 296 trees may be required to cut. At this stage of project planning higher side of tree cutting is taken as 300 for assessment of compensatory plantation to be adopted in the project. As per RUDSICO-EAP policy compensatory plantation in the ratio of 1:3 will be required therefore total 900 tree plantations are being suggested for compensatory plantations. During detail survey contractor will be required to confirm the presence of trees on the alignment of drains, which will be required to cut for construction works and provide list of tree cutting required to PIU.

85. These numbers of trees are tentative list for trees, which may be required to cut as per preliminary survey. Exact number of trees required to be cut can only be confirmed after confirmatory survey by contractor before start of construction works. Compensatory tree plantations more than 3 times would be planted.

86. During service improvement plan before construction begins, this alignment will be again reviewed and tree cutting will be minimised as much as possible. Maximum possible tree will be transplanted to minimise the negative impact of tree cutting. Tree which required to be cut after taking permission from tree authority, will be replaced by planting 3 times or as suggested by tree authority (which ever in maximum).

87. Following measures need to be implemented to minimize and/or compensate for the loss of tree cover.

(i) Minimize removal of trees by adopting to site condition and with appropriate layout design of proposed drains;
(ii) Tree with less than 50 cm girth will be transplanted to other locations;
(iii) Obtain prior permission for tree cutting at any site that may require tree cutting finalized during service improvement plan;
(iv) Plant and maintain 3 trees for each tree that is removed; and
(v) Community consultation will be conducted before and during tree cutting.

88. One of the critical aspects in drainage is, pollution of receiving water body (Jojri river) by polluted wastewater in storm water drainage. These drains are designed only for storm water, which does not include industrial effluent or domestic wastewater.

89. To **prohibit** the industrial discharge into storm water drains following measures should be considered:

(i) No industrial wastewater shall be allowed to dispose into drains;
(ii) No domestic wastewater from industrial units shall be allowed into drains; and
(iii) Conduct public awareness programs; in coordination with RSPCB, issue notice to all industries for compliance.

B. Pre-construction Impacts

90. **Utilities.** Telephone lines, electric poles and wires, water lines, gas pipe lines within the proposed project locations may require to be shifted in few cases. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with ULB will-

(i) identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase;
(ii) take prior permission from/intimation to concerned line agencies for shifting the existing utilities; and

(iii) Instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

91. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Construction work camps, stockpile areas, storage areas and disposal sites to be considered so that identified sites should not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up construction camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust and noise and to prevent social conflicts, shortages of amenities and crime). Extreme care will be taken to prevent disposals near forest areas, water bodies, swamps or in areas which will inconvenience the community. Construction sites, including disposal sites, will be selected by contractor in compliance with these conditions and the same will be reflected in Site Environmental Management Plan (SEMP) which is to be prepared by contractor prior to start of construction and approved by PIU.

92. **Site selection of sources of materials.** Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be assessed by PIU. Priority would be sites already permitted by Mines and Geology Department. If new sites are necessary, these would be located away from population centers, drinking water intakes and streams, cultivable lands, and natural drainage systems; and in structurally stable areas. It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Department of Mines & Geology and local revenue administration. If additional quarries will be required after construction is started, then the construction contractor shall use the mentioned criteria to select new quarry sites, with written approval of PIU. Contractor will identify sources of water for construction purposes and obtain necessary permissions as required, and approval of PIU before the use. Details of material sources and water sources will be provided in SEMP.

93. **Debris and Silt disposal.** Prior to the commencement of works, contractor shall identify a debris disposal site in consultation with the PIU and Consultant. Contractor will prioritize, if available, the use of solid/construction waste disposal sites operated under the consent from RSPCB. Contractor will follow all the prescribed rules[6] during construction and adhering to following criteria (including but not limited to)-

(i) Contractor shall prepare a construction and demolition waste management plan in pre-construction phase for safe disposal of construction and demolition wastes as per applicable rules and submit to PIU for approval
(ii) Dispose the construction waste and debris in construction and demolition waste management facility approved by RSPCB; if such facility is not available near the project town, the contractor shall identify disposal site confirming to the criteria, obtain permissions from local body and government agencies as required, and submit for the approval of PIU; disposal sites shall be used only after approval of the PIU
(iii) Sites shall not be located in forest areas, water bodies or drainage lines, swamps or in areas which will inconvenience the community
(iv) The site shall be selected preferably from barren, infertile lands.

[6]Construction and Demolition Waste Management Rules 2016 (refer appendix 7 and Table 4)

(v) The local governing body and community shall be consulted while selecting the site.
(vi) Debris disposal site shall be at least 200 m away from surface water bodies.
(vii) No residential areas shall be located within 100 m downwind side of the site.
(viii) The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.

C. Construction Impacts

94. The civil works for the subproject include earth work excavation for proposed drains. Earth work excavation will be undertaken by machine (backhoe excavator). Subproject includes construction of box type close drains and open drains. Sufficient care will be taken while excavation for proposed drains so that existing utilities and cables are not damaged. Trenches deeper than 1.5 m will be protected by shoring/bracings/step cutting to avoid collapse of trenches, and also to avoid any risk to surrounding buildings. The minimum working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. Extraneous soil after excavation of drains shall be used for filling low lying area or stored/ dumped in approved soil disposal sites.

95. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project locations in the built-up areas of the town where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. The anticipated impacts are temporary and for short duration. A detail survey is needed after finalization of alignment to access the feasibility of the alignment for need of any tree cutting, demolition of any structure, road and railway crossings, construction in any private land, presence of any sensitive receptor along alignment, disturbance to public or business etc. Mitigation measures have been prepared for potential adverse impacts. Prior consent and NOC from land owners (e.g. PWD, Railways, ULB etc.) from concerned departments prior to start of construction works, is required

96. Physical impacts will be reduced by the method of working and scheduling of work, whereby the project components will be (i) constructed by small teams working at a time; (ii) any excavation done near sensitive area like school, religious places and house will be protected as per standard norms etc (iii) finish excavation and construction works at earliest in a strech (iv) provide adequate barricades and road safety signage during proposed works in traffic areas (v) Further if night works are required (however unlikely, applicable only in extreme conditions) all the mitigation measures to reduce impacts of disturbance to minimum level to nearby habitants and road users should be ensured by contractor.

97. Construction of drains will be started from downstream point, which is general practice of gravity system and will be connected to end point of existing drains at last phase at the time of interconnection. New drains will be used to remove water of existing waterlogged area/ drains.

98. **Demolition works.** In the initial stage of project planning it is accessed that there may be requirement of demolition of structures such as CC road, boundary walls, religious structures etc.. Where demolition works are required, proper work plan and Mitigation measures will be required for demolition works. Structures to be demolished should be wetted through water sprinkling to reduce dust emission. Appropriate site for storage and disposal of demolished materials should be selected prior to start of demolition activities with prior permission/approval of PIU/ULB. All the safety measures should be adopted during demolition activities.

99. **Storage and Disposal of excavated earth and silt.** A large quantity of soil and silt will be excavated for construction/strengthening of drains. Some part of this excavated soil will be reused for construction of embankments and/or surface levelling; rest of the soil will need to be disposed in other locations. Proper storage and disposal plan from contractor is required before start of the work. Prior permission from land owner/concerned authority for storage and disposal of excess earth is required. Prior to the commencement of works, Contractor will follow all the prescribed rules[7] and shall identify a soil/debris disposal site in consultation with the PIU/ULB and adhering to following criteria:

(i) Contractor shall prepare a construction and demolition waste management plan in pre-construction phase for safe disposal of construction and demolition wastes as per applicable rules and submit to PIU for approval
(ii) Dispose the construction waste and debris in construction and demolition waste management facility approved by RSPCB; if such facility is not available near the project town, the contractor shall identify disposal site confirming to the criteria, obtain permissions from local body and government agencies as required, and submit for the approval of PIU; disposal sites shall be used only after approval of the PIU
(iii) Sites shall not be located in forest areas, water bodies or drainage lines, swamps or in areas which will inconvenience the community
(iv) The site shall be selected preferably from barren, infertile lands.
(v) The local governing body and community shall be consulted while selecting the site.
(vi) Debris disposal site shall be at least 200 m away from surface water bodies.
(vii) No residential areas shall be located within 100 m downwind side of the site.
(viii) The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.
(ix) Soil storage site should be properly demarcated by fencing and information board should be placed at entrance;
(x) At soil storage site soil should be covered by tarpaulin or regular water sprinkling should be done to reduce dust emission; and
(xi) At soil disposal site the disposed soil should be levelled on daily basis and no heap or mound should be left at end of the day.

100. Silt and sludge removal is regular activity conducted by ULB every year before start of monsoon. The Provision are considered in BOQ for silt and sludge clearance from proposed drains. As the silt is mixed with the water, handling and transport of silt/sediment in semi-solid / slurry form will lead to spillage of contaminated water/slurry. Accumulated drain water with silt/sediment, potentially mixed with solid waste / wastewater in some places, may present hazardous conditions for removal of sediment/silt. Following measures are suggested to safely desilt and dispose the desilted material:

(i) Desilting process of shall be conducted in dry season only;
(ii) Prior to desilting process, the drains shall be allowed dry so that there is no standing water on silt / sediment;
(iii) Do not conduct manual desilting process, use appropriate equipment / implements;

[7] Construction and Demolition Waste Management Rules 2016 and Solid Waste Management Rules (refer Table 4 and Appendix 7).

(iv) Desilting process shall be conducted in such a way that water content of the silt/sediment is low, so that contaminated water is not spilled during the loading, transport and unloading process;
(v) Workers shall be provided with appropriate PPE's; masks with oxygen cylinders shall be made available at the site, which shall be utilised during emergency; and
(vi) identify beneficial uses or dispose at suitable disposal site in consultation with the PIU/ULB.

101. **Sources of Materials.** Significant amount of gravel, sand, coarse aggregate, and cement will be required for this project. The construction contractor will be required to:

(i) Use material sources permitted by government;[8]
(ii) Verify suitability of all material sources and obtain approval of PIU;
(iii) Ensure that the loading and unloading of the materials and the transportation of the materials from source to construction site does not cause impact on health and safety of the workers and the community; and
(iv) Submit to PIU on a monthly basis documentation of sources of materials. . If contractor is purchasing ready mix concrete, asphalt/macadam and aggregates from third party, contractor will assure that all the parties/ suppliers are having CTE/CTO from RSPCB and will collect the copy of these certificates and submit to PIU/consultants.

102. **Air Quality.** Emissions from construction vehicles, equipment, and machinery used for excavation and construction will induce impacts on the air quality in the construction sites. Anticipated impacts include dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons. These however will be temporary limiting to construction activities only. To mitigate the impacts, construction contractors will be required to:

(i) Consult with PIU/on the designated areas for stockpiling of soils, gravel, and other construction materials;
(ii) Damp down exposed soil and any stockpiled material on site by water sprinkling;
(iii) Use tarpaulins to cover sand and other loose material when transported by trucks;
(iv) Clean wheels and undercarriage of haul trucks prior to leaving construction site
(v) Don't allow access in the work area except workers to limit soil disturbance and prevent access by barricading and security personnel;
(vi) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly, DGs should have proper stake height as per norms;
(vii) Ensure all the equipment are having PUC certificates;
(viii) Do regular water sprinkling in dusty areas to reduce dust emission during works;
(ix) Damp down the structures before demolishing to reduce dust emission;
(x) Damp down on regular basis all the access ways;
(xi) Maintain all the equipment and vehicles to reduce emission of smoke and keep pollution under control and keep records of periodic maintenance; and

[8]CTE and CTO will be required for batching plant, hot mix plant, crushers etc. if specifically established for this project. If contractor is purchasing raw material or ready mix concrete, asphalt/macadam and aggregates from third party, he has to be assured that third party is having CTE/CTO from RSPCB and should collect the copy of these and submit to PIU/consultants. Quarry sites should also have the desired permissions.

(xii) Conduct ambient air quality monitoring periodically as per Environmental Management Plan EMP.

103. **Surface Water Quality.** There is no any surface water source near the proposed site, which can be polluted due to construction activities, however, run-off from stockpiled materials and chemical contamination from fuels and lubricants during construction works can contaminate the drainage system of town. These potential impacts are temporary and short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

(i) Prepare and implement a construction waste / spoils management plan;
(ii) Avoid to construct any construction camps and labour camps near to any water body and do not allow to dispose any waste or sullage in to any water body;
(iii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
(iv) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
(v) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
(vi) Place storage areas for fuels and lubricants away from any drainage leading to water bodies and provide impermeable lining under the storage yard of fuels and lubricants;
(vii) Dispose any wastes generated by construction activities in designated sites;
(viii) Keep oil tray or pans under the DG set or during maintenance of mechanical equipment to avoid oil spillage resulting soil and water pollution; and
(ix) Conduct surface water quality Monitoring according to the Environmental Management Plan (EMP).

104. **Noise and Vibration Levels.** Construction works will be conducted along the roads ROW and vacant lands in Jodhpur urban area, where there are majorly houses, commercial activities, few religious places and small-scale businesses. The sensitive receptors are the schools, religious places, hospitals in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads, operation of construction equipment like concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearly buildings. This impact is negative but short-term, and reversible by mitigation measures. The construction contractor will be required to:

(i) Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
(ii) Use road cutters instead of breaker/hammer for cutting the road before excavation on roads;
(iii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle’s approach;
(iv) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor;
(v) DGs being used at site should have sound reducing (acoustic) enclosures, preferably silent DGs should be used at site;
(vi) Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s and equipment;

(vii) Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
(viii) Consult the custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals, exams of students etc.;
(ix) Provide all workers appropriate PPEs like ear plug/muff, working in high noise conditions;
(x) Keep all vehicles and equipment in good conditions to avoid excessive noise generation;
(xi) Provide noise barriers near sensitive receptors like schools, hospitals, temples, courts etc and consult in advance with sensitive receptors about the working hours (specially schools, hospitals, offices, courts etc) and avoid noisy works in those hours;
(xii) Avoid noisy works in nights in inhabited areas to avoid any disturbance to habitants;
(xiii) Consult in advance with habitants and inform them about the nature and duration of works; and
(xiv) Conduct noise monitoring according to the Environmental Management Plan (EMP).

105. **Management Plan for Night works (if required).** Following requirements should be fulfilled for construction works at night hours-

(i) Night works should be avoided at construction sites specially in residential areas and should be performed only when day works are not possible due to excessive traffic/public/pedestrian movement, site of cultural or religious importance, where there is huge crowd during day hours or any other unavoidable circumstances;
(ii) Contractor should plan for night works only after directions from PMU/PIU/CMSC;
(iii) Contractor should submit plan for night works for approval from PIU;
(iv) PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, residents welfare association/business association/vyapar of the affected areas and their consents/permissions should be taken prior to start of night works;
(v) PIU/CMSC engineers should check and ensure that all the preparation as per management plan is done by contractor and contractor is having all the necessary equipment and materials for night works;
(vi) Contractor is required to have following equipment/arrangements for night works:
    a. Contractors should have hand held noise level meter for measurement of noise during night hours;
    b. Contractors should have hand held lux meter for the measurement of illumination during night hours; and
    c. Preferably electrical connections is available for running equipment otherwise sound proof/super silent Diesel Generator set should be available;
(vii) Sound level should not increase as per following:

Type of area of work	Maximum noise level dB(A)
Industrial	70
Commercial	55
Residential	45

Type of area of work	Maximum noise level dB(A)
Silence zone	40

(viii) Illumination should be as follows:

Minimum illumination (lx)	Areas to be illuminated	Type of work activity
54	Illumination throughout the work area	General work area lighting, and performance of visual tasks of large size, or medium contrast, or low require accuracy
108	Illumination of work area and areas adjacent to equipment	Performance of visual tasks of medium size, or low to medium contrast, or medium required accuracy
216	Illumination of task	Performance of visual tasks of small size, or low contrast or high required accuracy or fine finish

(ix) As far as possible ready mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site;
(x) All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time;
(xi) Workers engaged in night works should have adequate rest/sleep in day time before start of night works;
(xii) Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night;
(xiii) All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements;
(xiv) Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests;
(xv) Horns should not be permitted by equipment and vehicles;
(xvi) Workers should not shout and create noise;
(xvii) First aid and emergency vehicles should be available at site;
(xviii) Emergency preparedness plan should be operative during night works;
(xix) Old persons and pregnant women and women having small kids should not work in night time;
(xx) All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise;
(xxi) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works;
(xxii) PIU/CMSC site engineers and contractors safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and videographic records as well as register the observations;
(xxiii) Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement;
(xxiv) After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians;

(xxv) Drivers and workers should be alert and responsive during night works;
(xxvi) All the wages to workers working in night hours should be as per the applicable labour acts;
(xxvii) Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours; and
(xxviii) Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

106. **Soil Contamination, Landscape and Aesthetics.** The construction works may require cutting of trees and also will produce excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. Unplanned disposal of these will have negative impacts on Landscape and overall aesthetics. These impacts are negative but are of short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Store fuel, oils, lubricants etc on impervious and protected areas, ensure spill control kits, and proper containments bunds to ensure no spillage
(ii) Prepare and implement construction waste / spoils management plan;
(iii) Avoid stockpiling of excess excavated soils;
(iv) Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas;
(v) Recover used oil and lubricants and reuse or remove from the sites;
(vi) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(vii) Minimize removal of vegetation and minimize cutting of trees;
(viii) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department;
(ix) Plant three native trees for every one that is removed;
(x) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
(xi) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

107. **Groundwater Quality**. Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. Although, groundwater is much deeper than the proposed trenching depth, and rains are scarce and limited to very short duration during monsoon, to ensure that water will not pond in pits and voids near project location, the construction contractor will be required to conduct excavation works in non-monsoon season to the maximum extent possible. These potential impacts are temporary and short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

(i) Prepare and implement a construction waste / spoils management plan (**Appendix C-13**);
(ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
(iii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
(iv) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;

(v) Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
(vi) Dispose any wastes generated by construction activities in designated sites; and
(vii) Conduct periodical ground water quality monitoring according to the Environmental Management Plan (EMP).

108. **Accessibility.** Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Considering limited availability of ROW and community safety on rural area at Shobawato ki Dhani, Pal and Tanawad, box type of drains are proposed in these rural area. During construction traffic on these roads will require diversion and temporary closer. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

(i) Prepare and implement a Traffic Management Plan **(Appendix C-14**);
(ii) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
(iii) Schedule transport and hauling activities during non-peak hours;
(iv) Locate entry and exit points in areas where there is low potential for traffic congestion;
(v) Keep the site free from all unnecessary obstructions;
(vi) Drive vehicles in a considerate manner;
(vii) Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours;
(viii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints;
(ix) Excavated roads to be wetted through water sprinkling to reduce dust emission;
(x) Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts;
(xi) Providing and fixing OPEN including strutting, shoring and packing cavities (wherever required); and
(xii) Providing and fixing CLOSE timbering including strutting, shoring and packing cavities (wherever required).

109. **Socio-Economic - Income.** The project components will be located in government land and there is no requirement for land acquisition or any resettlement. Construction works will impede the access of residents to specific site in limited cases. The potential impacts are negative and moderate but short-term and temporary. The construction contractor will be required to:

(i) Prepare and implement construction waste / spoils management plan (**Appendix C-13**);
(ii) Leave spaces for access between mounds of soil;
(iii) Provide walkways and metal sheets where required to maintain access across for people and vehicles;
(iv) Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools;
(v) Consult businesses and institutions regarding operating hours and factoring this in work schedules;
(vi) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints;

(vii) Notify community/ water users in advance about likely interruptions in water supply;
(viii) Provide alternate sources of clean water until water supply is restored; and
(ix) Provide all mitigation measures as given in resettlement plan (RP) prepared for the project to mitigate impacts on vendors and shopkeepers.

110. **Socio-Economic-Employment.** Manpower will be required during the 36-monthsconstruction stage. This can result in generation of temporary employment and increase in local revenue. Thus potential impact is positive and long-term. The construction contractor will be required to:

(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and
(ii) Secure construction materials from local market.

111. **Occupational Health and Safety.** Workers need to be mindful of the occupational hazards which can arise from working on roads, in height and excavation works. Potential impacts are negative and long-term but reversible by mitigation measures. Construction contractor will depute experienced EHS personnel and will be required to:

(i) Comply with all national, state and local labor laws (see **Appendix C-12**);
(ii) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b)ensuring all workers are provided with and use personal protective equipment;(c) OH&S Training[9] for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
(iii) Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
(iv) Provide medical insurance coverage for workers;
(v) Secure all installations from unauthorized intrusion and accident risks;
(vi) The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following:
    a. Work schedule should be adjusted to avoid peak temperature hours (12 - 3 PM);
    b. Provide appropriate shade near the work place; allow periodic resting and provide adequate water; and
    c. Provide necessary medicine and facilities to take care of dehydration related health issues;
(vii) Provide supplies of potable drinking water;

[9] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

(viii) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
(ix) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
(x) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
(xi) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
(xii) Ensure moving equipment is outfitted with audible back-up alarms;
(xiii) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and
(xiv) Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

112. **Community Health and Safety.** Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and reversible by mitigation measures. Considering limited availability of ROW and community safety on rural area at Shobawato ki Dhani, Pal and Tanawad, box type of drains are proposed in these rural area. The construction contractor will be required to:

(i) Plan routes to avoid times of peak-pedestrian activities;
(ii) Liaise with PIU in identifying risk areas on route cards/maps;
(iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure;
(iv) Provide road signs and flag persons to warn of on-going trenching activities;
(v) Survey the surrounding vulnerable buildings for likely issues in structural stability/ differential settlement during the excavation works;
(vi) Provide prior information to the local people about the nature and duration of work;
(vii) Provide hard barricades and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches;
(viii) Do not park heavy construction machinery on roads; and
(ix) Avoid storing excavated material on road.

113. **Work Camps.** Operation of work camps can cause temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. Potential impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Consult PIU before locating project offices, sheds, and construction plants;
(ii) Minimize removal of vegetation and disallow cutting of trees;

(iii) Provide drinking water, water for other uses, and sanitation facilities for employees;
(iv) Provide temporary rest and eating area at all work sites;
(v) Ensure conditions of liveability at work camps are maintained at the highest standards possible at all times; living quarters and construction camps shall be provided with standard materials (as far as possible to use portable ready to fit-in reusable cabins with proper ventilation); thatched huts, and facilities constructed with materials like GI sheets, tarpaulins, etc., shall not be used as accommodation for workers; accommodation shall meet the IFC standards for workers accommodation[10] which include: provision of safe housing, availability of electricity, plumbing, water and sanitation, adequate fire protection and dormitory/room facilities; accommodation shall be in the range from 10 to 12.5 cubic meter (m3) (volume) or 4 to 5.5 square meters (m2) (surface) per worker, a minimum ceiling height of 2.10 m; a reasonable number of workers are allowed to share the same room–(standards range from 2 to 8 workers); workers with accompanying families shall be provided with a proper and safe accommodation (Suggested guidelines based on IFC benchmark standards for workers accommodation is provided in **Appendix C-21**);
(vi) Prohibit employees from poaching wildlife and cutting of trees for firewood;
(vii) Train employees in the storage and handling of materials which can potentially cause soil contamination;
(viii) Recover used oil and lubricants and reuse or remove from the site;
(ix) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(x) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
(xi) Report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

114. **Social and Cultural Resources.** For this project, excavation will occur at locations not known to have archaeological values, so there is no risk of such impacts. Religious places such as temples are present nearby the proposed alignment of Nala and contractor will require to follow the mitigation measures as given below-

(i) Consult with concerned religious authorities, nearby people and devotees in pre-construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required;
(ii) Adjacent to religious/social/historic sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building;
(iii) Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places; and
(iv) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.

115. **Physical Cultural Resources.** There are no notable or significant archeological places or protected monuments or areas in Jodhpur project area. Therefore, no impacts envisaged but

[10] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation

risk of uncovering archeological remains, given the long history of town, during the excavations cannot be ruled out completely. Construction contractors therefore should follow the below measures in conducting any excavation work:

(i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
(ii) Stop work immediately to allow further investigation if any finds are suspected;
(iii) Inform local Archeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ; and
(iv) Prepare a chance find protocol

116. **Traffic diversion and/or road closure-** If traffic diversion and/or road closure is required for the proposed works, prior consent from traffic department will be required and prior information to affected areas and public should be disseminated through consultations by CAPC. Proper road signage and traffic aids should be provided at site. Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

(i) Prepare and implement a Traffic Management Plan;
(ii) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
(iii) Schedule transport and hauling activities during non-peak hours Locate entry and exit points in areas where there is low potential for traffic congestion;
(iv) Keep the site free from all unnecessary obstructions;
(v) Drive vehicles in a considerate manner;
(vi) Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours;
(vii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints;
(viii) Maintain sufficient access to houses and shopkeepers (commercial establishments) during construction work through metal sheets and temporary bridges; and
(ix) Locate entry and exit points in areas where there is low potential for traffic congestion.

D. Operation and Maintenance Impacts

117. **Proposed Drainage System:** The system have a design life of 15/30 years, during which shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the system in working order. The stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs will be small-scale involving manual, temporary, and short-term works involving regular checking and recording of performance for signs of deterioration and repairing.

118. Regular cleaning of drains, specially before start of monsoon season is required to avoid any blockage and overflow of drains, which may ultimately create public nuisance such as ponding in nearby places. Identify the suitable place for disposal of silt and solid waste, away from habitation and dispose the silt and solid waste after cleaning of drains; in a scientific manner so that it may not cause public nuisance or any harm to stray animals.

119. The new drains will contribute to an improvement in the physical appearance and condition of the town by helping to remove the large and unsightly pools of water that are an almost permanent feature of the town. Two new Nalas should also help to ensure that similar pools do not re-form in the future. With these projects implemented the quality of the town environment would then improve significantly. Removal of blockages in the Nalas and other drains, if left stockpiled alongside the drains, will have adverse impacts on the appearance of the area. Not only is this unhygienic, but it is also inefficient, as much of this material inevitably returns to the drains, where it may cause further blockage.

120. **Community Safety**: Box type closed drains has been proposed in the habitations areas are, whereas open drains are proposed in less or no inhabited areas. In each section, parapet walls on both sides of open drains are proposed in design for public safety.

121. **Project Benefits**. The citizens of the Jodhpur city will be the major beneficiaries of the improved drainage system, as the unsightly and unhygienic pools of standing wastewater will gradually disappear and should not recur in future. This should then improve the appearance and environment of the town, as well as protecting the ancient buildings and sites from the water damage they are exposed to at present. If, as expected, this ultimately brings more tourists into the town, then the citizens could benefit socio-economically from the related growth in the economy apart from improved environmental conditions of city.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

122. The active participation of stakeholders including local community, NGOs/CBOs, and the media in all stages of project preparation and implementation is essential for successful implementation as well as operation of the project. It will ensure that the subprojects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure is a must as per the ADB policy.

123. A three-tier consultation process has been adopted for RSTDSP project: focus group discussions, primary household sample surveys and a town-level public consultation workshop. Most of the main stakeholders have already been identified and consulted during preparation of preliminary design and IEE, and any others that are identified during project implementation will be brought into the process in the future. Primary stakeholders of the subproject are: residents, shopkeepers and businesspeople who live and work alongside the roads in which network improvements will be provided, and government and utility agencies responsible for provision of services, Jodhpur Nagar Nigam, Public Health Engineering Department, and Rajasthan Pollution Control Board. Secondary stakeholder are: NGOs and CBOs working in the area, community representatives, beneficiary community in general, government agencies, the executing and implementing agencies (LSGD and RUDSICO-EAP), Government of India and the ADB.

B. Public Consultation

124. The public consultation and disclosure program is a continuous process throughout the project implementation, including project planning, design and construction. Informal and formal consultations at different locations were also conducted during social and environmental impact assessment in Jodhpur in December 2021 – February 2022 (**Appendix 3**).

1. Consultation during Project Preparation

125. Institutional consultations were conducted with the Governmental Departments such as Local Self Government Department (Municipal Corporation, Jodhpur), Pollution Control Board, Jodhpur Development Authority, etc. The project proposals are formulated in consultation with Jodhpur Municipal Corporation and Jodhpur Development Authority and the proposals have been finalized only after certification of both the authorities that the proposals suit the requirements of the City.

126. Focus-group discussions with residents and other stakeholders were conducted to learn their views and concerns. A social and environmental impact assessment has been conducted in the town, covering sample households and nearby vendors to understand the basic characteristics of town, health status, and the infrastructure service levels, and also the demand for infrastructure services.

127. Informal and formal consultation are conducted with local population of the area, about at 11 places along with proposed alignment with about 99 persons (79 male and 20 females) from December 2021 to February 2022. A consultation meeting with elected ward councillors of Jodhpur Nagar Nigam, representatives of NGO, etc., conducted on 25 January 2023. Discussions were held about proposed project components, EMP measures, ownership of land, tree cutting, water logging problems and general people perception for proposed project. Project information was given to participants and their suggestions and comments were enquired about. People were agreed with proposed drainage works as they were suffering with poor drainage conditions in these locations. It was noted that people are willing to extend their cooperation as the proposed activities are supposed to enhance the environmental conditions and the living standard of the public. The public expressed their concern regarding the nuisance and disturbance (dust, road closure and traffic management activities) during the construction stage which can have impact on their day to day activities. Public opined that an appropriate operation and maintenance system should be in place, for proposed drainage system, for its best functioning and to have the maximum health and aesthetic benefits. Project team responded to the issues on nuisance, disturbance and operation and maintenance raised during the consultation that measures have been incorporated in the EMP. Details of public consultations are given in **Appendix 3**.

128. A town-level City Level Committee (CLC) has been formed in Jodhpur district by Government orders. City Level Committee meeting was organized during the detailed design stage to which representatives of primary and secondary stakeholders were invited. City Level Stakeholder committee meeting was organized for Jodhpur in District Head Quarter, Jodhpur on dtd. 24.11.2021 to discuss the matter of proposed Sewerage and Drainage works in Jodhpur under the chairmanship of District Collector, Jodhpur, in presence of Hon. Chief Minister of Rajasthan, Members of Legislative Assembly in Jodhpur, DPR consultants, RUDSICO-EAP officials, PHED officials, Municipal Corporation, Jodhpur-North and South officials, Jodhpur Development Authority officials, Water Resource Department, PWD and other invitee members. Proposed scope of works and technology of proposed sewerage and drainage works in Jodhpur was discussed in the meeting and approval was given for proposed works by Committee in this meeting. The project was agreed by the committee for further course of action by RUDSICO-EAP. Details of CLC meeting, minutes and photographs are attached in **Appendix 3**.

2. Consultation During Construction

129. Prior to start of construction, Jodhpur Municipal Corporation (JMC) and Jodhpur

Development Authority (JoDA) and PIU with the assistance of Consultants will conduct information dissemination sessions at major intersections and solicit the help of the local community leaders/prominent citizens to encourage the participation of the people to discuss various social and environmental issues. At town level, focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in project monitoring and evaluation.

130. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction and operational phases and also regarding the grievance redress mechanism. PIU with the help of Community Awareness and Participation Consultant (CAPC) will organize public meetings and will appraise the communities about the progress on the implementation of EMP. Meeting will also be organized at the potential hotspots/sensitive locations before and during the construction.

C. Information Disclosure

131. Executive summary of the IEE will be translated in the local language and made available at the offices of JoDA/JMC, RUDSICO-EAP- PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Jodhpur. Hard copies of the IEE will be accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Hindi will be placed in the official website of the JoDA/JMC/RUDSICO-EAP after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

132. Public information campaigns via newspaper/radio/TV, to explain the project details to a wider population will be conducted. Public disclosure meetings will be conducted at key project stages to inform the public about the progress and future plans. Prior to start of construction, the PIU will issue Notification on the start date of implementation in local newspapers A board showing the details of the project will be displayed at the construction site for the information of general public.

133. Local communities will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction. The road closure together with the proposed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

VIII. GRIEVANCE REDRESS MECHANISM

A. Project Specific Grievance Redress Mechanism

134. A project-specific, three-tier grievance redress mechanism (GRM) covers both environment and social issues. The GRM will be established to receive, evaluate, and facilitate the resolution of affected persons' concerns, complaints, and grievances about the social and environmental performance at project level. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns related to the project. Assessment of the GRM designed and implemented for Rajasthan Urban Sector

Development Program (RUSDP)[11] the system was effective in timely resolution of grievances in a transparent manner.[12] The multichannel, project-specific, three-tier GRM is functional at RUSDP, hence the design of GRM for RSTDSP takes into account the proposed institutional structure for RSTDSP and the positive features and learnings from the previous GRM.[13]

135. **Common Grievance Redress Mechanism.** A common GRM will be in place for social, environmental, or any other grievances related to the project. Implementation of the resettlement plans/RIPPs/DDRs/IEEs will follow the GRM described below. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the project.

136. Public awareness campaigns within entire ULB/Municipal area will ensure that awareness on grievance redress procedures is generated. The nodal officer- social/environment at field level through community awareness and public participation consultant (CAPPC) will conduct ULB/Municipal area-based awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements. Contractors will provide pamphlets to communities prior to start of works and billboards during construction. The pamphlets and billboards will include relevant environmental and social safeguards, GRM information, and contact details of key personnel from PIU and contractors.

B. Grievance Redress Process

137. Affected persons will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaint/suggestion boxes that will be installed by project PIUs or by e-mail, by post, or by writing in a complaints register in ULB offices/complaints register at contractor's work site[14] or by sending a WhatsApp message to the PIU[15] or by dialling the

[11] The procedures followed for grievance redress during implementation of RUSDP Phase III included the project GRM and the pilot GRM software application (smart check) in Pali, the Sampark portal of Government of Rajasthan, and the Chief Minister's helpline. Complaints received through various channels were mostly minor and pertained to damage to existing water supply pipelines and disruption of water supply during construction, delays in road restoration, and pending new connections. Complaints related to damage to private property (compound walls/steps, etc.) were less in number. The grievances were mostly possible to resolve in coordination with the contractors. Complaints received were immediately referred by the CAPC/PMDSC supervision staff to the PIU Nodal officer (safeguards) and concerned engineer at PIU, who advised them on further action. Follow up with the contractor on complaint resolution was undertaken by PIU Nodal officer CAPC and PMDSC and final feedback sought from complainant upon resolution. Complaints requiring inter-departmental coordination were referred to the PMU for resolution, and feedback provided to complainant. The PMU kept regular track of grievances through WhatsApp and email alerts, ensuring registration and follow-up until resolution.

[12] Town-level grievance registration data indicates that a large number of grievances were registered, pointing to the effectiveness of the multi-channel GRM. No major grievance was received for RUSDP Phase III. The GRM helped smoothen the process of project implementation, hence the proposed architecture for the RSTDSP GRM remains similar, with some refinement, taking into account the changes in institutional setup proposed for project implementation.

[13] Continued logistics support at field level will be key to successful management of grievance redress under RSTDSP. The target date for establishment of the first level (PIU level) and second level (Zonal level) of GRM is before loan negotiation.

[14] RUSDP piloted an online application based live GRM counter for resolution of public grievances over and above the usual process of grievance registration and redressal. This app based GRM - "RUIDP Smart Check" is available at Google play store (free of cost) and is operational. The RUIDP Smart Check "app" was launched in Pali town in July 2017 and is proposed to be scaled up in RSTDSP project towns. For persons without access to the application, the traditional channels will continue to be available.

[15] It is suggested for each PIU to have a dedicated WhatsApp group for registration of grievances and receipt of quick feedback, to be followed by more formal communication.

phone number of town level PIU/CAPPC or by dialling a toll-free number.[16] Any aggrieved person can also avail the facilities of online grievance monitoring system 'Rajasthan Sampark' portal to register their grievances which are a parallel mechanism of grievance registration, in addition to the project GRM.[17] Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken and feedback provided to the complainant on action/decision taken. The Safeguard and safety officer of town/city level PIU will have the overall responsibility for timely grievance redressal on environmental and social safeguards issues and for registration of grievances, related disclosure, with the assistance of project consultants. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor, and officials of PIU with assistance from CMSC and CAPPC on-site will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact numbers and names of the concerned PIU safeguard and safety officer, contractors, CAPPC and CMSC personal will be posted at all construction sites at visible locations.

(i) **1st level grievance.** The contractors, PIU executive engineer/assistant engineer designated as safeguard and safety officer (social and environment), CMSC (safeguard staff) and CAPPC can immediately resolve issues on-site, in consultation with each other and will be required to do so within 7 days of receipt of a complaint/grievance. If required, city level monitoring committee (CLMC)[18] will be involved in resolution of grievances at the 1st level;

(ii) **2nd level grievance.** All grievances that cannot be redressed within 7 days at field/PIU level will be brought to the notice of Zonal PIU headed by Additional Chief Engineer (ACE).The ACE at zonal PIU will resolve the grievance within 7 days of receipt of compliant/grievance in discussion with the ASO, field level PIU, CMSC, CAPPC and the contractor;

(iii) **3rd level grievance.** All the grievances that are not addressed by Zonal PIU within 7 days of receipt will be brought to the notice of the PMU. Depending on the nature of grievance, the project officer (social/environment) at PMU will resolve the grievance within 15 days of receipt of grievance with necessary coordination of Zonal PIU and CMSC and guidance/instruction of additional project director (APD-PMU);

(iv) Grievances not redressed through this process within/at the project level within stipulated time period will be referred to the CLC/GRC, which has been set up.[19] In its role as a GRC, the CLC will meet whenever there is an urgent, pending

[16] Project contractors in all project towns will have a toll-free number with specific working hours for registration of grievances related to RSTDSP.

[17] http://www.sampark.rajasthan.gov.in/RajSamWelcome.aspx

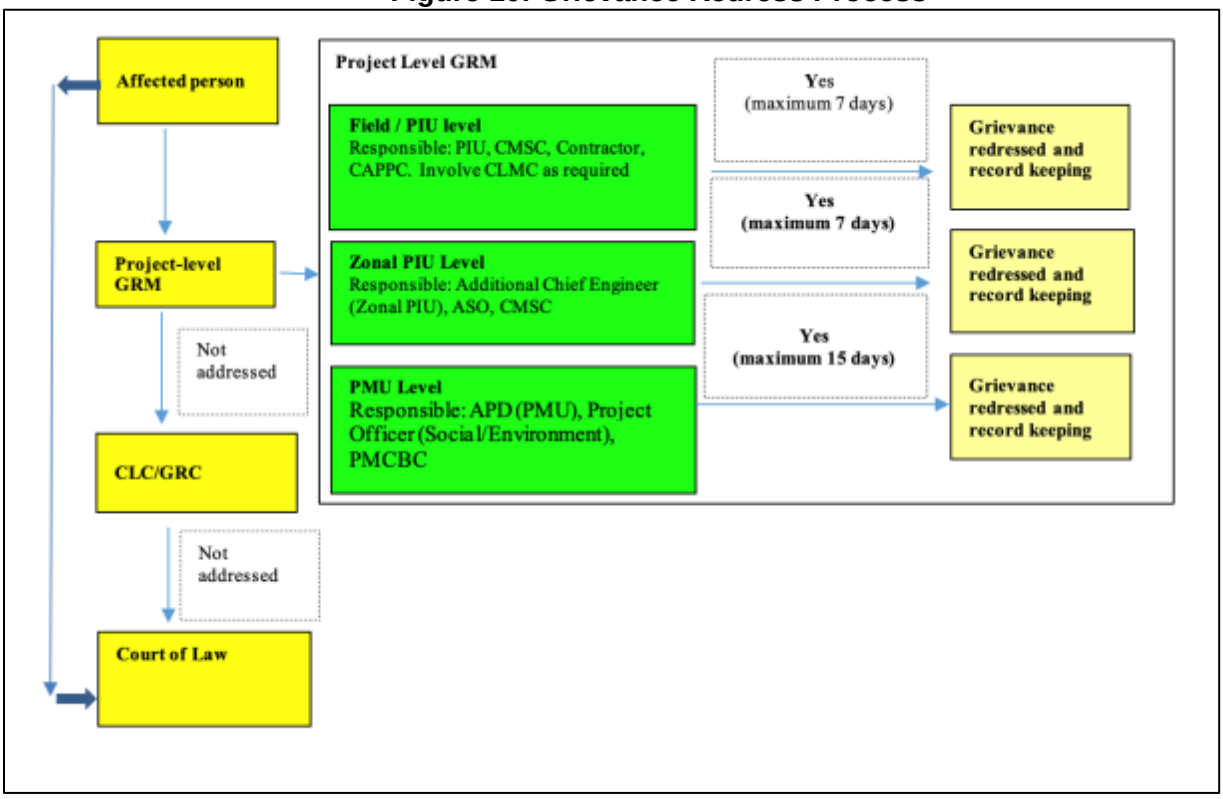
[18] The CLMC has been formed at the town/city level for planning and monitoring of work, resolve issues related to departmental coordination etc. It is headed by Commissioner/Executive Officer ULB (Chairman) and city engineer of public health engineering department (PHED), public works department (PWD) and head of PIU acting as Member Secretary.

[19] City Level Committee (CLC)/grievance redress committees (GRCs) has been constituted for each town/city under the Chairmanship of District Collector to provide overall subproject guidance and "to sort out issues and remove hindrances, if any". CLC formed at city-level/district level with members composed of: District Collector as Chairperson, and following as members: ULB Commissioner/Mayor/Chairman; Deputy Mayor/Vice Chairman ULB; Chairman/Secretary Urban Improvement Trust (UIT); Head of Zonal/field level PIU as Member Secretary; one representative each from relevant government departments as appropriate (PWD/PHED/Town Planning Department etc.). All CLCs in their role as GRCs will have at least one-woman member/chairperson. In addition, for project-related grievances, representatives of affected persons, community-based organizations (CBOs), and eminent citizens will be invited as observers in GRC meetings. The concerned Member of Parliament (MP) and Member of Legislative Assembly are also part of the CLC.

grievance. Other grievances can be discussed during its regular meetings. Zonal PIU will inform the CLC regarding any grievances required to be resolved urgently. The GRC will resolve the grievance within 15 days of receiving the complaint. In case of any indigenous peoples impacts in subprojects, the CLC/GRC must have representation of the affected indigenous people community, the chief of the tribe or a member of the tribal council as traditional arbitrator (to ensure that traditional grievance redress systems are integrated) and an NGO working with indigenous people groups; and

(v) The multi-tier GRM for the project is outlined below (**Figure 10**), each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. The GRC will continue to function throughout the project duration.

Figure 10: Grievance Redress Process



APD = Additional Project Director, ASO = Assistant Safeguards Officer, CAPPC = community awareness and public participation consultant, CMSC = construction management and supervision consultants, CLC = city level committee, CLMC = city level monitoring committee, GRC = grievance redress committee, PIU = project implementation unit, PMU = program management unit, PMCBC = project management and capacity building consultant.

138. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. In case of grievance related to land acquisition, resettlement and rehabilitation, the affected persons will have to approach a legal body/court specially proposed under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARRA), 2013.[20]

139. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[21]

140. **Record-keeping.** The PIU of each town and PMU will both keep records of grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were affected and final outcome. The

[20]The Authority admits grievance only with reference to the Land Acquisition and R&R issues under the RFCTLARRA, 2013.

[21] Accountability Mechanism. http://www.adb.org/Accountability-Mechanism/default.asp

number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU office, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

141. **Periodic review and documentation of lessons learned.** The PMU Project Officer (Environment) will periodically review the functioning of the GRM in each town and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

142. **Costs.** Contractors are required to allocated budget for pamphlets and billboards as part of the EMP. Costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned PIU at town level while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates.

143. Presently GRC in 14 ongoing project towns are functional as per RSTDSP's Grievance Redress Mechanism (GRM). Therefore 2nd and 3rd level GRC are already functional at Zonal PIUs (at Jaipur and Jodhpur) and PMU levels. PIU level GRC shall be formed in upcoming project towns after PIUs in new towns are established through office order from PMU for the same.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

144. The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i)providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project;(iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with.

145. A copy of the EMP must be kept at work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

146. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate budget for compliance with these EMP measures, requirements and actions.

147. Tables for Environment Management Plan during Design, Pre-construction, Construction and Operation phases are given below-

Table 10: Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Location impacts of proposed components	Nearby community may be affected due to increased pollution during construction and operation	(i) Work method should be prepared so that nearby community may have no or minimum impact due to proposed works (ii) Mitigation measures are prepared and included in design and EMP is attached with contract documents	List of pre-approved sites for -construction work camps, areas for stockpile, storage and disposal -Waste management plan	Consultants/PMU	No cost required
Requirement of tree cutting	Tree cutting may result loss of aesthetics and increase in air pollution	(i) project designs should be done so that minimum tree cutting is required (ii) project documents should include the minimum tree cutting provisions (iii) Provision for Compensatory plantations should be included in contract documents	As per RUDSICO-EAP policy; Tree Cutting Approvals; Compensatory Afforestation Plan;	Consultants/PIU/PMU	No cost required
Energy Efficiency	Loss of natural resources	(i) Use energy efficient electrical equipment (ii) Provision of use of energy efficient equipment in contract agreements and BOQ	As per BEE norms	Consultants/PMU	No cost required
Design of drains	Discharge of industrial effluent into drains	(i) No industrial wastewater shall be allowed to dispose into drains (ii) No domestic wastewater from industrial units shall be allowed into drains (iii) Conduct public awareness programs; in coordination with RSPCB, issue notice to all industries for compliance	RSPCB norms for industrial discharge	Consultants/PMU	No cost required
Incorporating EMP and Health and Safety requirements into Contractor Bid Document	Implementation of the EMP	The EMP should be included in the Bid Document so that the selected Contractor understands the issues and makes necessary plans to prepare and implement the EMP	EMP included in Bid Document	PMU	Project Costs
	Implementation of the Health and Safety measures by contractor	Health and safety requirements should be incorporated as part of the contract bid document so that the selected Contractor understands the issues and makes	EMP included in Bid Document	PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		necessary plans to prepare and implement the health and safety requirements.			

Table 11: Environmental Management Plan of Anticipated Impacts during Pre-Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Compliance with environmental subproject selection criteria	Environmental impacts due to subproject	Compliance with environmental subproject selection criteria	Consents, permits, clearance, NOCs, etc.	PIU and Jodhpur Development Authority	PMU	No costs required
Legal compliance	Environmental legal noncompliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design revisions and/or stoppage of works	(i) Obtain all consents, clearances (CTE/CTO from RSPCB), permits NOCs etc. before start of construction works (ii) Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction	Consents, permits, clearance, NOCs, etc.	PIU/Consultants in coordination of Jodhpur Development Authority	PMU	Cost of obtaining all consents, permits, clearance, NOCs etc. prior to start of civil works responsibility of PIU.
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	Environmental monitoring through NABL approved laboratory	Environmental Monitoring Report of Air, noise, soil and water quality	Construction contractor	Consultants/PIU	Contractor
Utilities	Telephone lines, electric poles and	(i) Identify and include locations and	-List and maps showing utilities to be	Contractor in collaboration with	Consultant / PIU	No cost required.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	wires, water lines and gas pipe line within proposed project area	operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. (iii) Require contractors to prepare construction waste / spoils management plan (**Appendix C-13**) and traffic management plan (**Appendix C-14**)	shifted (i) List of affected utilities and operators; (ii) Bid document to include requirement for a contingency plan for service interruptions (example provision of water if disruption is more than 24 hours), spoil management plan (**Appendix C-13**), and traffic management plan (**Appendix C-14**)	PIU and with approval of PMU		Mitigation measures are part of TOR of PMU, PIU and Consultants
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; encroachment in sensitive areas; disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the project location; (ii) If it is deemed necessary to locate elsewhere, consider sites that will not promote instability	-PIU approval of sites for construction work camps, areas for stockpile, storage and disposal -Waste management plan	Contractor to finalize locations in consultation and approval of PIU	Consultant / PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		and result in destruction of property, vegetation, irrigation, and drinking water supply systems; (iii) Do not consider residential areas; (iv) Take extreme care in selecting sites to prevent direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, Contractor will prioritize the use of solid/construction waste disposal sites operated under the consent from RSPCB. If unavailable or not feasible, contractor shall identify disposal site confirming to the following criteria, obtain permissions from local body and other government agencies as required, and submit for the approval of PIU; disposal sites shall be used only				contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		after approval of the PIU: (a) sites shall not be located in forest areas, water bodies or drainage lines, swamps or in areas which will inconvenience the community (b) site shall be selected preferably from barren, infertile lands. (c) no residential areas shall be located within 50 m downwind side of the site; and (d) site is minimum 250 m away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies				
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	(i) Prioritize sites already permitted by the Department of Mines and Geology (ii) If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material	(i) List of approved quarry sites and sources of materials; (ii) Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIU	PMU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		sources and to obtain the approval of PMU and (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU.				
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	(i) Obtain all necessary consents, permits, clearance, NOCs, etc. prior to award of civil works. (ii) Following consents are required- Tree cutting- local authority Storage, handling and transport of hazardous materials- RSPCB Sand mining, quarries, borrow areas- Department of mines and Geology Traffic diversion/road cutting- local authority, traffic police (ii) Ensure that all necessary approvals for construction to be	Consents, permits, clearance, NOCs, etc. Incorporated in final design and communicated to contractors.	PIU and Consultants	PIU	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU. Mitigation measures are part of TOR of PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		obtained by contractor are in place before start of construction (iii) Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. (iv) Include in detailed design drawings and documents all conditions and provisions if necessary				

Table 12: Environmental Management Plan of Anticipated Impacts during Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
EMP Implementation Training	Irreversible impact to the environment, workers, and community	(i) Project manager and all key workers will be required to undergo EMP implementation including spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc.	(i) Certificate of Completion (Safeguards Compliance Orientation) (ii) Posting of Certification of Completion at worksites	Construction Contractor	CMSC/ PIU	Cost of EMP Implementation Orientation Training to contractor is responsibility of PMU. Other costs responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(ii) Contractor has to depute a qualified EHS personnel in the start of the project to conduct training to all the personnel and effective monitoring of mitigation measures during construction	(iii) Posting of EMP at worksites			
Air Quality	Emissions from construction vehicles, equipment, and machinery used for construction resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons.	(i) Consult with PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; (iii) Damp down exposed soil and any stockpiled material on site by water sprinkling necessary during dry weather; (iv) Use tarpaulins to cover sand and other loose material when transported by trucks; and (v) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly. (vi) Quarterly environmental monitoring for ambient air as per EMP	(i) Location of stockpiles; (ii) Complaints from sensitive receptors; (iii) Heavy equipment and machinery with air pollution control devices; (iv) Certification that vehicles are compliant with Air Act (v) Quarterly environmental monitoring report for ambient air, noise, water and soil	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants	(i) Prepare and implement a spoils management plan (**Appendix C-13)** (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) Number of silt traps installed along	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	during construction can contaminate nearby surface water quality.	(ii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iii) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (iv) Dispose any wastes generated by work in designated sites; and (v) Conduct surface quality Monitoring according to the Environmental Management Plan (EMP)	trenches leading to water bodies; (iii) Records of surface water quality Monitoring; (iv)Effectiveness of water management measures; (v) No visible degradation to nearby drainages, Nalas or waterbodies due to civil works			
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	(i) Plan activities in consultation with PIU/Consultants so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; (ii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; (iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a	(i) Complaints from sensitive receptors; (ii) Use of silencers in noise-producing equipment and sound barriers; (iii) Equivalent day and night time noise levels (see **Appendix C-6** of this IEE)- No complaints from sensitive receptors;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		distance of 10 m or more from the vehicle/s. (v) Quarterly environmental monitoring for ambient noise as per EMP				
Ground Water Quality	Contamination of ground water quality due to spillage of oil and lubricants	Prepare and implement a spills management plan; Provide impermeable liner on the ground and place layer of mortar or concrete over it in the oil and lubricants storage areas, provide spillage trap in oil and lubricant store, use dip tray and pump to pour oil from oil and lubricant drums; Dispose any oil contaminated wastes generated by construction activities in scientific manner; and Conduct ground water quality monitoring according to the EMP	(i) Areas for storage of fuels and lubricants and waste materials; (ii) Number of oil traps installed in oil and lubricant storage areas; -Complaints from sensitive receptors; -CTO and CTE compliance; Monitoring Reports;	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Drain desilting	Contamination of land, surface and groundwater; occupational and community heath and safety	(i) Desilting process of shall be conducted in dry season only (ii) Prior to desilting process, the drains shall be allowed dry so that there is no standing water on silt / sediment (iii) Do not conduct manual desilting process, use appropriate equipment / implements (iv) Desilting process shall be conducted in such a way that water content of the silt/sediment is low, so that contaminated water is not spilled during the loading, transport and unloading process.; (v) Workers shall be provided with appropriate PPE's; masks with	(i) desilting schedule and proposed method (ii) PPEs to workers (iii) Reuse or disposal site identification	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		oxygen cylinders shall be made available at the site, which shall be utilised during emergency (vi) identify beneficial uses or dispose at suitable disposal site in consultation with the PIU/ULB:				
Soil contamination, Landscape and aesthetics	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items.	(i) Store fuel, oils, lubricants etc on impervious and protected areas, ensure spill control kits, and proper containments bunds to ensure no spillage (ii) Prepare and implement construction waste / spoils management plan (**Appendix C-13**); (iii) Avoid stockpiling of excess excavated soils; (iv) Coordinate with ULB/PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas; (v) Recover used oil and lubricants and reuse or remove from the sites; (vi) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (vii) Remove all wreckage, rubbish, or temporary structures which are no longer required; and (viii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.	(i) Complaints from sensitive receptors; (ii) Worksite clear of hazardous wastes such as oil/fuel (iiv) Worksite clear of any excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers As per Appendix C-13.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	(i) Obtain from PIU the list of affected utilities and operators if any; (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of service (iii) Take prior permission from concerned departments for shifting/removing the utilities (iv) inform nearby community in advance about the nature and timings of disturbance	As per contingency plan	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Ecological Resources – Terrestrial	Loss of vegetation and tree cover	(i) Minimize removal of vegetation and disallow cutting of trees; (ii) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and (iii) Plant three native trees for every one that is removed.	-Records -Plant native tree species as per RUDSICO-EAP Policy	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Land use	Environmental Issues due to land use change	The impact due to change in land use will be negligible due to this project.	-Latest land use records	Not applicable	PMU	Not applicable
Accessibility	Traffic problems and conflicts near project locations and haul road	(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; (ii) Schedule transport and hauling activities during non-peak hours; (iii) Locate entry and exit points in areas where there is low potential for traffic congestion; (iv) Keep the site free from all unnecessary obstructions;	(i) Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite (ii) Complaints from sensitive receptors;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(v) Drive vehicles in a considerate manner; (vi) Coordinate with Traffic Police for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; (vii) Notify affected sensitive receptors 1-week in advance through consultations and by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. (viii) Plan and execute the work in such a way that the period of disturbance/ loss of access are minimum. (ix) Provide pedestrian access in all the locations until normalcy is restored.	(iii) Number of signages placed at project location. As per Traffic Management Plan given in **Appendix C-14.**			
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	(i) Prepare and implement construction waste / spoils management plan (**Appendix C-13**). Contractor to Implement RP and to follow mitigation measures prescribed such as- (ii) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required for people; (iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools;	(i) Complaints from sensitive receptors; (ii) construction waste / Spoils management plan (iii) Number of walkways, signages, and metal sheets placed at project location.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and (v) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.				
Socio-Economic - Employment	Generation of temporary employment and increase in local revenue	(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; (ii) Secure construction materials from local market. (iii) Comply with labor laws	(i) Employment records; (ii) Records of sources of materials (iii) Compliance to labor laws (see **Appendix C-12** of this IEE)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Occupational Health and Safety	Occupational hazards which can arise during work	(A) Comply with all national, state and local core labor laws (see **Appendix C-12** of this IEE) (B) Ensure that qualified EHS personnel is deputed to look the H&S matter, EHS personnel should ensure to comply following- (i) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be	(i) Site-specific OH&S Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		followed for all site activities; and (e) documentation of work-related accidents; (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; (iii) Provide medical insurance coverage for workers; (iv) Secure all installations from unauthorized intrusion and accident risks; (v) The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following: (a) work schedule should be adjusted to avoid peak temperature hours (12 – 3 PM); (b) provide appropriate shade near the work place; allow periodic resting and provide adequate water, and (c) provide necessary medicine and facilities to take care of dehydration related health issues (v) Provide supplies of potable drinking water; (vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;	(vii) record of H&S orientation trainings (viii) personal protective equipment; (ix) % of moving equipment outfitted with audible back-up alarms; (xi) permanent sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. (xii) Compliance to core labor laws (see **Appendix C-12** of this IEE)			

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(vii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; (viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; (ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; (x) Ensure moving equipment is outfitted with audible back-up alarms; (xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and (xii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		per day without hearing protection. The use of hearing protection shall be enforced actively. (xiii) Provide proper solid and liquid waste management program in workers' campsite, separate from spoils and debris disposal, as their presence can add to existing waste volume at the project sites.				
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	(i) Plan routes to avoid times of peak-pedestrian activities. (ii) Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (iv) Provide road signs and flag persons to warn of on-going trenching activities.	(i) Traffic Management Plan (Appendix C-14); (ii) Complaints from sensitive receptors	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Safety requirements for deep trench works	Accidents, and risk hazard	Complete information on the underground structures (such as water pipelines, sewers, gas mains, electrical conduit system and other civic facilities) should be collected before doing the excavation work. Proper precautions shall be taken to prevent accident to the workmen engaged in excavation work and for the general public	Contractor's method statement for excavations On-site verification	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		All trenches in soil more than 1.5 m deep shall be securely shored and timbered. All trenches in friable or unstable rock exceeding 1.5 m in depth shall be securely shored and timbered Where the sides of trenches are sloped but not within 1.5 m of the bottom, the vertical sides shall be shored and the shoring shall extend at least 30 cm above the vertical sides. When open spaced sheathing is used, a toe board shall be provided to prevent material rolling down the slope and falling into the part of the trench with vertical walls. Shoring and timbering shall be carried along with the opening of a trench but when conditions permit, protection work, such as sheet piling may be done before the excavation commences. Approved quality of material with adequate structural strength shall be used for shoring and timbering a trench. Workers shall be instructed to use safety devices and appliances provided to them whenever it is necessary to do so Workers who are not aware of the hazards specific to the work shall not be permitted to proceed with the work without being properly instructed.				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		Safety helmets shall be worn by all persons entering trench where hazards from falling stones, timber or other materials exist Appropriate safety footwear (rubber boots, protective covers, etc.,) shall be worn by labours who are engaged in work requiring such protection Sides of excavation shall be inspected by PIU/PMDSC during the course of excavation from time to time and after every rain, storm or other hazard-increasing occurrence and protection against slides and cavings shall be increased, if necessary				
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	(i) Provide prior information to the local people about the nature and duration of work (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	-H&S plan including appropriate signs for each hazard present -Construction vehicles condition in H&S plan. Complaints from neighbourhood and monitoring of accidents	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Work Camps and work sites	Temporary air and noise pollution from machine operation, water pollution	(i) Consult with PIU before locating project offices, sheds, and construction plants; (ii) Minimize removal of vegetation and disallow cutting of trees;	(i) Complaints from sensitive receptors; (ii) Drinking water and sanitation facilities for employees –	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	from storage and use of fuels, oils, solvents, and lubricants Unsanitary and poor living conditions for workers	(iii) Provide drinking water, water for other uses, and sanitation facilities for employees; (iv) Ensure conditions of liability at work camps are maintained at the highest standards possible at all times; (v) Train employees in the storage and handling of materials which can potentially cause soil contamination; (vi) Recover used oil and lubricants and reuse or remove from the site; (vii) Manage solid waste according to the preference hierarchy: reuse, recycling and disposal to designated areas; (viii) Ensure unauthorized persons especially children are not allowed in any worksite at any given time.	(iii)Condition in list of preapproved sites for construction work camps, areas for stockpile, storage and disposal prepared by the Contractor.			
Impacts due to night works (if required as per nature of works and feasibility at site)	Occupational hazards which can arise during work at night in extreme and unavoidable cases	(i) Contractors should have hand held noise level meter for measurement of noise during night hours (ii) Contractors should have hand held lux meter for the measurement of illumination during night hours (iii) Preferably electrical connections is available for running equipments otherwise sound proof/super silent Diesel Generator set should be available (iv) Sound level should not	As per Management Plan for night works (**Appendix-C-18**).	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		increase as per EMP (v) Illumination should be adequate as required according to nature of works (vi) As far as possible ready mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site (vii) All the noise activity like hammering, cutting, crushing, running of heavy equipments should be done in day time and avoided in night time (viii) Workers engaged in night works should have adequate rest/sleep in day time before start of night works (ix) Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night (x) All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements (xi) Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests (xii) Horns should not be permitted by equipments and vehicles (xiii) Workers should not shout and create noise (xiv) First aid and emergency vehicles should be available at site (xv) Emergency preparedness plan should be operative during night works (xvi) Old persons and pregnant women and women having small kids should not work in night time (xvii) All the vehicles and equipments being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise (xviii) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works				
Social and Cultural Resources	Risk of archaeological chance finds and disturbance to socio cultural resources	(i) develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve:	Chance find protocol	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(ii) Conduct awareness training to contractor & supervision staff prior to start of excavation; (iii) Stopping work immediately to allow further investigation if any finds are suspected; (iv) Calling in the ASI/state archaeological department if a find is suspected, and taking any action they require to ensure its removal or protection in situ (v) Consult with concerned religious authorities, nearby people and devotees in pre-construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required (vi) Adjacent to religious/social sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building. (vii) Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places,				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(viii) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.				
Monsoon preparedness	Disruption of utilities and water logging in trenches	(i) As for a possible avoid trench works and excavation works during monsoon season to avoid any water logging and accident due to it (ii) if open trenches are not avoidable during monsoon, keep ready all the mitigations measures to avoid water logging such as dewatering pumps and sufficient pipes, traffic assistance, barricades etc. (iii) Guidelines for safety during monsoon is attached as **Appendix C-19**	As per monsoon preparedness plan& as per **Appendix-C-19** "Guidelines for Safety during Monsoon/Heavy Rainfall"	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Submission of EMP implementation report	Unsatisfactory compliance to EMP	(i) Appointment of supervisor to ensure EMP implementation (ii) Timely submission of monitoring reports including pictures	Availability and competency of appointed supervisor Monthly report	Construction contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
COVID-19 prevention and control during construction works	Health risk to workers due to COVID-19 virus	(i) provide face mask, hand gloves and sanitizers to workers during works (ii) Keep social distancing (iii) Educate workers about risks of COVID-19 (iv) Health check-up of workers suffering with symptoms of COVID-19 and test for same (v) isolation of workers suspected/suffering with COVID-19 and due medical care	Compliance of COVID-19 protocol and guidelines	Construction contractor	CMSC/ PIU	Contractor

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(vi) follow guidelines of WHO/Central/State/Local government and RUDSICO-EAP regarding COVID-19 (refer **Appendix C-23**)				
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (ii) All excavated roads shall be reinstated to original condition. (iii) All disrupted utilities restored (iv) All affected structures rehabilitated/compensated (v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. (vi) All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regrassed using the guidelines set out in the revegetation specification that forms part of this document. (vii) The contractor must arrange the cancellation of all temporary services. (viii) Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	PIU/Consultant report in writing that (i)worksite is restored to original conditions; (ii)camp has been vacated and restored to pre-project conditions; (iii)All construction related structures not relevant to O&M are removed; and (iv) worksite clean-up is satisfactory.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Table 13: Environmental Management Plan of Anticipated Impacts during Operation

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Cleaning of drainage	All work sites- Cleaning of drains may cause traffic disturbances, nuisances, public & worker safety	Remove the silts and other solid waste after cleaning the drains from site and dispose at approved dumping site in scientific manner Ensure traffic management during cleaning of drains and transportation of silt and solid waste	Site inspection will be done as per checklist is given in **Appendix-C-16**.	Weekly during construction	Supervising staff and safeguards specialists	No costs required
Check the blockages, overflow problem in drains	It may affect the draining system, overflow problem may contaminate land, water and create public health issues	Regular cleaning of drains, specially before start of monsoon to avoid blockages Implementation of regular O&M schedules	Follows regular O & M schedule	Jodhpur Development Authority	Jodhpur Development Authority	Jodhpur Development Authority
Disposal of silt and solid waste	Unsafe disposal of silt and solid waste may cause public nuisance and health issues	Identify the suitable place for disposal of silt and solid waste, away from habitation, in a scientific manner so that it may not cause public nuisance	Disposal site at suitable location	Jodhpur Development Authority	Jodhpur Development Authority	Jodhpur Development Authority
Safety precautions during drainage cleaning	Health and safety risk to workers engaged in drainage cleaning	Ensure all the safety equipment are available during manual cleaning As for as possible, use mechanical cleaning for cleaning of drains	-Training and Awareness campaign for Occupational, Health & Safety to ensure the use of PPE's.	Jodhpur Development Authority	Jodhpur Development Authority	Jodhpur Development Authority

Table 14: Environmental Monitoring Plan of ambient air, noise, water and soil quality and other during Construction

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Construction disturbances, nuisances, public & worker safety	All work sites	Implementation of dust control, noise control, traffic management, & safety measures. Site inspection checklist to review implementation is appended at **Appendix C-16**	Weekly during construction	Supervising staff, EHS officer and safeguards specialists	No costs required
Tree cutting	Alignment of both drains	Tree cutting permit taken, Tree cutting done	Continuous	Supervising staff, EHS officer and safeguards specialists	Contractor
Construction, Labour Camp, storage yard Management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	contractor
Solid waste management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	contractor
Construction and demolition waste management	All construction site	As per SEMP and applicable rules and regulations	Weekly	EHS officer, Environment Specialist of consultant	contractor
Consent to establish of batching plants, crusher, hot mix plant. DG sets etc.	Batching plants, crusher, hot mix plants etc	Copies of Consents	Periodically	EHS officer, Environment Specialist of consultant	No cost required for monitoring cost for obtaining CTE/CTO from Contractor
Ambient air quality	4 locations Bhairav Nagar Nala- 2 nos. Saran Nagar Nala- 2 nos	PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO	Quarterly except Monsoon period	Contractor	Contractor (ref table 20 & 19)
Ambient noise	4 locations Bhairav Nagar Nala- 2 nos. Saran Nagar Nala- 2 nos	Day time and night time noise levels	Quarterly	Contractor	Contractor (ref table 20 & 21)

Table 15: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of drain conditions	Full length of both the drains	Cracks, blockage, leakages etc.	Monthly	Jodhpur Development Authority	Jodhpur Development Authority
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	Jodhpur Development Authority	Jodhpur Development Authority
Disposal of silt and solid waste after cleaning of drains	Full length of both the drains	Identify suitable site and disposal of silt and solid waste in scientific manner	Monthly/ when required	Jodhpur Development Authority	Jodhpur Development Authority

B. Institutional Arrangements

148. The Local Self Government Department (LGSD) is the executing agency which is responsible for the overall strategic guidance and ensures the compliance with ADB loan covenants. RUDSICO is the implementing agency responsible for the technical supervision and project implementation. The RUDSICO Board (under the chairmanship of the Honorable Minister), the LGSD and the City Level Monitoring Committees (CLMCs, under the chairmanship of their respective commissioner/executive officer) is proposed to monitor the project implementation. The PMU is already established at state-level (Jaipur) and headed by a dedicated Project Director. The PIUs have two zonal offices (1 in Jaipur and 1 in Jodhpur). Each zonal office is headed by an additional chief engineer. Urban Local Bodies (ULBs) will be the final custodian and user of the created infrastructure. As primary stakeholders, the ULBs will be involved and engaged in the day-to-day monitoring and implementation.

149. At the PMU level, the Project Director is being supported by Additional Project Director (Chief Engineer-level) and a Chief Engineer, who are being supported by Dy Project Directors (Technical and Administration) and a financial advisor. There is one project officer for Social and another project officer for Environmental aspects within PMU.

150. The PMU is being supported by the Project Management and Capacity Building Consultants (PMCBC). The PMCBC shall manage preparation/vetting design documents, tendering of contracts, implementation of resettlement, environmental management and gender action plans; setting and managing project performance monitoring systems, planning and managing implementation of training and capacity building as well as institutional strengthening activities besides preparing reports as per ADB requirements. PMCBC has engaged a social safeguard specialist and environmental safeguard specialist at the PMU level for managing all social and environmental safeguard related support services as envisaged in its scope of work. They will be assisted by concerned field level safeguard support staffs of CMSCs and PIU.

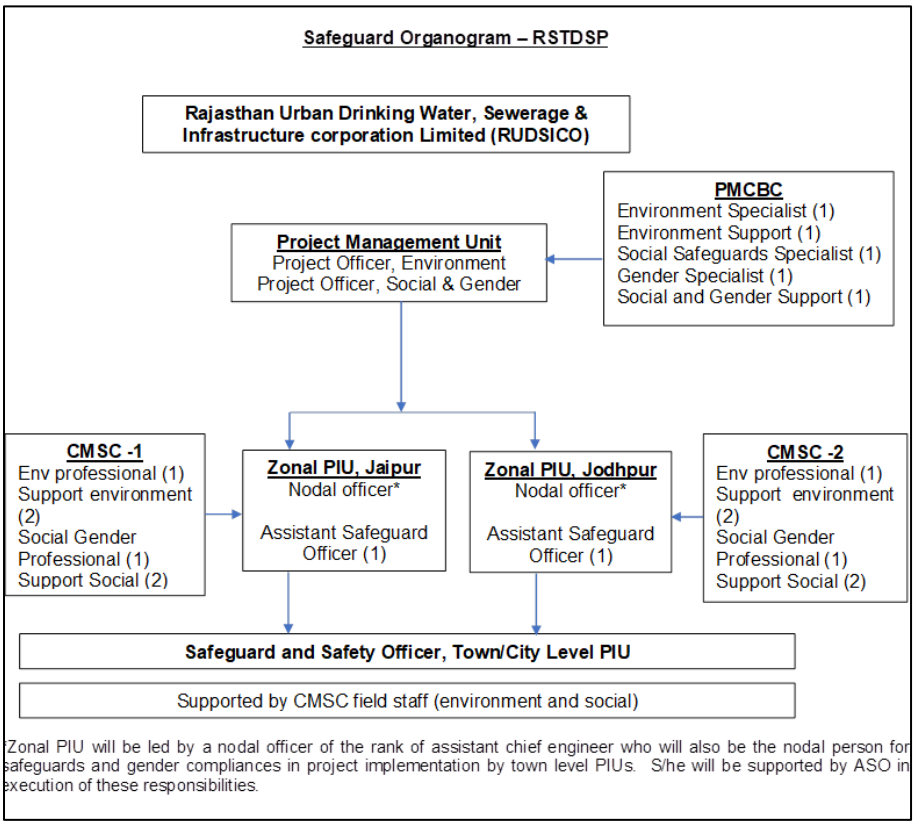
151. There are two zonal PIUs already established in Jaipur and Jodhpur. One PIU shall be established at every town before award of new projects. PIUs at the town-level shall be headed by a Superintending Engineer / Executive Engineer, who shall work as Project Manager and shall sign the contract documents, manage the contract and disburse payments as Drawing and Disbursing Officer.

152. **Construction management and supervision consultants (CMSCs) -** 2 nos. of CMSCs catering to Jaipur and Jodhpur units are already established. They shall directly support PIUs in day-to-day contract management, construction supervision including quality management of ongoing works etc. This shall include work measurement, quantities, verification of bills of contractors etc. In compliance with the EMP, the CMSCs shall develop a strategy to overcome the difficulties of construction/traffic management in narrow streets and also prepare detailed plans for detour of traffic during excavation. The CMSC will propose and implement mechanism for coordination among all stakeholders such as traffic police, roads department, user committees, etc., for smooth construction execution. Adequate measures shall be taken for working near physical cultural resources involving close coordination with the Department of Archaeology. The CMSC will lead design of surveys and investigations required for the protection of archaeological sites/heritage areas and prepare Archaeological Impact Assessments, or other agreed upon document to be approved by the Department of Archaeology for the archaeologically sensitive locations.

153. **Community awareness and public participation consultants (CAPPC)-** CAPC core unit is already established at PMU, Jaipur and at fields in ongoing 14 project towns. CAPC field team will be established in upcoming project towns after PIUs are formed in new towns. CAPC will closely work in the field (with PIUs) to facilitate creation of project awareness and ensuring public participation for all project works at the community level. This shall mainly involve house connections for water supply, sewerage and metering. CAPPC shall also undertake various IEC activities to promote and pursue health and hygiene among the communities.

154. **Figure 11** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table 16** and **17** summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 11: Environmental Safeguards Implementation Arrangement



155. **Project Management Unit.** RUDSICO will establish a state-level PMU, headed by dedicated project director, and housed in EAP division of RUDSICO. For the purpose of project implementation, 2 Zonal project implementation units (Zonal PIUs), at Jaipur and Jodhpur, headed by additional chief engineers (ACE) will be established. At PMU, there will be two dedicated project officers (i) project officer (Environment) and (ii) project officer (Social and Gender), who will be responsible for compliance with the environmental, social safeguards and gender in program implementation. Key responsibilities of the project officer (Environment) are enumerated in **Table 17**.

156. The PMU will be supported by 3 institutional consultants under the supervision and control of PD, PMU: (i) the project management and capacity building consultants (PMCBC) will support the PMU; (ii) 2 CMSC will support the 2 zonal PIUs and town-level PIUs; and (iii) CAPPC, will support the zonal PIUs and town-level PIUs.

157. **Zonal Project implementation units (Zonal PIUs).** There are 2 zonal level PIUs at Jaipur and Jodhpur. Under each zonal PIU, there will be city/town level PIUs, for ease of day-to-day monitoring and management at local level. The additional chief engineer at each Zonal PIU will serve as the Nodal Officer, Safeguards and Gender. Each Zonal PIU will be staffed with an assistant safeguards officer (ASO Environmental and Social Safeguards) who will assist PMU project officer (environment/social) in implementation of the environmental/social safeguards and GESI action plan in PIUs under its jurisdiction. Zonal PIUs will undertake internal monitoring and supervision and record observations throughout the project period to ensure that the safeguards and mitigation measures are provided as intended.

158. The zonal level ASO will oversee safeguards implementation by the city/town level PIUs, coordinate public consultations, information disclosure, regulatory clearances and approvals, implementation of resettlement plans, EMP implementation, and grievance redressal. Key safeguard tasks and responsibilities of the zonal PIU ASO (Environment) are enumerated in **Table 17**.

159. **Town/City Level Project Implementation Unit.** The town-level PIUs shall be responsible for the quality of works executed under the project and will be guided by the zonal PIUs. The city/town PIUs will be responsible for implementation of the IEE. The town-level PIUs will be headed by a project manager (executive engineer or assistant engineer) and supported by CMSC field staff. Environment Safeguard Professional of CMSCs will assist PIUs in implementation of environmental safeguard. At each PIU, the Assistant Project Manager will be given additional responsibilities of safeguard tasks and will be designated as safeguard and safety officer (SSO). The SSO will be assisted by the social and gender specialist and environment specialist of CMSC in reviewing updated/revised IEEs, etc. They will also be responsible for coordination of field level activities related to safeguards conducted by the contractor and CMSC. Key responsibilities of the town-level environment specialist are enumerated in **Table 17**.

160. **Contractors.** The contractor will be required to update the IEE and will be responsible for providing final design verification to the supervision consultant for finalization/updating of resettlement plan. The contractor shall appoint an environment, health and safety (EHS) engineer who will be responsible on a day-to-day basis for (i) ensuring implementation of EMP, (ii) coordinating with the town-level PIUs and environment specialists of project consultant teams; (iii) community liaison[22] consultations with interested/affected people, (iv) field-level grievance redress; and (iv) reporting.

161. The Contractor has required to submitted to RUDSICO-EAP, for review and approval, a SEMP including (i) proposed sites or locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program per SEMP; (iv) budget for SEMP implementation. No works can commence prior to approval of SEMP.

162. A copy of the EMP or approved SEMP will be kept on-site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or SEMP constitutes a failure in compliance and will require corrective actions. The EARF and the IEEs specify responsibilities in EMP implementation during design, construction and O&M phases.

163. RUDSICO-EAP will ensure that bidding and contract documents include specific provision requiring Contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste and (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS, to employees and local communities surrounding the project sites.

[22] Reasonable size social outreach team (SOT) to be appointed by contractor to facilitate community liaison, consultations and R&R implementation (including resolution of grievances). Requirement of SOT will be included in bid document.

Table 17: Institutional Roles and Responsibilities for Environmental Safeguards Implementation

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
PMU (Project Officer; Environment),	(i) Review REA checklists and assign categorization based on ADB SPS 2009 (ii) Review and approve EIA/IEE (iii) Submit EIA/IEE to ADB for approval and disclosure in ADB website (iv) Ensure approved IEEs are disclosed in RSTDSP/PMU websites and summary posted in public areas accessible and understandable by local people. (v) Ensure environmental management plans (EMPs) are included in the bid documents and contracts (vi) Organize an orientation workshop for PMU, PIU, ULB and all staff involved in the project implementation on (a) ADB SPS, (b) Government of India national, state, and local environmental laws and regulations, (c) core labor standards, (d) OH&S, (e) EMP implementation especially spoil management, working in congested areas, public relations and ongoing consultations, grievance redress, etc. (vii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (viii) Organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.	(i) Over-all environmental safeguards compliance of the project (iii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (i) Review monthly monitoring report (ii) Prepare and submit to ADB semi-annual monitoring reports (iv) If necessary, prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (iii) Review and submit Corrective Action Plans to ADB (iv) Organize capacity building programs on environmental safeguards (iv) Coordinate with national and state level government agencies (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (ix) Coordinate PIUs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	(ix) Ensure compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (x) Assist PMU, PIUs, and project NGOs to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. (xi) Assist in the review of the contractors' implementation plans to ensure compliance with the IEE.		
PIU, Safeguard and Safety Officer (SSO)	(i) Ensure IEE is included in bid documents and contract agreements. Ensure cost of EMP implementation is provided. (iv) Disclose of approved EIAs/IEEs. (v) Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance to the provisions and conditions. (vi) EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. (vii) Organize an induction course for the training of contractors, preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.	(i) oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations. (ii) take necessary action for obtaining rights of way; (iii) oversee implementation of EMPs, including environmental monitoring by contractors; (iv) take corrective actions when necessary to ensure no environmental impacts; (v) submit monthly environmental monitoring reports to PMU, (vi) conduct continuous public consultation and awareness; (vii) address any grievances brought about through the grievance redress mechanism in a timely manner as per the IEEs; and	(i) Conducting environmental monitoring, as specified in the EMP. (ii) Issuance of clearance for contractor's post-construction activities as specified in the EMP.
Consultant – 1.PMCBC-Environmental Safeguard Specialist – 1 no.	(i) Review IEE/EMP submitted by CMSC and revise report to submit to PMU (ii) Assist PMU and PIU in obtaining all necessary clearances, permits, consents, NOCs, etc. Ensure	(i) Monitor EMP implementation (ii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs.	

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	provisions and conditions are incorporated in the IEE and detailed design documents. (iii) Assist in ensuring IEE is included in bid documents and contract agreements. (iv) Assist in determining adequacy of cost for EMP implementation. (v) Assist in addressing any concern related to IEE and EMP. (vi). Conduct specific assessment requirements		
Consultant- 2. CMSC- 2 nos. Environmental safeguards professional	(i) Update initial environmental assessment for proposed project using REA checklists and submit to PIU/PMCBC (ii) Assist in summarizing IEE and translating to language understood by local people.	Monitoring of Implementation of EMP at site by contractor Recommend corrective action measures for non-compliance by contractors Assist in the review of monitoring reports submitted by contractors (iv) Assist in the preparation of monthly monitoring reports conduct continuous public consultation and awareness;	(i) Assist in the inspection and verification of contractor's post-construction activities.
Contractors (EHS Engineer)	(i) Review the IEE and provide information about changes needed as per revised design and scope of works to ESS of PMCBC for final revision of IEE (ii)Prepare EHS plan and take approval from CMSC/PIU and Ensure EMP implementation cost is included in the methodology. (iii) Undergo EMP implementation orientation by ESS of supervision consultant prior to start of works (iv) Provide EMP implementation orientation to all workers prior to deployment to worksites (v) Seek approval for camp sites and sources of materials. (vi) Ensure copy of IEE is available at worksites. Summary of IEE is translated to language understood by	(i) Implement EMP. (ii) Implement corrective actions if necessary. (iii) Prepare and submit monitoring reports including pictures to PIU (iv) Comply with all applicable legislation, is conversant with the requirements of the EMP; (v) Brief his staff, employees, and laborer about the requirements of the EMP and provide environmental awareness training to staff, employees, and laborers; (vi) Ensure any sub-contractors/ suppliers who are utilized within the context of the contract comply with all requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf; (vii) Bear the costs of any damages/compensation resulting from non-	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	workers and posted at visible places at all times.	adherence to the EMP or written site instructions; (viii) Ensure that PIU and ACM/SO are timely informed of any foreseeable activities related to EMP implementation.	

C. Capacity Building and Development

219. Executing and implementing agencies need to have a sustained capacity to manage and monitor environmental safeguards. Although specialist consultants support will be available to PMU and PIUs, it is necessary to mainstream safeguards in day-to-day working. Therefore, PMU and PIUs require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in preparation of IEE, implementation of mitigation measures, and subsequent monitoring. Trainings and awareness workshops are included in the project with the primary focus of enabling the PMU and PIU staff to understand impact assessments and carry out environmental monitoring and implement EMPs. After participating in such activities, the participants will be able to review environmental assessments, conduct monitoring of EMPs, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender documents and carry out necessary checks and balances during project implementation.

220. PMCBC's ESS shall assess the capabilities of the target participants, customize the training modules accordingly and provide the detailed cost.

221. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project, along with the frequency of sessions, is presented in Table 18.

Table 18: Capacity Building Program on EMP Implementation

Sl. No.	Description	Target Participants and Venue	Cost and Source of Funds
1	Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement -EARF of RSTDSP -Government of India and Rajasthan applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH&S, etc. -Incorporation of EMP into the project design and contracts -Monitoring, reporting and corrective action planning	All staff, ULBs and consultants involved in the project At PMU, Jaipur	PMU cost

2	Treated Effluent Reuse Concepts, Design and Management	All staff at PMU and ULBs	PMU cost
3	Sludge Reuse Concept, Design and Management	All staff at PMU and ULBs	PMU cost
4	EMP implementation (2 days) -Roles and responsibilities -OH&S planning and implementation -Wastes management (water, hazardous, solid, excess construction materials, spoils, etc.) -Working in congested areas, - Public relations - Consultations - Grievance redress -Monitoring and corrective action planning -Reporting and disclosure -Post-construction planning	All staff and consultants involved in the subproject All contractors before start of construction works At PIU	PMU cost
5	Plans and Protocols (1 day) -Construction site standard operating procedures (SOP) - Asbestos Management Plan -Heritage Impact Assessment -Biodiversity and Critical Habitat Assessment - Site-specific EMP -Traffic management plan -Spoils management plan -Waste management plan - Chance find protocol - O&M plans - Post-construction plan	All staff and consultants involved in the project All contractors before start of construction works or during mobilization stage. At PIU	PMU cost Contractors cost as compliance to contract provisions on EMP implementation
6	Experiences and best practices sharing - Experiences on EMP implementation - Issues and challenges - Best practices followed	All staff and consultants involved in the project All contractors All NGOs At PMU Jaipur	PMU Cost
7	Contractors Orientation to Workers on EMP implementation (OH&S, core labor laws, spoils management, etc.)	All workers (including manual laborers) of the contractor prior to dispatch to worksite	Contractors cost as compliance to contract provisions on EMP implementation

D. Monitoring and Reporting

222. Prior to commencement of the work, the contractor will submit a compliance report to PIU ensuring that all identified pre-construction environmental impact mitigation measures as detailed in the EMP will be undertaken. PIU with the assistance of the SO and ESS of PMCBC, consultant will review the report and thereafter PMU will allow commencement of works.

223. During construction, results from internal monitoring by the contractor will be reflected in their monthly EMP implementation reports to the PIU and ACM, CMSC. Project officer (Environment) and ACM will review and advise contractors for corrective actions if necessary. Monthly report summarizing compliance and corrective measures taken will be prepared by safeguard officer with the assistance of ACM and submitted to PMU.

224. Quarterly report shall be prepared by CMSC and PIU and submitted to PMU for review

and further actions.

225. Based on monthly and quarterly reports and measurements, PMCBC will draft semi-annual report and submit PMU for their review and further submission to ADB (**Appendix C-15**). Once concurrence from the ADB is received the report will be disclosed in the Project website.

226. The PMU will submit semi-annual environmental and social safeguards monitoring reports to ADB, which will be reviewed and disclosed on ADB's website. The monitoring reports will be prepared by PMU with assistance from the PMCBC based on inputs from the PIU's safeguard officers, CMSC, contractors and NGOs, where relevant. The status of safeguard implementation, issues, and corrective actions including associated cost and schedule are to be clearly reported to ADB. The status of safeguards implementation will also be discussed at each ADB review mission and with necessary issues and agreed actions recorded in Aide Memoires. ADB will also carry out annual environmental and/or social (including gender) reviews of the Project. The outline of the semi-annual environmental monitoring report is in **Appendix C-15**. ADB's monitoring and supervision activities are carried out on an ongoing basis until a project completion report (PCR) is issued. Thus, semi-annual report, which may cover O&M of completed packages, will be submitted to ADB until PCR is issued.

227. ADB will review project performance against the project commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system.

E. EMP Implementation Cost

228. Most of the mitigation measures require the contractors to adopt good site practice. contractor being bound to adopt several mitigation measures through various legal obligations (e.g., BOCW Act, Labour acts etc.) such as use of PPEs, provide toilets and potable drinking water, labour camp management, safety at work sites, safety in equipment operations etc. which should be part of their normal procedures; are not included in EMP cost of this project. Mitigation that is the responsibility of PIU/ULB will be provided as part of their management of the project, so this also does not need to be duplicated here. Cost for the capacity building program is included as part of the project. Regardless of these, project specific costs of mitigation by the construction contractors are included in the EMP budget for the civil works are enumerated here (**Table 19**).

Table 19: Cost Estimates to Implement the EMP

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
A.	**Mitigation Measures**						
1	Compensatory plantation measures*	Construction	per tree	900	4050	36,45,000	Civil works cost
	Subtotal (A)					**36,45,000**	
B.	**Monitoring Measures**						
1	Air quality monitoring**	Pre-construction and Construction (quarterly)	per sample	24	4920	1,18,080	Civil works cost

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
2	Noise levels monitoring**	Pre-construction and Construction (quarterly)	Per sample	24	1980	47,520	Civil works cost
	Subtotal (B)					**1,65,600**	
C.	**Capacity Building**						
1.	Introduction and sensitization to environment issues	Pre-construction	lump sum			100,000	PMU
2.	EMP implementation	Construction	lump sum			50,000	PMU
3.	Plans and Protocols	Construction	lump sum			25,000	PMU
			lump sum			25,000	Civil works cost
4.	Experiences and best practices sharing	Construction/ Post-Construction	lump sum			100,000	PMU
5.	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum			25,000	Civil works cost
	Subtotal (C)					**325,000**	
D	**Civil Works**						
1	Water Sprinkling for dust suppression	Construction	KL	3000	111	333,000	Civil works cost
2	**Barricading**						
	Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts	Construction	m	20232.77	50	10,11,639	Civil works cost
3	**Timbering**						
	Providing and fixing OPEN including strutting, shoring and packing cavities (wherever required)	Construction	Sq.m	13121.88	64	839800	Civil works cost
	Providing and fixing CLOSE timbering including strutting, shoring and packing cavities (wherever required)	Construction	Sq.m.	43373.96	125	54,21,745	Civil works cost
	Sub Total (D)					**76,06,184**	

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
E	**Grievance Redressal Mechanism**				Lump sum	350,000	Civil works cost
	Sub Total (F)					**350,000**	
	Total (A+B+C+D+E+F)				**INR**	**1,20,91,784**	

* In preliminary design about 296 trees may be required to cut. During service improvement Paln contractor will be required to confirm exact number of tree cutting. Tree cutting requirement for proposed drainage works can be decided only after confirmatory survey of full length of alignment by contractor. In this stage higher side of tree cutting numbers are taken as 300 trees. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works. Therefore 900 numbers of trees are taken as compensatory plantation.
** As per table 20

Summary of EMP Cost incurred by Institution :

Contractor Cost - INR 1,18,16,784/-
PMU Cost - INR 2,75,000/-
Total - INR 1,20,91,784/-

(In Words: Rupees One Crores Twenty Lacs Ninety one Thousands and seven hundred eighty four Only)

Table 20: Details of environment monitoring locations

Project components where environmental monitoring is required	Total numbers of environmental monitoring required in one quarter	Total numbers of environmental monitoring required in year (three quarters leaving quarter of monsoon)	Project duration	Total number of environmental monitoring required during project duration
Bhairav Nagar Nala- 2 locations Saran Nagar Nala- 2 locations **Total- 2 Locations**	Air- 4 Noise-4 Ground Water- 4	Air- 12 Noise- 12 Ground Water-12	2 years	Air- 24 Noise- 24 Ground Water- 24

X. CONCLUSION AND RECOMMENDATION

229. The process described in this document has assessed the environmental impacts of all elements of the Jodhpur Drainage subproject. All potential impacts were identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant. During the construction phase, impacts mainly arise from the construction dust and noise, the need to dispose of large quantities of waste soil due to excavation of proposed drains; and from the disturbance of residents, businesses, traffic and important buildings by the construction work. The social impacts (access disruptions) due to construction activities are unavoidable, as the residential and commercial establishments exist along the roads where drains will be constructed. A resettlement plan has been developed in accordance with ADB SPS 2009 and Government of India laws and regulations.

230. In Jodhpur City area Bhairav Nala and RTO Nala are major drainages system for rainwater and local discharge. The catchment of Bhairav Nala originates from Takht Sagar hill areas in upstream of Shobawato ki Dhani, where drain terminates into plain area. There is no well-defined drain beyond Shobawato ki Dhani. In the past, the well-defined drain existed upto Shobawato ki Dhani, after that the drain have not well define cross section and water spread into the surrounding fields. Therefore, planning of proper drain is necessary to safely discharge the drain water, as development of Jodhpur city taking palace in this area. At Saran Nagar, the existing drain 3-3 (from Krishi Mandi - Bhadwasia -Vishwakarma Nagar - Vidya Nagar - RTO Office - Gulab Nagar - Sirkariya Beri) upto Jojari river consider under this project, which does not have well define cross section and results in spreading of water into the surrounding fields and neighbouring colonies.

231. The subproject is formulated to address gaps in Drainage infrastructure in a holistic and integrated manner. The Project Components include improvements in drainage infrastructures of Bhairav Nagar Nala and Saran Nagar Nala to discharge the storm water of both drains in to Jojari River to improve the drainage system of the town and to prevent the stagnant water of both the drains.

232. Anticipated impacts of proposed drainage systems during operation and maintenance will be related to check and repair of blocks, overflows and leakages in both drains. Regular cleaning of drains and safe disposal of removed silt and solid waste from drains are major area of concern during operation phase and mitigation plans are required for same.

233. The public participation processes undertaken during project design ensured stakeholders are engaged during the preparation of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during implementation. The project's grievance redress mechanism will provide the citizens with a platform for redressing grievances, and describes the channels, timeframe, and mechanisms for resolving complaints about environmental performance.

234. The Environmental Management Plan proposed in the project includes mitigation measures for identified impacts, training and capacity building activities, a monitoring plan to ensure that the environmental standards are maintained throughout the project construction period and a reporting plan to ensure that the project is implemented as per environmentally sound engineering and construction practices. The budgetary provision for mitigating the anticipated impacts by proposed subproject component is made in the project for effective implementation of the EMP Plan.

235. The EMP will assist the PMU, PIU, Consultants and contractors in mitigating the environmental impacts, and guide them in the environmentally sound execution of the proposed project. The EMP will also ensure efficient lines of communication between PIU/ULB, PMU, consultants and contractor. A copy of the EMP shall be kept on-site during the construction period at all times. The EMP shall be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

236. The project will benefit the general public by contributing to the long-term improvement of Drainage system and community liveability in Jodhpur. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigation measures and environmentally sound engineering and construction practices.

237. Therefore, as per ADB SPS, the project is classified as environmental category B and does not require further environmental impact assessment.

238. **Recommendations.** The following are recommendations applicable to the subproject to ensure no significant impacts:

(i) Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
(ii) Include this IEE in bid and contract documents;
(iii) Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation;
(iv) Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location;
(v) Conduct safeguards induction to the contractor after award of contract;
(vi) Ensure contractor appointed qualified environment, health and safety (EHS) officers prior to start of works;
(vii) Timely disclosure of information and establishment of GRM;
(viii) Involvement of contractors, including subcontractors, in first level GRM;
(ix) Strictly supervise EMP implementation;
(x) Continuous consultations with stakeholders; and
(xi) Documentation and reporting on a regular basis as indicated in the IEE.

Appendix 1: REA Checklist

Instructions:

The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.

This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.

Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP)/Jodhpur Drainage subproject, Distt. Jodhpur, Rajasthan
Sector Division: Urban Development

REA Checklist- Urban Development

SCREENING QUESTIONS	Yes	No	REMARKS
A. **Project Siting** Is the project area…			
Densely populated?	√		Subproject activities are scattered to entire town including the densely populated areas.
Heavy with development activities?	√		Jodhpur is a developed town with continuous urban expansion, there are several industries and mostly agriculture, business and service are the common occupations
Adjacent to or within any environmentally sensitive areas?			
Cultural heritage site		√	There is one ASI protected monument (Mandore Fort) in Municipal Area of Jodhpur, which is approx.. 7.2 km from Saran Nagar Nala and 14.1 km from Bhairav Nala. There are 3 State Protected areas in the Municipal area of Jodhpur, which are approximately between 5 km to 15 km from both the Nala. Therefore proposed works of both the Nala will have no any significant adverse impact to any cultural heritage site in Jodhpur
Protected Area		√	Gudha Vishnoia Conservation Reserve is the nearest environmentally sensitive area, which is approx.. 11.8 km from Saran Nagar Nala and approx.. 18.4 km from Bhairav Nala
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	Gudha Vishnoia Conservation Reserve is the nearest environmentally sensitive

SCREENING QUESTIONS	Yes	No	REMARKS
			area, which is approx.. 11.8 km from Saran Nagar Nala and approx.. 18.4 km from Bhairav Nala
Bay		√	
B. Potential Environmental Impacts Will the Project cause…			
Impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.		√	No such impacts on existing sanitation and solid waste disposal systems
Deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		√	No such impact is anticipated
Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		√	No impacts on land and ecosystem is anticipated
dislocation or involuntary resettlement of people		√	Project does not involve land acquisition / involuntary resettlement /displacement. During the sewer construction, particularly in narrow streets there may be temporary disruption to household and there will also be temporary loss of livelihood to roadside vendors, the same is addressed in the Resettlement Plan.
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact on vulnerable groups
Degradation of cultural property, and loss of cultural heritage and tourism revenues?		√	There will be no impact on any cultural property, heritage and tourism revenues
Occupation of low-lying lands, floodplains, and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to polluting industries?		√	No such impact is anticipated
Water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters?		√	No such impact is anticipated rather proposed improvements of both drains will improve the environmental conditions of the city
Air pollution due to urban emissions?		√	No such impact is anticipated

SCREENING QUESTIONS	Yes	No	REMARKS
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	√		Occupational health and safety risks are negligible due to chemical and biological hazards during construction in sewerage works, physical hazards may arise due to safety risks during construction works. During operation of drainage system physical and biological hazards may cause health and safety risks to workers for which mitigation measures will be required
Road blocking and temporary flooding due to land excavation during rainy season?	√		Temporary flooding may occur in excavated trenches during rainy season and mitigation measures will be required to overcome flooding due to construction works
Noise and dust from construction activities?	√		Noise and dust problem may occur during construction activities
Traffic disturbances due to construction material transport and wastes?	√		Traffic disturbances may occur during construction works and traffic management plan will be required
Temporary silt runoff due to construction?	√		Jodhpur is predominantly dry and rainfall is very limited
Water depletion and/or degradation?		√	No such impact is anticipated
Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		√	No such impact is anticipated
Contamination of surface and ground waters due to sludge disposal on land?	√		Silt and solid waste emerging from cleaning of drains will create such problem if not addressed
Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		√	No such impact is anticipated
Large population influx during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		√	Most of the unskilled workers will be hired locally, some of skilled workers will be brought from outside but numbers will not so large to have impacts on social infrastructure and services.
Social conflicts if workers from other regions or countries are hired?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is necessary, labour camps and facilities will be provided appropriately. No conflicts envisaged
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		√	No explosives shall be used in project. Fuel and other chemicals will be used in very less quantities which will not have significant impact on community health and safety. Safe handling of fuels and chemicals will be ensured by contractor.

SCREENING QUESTIONS	Yes	No	REMARKS
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	√		Community safety risk may be there during construction during excavation, equipment and vehicle operation, construction etc. for which mitigation measures will be required by contractor

Checklist for Preliminary Climate Risk Screening

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP), Jodhpur Drainage subproject, District - Jodhpur , Rajasthan

Sector : Urban Development

Subsector: Urban Drainage

Division/Department: SARD/SAUW

Screening Questions		Score	Remarks[23]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	No such issue may affect the project
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	No such issue may affect the project
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	No such issues may affect the project
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	No such issue may affect the project
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	No problem will envisaged in future which likely affect the performance of project output

Options for answers and corresponding score are provided below:

Response	Score

[23] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Low

Other Comments: The proposed subproject activity involves construction of two Nalas and the anticipated environmental impacts are very marginal and the construction activity does not impose any threat to the existing climatic conditions.

Appendix 2: List of ASI and State Protected Monuments in Jodhpur

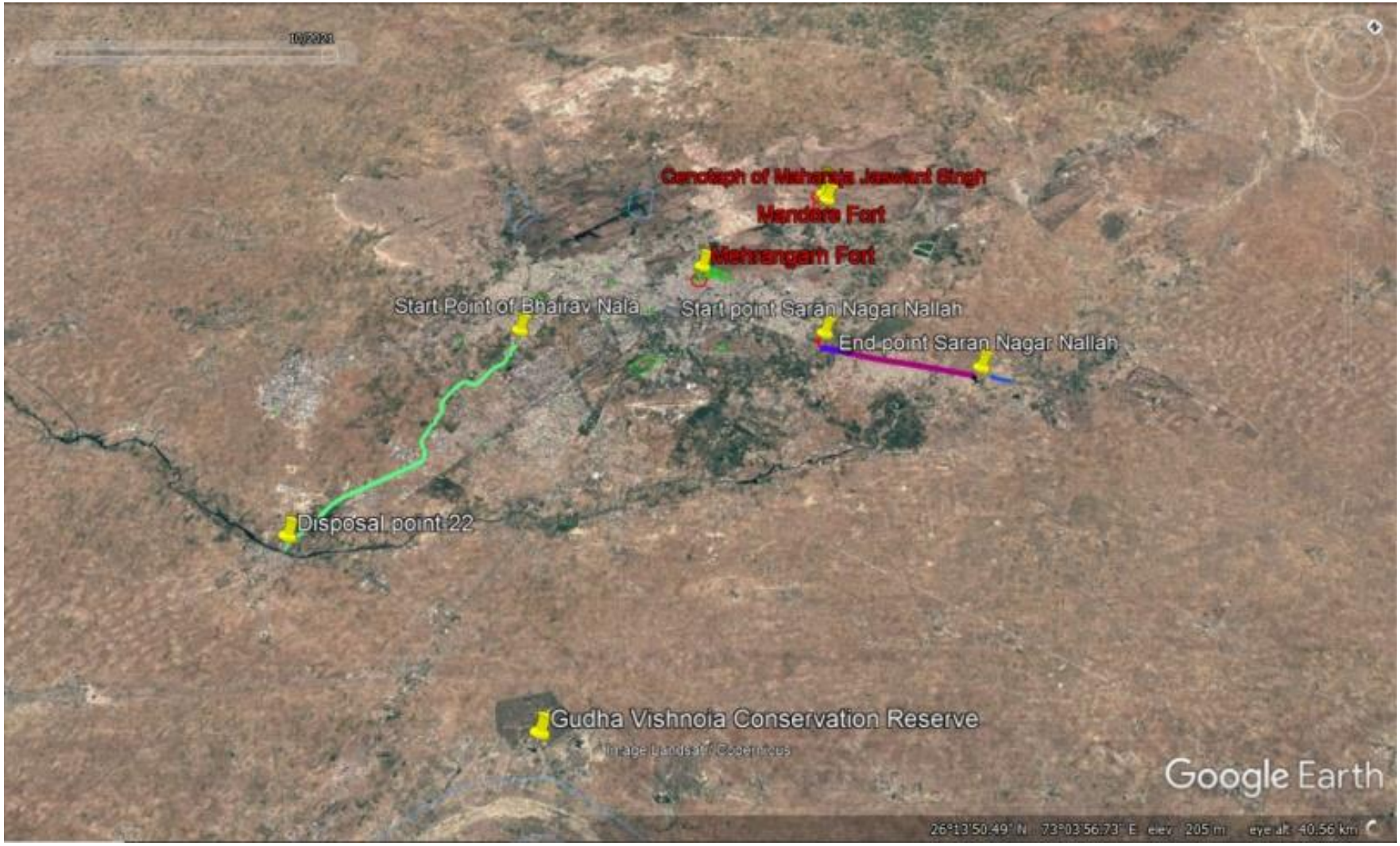
A. List of ASI Protected Monuments in Jodhpur

S.N. in ASI List	Monument's name	Location	Town
89.	Fort	Mandore	Jodhpur

B. List of State Protected Monuments in Jodhpur

District-Jodhpur		
S. No	Name of Monument	Location
1.	Jodhpur Fort	Jodhpur
2.	Hari-Har Temple-1	Osian
3.	Hari-Har Temple-2	Osian
4.	Hari-Har Temple-3	Osian
5.	Hari-Har Temple-4	Osian
6.	Hari-Har Temple-5	Osian
7.	Sun Temple	Osian
8.	Shiv Temple	Osian
9.	Piplad Mata Temple	Osian
10.	Vishnu Temple	Osian
11.	Jain Temple	Osian
12.	Sachiya Mata Temple	Osian
13.	**Baori (Jalara or Jhalara)**	Osian
14.	Heroes Hall (Veeron ki Dalan)	Mandore
15.	Cenotaph of Rao Mal Deva	Mandore
16.	Cenotaph of Motaraja Udai Singh	Mandore
17.	Cenotaph of Sawai Raja Sur Singh	Mandore
18.	Cenotaph of Raja Gaj Singh	Mandore
19.	Cenotaph of Maharaj Jaswant Singh-I	Mandore
20.	Cenotaph of Maharaj Ajeet Singh	Mandore
21.	Cenotaphes at Panch Kunda	Mandore
22.	Kakku Deval and Kirti Stambha	Ghatiyala
23.	Sculputre of Tokeshwara Maharaj	Mandore
24.	Ravana ki Chanwari	Mandore
25.	City wall Jodhpur	Jodhpur
26.	Shiv Mandir, Lamba (Khasra No. 1529)	Bilara
27.	Vishnu & Shiv Mandir, Buchakala	Bilara
28.	Prachin, Mandir, Gangana (Khasra No. 123)	Jodhpur
29.	Prachin Mahal, Sursagar	Jodhpur
30.	Durg Phalodi	Phalodi
31.	Zanana Mahal	Mandore
32.	Harsh ka Deval (Shiv Temple)	Varna (Bilara)
33.	Prachin Shiv Temple Baori, Bhopalgarh	Bhopalgarh
34.	Prachin Shivalay, Bhundana	Bhopalgarh

C. Location of ASI and State Protected Monuments in Jodhpur City area and conservation reserve and Proposed Project Components of Jodhpur Drainage



Appendix 3: Stakeholders Consultations Conducted During Project Preparation

A. Consultations during Social and Environmental Impact Assessment

Various consultations were done during social and environmental impact assessment of the project with residents of the town at various locations to understand their level of satisfaction about the present water supply and sewerage conditions in town and also to understand their awareness about the proposed works and their willingness/acceptance of the proposed works under RUSTDIP. Details of these consultations are given below-

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
1	09th December 2021	Rupa Ram, Bhala Ram Patel, Hari Ram Jat, Kishan Meghwal, Kumbharam Jat, Radhey Shyam, Shankar Lal Jat, Pawan Das, Bala Ram jat, Pradeep, Indula Devi, **M- 10** **F- 1**	Tanawada Phata Hanuman Nagar - located on proposed alignment of Shobhavato ki Dhani to jojari River	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for Jodhpur because during moonson season it is difficult to visit at Shobawati ki Dhani and adjoining areas, trees present at alignment should be saved as much as possible, no wildlife reported in the proposed areas
2	09th December 2021	Ram Raj, Vinita, Vishakha, Sava Ram, Laxman, Abdul, Rai Kishore, Sangita, Savita, Mimi, Reha, Suresh Jat, Hema Ram, hema Ram Jingar, Bapu Lal **M- 9** **F- 6**	Dhinano ki Dhani located on proposed alignment of subproject storm water drainage Bhairav Nala	Status of existing drainage system, Information about project components and feedback about the project, status of activities in the alignment of proposed drainage works, probable disturbance during construction works	Participants' main concern is about loss of the access to their fields during construction phase. They demanded alternative arrangements should be made prior to start of civil works. Participants welcome the proposed drainage project
3	10th December 2021	Geeta Devi, Anjana Singh, Kailash Kumar, Sarita Singh, Satyanarayan, Sati Chand, Goverdan Singh, Gudiya	Derbi Textile Colony - located on proposed alignment of subproject storm water drainage	Status of existing drainage system, Information about project components and feedback about the project, probable	There is no drainage system in this area and Bhairav Nala terminates abruptly at Shobawato ki Dhani, therefore, Derbi Textile colony, Bihari Colony, Murli Nagar etc are prone to severe

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
		Devi, Kiran, Arun, **M- 4** **F- 7**	Bhairav Nala	disturbance during construction works, presence of trees and wildlife in drain alignment	inundation during rainy season. And later on, water logged reported throughout the year in low laying areas. these local inhabitants are bound to live in an unhealthy environmental situation and also causes inconvenience to the residents including improper garbage assimilation, damages to the infrastructure, loss of business and spreading of diseases Participants expressed their happiness that the project will ensure better health and hygiene in their neighbourhood. They believe that this will reduce incidences of diseases. They insisted to avoid unnecessary tree cutting
4	11th December 2021	Saaya, Jagdish Pandit, Mangilal, tejaram, **M- 3** **F- 1**	RTO to Saran Nagar section of Proposed Drainage Subproject. Consultation with Likely to be affected persons	Status of existing drainage system, Information about project components and feedback about the project, any suggestions or comments about proposed project of drainage works	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They also told that this subproject is urgently required because during moonson season it is difficult to travel on the road.
5	11th December 2021	Kamal Kishore, Raju, Lekhraj, Ramesh, Mohan Ram, Mukesh **M-6** **F-0**	Mata ki Than to Saran Nagar section located on RTO to Saran Nagar section of Proposed Drainage Subproject. Consultation with local residents and including Likely to be	Status of existing drainage system, Information about project components and feedback about the project, environmental problems due to accumulation of water in the area and will the project have positive impact	There is no drainage system in this area and RTO Nala terminates abruptly after crossing the railway line under culvert. Inhabitants of Ambedkar Nagar etc. are prone to to severe inundation during rainy season only. These local inhabitants are bound to live in an unhealthy environmental situation which also causes inconvenience to the residents including improper garbage

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
			affected persons		assimilation, damages to the infrastructure, loss of business and spreading of diseases Participants expressed their happiness that the project will ensure better health and hygiene in their neighborhood. They believe that this will reduce incidences of diseases. Prior information of civil works should be shared so that shift to the other side of the road
6	11th December 2021	Sagar Ram, Om Prakash, Shahabuddin, Hanuman, Ashok,Kalu Ram, Nima Ram, Sumer, Ramesh Kumar, Prakash, Sahi Ram, Oma Ram, Radheyshyam, Sawal Ram, Santosh, Shyam, Jabbar, Rawat Ram, Mahendra Singh, **M-19 F-0**	Saran Nagar Flyover located on Saran Nagar to Jojari River section of Proposed Drainage Subproject. Consultation with Likely to be affected persons	Status of existing drainage system, Information about project components and feedback about the project, presence of any wildlife or trees in the project area, environmental problems due to accumulation of water in the area and will the project have positive impact	All the participants requested that prior information of civil works must be shared so that they can shift to the other side of the road. They also told that this subproject is urgently required because during monsoon season it is difficult to travel on the road, people suffer due to water logging in the area, mosquitos breeding also increases during water logging in the area, no wildlife are reported in the project areas, trees are coming in the proposed alignment and if required trees can be cut as per govt. norms
7	11th December 2021	Rekha, Pappu, Rizban, Pappu Ram, Vimla, Ghanshyam, Dinaram, Depak, Tarachand, Devaram Dewasi, Poonam, Munnilal, Soyal, Rishabh, Rakesh, Farmaan, Muli	Saran Nagar Flyover located on Saran Nagar to Jojari river section of Proposed Drainage Subproject. Consultation with Likely to be affected persons	Status of existing drainage system, Information about project components and feedback about the project, any gender specific concerns and suggestions	All the participants told that this subproject is urgently required because during monsoon season huge water logging occurs in this area, drain is full of water with foul smell and shrubs, proposed improvements in existing drains will be helpful to improve environmental conditions

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
		Devi, Arjun Singh **M-12** **F-5**			
8	01.02.2022	Pravin, Umesh, Surinder, Ramesh **M-4** **F-0**	Asha Purna Enclave	Status of land of proposed drain alignment, presence of trees on the alignment	Land status of proposed drain is not clear to participants, few trees may be cut in the proposed alignment
9	03.02.2022	Jitendra Choudhary, Mahabeer Singh, Bhalla Ram **M-4** **F-0**	Proposed alignment of Bhairav Nala	Proposed works of drainage, problems due to existing drainage system, presence of trees and wildlife in the area	Proposed works of drainage is good for reduction of water logging problems in the area, trees are present in the alignment and people are not having concern about tree cutting requirement, no wild life is present in the alignment
10	04.02.2022	Bhanwar Ram, Thuna Ram, Mada Ram **M-3** **F-0**	Proposed alignment of Bhairav Nala	Proposed works of drainage, problems due to existing drainage system, presence of trees and wildlife in the area	Proposed works of drainage is good for reduction of water logging problems in the area, trees are present in the alignment and people are not having concern about tree cutting requirement, no wild life is present in the alignment
11	05.02.2022	Likna Ram, Badri Ram, Mahipal, Godu Ram, Ashok **M-5** **F-0**	Bagban Krishi Form	Status of land of proposed drain alignment, presence of trees on the alignment	Land status of proposed drain is not clear to participants, few trees may be cut in the proposed alignment
		Total Participants M- 79 F- 20			

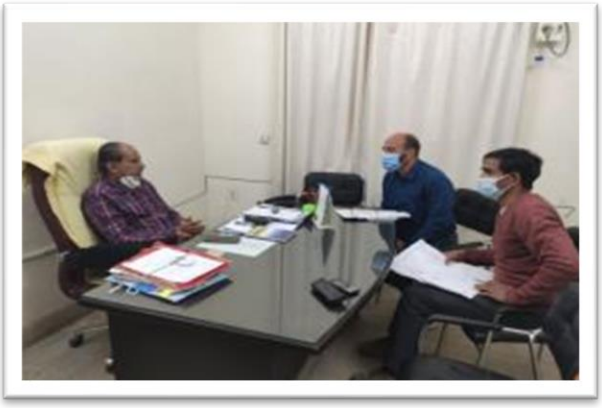
Photographs of Public Consultations

Public consultations between Saran Nagar to Jojari river

Public consultations between Saran Nagar to Jojari river

Public consultations At Dhinao ki Dhani

Public consultations At Dhinao ki Dhani



Consultation with Officials of Jodhpur Development Authority (JoDA)

Consultation with Patwari and Junior Engineer of JoDA

Public Consultations At Labour Colony under Derbi Textiles

Public Consultations At Labour Colony under Derbi Textiles

Public Consultations at Tanawara Phata Market on Salawas Road

Public Consultations at Tanawara Phata Market on Salawas Road

Consultations at Poorvi Pal Yojna colony

Consultations at Poorvi Pal Yojna colony

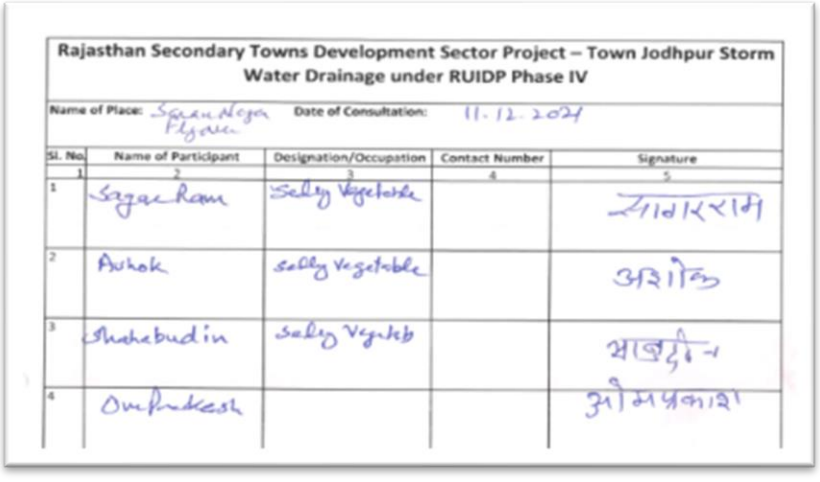
Consultations with resident welfare association of Ashapurna Enclave

Consultations with JoDA officers

Consultations in village Pal

Consultations in village Pal

Consultation Attendance sheet



Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Name of Place: Sardarpura Phase-I Date of Consultation: 11.12.2024

Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	Sagar Ram	Selling Vegetable		सागरराम
2	Ashok	Selling Vegetable		अशोक
3	Shahabudin	Selling Vegetab		शाहबुद्दीन
4	Omprakash			ओमप्रकाश

Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Name of Place: Dhingana Ki Dhani, Jodhpur Date of Consultation: 9/12/2021

Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	Suresh Jat	Kisaan	9660326130	
2	Hema Ram Ji	kisaan	[redacted]	
3	Hemram Ji Jat	Farmer	7425867402	
4	Babu Lal Ji	Student	"	
5				

Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Name of Place: Dussi textile colony, Jodhpur Date of Consultation: 10/12/2021

Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	Geetdevi Mali	house wife	9166166962	
2	Ranjana Singh	Teacher	9772831523	
3	Rajpurohit Kainsh Kanwar	house wife	8890290874	
4	Sarita Singh	house wife	9057002839	
5	Satyanarayan	kisaan		
6	Satichand	factory worker		
7	Chandan Singh	working in handicraft		
8	Sudiya devi	housewife	6378163165	
9	Kiran Mali	house wife	9928973	
10	Arun Thakur	Student	8949147	
11				

AP ENCLAVE Residents Welfare society
&
ASHAPURNA ENCLAVE VIKAS SAMITI

Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Name of Place: office of RIOA, Ashapurna Enclave Date of Consultation: 01.02.2022

Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	PRAVIN JI	Secretary	93147 01175	
2	UMESH JI	Executive Member	93144 57475	
3	SURINDER JI	President	97830 94000	
4	RAMESH JI	MEMBER	98290 28379	
5	MAHABIR SINGH	Env. Engr.	95035 57249	
6	V. PATIL	TL		
7				

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Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

BAGBAN KRISHI FARM KI DHANI

Name of Place: JUMBAWA Date of Consultation: 05/02/2022

Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	LIKMA RAM	Farmer	982828 7136	Likma Ram
2	BADRIRAM	farmer	931471 6044	
3	MANIRAM	CA (Chmd)	94141 33444	
4	GodaRam	Businessman	99290 50975	
5	Ashok	Student	730000 0629	
6				

Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Name of Place: Highway Dabla Bypass Date of Consultation: 03-02-2022

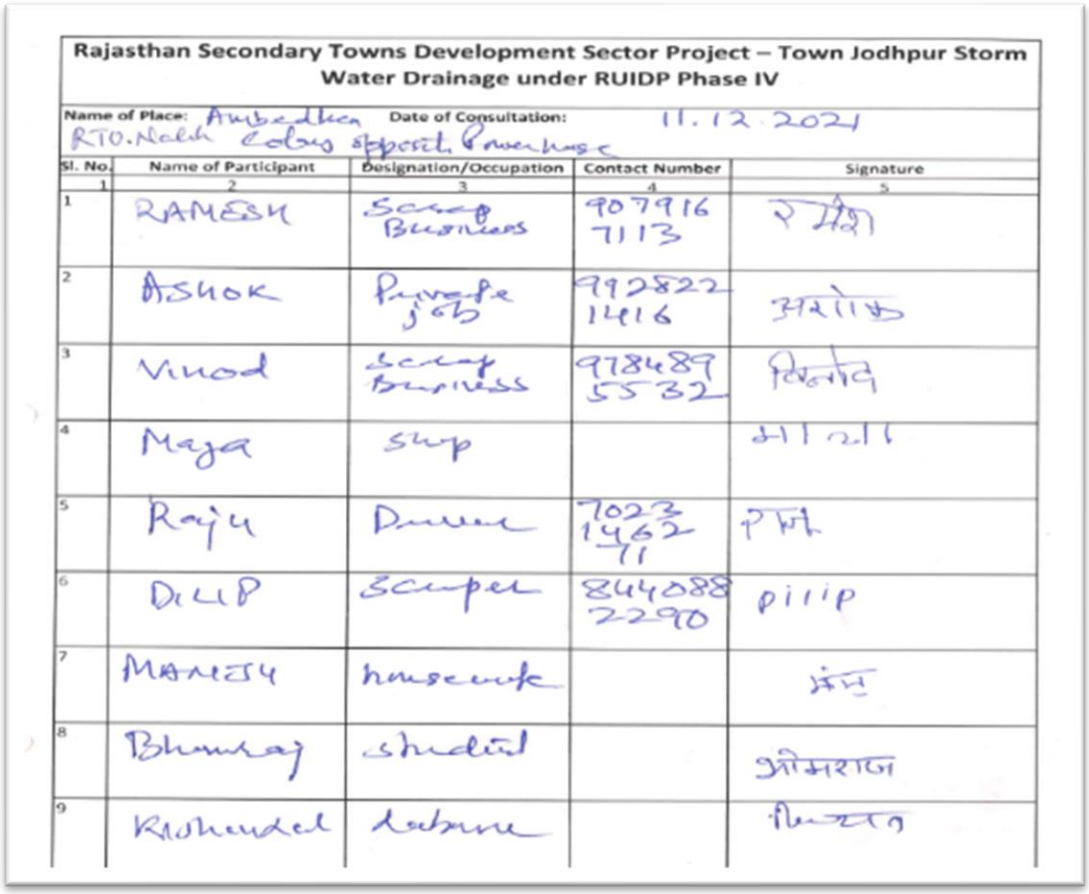
Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	JITENDRA JI CHAUDHARY	Farmer and Businessman	98293 00131	
2	Dr. Mahabir Singh			
3				
4	BHALLA RAM	Sarpanch, PAL	8947701883	
5				
6				

Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Name of Place: DHANALA NADA CHARAN KI DHANI Date of Consultation: 04-02-2022

Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	BHANWARA RAM	Farmer		
2	THAMA RAM	Farmer	63755 35397	
3	~~BHALA RAM~~ MADA RAM	Farmer	9772542300	
4				

RTO to Saran Nagar at Ambedkar Nagar opposite Power House



Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Name of Place: Ambedkar Date of Consultation: 11.12.2024
RTO. Nalah colony opposit Powerhouse

Sl. No.	Name of Participant	Designation/Occupation	Contact Number	Signature
1	2	3	4	5
1	RAMESH	Scrap Business	907916 7113	
2	ASHOK	Private job	992822 1416	
3	Vinod	Scrap Business	978489 5532	
4	Maya	Shop		
5	Raju	Driver	7023 1462 71	
6	DILIP	Scrapper	844088 2290	
7	MAHESH	housewife		
8	Bhanwaj	student		
9	Rishendel	labour		

Rajasthan Secondary Towns Development Sector Project – Town Jodhpur Storm Water Drainage under RUIDP Phase IV

Stakeholder Consultation Meeting on 6 February 2023

Government of Rajasthan
Office of Superintending Engineer
Rajasthan Urban Infrastructure Development Project
Phase-IV, Tranche –II (RSTDSP), PIU-Jodhpur
(Email:- ju.ruidp@rajasthan.gov.in)

(40)RUIDP/Ph-IV/GEN/994 Date: 6/2/2023

Minutes of Stakeholder Meeting

A city level Stakeholder Meeting and Public Consultation was held on 25.01.2023 at CSI Nagar Nigam Office, Jodhpur under the Chairmanship of Executive Engineer, PIU, Jodhpur, for awareness and discloser of information about Jodhpur Sewerage and Drainagesubprojects, including project benefits, details of Environmental Management Plan, Environmental and Social Safeguarded, provision of Health and Safety, etc. Proposed scope of works and other provisions in the wastewater and drainage projects in Jodhpur city were appraised to the stakeholders through PowerPoint presentation with salient features of the proposed works. Details of area covered under the wastewater and drainage project and other components of the projects was also appraised to stakeholders along with the provisions for environmental and social safeguard and Grievance redressal mechanism. Meeting was attended by several ward councillors of Jodhpur Nagar Nigam, representatives of NGOs, PIU, Jodhpur, Environmental and Social and Safeguard Professionals of CMSC-2 and CAPP personals. A few members suggested if the additional areas would have covered in the project, it would have been good for the inhabitants of those areas.

Counsellors and other representatives exhibited their contentment for the selection and implementation of Jodhpur WW and Drainage project. The attendance sheet of participants of stakeholder meeting is attached at separate sheet.

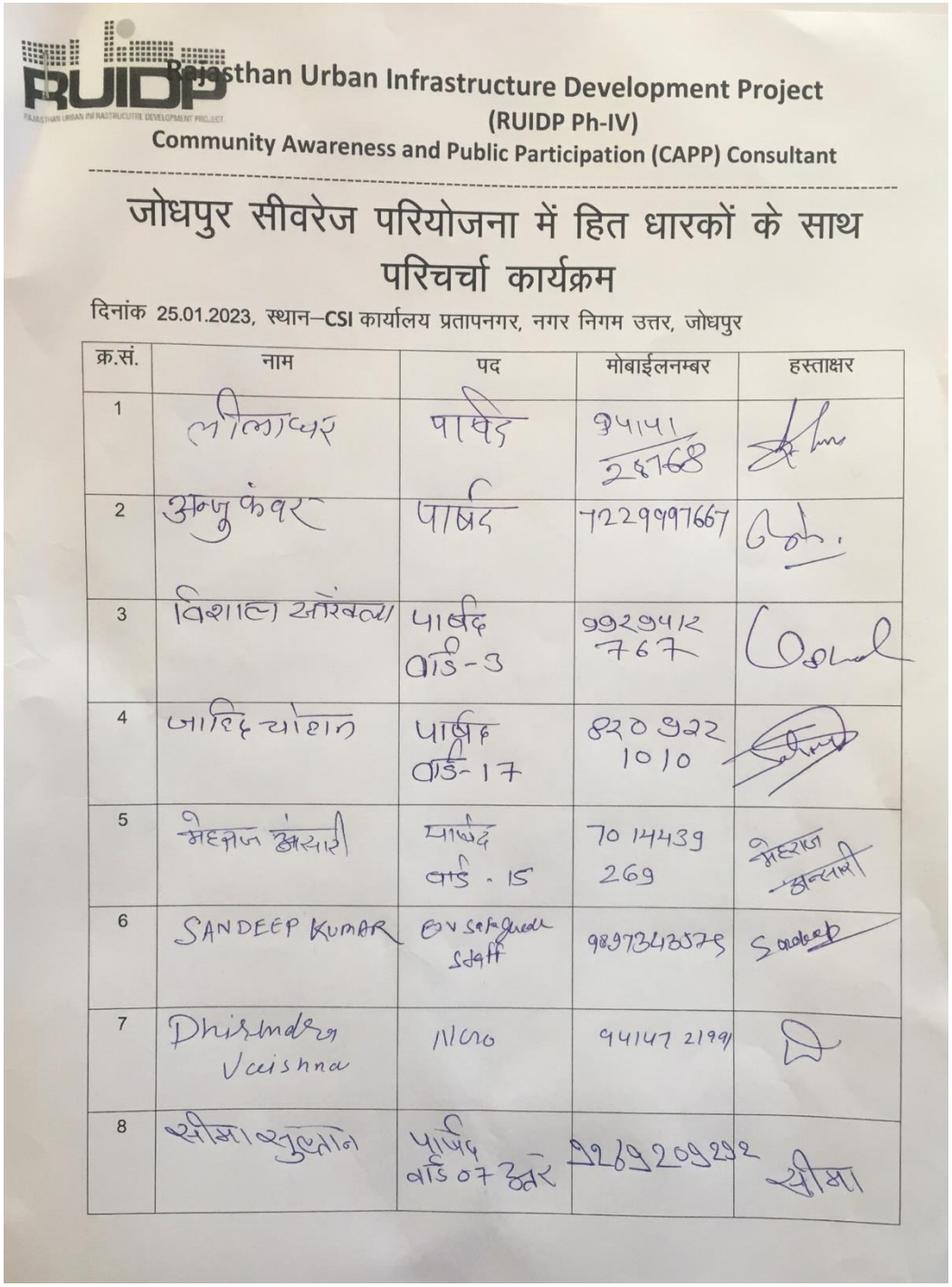
Meeting was ended with a note of thanks to chair

(Nemichand Gehlot)
Executive Engineer
RUIDP, PIU-Jodhpur

A. Photos of Stakeholder Consultation


राजस्थान ग्रामीण आजीविका विकास परियोजना
जोधपुर सीवरेज परियोजना में
हितधारकों के साथ परिचर्चा

B. Attendance Sheet of Stakeholder Consultation



Rajasthan Urban Infrastructure Development Project
(RUIDP Ph-IV)
Community Awareness and Public Participation (CAPP) Consultant

जोधपुर सीवरेज परियोजना में हित धारकों के साथ परिचर्चा कार्यक्रम

दिनांक 25.01.2023, स्थान–CSI कार्यालय प्रतापनगर, नगर निगम उत्तर, जोधपुर

क्र.सं.	नाम	पद	मोबाईलनम्बर	हस्ताक्षर
1	लीलाधर	पार्षद	94141 28768	
2	अन्जु कंवर	पार्षद	7229997667	
3	विशाल ओरबत्या	पार्षद वार्ड-3	9929412 767	
4	जाहिद चौहान	पार्षद वार्ड-17	820922 1010	
5	मेहराज अंसारी	पार्षद वार्ड. 15	70 14439 269	मेहराज अन्सारी
6	SANDEEP KUMAR	BV Safaiwala Staff	9897343579	Sandeep
7	Dhirendra Vaishna	NGO	94147 21991	
8	सीमा सुल्तान	पार्षद वार्ड 07 उत्तर	9269209292	सीमा

Rajasthan Urban Infrastructure Development Project
(RUIDP Ph-IV)
Community Awareness and Public Participation (CAPP) Consultant

9	[illegible]	पार्षद पुरोहितों वार्ड 07 उत्तर	9782288787	[illegible]
10	अजय जोशी	पार्षद वार्ड - 11 उत्तर	9314711418	[illegible]
11	प्रदीप पंवार	पार्षद वार्ड- 10 (उत्तर)	9209479555	[illegible]
12	भैरोंचन्द्र गहलोत	अधि० अभि० आर० यू० आई० स्कीम जोधपुर	9413145233	[illegible]
13	मनोज शर्मा	CMEI CAPP	8094002757	Manoj
14	Govind Singh Rathore	Consultant ADB	9560967524	[illegible]
15	[illegible]	पार्षद पुरोहितों	7727863780	[illegible]
16	Dinesh parmar	Support Engineer	8005922688	[illegible]
17	Saurabh Panday	CMIE - II	98263 99058	[illegible]
18	RAJEEV SHARMA	Gandak Social Safeguard Expt CMSC-II	93101 03101	[illegible]

Rajasthan Urban Infrastructure Development Project
(RUIDP Ph-IV)
Community Awareness and Public Participation (CAPP) Consultant

19	Dr. Maharveer P. Saini	Env. Safeguard Professional CMSC-II Jodhpur	9509455746	

B. Stakeholders Consultations in CLC:

City level Stakeholder Committee (CLC) Meeting (dtd. 24.11.2021)- A town-level City Level Committee (CLC) has been formed in Jodhpur district by Government orders. City Level Committee meeting was organized during the detailed design stage to which representatives of primary and secondary stakeholders were invited. City Level Stakeholder committee meeting was organized for Jodhpur in District Head Quarter, Jodhpur on dtd. 24.11.2021 to discuss the matter of proposed Sewerage and Drainage works in Jodhpur under the chairmanship of District Collector, Jodhpur, in presence of Hon. Chief Minister of Rajasthan, Members of Legislative Assembly in Jodhpur, DPR consultants, RUDSICO-EAP officials, PHED officials, Municipal Corporation, Jodhpur-North and South officials, Jodhpur Development Authority officials, Water Resource Department, PWD and other invitee members. Proposed scope of works and technology of proposed sewerage and drainage works in Jodhpur was discussed in the meeting and approval was given for proposed works by Committee in this meeting. The project was agreed by the committee for further course of action by RUDSICO-EAP. Details of CLC meeting, minutes and photographs are given below-

Minutes of CLC meeting with Outcomes

Office of District Collector, Jodhpur

No.RUIDP/Phase IV/Jodhpur/2021/567 Date 24.11.2021

Minutes of City Level Committee Meeting- Jodhpur

A City Level Committee meeting held on 24.11.2021 under the chairmanship of District Collector, Jodhpur for finalization of works of Sewerage and Drainage in Jodhpur city under RUIDP Phase-IV (Tranche-II).

List of Public Representative, Officials, & other stake holders attended the meeting, is enclosed at **Annexure 'A'**.

It was initially briefed that RUIDP will take up sewerage and drainage works in Jodhpur city under Phase-IV, Trenche-II with ADB funding.

Proposed scope of works and other provisions considered in sewerage & Drainage works in Jodhpur City were appraised to the committee members and other stakeholders through Power Point Presentation with tentative cost of project. Salient features of proposed work in Jodhpur city are as under:-

1. **Sewerage Works**

   In the proposed sewerage works, the provisions considered for the rehabilitation of old and damaged sewerline by CIPP technology, increasing the capacity of old laid sewerline by pipe bursting technology, CC/ BT road restoration (full width road restoration in CC roads - upto 4m & in BT road upto 7m) depending upon the site conditions. House sewer connections, sewer laying through trencheless technology to avoid inconvinence to public (where the depth of sewer is gerater than 3.5 m), Installation of sensors in sewer manholes at strategic locations for real time information of overflow / chocking at control room are also proposed.

   Brief description of proposed works are as under:-

   - Total sewerline proposed in Jodhpur City is approx. 478.30 Kms. The area wise detail is as below:-
   - Jodhpur Nagar Nigam (North) - 150.10 Kms
   - Jodhpur Nagar Nigam (South) - 171.60 Kms
   - Jodhpur Development Authority - 156.60 Kms
   - Out of 478.30 Kms, 156.30 Kms are for Augmentation, rehabilitation and Up-gradation of existing sewerage lines works and 322 Kms is proposed as new sewerline works.
   - Construction of new 10 MLD Sewage Treatment Plant at Khokhariya on SBR technology.
   - Provisions of approx. 51,630 house sewer connections.
   - Estimated total cost of proposed works under sewerage is 452.21 Cr.

2. **Drainage Works**

   Two major drains of Jodhpur town viz. Bhairav Nallah and Mata Ka than Nallah is proposed to extend up to Jojhari River to sort out the problem of storm water accumulation within the city.

   Brief description of proposed works are as under:-

a. **Extension of strom water drainage system of Bhairav Nallah (from Sobhawaton ki Dhani to Jojhari River):-**

i. It is proposed to construct the drainage system by covering the area starting from Shobhawato ki dhani to Pal Village, Tanawara, and Ghinnado ki Dhani & Salawas road till Johari River.
ii. Length of proposed drain is 13.10 kms. out of which drainage cover will be provided on around 7.50 kms while the remaining length will be covered as the open drainage works.
iii. Estimated cost of this work is Rs. 141.00 Cr.

b. Extension of strom water drainage from Mata ka Than to Jojhari River:-

i. It is proposed to construct the drainage system by covering the area starting from extension of Mata Ka Than upto Saran Nagar Flyover, Extension of existing Krishi Mandi nallah upto Saran Nagar Flyover and extension of RTO Nallah from Saran Nagar Flyover to Jojhari River.
ii. Length of proposed drains under this work is 8.0 kms.
iii. Estimated cost of this works is Rs. 66.16 Cr.

3. Rising ground water problem in jodhpur city- finding sustainable solution

To find out the sustainable solution of the rising ground water table problem, following proposal has been considered:

i. Provision for developing pattern to use Surface and Ground Water sources as one integrated resource including IEC activities etc.
ii. Provision for Water Balance Study
   a) For PHED to meet ancillary requirements e.g. additional flow meters etc. against work already planned/sanctioned for monitoring at Kaylana and Takhatsagar Impounding reservoirs.
   b) For accounting roll of rainfall by calculations of recharge/draft of ground water: Flow measurement in seven major drains of the city at minimum 14 spots in rainy season months.
iii. Provision for
   a) Increasing Ground Water Abstraction (adding 35 new sources in affected area.
   b) Providing new 65 piezo-meters with SCADA compatibility etc.
iv. Provision for mapping/ satellite imaginary work etc to be conducted by RRSC/ISRO, Jodhpur
v. Provision for capacity building of GWD in regard installation and operation of Telemetric Digital water level recorder (TDWLR), preparation of supporting digital maps etc.
vi. Provision for "Ground water Contouring and Aquifer Modeling" alongwith exploring the possibility of Tracer Study/ Isotope Study and Curtain Grouting including its execution requirement complete including drilling of required bore holes.

Tentative cost for this proposal is 27.30 Crs.

District Collector, Jodhpur focussed on maintaitng the quality standards and timely completion of works, going to be executed under RUIDP.

District Collector, Jodhpur raised the concern for the quality parameter of the

treated sewage from existing STP's to be maintained as per latest NGT/CPCB and suggested to take up the work of up-gradation of existing STPs in coming phases, especially Nandari STP.

Looking to the requirement of digitization of existing and GIS mapping of proposed sewerage network and other assests, it was directed to include the same in the project.

Suggestions and directions of the City level committee will be incorporated in the detailed project report. The City Level Committee decided to approve the Detailed Project Reports of Sewerage and Drainage works for which the brief is mentioned as above.

Meeting ended with vote of thanks to the chair.

(Inderjeet Singh)
District Collector and Chairman CLC,
Jodhpur

No. RUIDP/Phase-IV/Jodhpur/2021/ 568-583 Date: 24.11.2021

Copy to the following for information and necessary action please:

1. PA to Hon'ble Chief Minister & Member of Legislative Assembly – Sardarpura (Jodhpur)
2. PA to Hon'ble Member of Parliament -Jodhpur
3. PA to Hon'ble Member of Legislative Assembly – Soorsagar (Jodhpur)
4. PA to Hon'ble Member of Legislative Assembly –Jodhpur
5. PA to Hon'ble Member of Legislative Assembly – Luni (Jodhpur)
6. PA to District Collector and Chairman CLC, Jodhpur.
7. PA to Mayor, Nagar Nigam, Jodhpur-South
8. PA to Mayor, Nagar Nigam, Jodhpur-North
9. Chairman, Jodhpur Development Authority
10. Commissioner, Municipal Corporation, Jodhpur (North/South).
11. Commissioner, Jodhpur Development Authority, Jodhpur
12. PA to Project Director, RUIDP, Jaipur.
13. PA to Dy. Mayor, Nagar Nigam, Jodhpur-South
14. PA to Dy. Mayor, Nagar Nigam, Jodhpur-North
15. Chief Engineer, Nagar Nigam Jodhpur
16. Addl. Project Director, RUIDP, Jaipur.
17. Addl. Chief Engineer, RUIDP, Jaipur.
18. Director Engineering, Jodhpur Development Authority, Jodhpur
19. Addl. Chief Engineer, PHED, Jodhpur
20. Addl. Chief Engineer, PWD, Jodhpur
21. Addl. Chief Engineer, JDVVNL, Jodhpur
22. Addl. Chief Engineer, WRD, Jodhpur
23. Senior Town Planner, Jodhpur
24. M/s Exceltech Consultant, Jaipur.
25. M/s Mars Planning Engineering, Ranchi.
26. M/s Advance Engineering Consultant, GandhiNagar (Gujarat).

24.11.21

Addl. Chief Engineer
RUIDP, Phase-IV, Zone- Jodhpur

Attendance Sheet of CLC Meeting

ATTENDANCE SHEET of City Level Committee (CLC) meeting, Jodhpur

Purpose: - Discussion of broad scope of DPR and identification & finalization of Drainage &sewerage works to be taken up in Jodhpur under RUIDP Phase IV.

Date of Meeting :24th November, 2021at 3:00 PM

Venue : Meeting Hall, Collectorate, Jodhpur

S.No.	Name	Designation and Organization	Signature
1.	Sh. Ashok Gehlot	Hon'ble Chief Minister & Member of Legislative Assembly – Sardarpura (Jodhpur)	
2.	Sh. Gajendra Singh Shekhawat	Hon'ble Union Cabinet Minister, Ministry of Jal- Shakti & Member of Parliament-Jodhpur	
3.	Smt. Manisha Panwar	Hon'ble Member of Legislative Assembly –Jodhpur City	
4.	Smt. Suryakanta Vyas	Hon'ble Member of Legislative Assembly –Soorsagar (Jodhpur)	
5.	Sh. Mahendra Bishnoi	Hon'ble Member of Legislative Assembly –Luni (Jodhpur)	
6.	Sh. Indrajeet Singh	District Collector and Chairman CLC-Jodhpur	
7.	Smt. Kunti Deora Parihar	Mayor, Nagar Nigam, Jodhpur-North	
8.	Ms. Vanita Seth	Mayor, Nagar Nigam, Jodhpur-South	
9.	Sh. Abdul Karim	Dy. Mayor, Nagar Nigam, Jodhpur-North	
10.	Sh. Kishan Laddha	Dy. Mayor, Nagar Nigam, Jodhpur-South	
11.	Sh. Qummer Choudhary	Commissioner, Jodhpur Development Authority, Jodhpur	
12.	Sh. Rajendra Singh Kaviya	Commissioner, Municipal Corporation, Jodhpur-North	
13.	Sh. Arun Purohit	Commissioner, Municipal Corporation, Jodhpur-South	

14.	Sh. D. K. Meena	Chief Engineer, Nagar Nigam, Jodhpur	
15.	Sh. Arun Vyas	Chief Engineer, RUIDP, Jaipur	
16.	Sh. L.R. Vishnoi	Director Engineering, Jodhpur Development Authority	
17.		Addl. Chief Engineer, PWD, Jodhpur	
18.	M. S. Charan	Addl. Chief Engineer, JDVVNL, Jodhpur	
19.	Narayanlal Kumhar	Addl. Chief Engineer, WRD, Jodhpur SE WRD Jodhpur	
20.	VINOD BHARTI	Addl. Chief Engineer, PHED, Jodhpur	
21.	Virendra Ajmera	Addl. Chief Engineer, RUIDP, Zone-Jodhpur	
22.	Yogesh Kr.	(DTP) Senior Town Planner, Jodhpur	
23.	Sampat Meghwal	ACE NNJ(S)	
24.	Sh. P. S. Tanwar	SE, Nagar Nigam Jodhpur North	
25.	Mookesh Bhati	AEE, PWD, Jodhpur	mookesh
26.	Yogesh Kr.		
27.	Rekha Chaudhary	TA to XEn., WR Div. Jodhpur	
28.	RAGHVENDRA SINGH	DPR CONSULTANT (SEWER) EXECTECH CONSULTANCY	
29.	Satish Chillar	DPR Consultant from JODA	
30.	Shubham Shah	MARS Ranchi	
31.	Ravi Suthar	SDS, PMCBC, RUIDP PM-4	
32.			
33.			
34.			
35.			

Photographs of CLC Meeting

Appendix 4: Photographs of Proposed Component Locations
Bhairav Nagar Nala

Gair Mumkin Rasta encraoched at Ashapurna Enclave Colony under subproject Chainage 1.720 - 1.850. Proposed alignment will pass through Playground of Ashapurna Enclave Colony

Gair Mumkin Rasta encraoched at Ashapurna Enclave Colony under subproject Chainage 1.850 – 2.200. Proposed alignment will pass through along with boundary wall and inside agricultural field

Gair Mumkin Rasta encraoched at out side Ashapurna Enclave Colony and will pass along the structure. But no impact is anticipated on structure.

2.340 to 2.610, After crossing the NHAI Bypass to Central Academy Road. Agricultural field behind the bushes.

Dirt Road under village Dhinano ki Dhani and Tanawada under Chainage 3.730- 6.350.


6.850 to 7.050, Gair Mumkin Rasta Encroached by local Farmer to joining at Salawas road, near ISKCON temple

2.6100 to 2.950, On central Academy road. From this point proposed alignment will be on LHS. Insufficient ROW is reported, refer to photo. Structures are seen on the edge of the paved road


7.050 to Jujari river, Under this chainage, proposed alignment will be on RHS of existing road “Salawas road”. Sufficient ROW is reported. Few vendors are seen doing commercial activities on earthen shoulder of the road on RHS at Tangwara Phata (Chainage 7.300), Hanuman Nagar (7.700), near Petrol pump (9.200) and chainage 12.000.

Saran Nagar Nala


Subproject Chainage 0.000


Subproject Chainage 0.000 to 1.300


Subproject Chainage 1.100 Boundary wall of railway colony on the edge of the road


One CPR (small religious platform) likely to be affected at Chaianage 1.000

CPR (small religious platform) likely to be affected at Dhapi Marbles

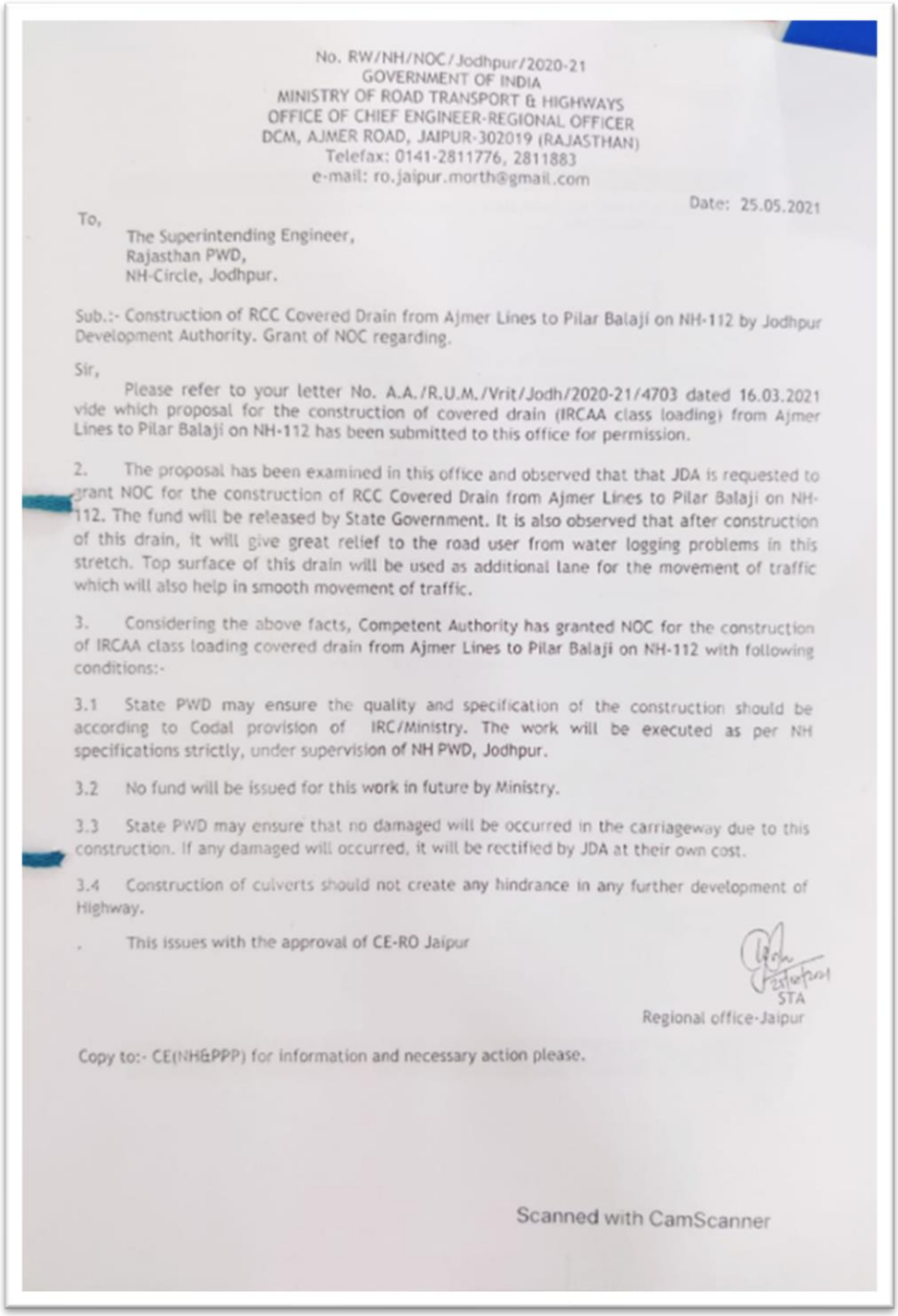
From this location at subproject chainage 4.800 cross NH 112 from LHS to RHS

Proposed Alignment Way to Jojari river

Proposed Alignment Way to Jojari river at Mahadev Nagar, a underdeveloped colony

View of Jojari river

Appendix 5: No Objection Certificate Issued by NHAI to construct Drains in Jodhpur



No. RW/NH/NOC/Jodhpur/2020-21
GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
OFFICE OF CHIEF ENGINEER-REGIONAL OFFICER
DCM, AJMER ROAD, JAIPUR-302019 (RAJASTHAN)
Telefax: 0141-2811776, 2811883
e-mail: ro.jaipur.morth@gmail.com

Date: 25.05.2021

To,

The Superintending Engineer,
Rajasthan PWD,
NH-Circle, Jodhpur.

Sub.:- Construction of RCC Covered Drain from Ajmer Lines to Pilar Balaji on NH-112 by Jodhpur Development Authority. Grant of NOC regarding.

Sir,

Please refer to your letter No. A.A./R.U.M./Vrit/Jodh/2020-21/4703 dated 16.03.2021 vide which proposal for the construction of covered drain (IRCAA class loading) from Ajmer Lines to Pilar Balaji on NH-112 has been submitted to this office for permission.

2. The proposal has been examined in this office and observed that that JDA is requested to grant NOC for the construction of RCC Covered Drain from Ajmer Lines to Pilar Balaji on NH-112. The fund will be released by State Government. It is also observed that after construction of this drain, it will give great relief to the road user from water logging problems in this stretch. Top surface of this drain will be used as additional lane for the movement of traffic which will also help in smooth movement of traffic.

3. Considering the above facts, Competent Authority has granted NOC for the construction of IRCAA class loading covered drain from Ajmer Lines to Pilar Balaji on NH-112 with following conditions:-

3.1 State PWD may ensure the quality and specification of the construction should be according to Codal provision of IRC/Ministry. The work will be executed as per NH specifications strictly, under supervision of NH PWD, Jodhpur.

3.2 No fund will be issued for this work in future by Ministry.

3.3 State PWD may ensure that no damaged will be occurred in the carriageway due to this construction. If any damaged will occurred, it will be rectified by JDA at their own cost.

3.4 Construction of culverts should not create any hindrance in any further development of Highway.

. This issues with the approval of CE-RO Jaipur

STA
Regional office-Jaipur

Copy to:- CE(NH&PPP) for information and necessary action please.

Scanned with CamScanner

Appendix 6: Integrated Biodiversity Assessment Report (IBAT analysis) for Jodhpur

IBAT

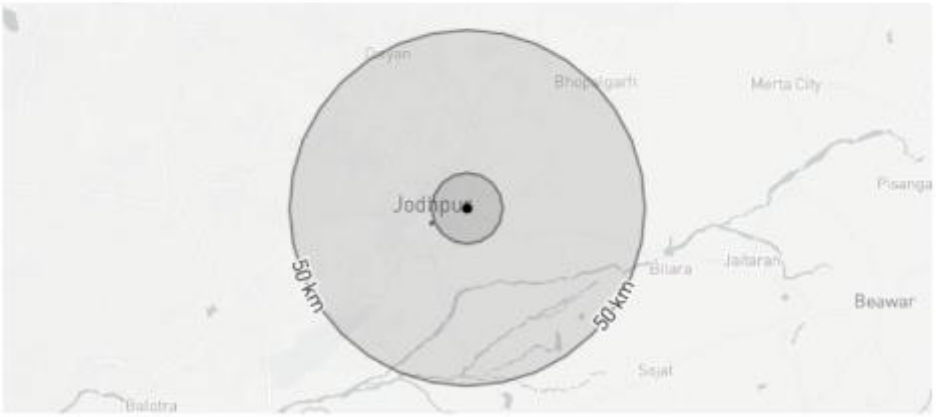
Integrated Biodiversity Assessment Tool
World Bank Group Biodiversity Risk Screen

JODHPUR SEWERAGE SUBPROJECT_STP

- **Country:** India
- **Location:** [26.3, 73.1]
- **IUCN Red List Biomes:** Terrestrial, Freshwater
- **Created by:** Noime Walican

Overlaps with:

Protected Areas	1 km: 0	10 km: 0	50 km: 0	0
World Heritage (WH)	1 km: 0	10 km: 0	50 km: 0	0
Key Biodiversity Areas	1 km: 0	10 km: 0	50 km: 1	1
Alliance for Zero Extinction (AZE)	1 km: 0	10 km: 0	50 km: 0	0
IUCN Red List				15
Critical Habitat				Unclassified



Displaying project location and buffers: 1 km, 10 km, 50 km

WORLD BANK GROUP

This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)

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About this report

The recommendations stated alongside any Protected Areas and Key Biodiversity Areas identified in this report are determined by the following:

Protected Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies a designation that includes either 'natural' or 'mixed world heritage site'.
- 'Assess for Critical Habitat' is stated if the report identifies a Strict Nature Reserve, Wilderness Area or National Park as coded by IUCN protected area categories Ia, Ib and II.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of protected area.

Key Biodiversity Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies an Alliance for Zero Extinction site.
- 'Assess for Critical Habitat' is stated if the report identifies Critically Endangered or Endangered species OR species with restricted ranges OR congregatory species as coded in the IUCN Red List of Threatened Species.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of Key Biodiversity Area.

IBAT provides initial screening for Critical Habitat values. Performance Standard 6 (PS6) defines these values for Critical Habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, Critical Habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see https://www.ifc.org/ps6 for full details on PS6 and GN6.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts
- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of Critical Habitat
- Assess the need for engaging a biodiversity specialist
- Identify additional conservation experts or organizations to inform further assessment or planning

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment as described in PS6 and GN6. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the Sensitive Data Access Restrictions Policy for the IUCN Red List. This relates to sensitive Threatened species and KBAs triggered by sensitive species.

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Priority Species

Habitat of significant importance to priority species will trigger Critical Habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within the 50km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming knownor likely occurrence of these species within the project area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the project be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 50km of the area of interest.
For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Ardeotis nigriceps	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial
Vanellus gregarius	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Varanus flavescens	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Nilssonia gangetica	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Oxyura leucocephala	White-headed Duck	AVES	EN	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
Falco cherrug	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
Leptoptilos dubius	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
Tecomella undulata	Desert Teak	MAGNOLIOPSIDA	EN	Decreasing	Terrestrial

Restricted Range Species

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Macrobrachium rosenbergii	Giant River Prawn	MALACOSTRACA	LC OR LR/LC	Unknown	Freshwater

IBAT

Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

There are no protected areas to show for this report.

Key Biodiversity Areas

The following key biodiversity areas are found within 1 km and 10 km and 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	IBA	AZE	Recommendation
Sardar Samand Lake	50 km	Yes	No	Assess for critical habitat

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
AVES	263	22	6	5	11	15	226	0
MAMMALIA	56	4	0	1	3	2	50	0
REPTILIA	48	6	0	2	4	2	39	1
MAGNOLIOPSIDA	36	1	0	1	0	0	34	1
LILIOPSIDA	48	1	0	0	1	0	45	2
AGARICOMYCETES	2	0	0	0	0	1	1	0
AMPHIBIA	8	0	0	0	0	0	8	0
INSECTA	39	0	0	0	0	0	38	1

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
GASTROPODA	17	0	0	0	0	0	17	0
ACTINOPTERYGII	31	2	0	0	2	1	28	0
POLYPODIOPSIDA	2	0	0	0	0	0	2	0
BIVALVIA	6	0	0	0	0	0	6	0
MALACOSTRACA	2	0	0	0	0	0	2	0

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Recommended citation

IBAT PS6 & ESS6 Report. Generated under licence 6274-25849 from the Integrated Biodiversity Assessment Tool on 11 January 2022 (GMT). www.ibat-alliance.org

Recommended Experts and Organizations

For projects located in Critical Habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or Critical Habitat (GN6: GN23). Where Critical Habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

Birdlife Partners

URL: https://www.birdlife.org/worldwide/partnership/birdlife-partners

Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: https://www.iucn.org/commissions/ssc-groups

IBAT analysis report for Jodhpur

IBAT

Integrated Biodiversity Assessment Tool

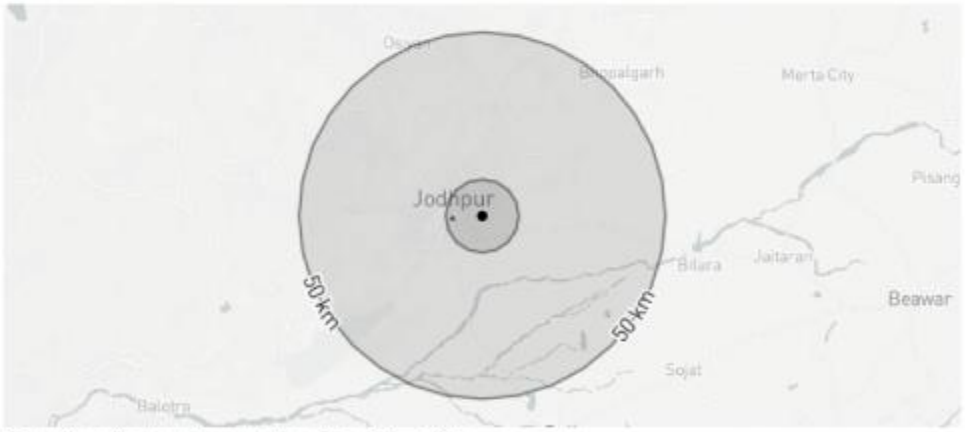
World Bank Group Biodiversity Risk Screen

JODHPUR SPS SITE

- **Country:** India
- **Location:** [26.3, 73.1]
- **IUCN Red List Biomes:** Freshwater, Terrestrial
- **Created by:** Noime Walican

Overlaps with:

Protected Areas	1 km: 0	10 km: 0	50 km: 0	0
World Heritage (WH)	1 km: 0	10 km: 0	50 km: 0	0
Key Biodiversity Areas	1 km: 0	10 km: 0	50 km: 2	2
Alliance for Zero Extinction (AZE)	1 km: 0	10 km: 0	50 km: 0	0
IUCN Red List				15
Critical Habitat				Unclassified



Displaying project location and buffers: 1 km, 10 km, 50 km

WORLD BANK GROUP

This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)

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About this report

The recommendations stated alongside any Protected Areas and Key Biodiversity Areas identified in this report are determined by the following:

Protected Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies a designation that includes either 'natural' or 'mixed world heritage site'.
- 'Assess for Critical Habitat' is stated if the report identifies a Strict Nature Reserve, Wilderness Area or National Park as coded by IUCN protected area categories Ia, Ib and II.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of protected area.

Key Biodiversity Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies an Alliance for Zero Extinction site.
- 'Assess for Critical Habitat' is stated if the report identifies Critically Endangered or Endangered species OR species with restricted ranges OR congregatory species as coded in the IUCN Red List of Threatened Species.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of Key Biodiversity Area.

IBAT provides initial screening for Critical Habitat values. Performance Standard 6 (PS6) defines these values for Critical Habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, Critical Habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see https://www.ifc.org/ps6 for full details on PS6 and GN6.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts
- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of Critical Habitat
- Assess the need for engaging a biodiversity specialist
- Identify additional conservation experts or organizations to inform further assessment or planning

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment as described in PS6 and GN6. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the Sensitive Data Access Restrictions Policy for the IUCN Red List. This relates to sensitive Threatened species and KBAs triggered by sensitive species.

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Priority Species

Habitat of significant importance to priority species will trigger Critical Habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within the 50km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming knownor likely occurrence of these species within the project area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the project be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 50km of the area of interest.
For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Nilssonia gangetica	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Oxyura leucocephala	White-headed Duck	AVES	EN	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
Falco cherrug	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
Leptoptilos dubius	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
Ardeotis nigriceps	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial
Vanellus gregarius	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Varanus flavescens	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
Tecomella undulata	Desert Teak	MAGNOLIOPSIDA	EN	Decreasing	Terrestrial

Restricted Range Species

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Macrobrachium rosenbergii	Giant River Prawn	MALACOSTRACA	LC OR LR/LC	Unknown	Freshwater

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Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

There are no protected areas to show for this report.

Key Biodiversity Areas

The following key biodiversity areas are found within 1 km and 10 km and 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	IBA	AZE	Recommendation
Kharda Dam	50 km	Yes	No	Assess for critical habitat
Sardar Samand Lake	50 km	Yes	No	Assess for critical habitat

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
REPTILIA	48	6	0	2	4	2	39	1
AVES	263	22	6	5	11	15	226	0
MAMMALIA	56	4	0	1	3	2	50	0
ACTINOPTERYGII	31	2	0	0	2	1	28	0
AMPHIBIA	8	0	0	0	0	0	8	0
INSECTA	39	0	0	0	0	0	38	1
GASTROPODA	17	0	0	0	0	0	17	0

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
POLYPODIOPSIDA	2	0	0	0	0	0	2	0
MAGNOLIOPSIDA	36	1	0	1	0	0	34	1
LILIOPSIDA	48	1	0	0	1	0	45	2
BIVALVIA	6	0	0	0	0	0	6	0
MALACOSTRACA	2	0	0	0	0	0	2	0
AGARICOMYCETES	2	0	0	0	0	1	1	0

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Recommended citation

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Recommended Experts and Organizations

For projects located in Critical Habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or Critical Habitat (GN6: GN23). Where Critical Habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

Birdlife Partners

URL: https://www.birdlife.org/worldwide/partnership/birdlife-partners

Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: https://www.iucn.org/commissions/ssc-groups

Common Appendices C1 – C24 attached separately

Appendix C-1: Drinking Water Standards
Appendix C-2: Ambient Air Quality Standards
Appendix C - 3: Emission limits for New DG sets up to 800 KW
Appendix C- 4: Stack Height Requirement of DG set
Appendix C-5: Vehicle Exhaust Emission Norms
Appendix C-6: Ambient Noise Quality Standards
Appendix C-7: Noise Limits for DG Set
Appendix C-8: Effluent Discharge Standards for Sewage Treatment Plant
Appendix C-9: Pages from Rajasthan State Sewerage and Waste Water Policy for reuse of treated effluent and sludge
Appendix C-10: Guidelines for Reuse of Treated Effluent and Sludge from STP for Beneficial Purposes
Appendix C-11: Guidelines for compensatory tree plantation in RUIDP works
Appendix C-12: Salient Features of Laws applicable to Construction Works including Labor Laws
Appendix C-13: Sample Outline Spoil Management Plan
Appendix C-14: Sample Outline Traffic Management Plan
Appendix C- 15: Sample Six Monthly Reporting Format
Appendix C-16: Sample Environmental Site Inspection Report
Appendix C-17: Sample Grievance Registration Form
Appendix C-18: Management Plan for Night works at Project Sites
Appendix C-19: Guidelines for Safety during Monsoon/Heavy rainfall
Appendix C-20: Sample ACM Management Plan
Appendix C-21: Guidelines for Workers Camps
Appendix C-22: Guidelines for Safety in Chlorine Usage
Appendix C-23: Guidelines for Prevention and Control of COVID-19
Appendix C-24: RUDSICO-EAP Guidelines for implementation of Prevention and Control Measures for COVID-19