Initial Environmental Examination

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

Nawalgarh Storm Water Drainage

Prepared by Rajasthan Urban Infrastructure Development Project, Government of Rajasthan for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 27 July 2022)

Currency unit – Indian rupee (₹)
₹1.00 = $ 0.01
$1.00 = ₹ 79.87

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 Organisation

WEIGHTS AND MEASURES

m^3	–	cubic meter
dB	–	decibels
^oC	–	degree centigrade
dia	–	diameter
kg	–	kilogram
kl	–	kilolitre
km	–	kilometer
kmph	–	kilometer per hour
KLD	–	kilolitres per day
ha	–	hectare
HP	–	horsepower
LPCD	–	litters per capita per day
lps	–	litters per second
m	–	meter
mg	–	milligram
mm	–	millimetre
MCM	–	million cubic meters
MLD	–	million liters per day
km^2	–	square kilometer

NOTE

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

CONTENTS

APPENDICES

Appendix C1 – C26 – common appendices, attached separately, provide statutory standards, guidelines, reporting templates etc. are applicable to all subproject IEEs.

List of common Appendices

Appendix C-24: RUDSICO-EAP Guidelines for implementation of Prevention and Control Measures for COVID-19
Appendix C-25: Management of Work Plan during Festivals and Melas
Appendix C-26: Sample Chance by find protocol

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.

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

Drainage components: (i) one storm water pumping station (18.68 mld) near Fire Brigade office; (ii) 3 storm water collection chambers (11.77 mld, 20.09 mld and 9.10 mld) at Swamiyon ka Jav, Bakra Mandi and Bhakton Ka Johad; (iii) one collection pond at Derena Johad; (iv) rising main of 1.75 km of diameter 600 mm; (v) gravity main of 3.4 km of diameter 500-600 mm; (vi) road restoration.

Screening and Categorization assessment of potential impacts. Nawalgarh 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. Per Government of India environmental impact assessment (EIA) Notification, 2006, subproject do not require environmental clearance.

Description of the Environment: Subproject components are located in Nawalgarh Town 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 sites. The project sites are located in existing road right of way (RoW) and government-owned lands. The storm water collection networks will traverse through roads within ROW. Therefore, no impacts shall be envisaged regarding location. No tree cutting will be required as per preliminary design, however, if any tree felling is required measures like compensatory plantation in the ration of 1: 3 and transplantation of trees with girth less than 50 cm will be implemented. Nawalgarh is a heritage town and is famous for its fresco and havelis and considered as Golden City of Rajasthan. Nawalgarh town has no state protected monuments or ASI protected monuments. Some of the famous structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, Roop Niwas Palace etc. The proposed alignment of the rising main and gravity main pipelines are at considerable distance from such structures. No subproject activity will be conducted within the immediate vicinity of the heritage structures. Further, in general the project has in place measures to ensure impact to common property resources (CPRs) are avoided. There are no protected areas, forest blocks, wetlands, mangroves, or estuaries in or near the

project locations. Screening of project area based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected area within 50 km of Nawalgarh town (Appendix 7). However, there are five conservation reserves declared by State forest department within the 50 km radius of project area (i) Shakambari Conservation Reserve, which is about 24 km of Nawalgarh city, (ii) Beed Jhunjhunu Conservation Reserve, which is about 42 km (iii) Bansiyal Kethadi Conservation Reserve, which is about 44 km (iv) Bansiyal - Khetri Bagore Conservation Reserve which is about 42 km, and (v) Mansa Mata Conservation Reserve which is about 40.2 km from Nawalgarh City (Project area).

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. Temporary measures suggested to avoid any disturbance / damage to buildings during construction of drainage system in nearby roads. Potential impacts were identified in relation to location, design, construction and operation of the improved infrastructure. During the construction phase, impacts mainly arise from the need to dispose of waste soil and disturbance of residents and traffic. 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 for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; etc to be developed and implemented during construction phase. The project sites are located in existing road right of way (RoW) and government-owned lands. The pipeline networks will traverse through roads within RoW. Therefore, no impacts shall be envisaged regarding location. Access to the residences will be ensured during construction. The project will adopt measures that include traffic management during drainage work, advance information to residents prior to start of work, ensuring access to residences and pedestrians through planks. These are common temporary impacts of construction in urban areas, and there are well developed methods for their mitigation. Mitigation measures have been developed to reduce all negative impacts to acceptable levels.

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. Except for drainage system construction, all other 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. Drainage 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 (ii) proper planning and scheduling of drainage construction 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 always kept on-site during the construction period. 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 8 places along with proposed alignment with about 28 persons in month of December 2021. 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 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 Nawalgarh will be the major beneficiaries. The subproject is primarily designed to improve environmental quality and living conditions of Ratangarh Town through provision of improvement of drainage system. The benefits arising from this subproject include: (i) Improved drainage system will result in the better environmental conditions of city, (ii) improved public health particularly reduction in vector borne and infectious diseases, (iii) 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). This IEE needs to be updated during the detailed design, reviewed and approved by ADB, and disclosed prior to start of construction.

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. **Nawalgarh drainage subproject**. This is one of the subprojects proposed under RSTDSP-AF. It will improve the drainage system 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 is proposed for implementation under the small works modality. The IEE is based mainly on field reconnaissance surveys and secondary sources of information. No field monitoring (environmental) survey was conducted; however, the environmental monitoring program developed as part of the environmental management plan (EMP) will require the contractors to establish the baseline environmental conditions prior to commencement of civil works. Stakeholder consultation was an integral part of the IEE. This IEE will be updated during the pre-construction phase to reflect any 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:

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

II. DESCRIPTION OF PROJECT

A. Nawalgarh Town

8. **Location, Area and Connectivity*:*** Nawalgarh Town: Nawalgarh is a Municipal town in Jhunjhunu district of Rajasthan state. Jhunjhunu district is on northwestern side of Rajasthan. This town was considered as Nagar Palika on 1st January 1945. It situated on Jaipur - Jhunjhunu and Sikar Loharu route. The city is situated between 26°38'59"N Latitude and 74°1'48"E Longitude. It is located 200 km away from Jaipur, 40 Km from Sikar and 250 Km from Delhi. This city is well connected with road & rail transportation. The average elevation of the town is 408 m (1339 ft) above MSL.

9. The geographical area of the city is about 15.24 Sq. Km The climate of Nawalgarh is hot and dry. The maximum temperature during summer months rises up to 45 °C quiet frequently and during winter months temperature goes downs up to 5 °C. The mean annual rainfall is around 431 mm and takes place between July- Septembers. Winds blow manly in April to September from south west & from October to March from North East in summers humidity is lowest i.e. 20-25%.

10. As of 2011 census of India, Nawalgarh had a population of 94487 souls. Males constitute 48745 of the population and females 45742. Nawalgarh has an average literacy rate of 64% which is higher than the state average of 66.11%, Male literacy is 74%, and female literacy is 53%. In Nawalgarh, Sex Ratio in the town is also higher than the state ratio which is 940 against state average of 928. Sex Ratio of child is 926 compared to Rajasthan state average of 888. The major regional languages spoken are Marwari, Hindi, English and Urdu.

11. Nawalgarh is a heritage town and is famous for its fresco and havelis[1] and considered as Golden City of Rajasthan. Nawalgarh town has no state protected monuments or ASI protected monument. Some of the famous structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, etc.

B. Existing Infrastructure Systems of Nawalgarh Town

1. Water Supply

12. As per SECC data, about 77% population had a water source within their premises, and 15% had a water source near their premises. About 800 families had a water source away from their premises. The entire water supply scheme for the town is distributed into 11 zones. The source of water supply is through tube wells. There are ward wise ESRs in town, from where water is distributed. In terms of treatment, only chlorination is done by PHED.

13. Ground water is the only source of water supply in Nawalgarh. There are 25 tube wells located in Nawalgarh, which supply water to the town. In second order come hand pumps, which are 51 in number. Except the above sources there are 15 open wells available in the town, which contribute very minimally. The average depth of water table in Nawalgarh is about 50 m. The supply timing is once a day in the morning.

2. Sewerage System

[1] Haveli is usually multi-storey, organized around two courtyards in India.

14. At present there is no sewerage system in Nawalgarh. There is a huge problem of storm water management in the town. Most private toilets have septic Tank/ deep wells. For storm water management only road side drains are available in some part of the town which serves little purpose as the waste is discharged in open which has led to formation of ponds at 5 locations. More than 75% of the waste water flows upto Bhagton ka Johra while the balance is accounted for by the other locations.

C. Existing Drainage System of Nawalgarh Town

15. Presently the roads in Nawalgarh town are provided with open drains, but most of the drains are silted resulting in overflow and resulting flooding in monsoon. As reported by Nawalgarh Municipal Board, the total length of drains is approximately 16 km. The general elevation of Nawalgarh town is approximately 408 m above Mean Sea Level and the overall topography is from northeast to southwest direction of the city. The general slope of the city is from north to south, which is also the direction of Storm water management project. Nearly, all ephemeral streams flow in this direction. Nawalgarh initially had a natural system of drainage and governed by the physiographic profile. Over the years, the population grew and utilizing the available open space more intensely, which has changed the natural drainage physiographic system.

16. As per discussion with Nawalgarh Municipal Board and as per preliminary survey, following locations namely, Fire Brigade, Bakra Mandi, Swaliyon ka Jav and Bhakton ka Johad are majorly flood affected areas in the town. It is causing considerable inconvenience to general public and economic losses as no business/marketing activity can be carried out in and around these areas during water logging period. This is a recurring problem for which a suitable surface drainage system needs to be developed. Presently, Municipal Board is managing the flooding situations with temporary arrangements by pumping the received runoff from these locations to other low-lying areas at the outskirt of the town. Existing condition of drainage in Nawalgarh and details of water logging areas are given in Table 1. Flood affected areas of the town are marked in Google map in Figure 1.

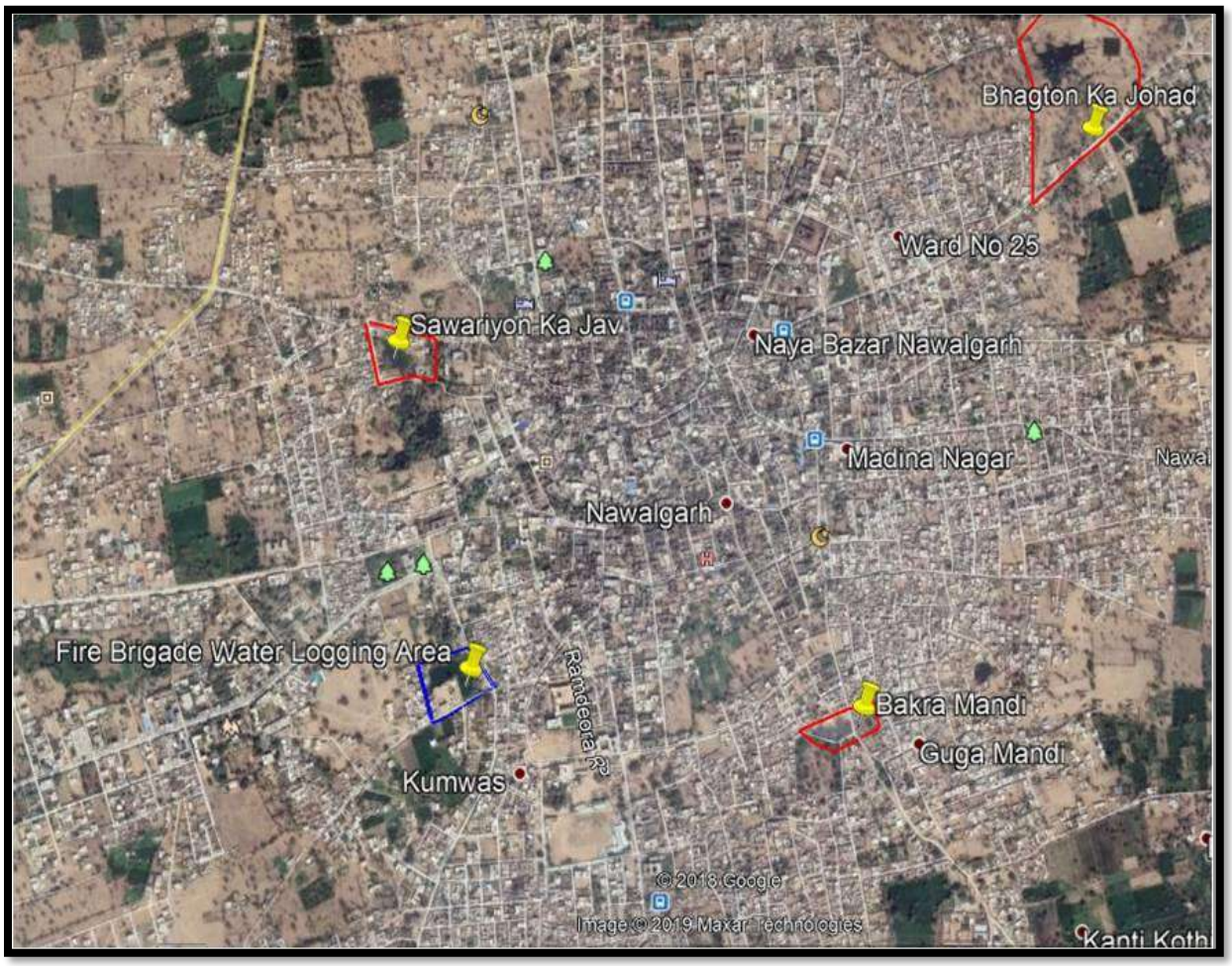
Table 1: Details of water logging areas

Fire brigade water logging area: Water logged in the low-lying area behind fire brigade building and sewage treatment plant (STP) land. Temporary arrangement (pump sets) to pump storm water received at this point to open land at outskirt of municipal areas.	

Bakra mandi water logging area: Water logged in the low-lying area. Temporary arrangement (pump sets) to pump storm water received at this point to open land at outskirt of municipal areas.	 
Bhakton ka johad water logging area: Existing drain filled with storm water/ sewage at lowest points. Temporary arrangement (pump sets) to pump storm water received at this point to open land at outskirt of municipal areas	 
Swaliyon ka jav water logging area: Water logged in the low-lying area at Swaliyon ka jav. A large area flooded during the rainy season.	 

Source: Detailed Project Report-Nawalgarh

Figure 1: Flood affected areas in Nawalgarh town marked on google map



Source: Detailed Project Report-Nawalgarh ,2022

D. Need of the Project

17. There is lack of drainage\outfall system in the project area. To ensure proper disposal of surface runoff in order to avoid inundation of city areas and streets, development of Storm water management system is required. In the identified areas where the inundation is a frequent feature during rains need immediate interventions toward collection of storm water and its efficient disposal to the final discharge location. Flood prone areas are identified and designing, and implementing of flood mitigation strategies is urgently required.

18. Nawalgarh being prominent tourist town of Shekhawati region and attracts many tourists every year and is also known as Gateway to Shekhawati tourism circuit of the state. Therefore, there is great need for taking up allied works along with new storm water management system in Nawalgarh to address the flooding and inundation of residential and market areas to improve the overall drainage infrastructure and to enhance the livability of town, which is also a famous tourist destination.

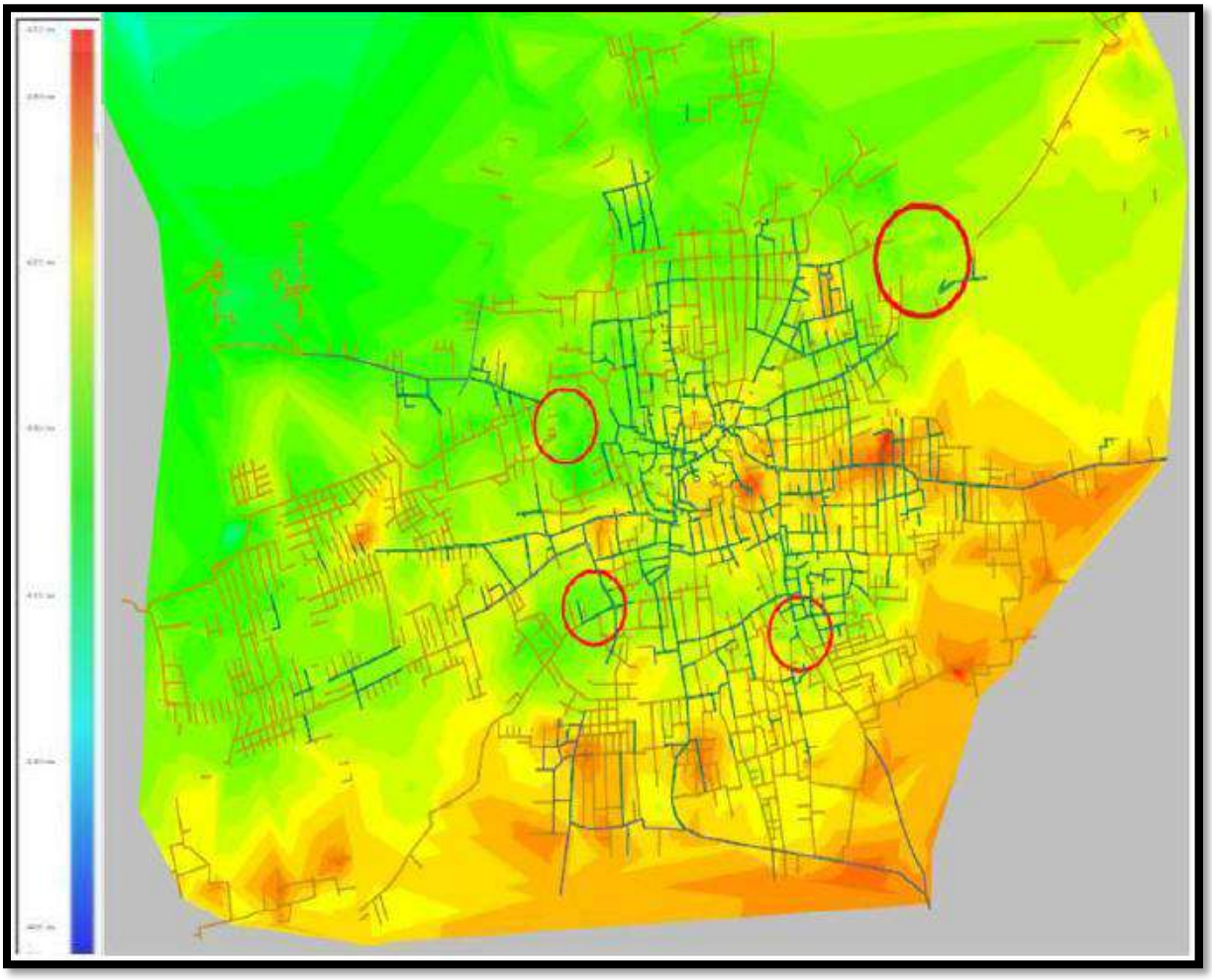
E. Proposed Subproject:

19. Drainage subproject in Nawalgarh town is one of the subprojects proposed under the investment component of RSTDSP-additional financing. The key components are: (i) one storm

water pumping station of 20.09 mld near fire brigade office; (ii) 3 storm water collection chambers of 11.77 mld,18.68 mld and 9.10 mld at Swamiyon ka Jav, Bakra Mandi and Bhakton Ka Johad; (iii) one collection pond at Derena Johad, (iv) rising main-1.75 km of dia 600 mm; (v) gravity main-3.4 km of dia 500-600 mm; (vi) road restoration. Details of works proposed are presented in Table 2 to Table 7.

20. **Planning of Storm water management project Network**. The planning of Storm water management project system has been done firstly by creating the Storm water management zone and Digital Elevation Model (DEM). Digital Elevation Model for the town has been generated based on the actual topographical survey data in 3D Civil Model. Based on the DEM it is evident that the town slopes from South-East to North West with level varying from 400 m to 435 m (Figure 2.). There are several low-lying areas within the city, which gets flooded during the rainy seasons.

Figure 2: Digital Elevation Model of Nawalgarh Town



Source: Detailed Project Report-Nawalgarh ,2022

21. A state Highway No 8 passes from a distance and is the main road connecting. Highway NH-114A and NH-333 passes through centre of the town in East-West direction. Two railway lines also pass through the town. Thus, based on the natural topography and orientation of the receiving water body, whole town has been proposed to divide in four Storm water management zones, with outfall points in low lying areas and are briefed in respective sections. The catchment

outside the municipal boundary and contributing run off in the town has also been considered while arriving at Storm water management zones.

22. Due to insufficient hydraulic capacity shallow ponds have not been considered in storm water management. It has been assumed that runoff will reach the low-lying areas flowing over and along the roads as presently storm water management system is not in place or if exists not in very good condition. The routing of Storm water has been planned broadly along the natural topography of the town to ensure optimum Storm water management.

23. The proposed storm water Storm water management project is a separate system which has been selected based on the following advantages over a combined system. Separate collection prevents the overflow of sewer system and Sewage Treatment Plants during rains

- Separate collection prevents mixing of the relatively little polluted surface run-off with chemical and microbial pollutants from the municipal sewage
- The design of sewers and the pumping station/ treatment plants in a separate system needs to be done considering only the volume of the sewage and therefore is economical
- The storm water run-off collected through a separate system can be recharged into ground and/or disposed into receiving water body

24. **Configuration of drainage zones.** While planning the storm water drainage zones, following aspects were considered and storm water drains were designed for gravity flow. (i) Topography - Ground slope, (ii) Drain Routing - Along the roads, (iii) Optimization of the drain depths and (iv) Availability of natural ponds. Based on the natural topography and orientation of the natural depression/low lying areas, the whole town has been divided into four zones, i.e., Zone-1, Zone-2, Zone-3 and Zone-4

(i) **Zone-1** is located in the Northwest of the town. The catchment is generally naturally inclined towards the lowest point of the zone i.e., Swaliyon ka Jav. Total Catchment of his zone is around 68 Hectare. Main road connecting State highway and Nawalgarh Town forms the Boundary in South. Outfalls have been designed to drain water into the existing pond of Swaliyon ka Jav.

(ii) **Zone-2** is located in the Southeast Direction of the town. The catchment is generally naturally inclined towards the lowest point of the zone i.e., Bakra Mandi. Total Catchment of his zone is around 90Hectare. Though, the inclination of natural topography of buffer zone is towards the zone, however, open land forms a kind of barrier to receive a runoff from Buffer zones.

(iii) **Zone-3** covers geographical area of 48 Hectare and is located in the Northwest of the town. The catchment is generally naturally inclined towards the lowest point of the zone i.e., behind the Fire Brigade. Main road connecting State highway and Nawalgarh Town forms the Boundary in North and habitation extent in south makes the southern boundary. Ridge line forms the boundary in east directions.

(iv) **Zone-4** is located in the Northeast of the town. The catchment is generally naturally inclined towards the lowest point of the zone i.e., Bhakton Ka Johad Water Logging Area. Total Catchment of his zone is around 84 Hectare.

25. Based on the above, discharged to be received at the pumping stations are as follows

Table 2 : Proposed Drainage Zones and run-off

Zone No	Flow in LPS
Zone 1	136.21
Zone 2	232.52
Zone 3	216.23
Zone 4	105.31

Table 3: Proposed Storm Water Pumping Station and Collection Chamber

Zone No.	Components	Location of SWPS and SWCC	Peak Discharge (Q) in MLD
Zone-1	Storm Water Collection-1	Swamiyon Ka Jav	11.77
Zone-2	Storm Water Pumping Station -1	Near Bakra Mandi	20.09
Zone-3	Storm Water Collection-2	Near Fire Brigade office	18.68
Zone-4	Storm Water Collection-3	Bhakton Ka Johad	9.10

SWPS= storm water pumping station; SWCC= storm water collection chamber
Source: Detailed Project Report-Nawalgarh ,2022

26. One drainage pumping station with wet well capacity of 810 Cum of peak runoff has been proposed in the Nawalgarh at Fire brigade to evacuate the flood water of fire brigade and Bakra Mandi area. Three Nos of collection chambers are proposed to evacuate the flood water by gravity main. Pump has been provided with 50% Standby Capacity. Brief details of the pumping station proposed are provided:

Table 4: Proposed Drainage Pumping Station and pumps

SWPS No.	Flow in LPS	Diameter	Depth	Pump Capacity	Pump Inventory
SWPS-1	448.75	15 m	5.0 m	125 & 250	1 W+1 S& 2 W+2 S

Source: Detailed Project Report-Nawalgarh ,2022

Table 5: Proposed Storm Water Pumping Station (SWPS) and Collection Chamber

Zone No.	Location of SWPS/ Collection Chamber	Component	Catchment area (A) in Hectare	Peak Discharge (Q) in cum/sec	Peak Discharge (Q) in MLD	Peak Discharge (Q) in lps
Zone-1	Swamiyon Ka Jav	Collection Chamber-1	68.00	0.14	11.77	136.21
Zone-2	Near Bakra Mandi	Collection Chamber-2	90.0	0.23	20.09	232.52
Zone-3	Near Fire Brigade office	Storm Water Pumping Station	48.0	0.22	18.68	216.23
Zone-4	Bhakton Ka Johad	Collection Chamber-3	84.0	0.11	9.10	105.31

Source: Detailed Project Report-Nawalgarh ,2022

27. Proposed Rising Main Rising main has been designed as per the economic rising main as details are shown in the table below.

Table 6: Details of Rising and Gravity Mains

From	To	Length (m)	Pipe Dia (mm)	Type	Material
Storm Water collection chamber 01 at Swamiyon ka Jav	Bardana Johad	1850.00	500	Gravity Main	NP4
Storm Water collection chamber 02 at Bakra Mandi	Sump at SWPS-1 at Fire Brigade	1300.00	600	Gravity Main	NP4
Storm Water collection chamber at Fire Brigade	Sump at SWPS-1 at Fire Brigade	50.00	500	Gravity Main	NP4
Sump at SWPS-1 at Fire Brigade	Derana Johad	1750.00	600*	Pumping Main	DI
Storm Water collection chamber 03 at near Bhakton Ka Johad	Bhagton ka Johad	200.00	500	Gravity Main	NP4

Source: Detailed Project Report-Nawalgarh ,2022

28. **Disposal locations of storm water.** The Proposed Derana Johad, Existing Bardana johad and Existing Bhakto ka Johad are selected as ultimate receiving body for spare water due to its suitability in terms of approach, surface area and topography.

29. The storm water from SWPS, Fire Brigade will be disposed into the Derena Johad location near Sikar Road outside the Nawalgarh town to be restored as an out fall storage lake. Presently, the Derena Johad is an open land. No treatment is proposed in the pond bed to facilitate percolation and groundwater recharge, slopes are proposed to have stone pitching which again will enable percolation through vertical slopes, In present proposal digging of Derena Johad, Walkway around the lake, stone pitching and fencing are proposed for the lake to utilize this water body for community usages. The pond is proposed to have permanent railings all around to ensure community safety in pond area.

30. Volume of Dedhana Pond has been calculated based on the average rainy days of the last 29 years which is approximately 26 days spread over the 12 months. Maximum Flow coming to Dedhana Johad is 28.77 MLD. The pond will have a total surface area of the proposed Johad as 2.265 ha or 2.2650 Sqm and an average depth of 6 meters the final capacity of the Johad is 135900 m3 or 135.9 million litters. Shape of the ponds has been kept in natural pond shape and will be constructed around 10.0 m away from the road between proposed ponds with stone pitching and embankment is slope of 1:2 (V:H).

31. Since the untreated (open) pond bed and the stone pitched walls will allow percolation and subsequent ground water recharging, therefore the continuous water loss will occur from the pond. Apart from percolation, evaporation losses also occur to the tune of 1.4 m to 3.0 m (annual losses). In view of storage capacity of the pond and evident losses it is unlikely that the flooding will occur due to overfilling of the pond, except it rains more than design rainfall intensity.

32. Excavated earth will be disposed of at disposal points designated by the Local Body and prior permission for the same will be taken prior to disposal of earth.

33. This proposed Johad is being developed in view of creating an additional recreational point in the vicinity of Nawalgarh, apart from other uses of water stored in it. Water will be utilized in various activities, including irrigation, as per Local Body directions.

34. Proposed land is classified in revenue records (khasra no. 479/390) as a Pastureland / land reserved for other general purposes and owned by state government and presently under

the possession of Municipal Board, Nawalgarh. Municipal Board, Nawalgarh has already issued letter to District Collector, Jhunjhunu for allotment of said land for storm water collection pond. The process of conversion i.e. change in land use classification/transfer with the intervention of District Collector will be completed before start of civil work.

35. Existing **Bhakto ka Johad disposal** a low lying area known as Bhakto ka johad has been selected as an out fall pit to dispose the water. This is a natural small pond in low lying area. This is a natural pond in the lowlying area in the eastern side of Nawalgarh. Being at the lowest point in its catchment, this pond received surface water as well as drain water from existing drains. The pond can store the storm water generated in its catchment and the same can be used for various local purposes including irrigation, in its downstream.

36. Existing **Swamiyon ka Jav disposal** at Bardana Johad has been selected as a out fall to dispose the water. This Johad is in the Western proximity of town. This is a low lying area with natural depression. Bardana Johad can store the drained storm water from its catchment and can be utilized during the lean period for various purposes including irrigation and construction water needs.

37. The stored water of above three ponds will improve the groundwater of the area other than percolation and subsequent ground water recharging, the stored water will be utilized in various activities, including irrigation, as per Local Body directions.

F. Proposed Subproject Components

38. 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) and revised IEE shall be submitted to ADB for approval and after approval from ADB shall be applicable to contractor throughout the project. Table 7 shows the nature and size of the various components of the storm water drainage system. Contour map, key plan of storm water, layout of pumping station, sump and collection chambers and rising/gravity main are shown in Figure 3 to Figure 18.

Table 7: Proposed Subproject Components of Drainage Works in Nawalgarh Town

Infrastructure	Function	Description	Location
Construction of Storm Water Pumping station (SWPS) of 18.68 MLD – Near Fire Brigade office	One Pumping station with wet well capacity of 810 Cum of peak runoff has been proposed in the Nawalgarh at Fire brigade to evacuate the flood	The pumping stations shall be circular in shape and shall consist of an inlet chamber, coarse screen chamber and a wet well. Non-clog sewage Submersible pumps will be installed in the wet-well. All electrical equipment's like transformers, DG set, etc shall be installed at a suitable distance from the wet well. Civil Structure shall be provided for the electrical equipment installations. LT control panel will be located in the room above the wet well. This room will be ventilated well. The present / natural ground level has been raised up to road level to prepare FGL and further top of walls is kept 500 mm above that	Storm water pumping station (SWPS) of 18.68 mld capacity will be constructed in the adjacent land near existing sewerage treatment plant (constructed under Urban Infrastructure Development Scheme for Small and Medium Towns Scheme - UIDSSMT). The proposed site is located near fire brigade office,

<table>
<tr><th>Infrastructure</th><th>Function</th><th>Description</th><th>Location</th></tr>
<tr><td></td><td>water of Fire Brigade and Bakra Mandi area to the final disposal point.</td><td>FGL so as to make the site free from flooding, etc. Brief details of the pumping station proposed are provided:
Flow in LPS: 448.75
Diameter: 15 m
Depth: 5.0 m
Pump Capacity: 125&250
Pump Inventory: 1 W+1 S& 2 W+2</td><td>which is owned by state government and presently under the possession of Municipal Board, Nawalgarh (Coordinates: Latitude 27°50.'53.89"N and Longitude75°16'05.27"E) .
Presently storm water already getting disposed of near the proposed site. Under this scheme, through pumping main, all the storm water of this location will be disposed in the collection pond proposed at Derena Johad by pumping main. Total land required for SWPS is 600m^2 and available land is about 2,501,400m^2. It is pertinent to mention that existing collection point and the proposed SWPS is part of the same land parcel bearing the same khasra number. No objection certificate of Municipal Board, Nawalgarh is attached in Appendix 6</td></tr>
<tr><td colspan="4">Construction of Storm Water Collection Chambers</td></tr>
<tr><td>Collection Chamber-1 (Swamiyon ka Jav)</td><td>Storm water collection chambers are proposed to evacuate the flood water by gravity main.</td><td><table><tr><th>Parameters</th><th>Swamiyon Ka Jav</th><th>Bakra Mandi</th><th>Bakton Ka Johad</th></tr><tr><td>Depth from G.L.</td><td>1.48</td><td>1.48</td><td>1.48</td></tr><tr><td>Total flow in MLD</td><td>11.77</td><td>20.09</td><td>9.10</td></tr><tr><td>Retention time minute</td><td>1</td><td>1</td><td>1</td></tr><tr><td>Storage capacity cum</td><td>8</td><td>14</td><td>6</td></tr><tr><td>Length (M)</td><td>3.4</td><td>4.4</td><td>3.0</td></tr></table></td><td>Storm water collection chamber of 11.77 mld at Swamiyon ka Jav is proposed in the adjacent land of sewerage pumping station that was constructed under Atal Mission for Rejuvenation and Urban Transformation (AMRUT) scheme.The proposed land owned by Thakur Bihari Temple trust. Temple trust has already provided their concurrence for construction of sewerage pumping station under AMRUT scheme. The Thakur Bihari Temple</td></tr>
</table>

<table>
<tr><th>Infrastructure</th><th>Function</th><th>Description</th><th>Location</th></tr>
<tr><td></td><td></td><td></td><td>Trust has provided 400m^2 land under khasra no.1334 and 1335 to construct the SPS. Municipality has utilized about 250m^2 for construction of the SPS and 150 m^2 land is still available. The proposed storm water collection chamber requiring about 90 m^2 of land will be constructed within the remaining land parcel beside the existing SPS. Identified site is adjacent to the existing pumping station and is reported vacant, unused and without any settlement/ squatter or other use (Latitude 27°51.'15.89"N and Longitude75°15'59.65"E) Under this scheme, storm water of this zone 1 (Swamiyon Ka Jav) will be collected in this chamber and through pumping main this will be disposed in the Bardana Johad has been selected as a out fall to dispose the water.

No objection certificate of Municipal Board, Nawalgarh is attached in Appendix 6</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>Collection Chamber-2 (Near Bakra Mandi)</td><td></td><td><table><tr><th>Parameters</th><th>Bakra Mandi</th></tr><tr><td>Depth from G.L.</td><td>1.48</td></tr><tr><td>Total flow in MLD</td><td>20.09</td></tr><tr><td>Retention time minute</td><td>1</td></tr><tr><td>Storage capacity cum</td><td>14</td></tr><tr><td>Length (M)</td><td>4.4</td></tr></table></td><td>Storm water collection chamber of 20.09 mld is proposed in the adjacent land near Bakra Mandi, which is owned by state government and presently under the possession of Municipal Board, Nawalgarh. (Latitude 27°50.'49.41"N and Longitude75°16'36.13"E) .</td></tr>
</table>

Infrastructure	Function	Description	Location
			Land parcels currently serve as collection point for local wastewater discharge and are not under any other use by local community or government. Sites are lying vacant, filled with storm and wastewater (free of encumbrances) and are not in use for any other purpose. This collection chamber will be constructed in the same parcel of land where storm water pumping station is proposed. Land required for storm water collection chamber is approximately 500m^2 and available land is about 2,501,400 m^2. Confirmation letter of Municipal Board, Nawalgarh is attached in **Appendix 6** . During impacts assessment, it was noticed that some structures are present around the proposed site. It is confirmed through field visits and design review that there will be no impact on the structures during construction activity and all the safety measures as per the project EMP will be ensured by contractor as per contract clause. All the structures are present outside the land parcel proposed for construction of storm water collection chamber. Under this scheme, storm water of this zone 2 (near Bakra Mandi) will be

<table>
<tr><th>Infrastructure</th><th>Function</th><th>Description</th><th>Location</th></tr>
<tr><td></td><td></td><td></td><td>collected in this collection chamber and through gravity main this will be disposed in the existing sump at SWPS at Fire Brigade office. Ultimately from SWPS at Fire Brigade it will be disposed in the collection pond proposed at Derena Johad by pumping mains.</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>Collection Chamber-3 (Bhakton Ka Johad)</td><td></td><td><table><tr><th>Parameters</th><th>Bakton Ka Johad</th></tr><tr><td>Depth from G.L.</td><td>1.48</td></tr><tr><td>Total flow in MLD</td><td>9.10</td></tr><tr><td>Retention time minute</td><td>1</td></tr><tr><td>Storage capacity cum</td><td>6</td></tr><tr><td>Length (M)</td><td>3.0</td></tr></table></td><td>Storm water collection chamber of 9.10 mld at Bhakton Ka Johad is proposed Proposed land is owned by private owner (Mr. Vijay Kumar Bhagat). Land owner has already provided written confirmation to provide 2116 m^2 land for the construction of sewerage treatment plant under AMRUT project. As sewerage treatment plant was constructed in other land, hence the land parcel is totally vacant and collection chamber is proposed here (Latitude 27°51.'37.91"N and Longitude75°16'58.96"E) .
Approximately 90m^2 land will be required for the collection chamber and adequate space is available. Land is classified as Gair Mumkin Johar (uncultivable wasteland or dam that capture and conserve rainwater) and site visit reveal that in the entire plot of 2116 m^2 is low laying and storm water and wastewater is getting accumulated. Copy of consent letter is attached in Appendix 6
The proposed collection chamber is to be constructed in the front of</td></tr>
</table>

Infrastructure	Function	Description	Location
			the Bhakton Ka Johad and through gravity main, all the storm water will be discharged in the Johad. Both the collection chamber and disposal of drains are in Gair Mumkin land. Bhakton Ka Johad is also on the same land parcel.
Disposal Pond			
Storm water collection pond is proposed at Dedhana Johad.	The storm water from SWPS Fire brigade will be disposed into the Dedhana Johad location near Sikar Road outside the Nawalgarh town.	Volume of Dedhana Johad Has been calculated based on the average rainy days of las 29 years which is approximately 26 days. Flow coming to Dedhana Johad is 28.77 MLD. Adopting the pond depth of 6.0m and area of 2.265 Ha total storage capacity of the pond will be approx. 3.51 days. Shape of the ponds has been kept in natural pond shape and will be constructed around 10.0 m away from the road between proposed ponds with stone pitching and embankment is slope of 1:2 (V:H).	Storm water collection pond is proposed at Dedhana Johad **Latitude** 27°49.'55.47"N **and Longitude**75°15'45.00"E) Proposed land is classified in revenue records (khasra no. 479/390) as a Pasture land / land reserved for other general purposes and owned by state government and presently under the possession of Municipal Board, Nawalgarh. Municipal Board, Nawalgarh has already issued letter to District Collector, Jhunjhunu for allotment of said land for storm water collection pond. The process of conversion i.e. change in land use classification/transfer with the intervention of District Collector will be completed before start of civil work. Proposed site is lying vacant (free of encumbrances) and is not in use for any productive or other purpose. The land is not used for grazing cattle's by any community. Total land available is approximately 28,100 m^2

Infrastructure	Function	Description	Location
			which is adequate for the collection pond.
Rising Mains /Gravity Mains			
Rising Mains /Gravity Main	Rising and gravity main pipelines are proposed for disposal of storm water from Storm Water Pumping Station (SWPS) and Storm Water collection chambers to designated disposal Point respectively	The rising mains comprises laying of DI K-9 pipe of 1.75 km with diameter 600m Gravity mains comprises laying of NP 4 pipe of 3.4 km of diameter 500-600 mm; ;	Rising and gravity main pipelines are proposed in the right of way (ROW) of government road, which is owned by Municipal board, Nawalgarh. No commercial establishment - permanent shops or mobile vendors exist along the route and no economic impact or physical relocation and impact is anticipated. The pipelines will be laid on the centre of the roads/either of left- or right-hand side on the road. The stair cases and access ramps of the residences constructed over the existing drains will not be dismantled as pipelines will be laid through road cutting on the centre of the road. . No objection for laying of pipeline has been received from Municipal board, Nawalgarh, attached in Appendix 6.
Road Restoration		For The rising mains comprises laying of DI K-9 pipe of 1.75 km with diameter 600m Gravity mains comprises laying of NP 4 pipe of 3.4 km of diameter 500-600 mm;	Rising/gravity mains of dia (500-600 mm) will be laid on ROW of roads/ on roads. This will involve road cutting (mostly cement concrete roads) at certain locations and the same will be restored as per design specifications/pre-project condition. The contractor will carry out the final design and measurement / quantity of road restoration as required. Transect walk conducted along the proposed corridor of rising/gravity main alignment and it is

Infrastructure	Function	Description	Location
			confirmed that no commercial establishment - permanent shops or mobile vendors exist along the route and no economic impact or physical relocation and impact is anticipated.

G. Subproject Benefits

39. The subproject is primarily designed to improve environmental quality and living conditions of Nawalgarh city through provision of Storm water management improvement works. The citizens of the Nawalgarh will be the major beneficiaries of this subproject. The citizens of the Nawalgarh will be the major beneficiaries of this subproject. Implementation of drainage subproject in Nawalgarh will address the issues of inundation of many areas in city during the heavy rainfall and will make the city more livable. It will also improve public health particularly reduction in waterborne and infectious diseases, reduce risk of groundwater contamination. People would spend less on healthcare and lose fewer working days due to illness, so their economic status, as well as their overall health shall also improve. The town being a major tourist attraction and an improved drainage system in the town will further improve the tourism potential of town, hence will contribute to improved economy.

H. Implementation Schedule

40. After the completion of designs, bids were invited in September 2022 for the subproject. After evaluation of bids LOA was issued to successful bidder on 13 January 2023 and thereafter work is awarded. Project duration of work is 18 months. After completion of construction and commissioning, the drainage works shall be handed over to Nawalgarh Nagar Palika, who will operate and maintain the drains.

Figure 3: Index map of proposed Storm water management project work showing SWPS and Rising Mains.

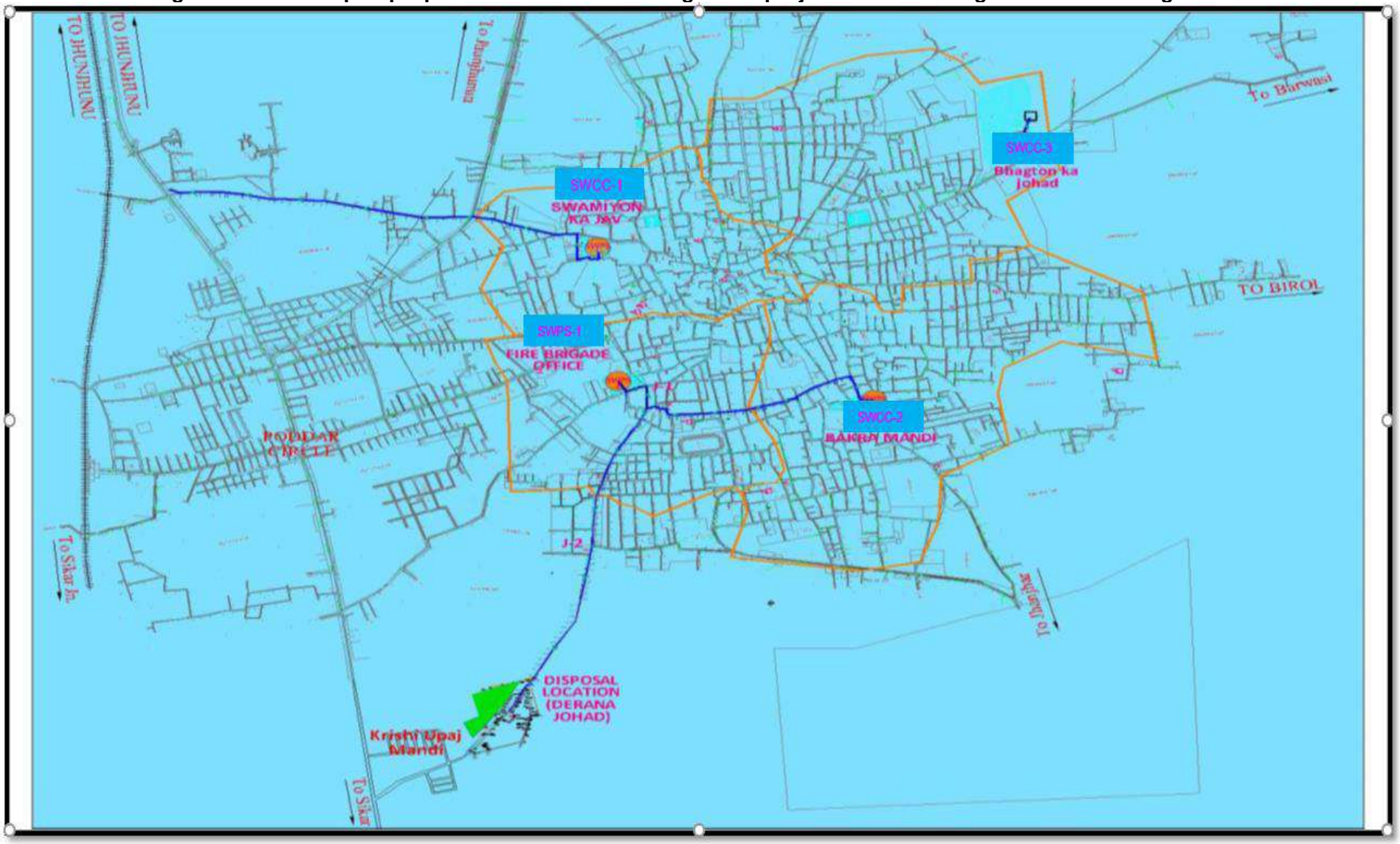


Figure 4: Contour map of Nawalgarh

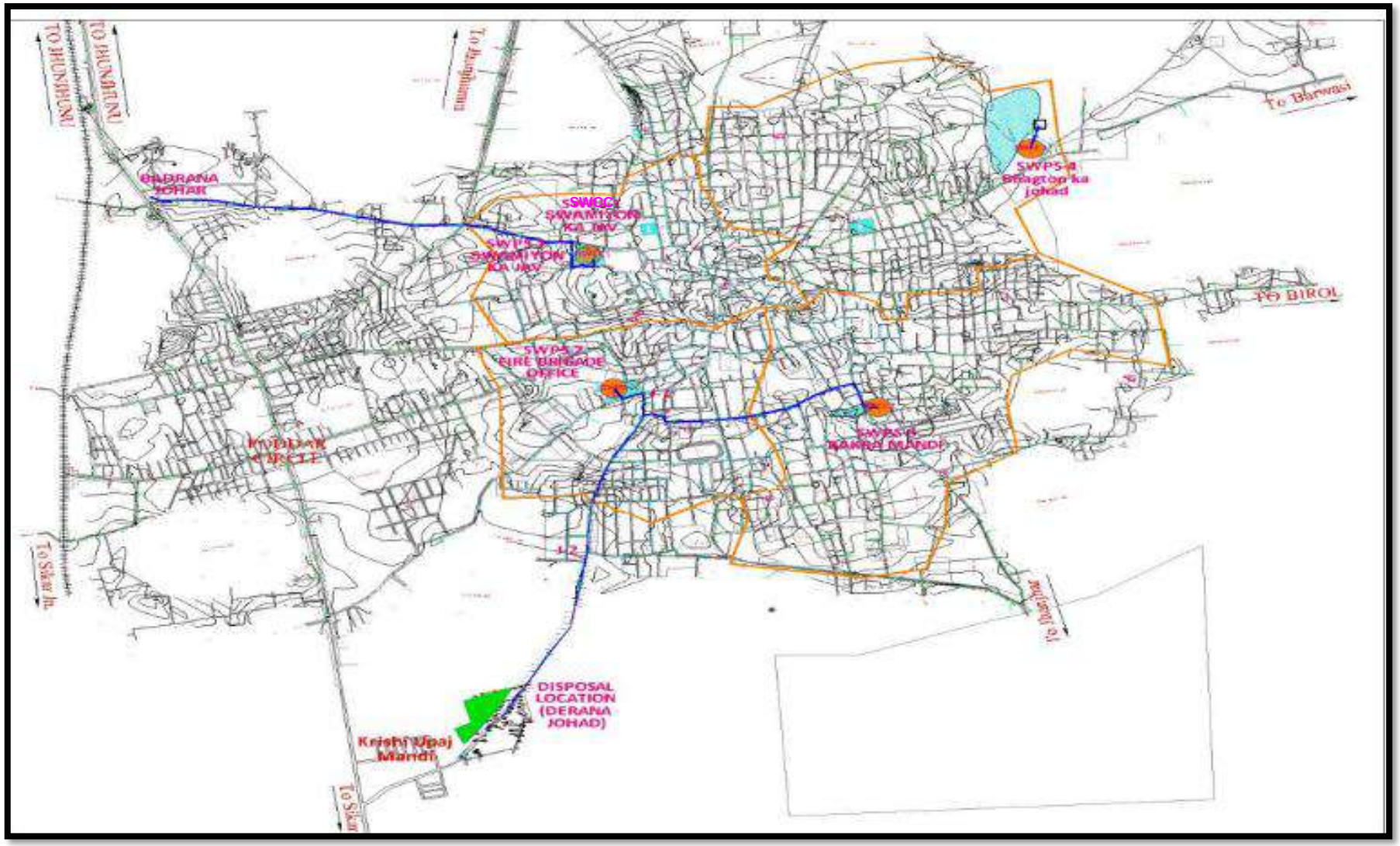
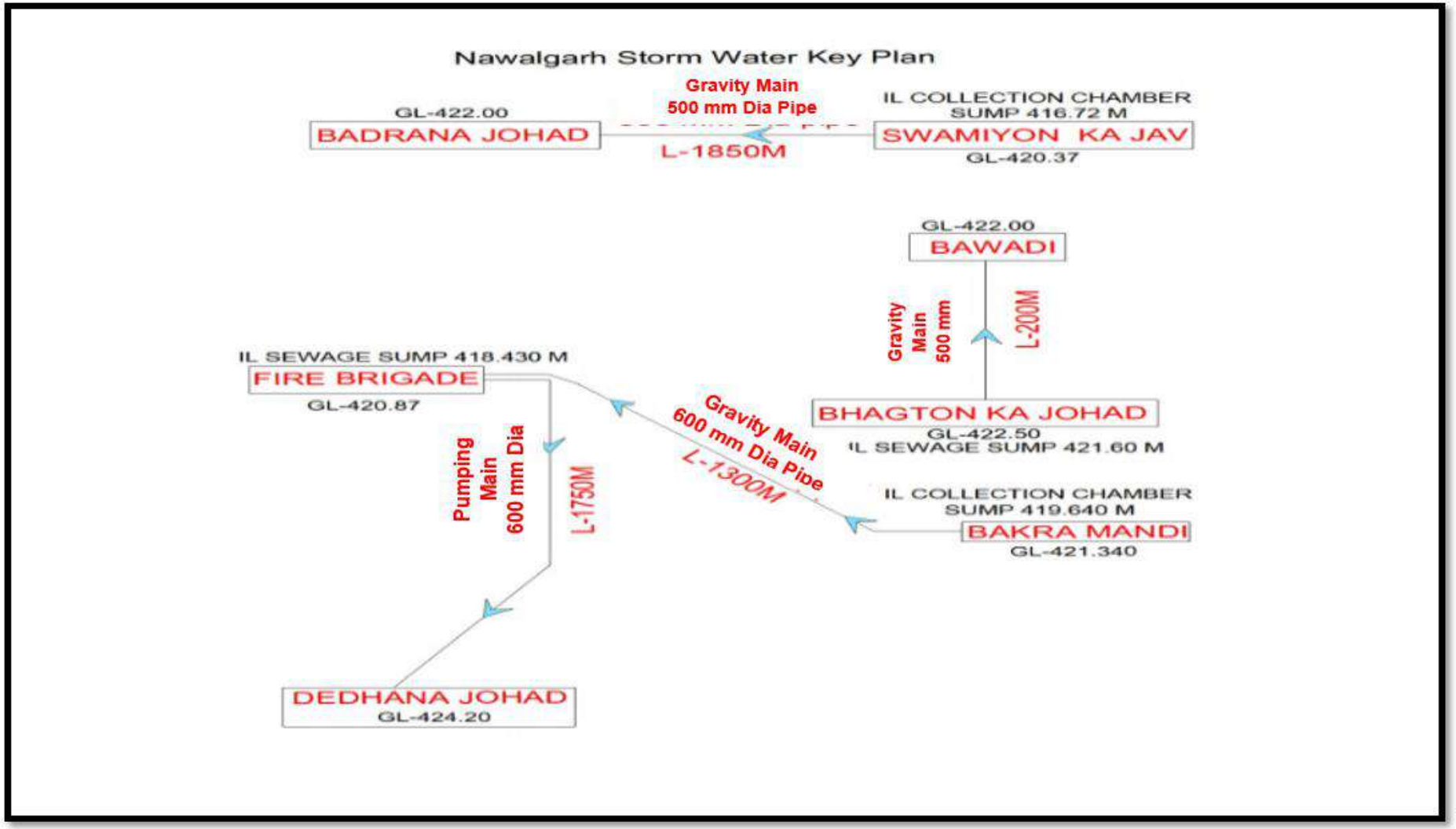


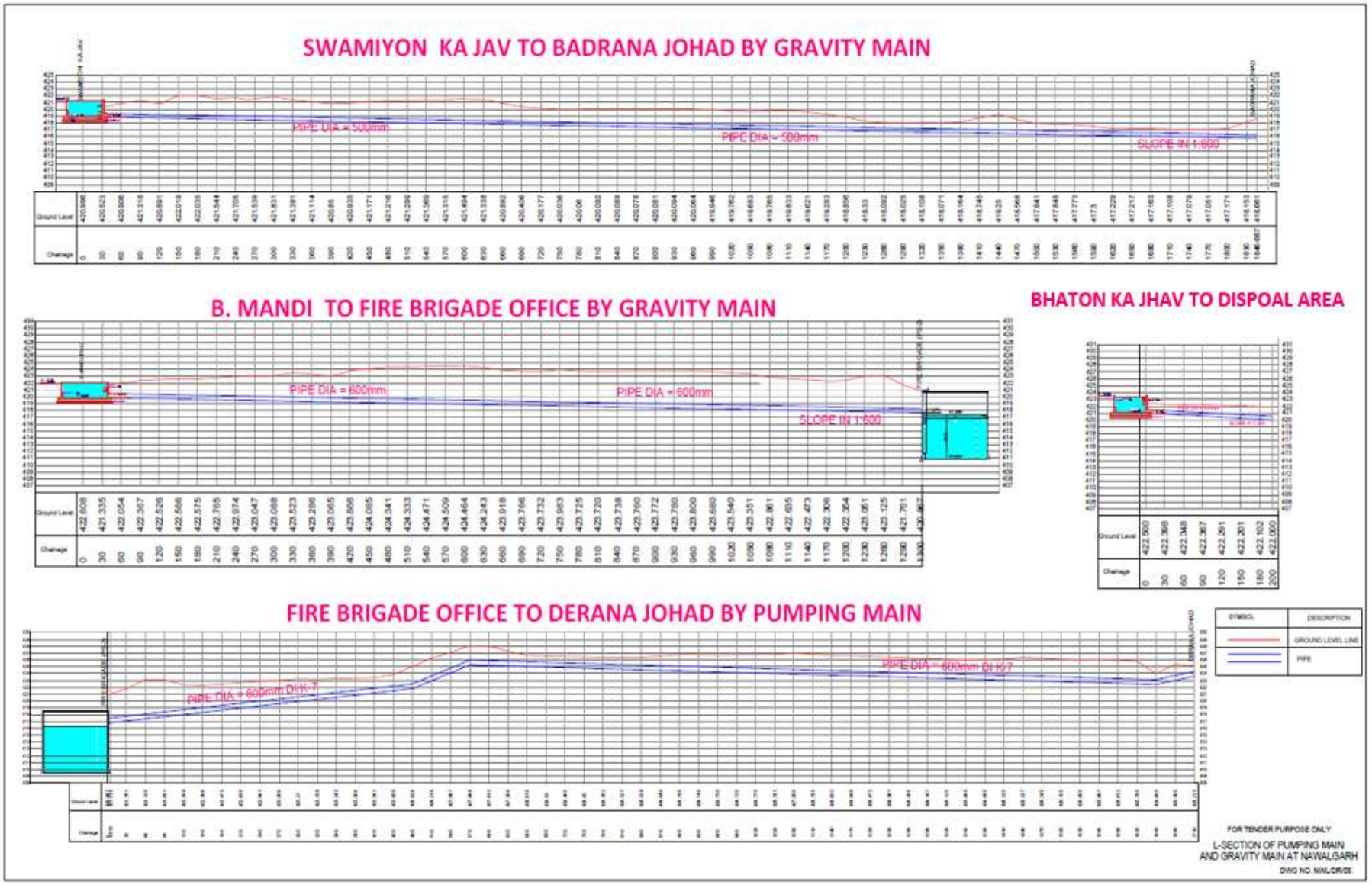
Figure 5: Location of various proposed project components marked on google map

Figure 6: Schematic Diagram of Proposed Drainage System



Source: Detailed Project Report-Nawalgarh ,2022

Figure 7: L-section of pumping main and gravity main at Nawalgarh



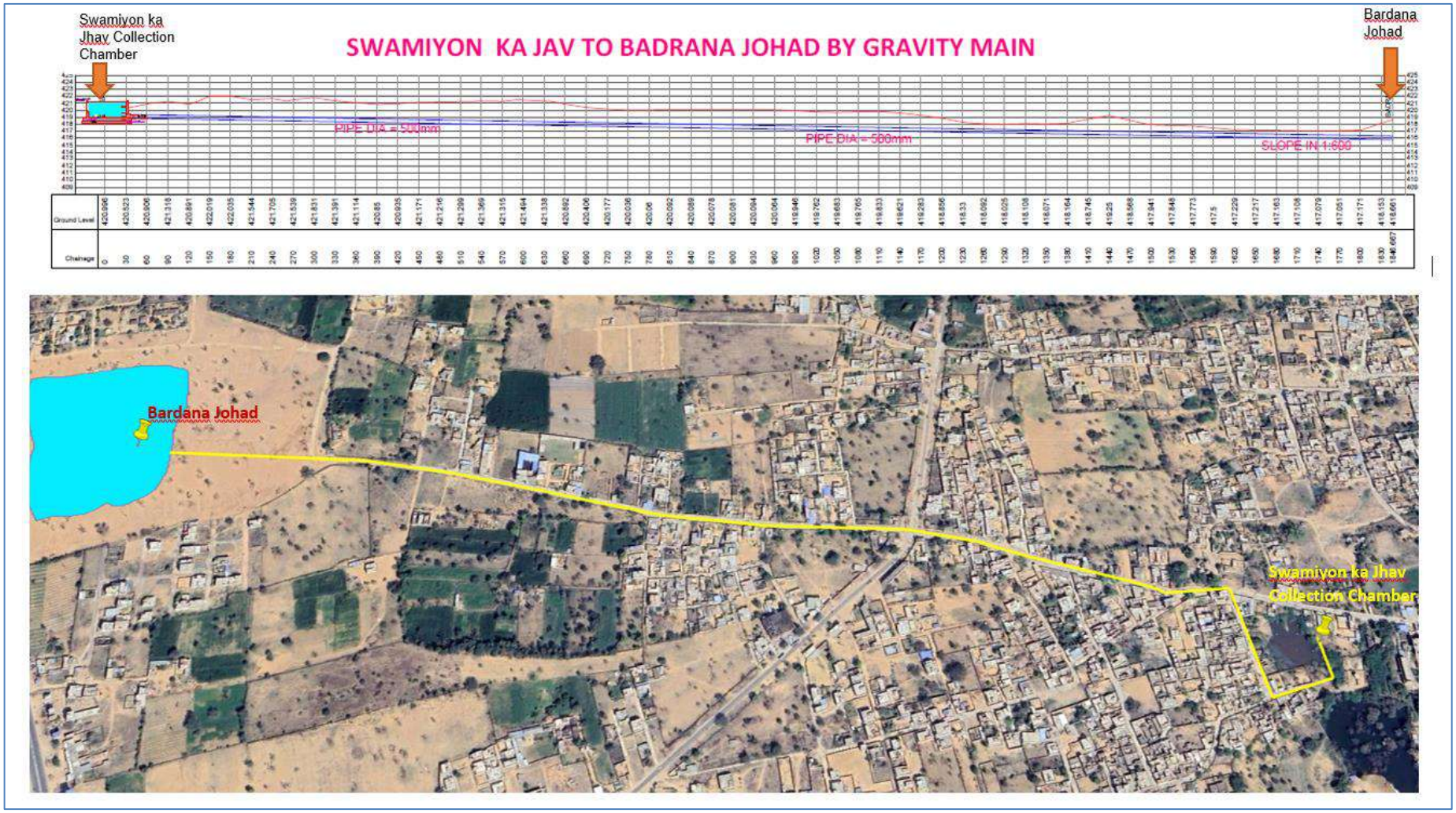

Swamiyon ka Jhav Collection Chamber
SWAMIYON KA JAV TO BADRANA JOHAD BY GRAVITY MAIN
Bardana Johad
PIPE DIA = 500mm
PIPE DIA = 500mm
SLOPE IN 1:600
Ground Level
Chainage
Bardana Johad
Swamiyon ka Jhav Collection Chamber

Figure 8: L-Section of Gravity main from Bakra Mandi SWCC to Fire Brigade Pumping Station Location of Collection Chamber, Gravity main and Fire Brigade SWPS in Google map

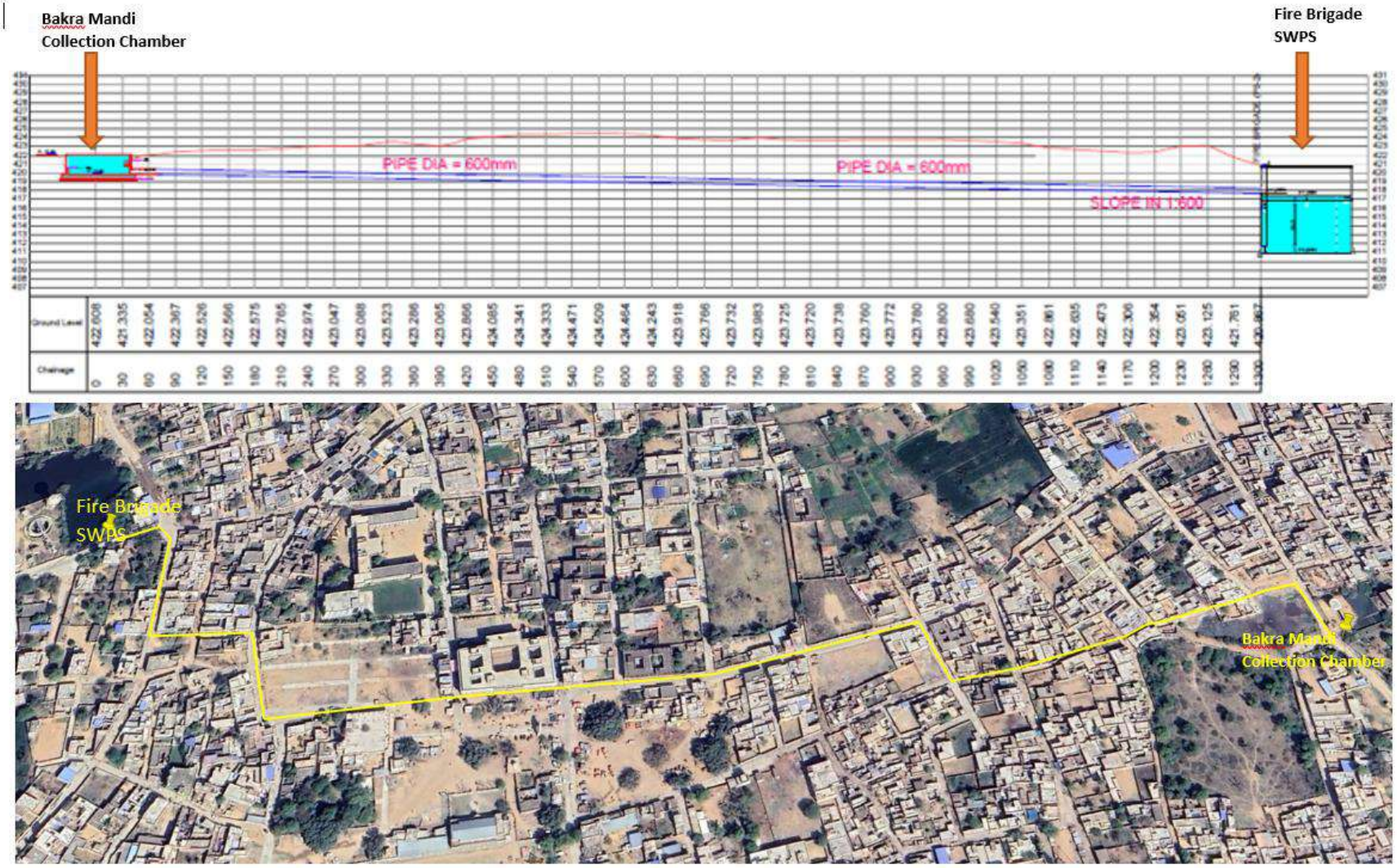
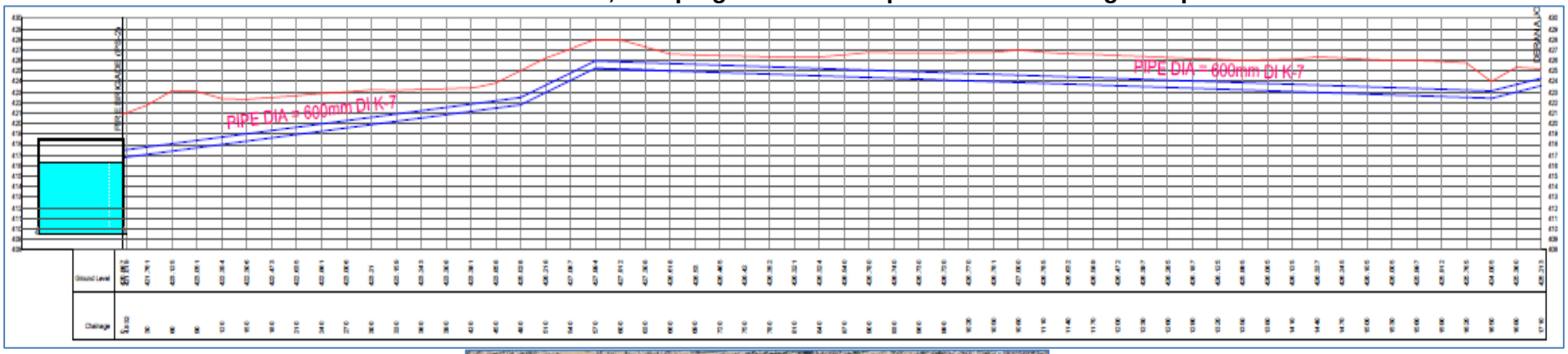


Figure 9: L-Section of Pumping main from Fire Brigade Pumping Station to Dedhana Johad Disposal Point

B. Location of SWPS, Pumping main and Disposal Point in Google map



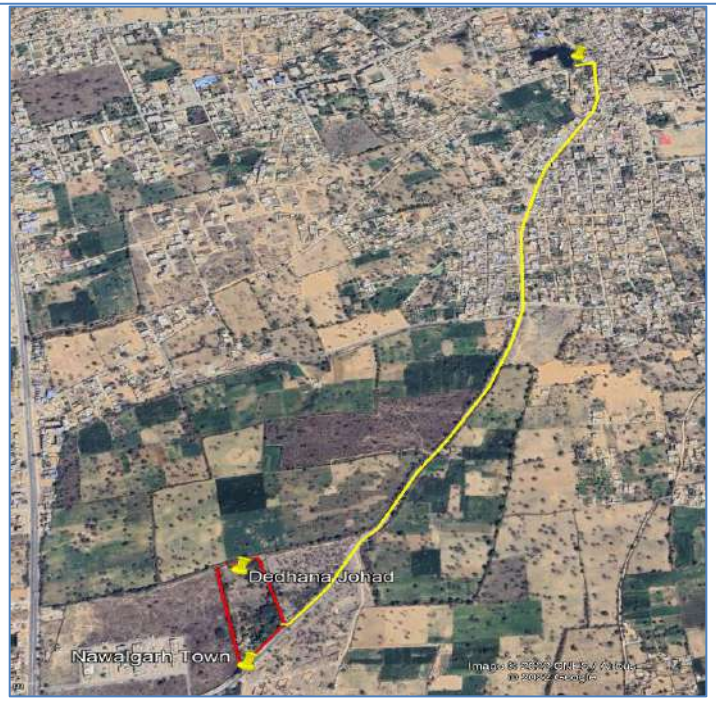


Figure 10: L-Section of Gravity main from Bhakton ka Johad Collection Chamber to Bhakton ka Johad Disposal Point B. Location of Collection Chamber, Gravity main in Google map

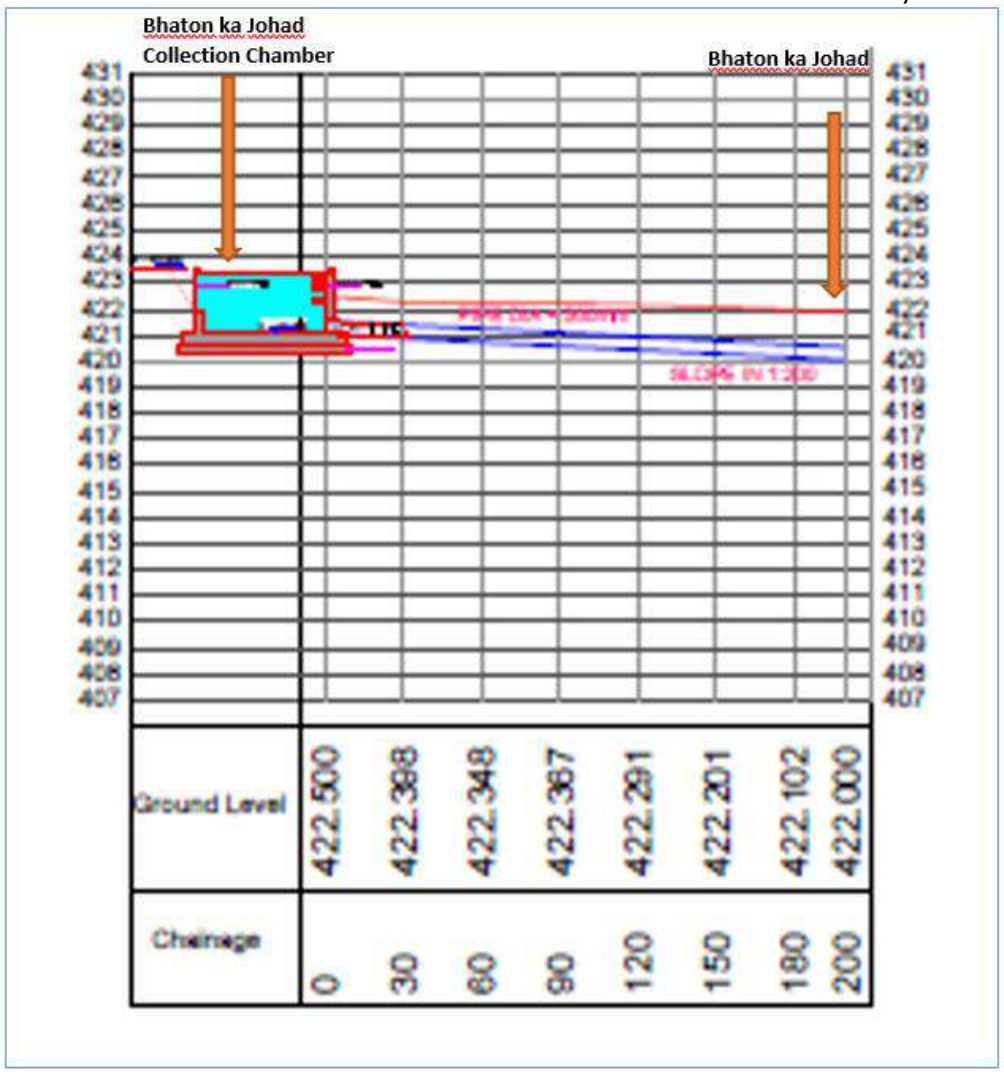


Figure 11: Layout of Sump & Collection Chamber

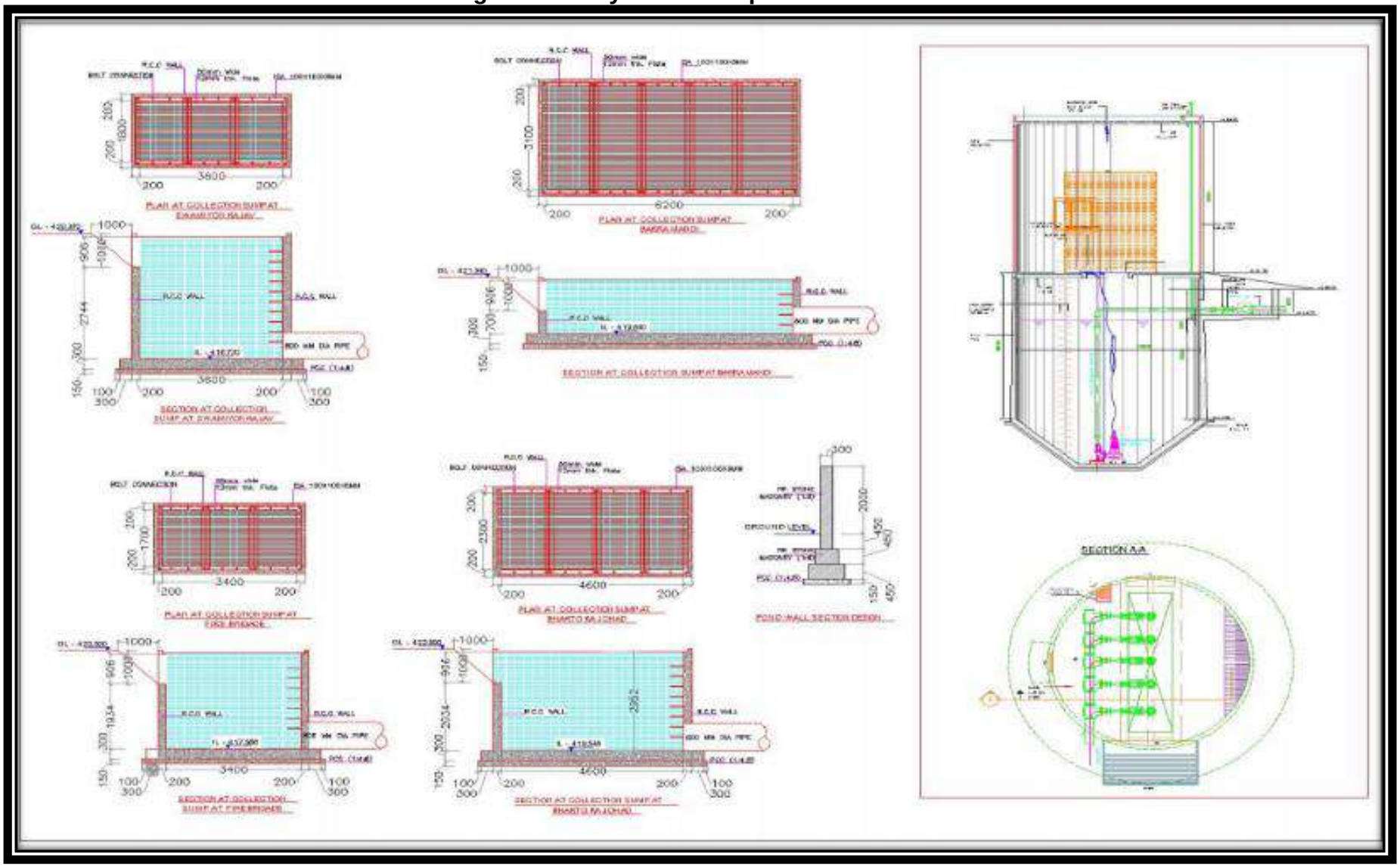


Figure 12: Location of proposed pumping station near Fire Brigade office, marked on google map (Latitude 27 ° 50.'53.89"N and Longitude75 ° 16'05.27"E)

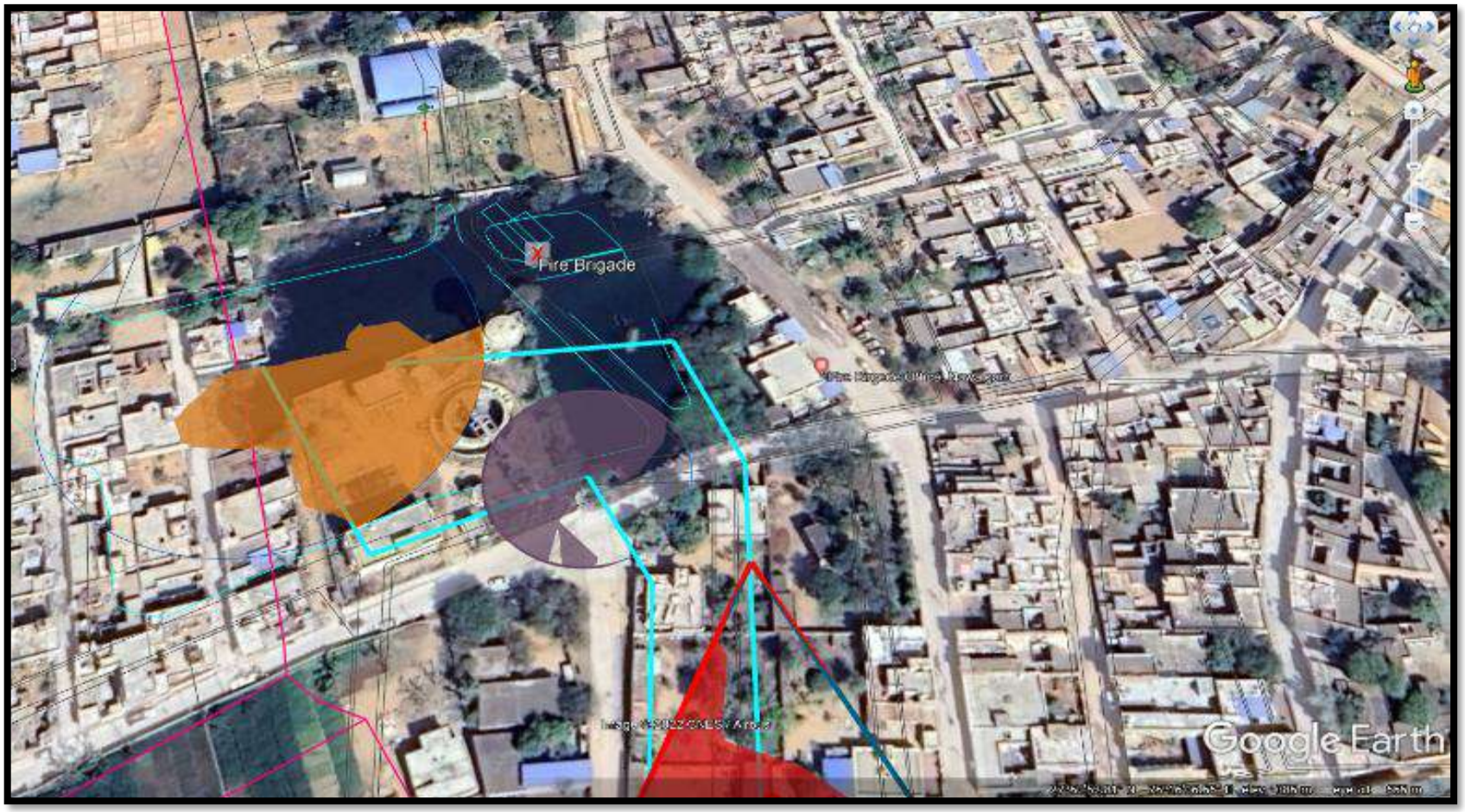


Figure 13: Location of proposed Collection Chamber-1 (Swamiyon ka Jav) site marked on google map (Latitude 27 ° 51.'15.89"N and Longitude75 ° 15'59.65"E

Figure 14: Location of proposed Collection Chamber-2- Bakra Mandi, marked on google map (Latitude 27°50.'49.41"N and Longitude75°16'36.13"E

Figure 15: Location of proposed Collection Chamber-3 (Bhakton Ka Johad) site marked on google map (Latitude 27° 51.'37.91"N and Longitude 75° 16'58.96"E

Figure 16: Distances of major project feature from Heritage site Sheesh Mahal in Nawalgarh.

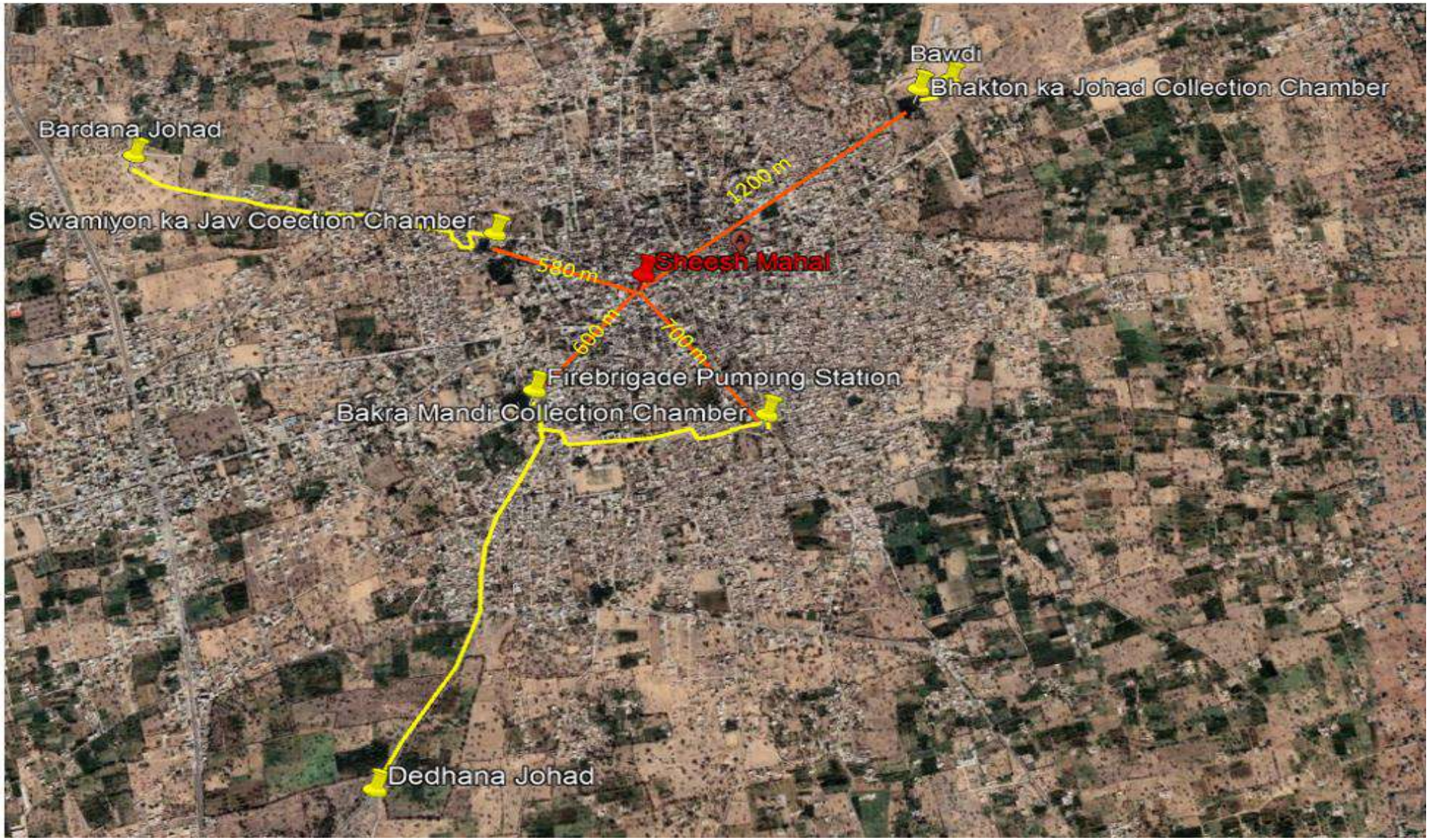


Figure 17: Distances of major project feature from Heritage site Poddar Haveli in Nawalgarh

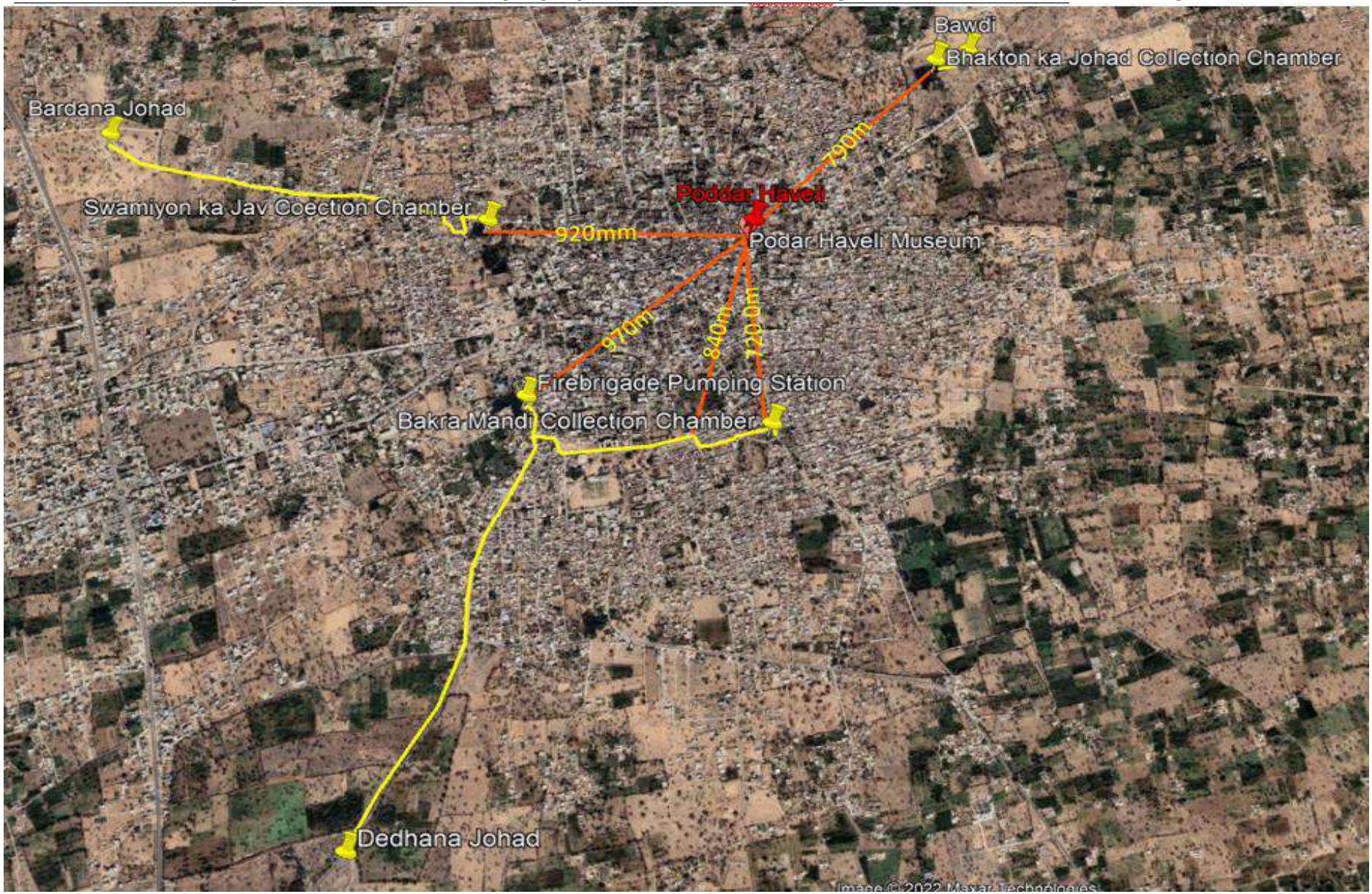
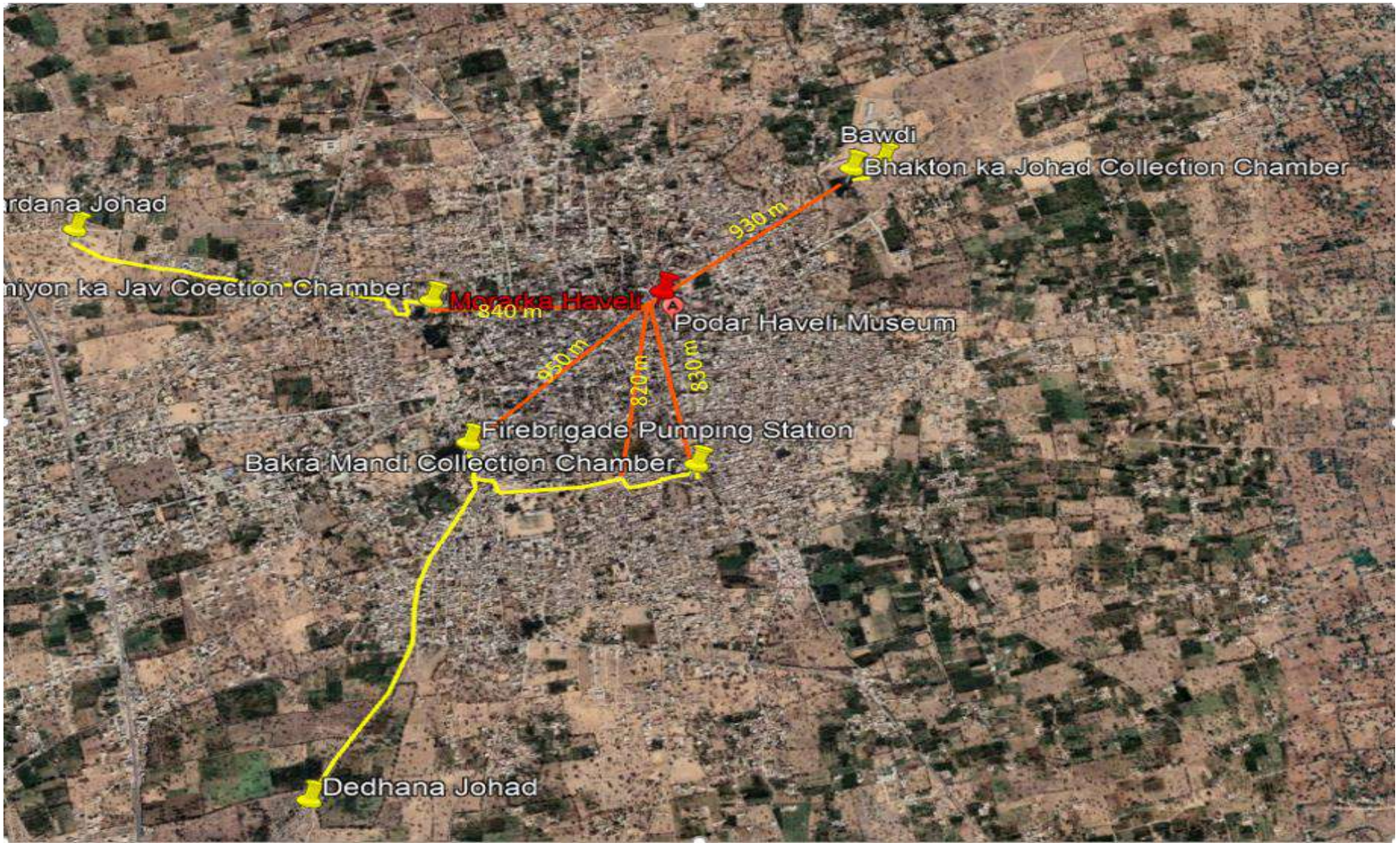


Figure 18 . Distances of major project feature from Heritage site Morarka Haveli in Nawalgarh .



III. ANALYSIS OF ALTERNATIVES

41. The ADB SPS 2009 requires an analysis of project alternatives to determine the best method of achieving project objectives (which is safely collecting Storm water, in Nawalgarh 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.

42. The "with" and "without" project scenarios are analyzed with respect to the development of the state by the back-drop of requirement of reliable quality infrastructure for sustained growth economy and consequent well-being of its citizens. There is lack of outfall system in the Nawalgarh town Therefore, to ensure proper disposal of surface runoff in order to avoid inundation of city areas and streets, construction of storm water collection chambers at three locations and a storm water pumping station and collection pond, along with laying of rising mains from the pumping station/Collection Chamber up to the disposal points is proposed under the subproject. Descriptions of various alternatives considered for proposed components are presented in the following Table 8.

Table 8: Analysis of Alternatives

1.	**Project Need – No Project Alternative**
Type of alternative	**'No project' / 'with project' alternative**
Description of alternatives	**<u>No project alternative</u>** Low depressed areas in Nawalgarh city are submerged during heavy rainfall due to improper drainage system, leakage in underground pipe lines, and blockage of road during monsoon season Water born dieses will be increased during monsoon season due to the stagnant water at low depression areas Excess problem is created near the low laying/water logged areas during monsoon season due to heavy rainfall. As per discussion with Nawalgarh Municipal Board and as per preliminary survey, the following locations namely Fire Brigade, Bakra Mandi, Swaliyon ka Jav and Bhakton ka Johad are majorly flood affected areas in the town. It is causing considerable inconvenience to general public and economic losses as no business/marketing activity can be carried out in and around these areas during water logging period. This is a recurring problem for which a suitable surface drainage system needs to be developed. 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;

	• reduced risk of groundwater contamination through appropriate sewer collection and treatment; • improvement in quality of water bodies due to disposal of storm water • improved 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 systems. The project will construct improved drainage system in the project areas. 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 Nawalgarh town will be improved. Water submergence problems will be controlled at low depressed areas through improvement in storm water drainage system, development of disposal locations and proposed new pipelines with high pumping capacity. Water born dieses will be controlled due to pumping out the stagnant storm water. Excess quantity of storm water will be pumped out through new pumping motors and pipelines. 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. .
Selected Alternative	Without subprojects would yield the area to be continuously under-serviced that puts the health of the general public at an increasing risk and could potentially worsen the living environment. This 'no project' scenario would impede further social and economic development of the district/area and the defer commitments to improve the proportion of the population with sustainable access to clean environment and basic drainage and sanitation. **Given the large-scale benefits to the population and environment, 'with project' alternative is considered appropriate**
2	**Project Locations**
Description of alternatives	**A. Pumping Station and Collection Chambers** • **One Storm water pumping station (SWPS) of 18.68 mld** capacity will be constructed near fire brigade office, which is owned by state government and presently under the possession of Municipal Board, Nawalgarh (Coordinates: Latitude 27°50.'53.89"N and Longitude75°16'05.27"E). Presently storm water already getting disposed of near the proposed site. Under this scheme, through pumping main, all the

	storm water of this location will be disposed of in the collection pond proposed at Derena Johad. Total land required for SWPS is 600m^2 and available land is about 2,501,400m^2. • **Storm water collection chamber of 11.77 mld at Swamiyon ka Jav** is proposed in the adjacent land of sewerage pumping station (SPS). The proposed land is owned by Thakur Bihari Temple trust. Temple trust has already provided their concurrence for construction of sewerage pumping station under AMRUT scheme. The Thakur Bihari Temple Trust has provided 400m^2 land to construct the SPS. Municipality has utilized about 250m^2 for construction of the SPS and 150 m^2 land is still available. The proposed storm water collection chamber requiring about 90 m^2 of land will be constructed within the remaining land parcel beside the existing SPS. Identified site is adjacent to the existing pumping station and is reported vacant, unused and without any settlement/ squatter or other use (Latitude 27°51.'15.89"N and Longitude75°15'59.65"E). Under this scheme, storm water of this zone 1 (Swamiyon Ka Jav) will be collected in this chamber and through pumping main this will be disposed in the pond/Johad at Badrana. • **Storm water collection chamber of 20.09 mld is proposed in the adjacent land near Bakra Mandi**, which is owned by state government and presently under the possession of Municipal Board, Nawalgarh. (Latitude 27°50.'49.41"N and Longitude75°16'36.13"E). Land parcels currently serve as collection point for local wastewater discharge and are not under any other use by local community or government. Sites are lying vacant, filled with storm and wastewater (free of encumbrances) and are not in use for any other purpose. . Land required for storm water collection chamber is approximately 500m^2 and available land is about 2,501,400 m^2. Under this scheme, storm water of this zone (near Bakra Mandi) will be collected in this chamber and through pumping main this will be disposed of in the existing sump at SWPS at Fire Brigade office. • **Storm water collection chamber of 9.10 mld at Bhakton Ka Johad** is proposed on land owned by private owner (Mr. Vijay Kumar Bhagat). The land parcel is totally vacant and collection chamber is proposed here (Latitude 27°51.'37.91"N and Longitude75°16'58.96"E). Approximately 90m^2 land will be required for the collection chamber and adequate space is available. Land is classified as Gair Mumkin Johar (uncultivable wasteland or dam that capture and conserve rainwater) and site visit reveal that in the entire plot of 2116 m^2 is low laying and storm water and wastewater is getting accumulated. The proposed collection chamber is to be constructed in the front of the Bhakton Ka Johad and through pumping main, all the water will be discharged in the Johad. • **Storm water Collection Pond is proposed at Dedhana Johad** (Latitude 27°49.'55.47" and Longitude75°15'45.00"E). Proposed land is classified as a Pasture land / land reserved for other general purposes and owned by state government and presently under the possession of Municipal Board, Nawalgarh. Municipal Board, Nawalgarh has already issued letter to District Collector, Jhunjhunu for allotment of said land for storm water collection pond. The process of conversion i.e. change in land use classification/transfer with the intervention of District Collector will be completed before start of civil work. Proposed site is lying vacant (free of encumbrances) and is not in use for any productive or other purpose. The land is not used for grazing cattle's by any community. Total land available is approximately 28,100 m^2 which is adequate for the collection pond. The storm water from SWPS Fire brigade will be disposed into the Dedhana Johad location near Sikar Road outside the Nawalgarh town **B. Rising and gravity main pipelines** are proposed for disposal of storm water from Storm Water Pumping Station (SWPS) and Storm Water collection chambers to designated disposal Point respectively. The rising mains comprises laying of DI K-9 pipe of 1.75 km with diameter 600m and Gravity mains comprises laying of NP 4 pipe of 3.4 km of diameter 500-600 mm. Rising and gravity main pipelines are proposed in the right of way (ROW) are proposed in the right of way (ROW) of government road, which is owned by Municipal board, Nawalgarh. No commercial establishment - permanent shops or mobile vendors exist along the route and no economic impact or physical relocation

	and impact is anticipated. The pipelines will be laid on the centre of the roads/either of left or right hand side on the road. The stair cases and access ramps of the residences constructed over the existing drains will not be dismantled as pipelines will be laid through road cutting on the centre of the road. Nawalgarh is a heritage town and is famous for its fresco and havelis. Some of the famous structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, Roop Niwas Palace etc. The proposed alignment of the rising main and gravity main pipelines are at considerable distance from such structures. No subproject activity will be conducted within the immediate vicinity of the heritage structures No tree cutting is required at any of the locations proposed for Collection chambers, SWPS & Collection pond. No any adverse environmental impacts envisaged There is no ASI or State protected monuments in Nawalgarh town. There are no protected areas, forest blocks, wetlands, mangroves, or estuaries in or near the project locations Screening of project area based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected area within 50 km of Nawalgarh town. 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 three numbers storm water collection chambers, one storm water pumping station and collection pond locations along with rising/gravity mains are selected based on available ROW and govt. lands and hence no project alternatives considered.

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy

43. 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.

44. 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.

45. The environmental impacts of Nawalgarh Storm water management project 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.

46. **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.

47. **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.

48. **Public Disclosure.** The IEE will be put in an accessible place (e.g., local government offices, libraries, community centers, 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.

49. **Consultation and Participation.** ADB SPS, 2009 require borrower to conduct meaningful consultation[2] 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.

50. **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.

51. **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.

52. **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.

53. **Occupational Health and Safety.** ADB SPS, 2009 requires the borrower[3] to ensure that workers[4] 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

[2] 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.

[3] 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.

[4] 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.

accidents, injury, and disease arising from, associated with, or occurring during the course of 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.

54. **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.

55. **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.

56. **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[5] and Sector Specific [Water and Sanitation] Guidelines[6]). 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

57. 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

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

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

quality, effluent discharge, and protected areas. Compliance is required in all stages of the subprojects including design, construction, and operation and maintenance.

58. **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.

59. **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.

60. **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.

61. None of the components of this Storm water management project falls under the ambit of the EIA Notification 2006, and, therefore EIA Study or environmental clearance is not required for the subproject.

62. **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 9.

C. Environmental Regulatory Compliance

63. Table 9 presents a summary of environmental regulations and mandatory requirements applicable to Nawalgarh Storm water management project.

Table 9: Applicable Environmental Regulations

Law	Description	Requirement	Relevance to Project 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	RSTDSP should adhere to NEP principle of “enhancing and conservation of environmental resources and abatement of pollution”.	All phases of project

Law	Description	Requirement	Relevance to Project Phase
	betterment of 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	Project 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 project
EIA Notification,2006	Projects indicated in the schedule of this notification require EIA study and environmental clearance.	None of the components of this subproject falls under the ambit of the notification; no EIA study or environmental clearance required	-

Law	Description	Requirement	Relevance to Project Phase
Central Ground Water Authority (CGWA) Public Notice 2/100	Public Notice specifies districts and areas where there are restrictions on the construction and installation of any new structure for extraction of groundwater resources without specific approval from the CGWA	No new ground water well are proposed in subproject	Not applicable
Central Ground Water Authority under Department Of Water Resources, River Development And Ganga Rejuvenation - Gazette Notification dtd. 24.09.2020	extraction of ground water for drinking & Domestic use for Residential apartments/ Group Housing Societies/ Government water supply agencies in urban areas need to take NOC from Central Ground Water Authority (CGWA)	For grant of No Objection Certificate for ground water extraction, the project proponent has to furnish the details as per the guidelines issued by the CGWA in proper format as available in CGWA website (https://cgwa-noc.gov.in/LandingPage/index.htm). No new ground water well are proposed in subproject	Pre-construction/ construction and operation
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	Proposed project components does not require consent under this Act	Not applicable

Law	Description	Requirement	Relevance to Project Phase
	Operate (CTO) before commissioning.		
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 where material is being purchased is having CTE/CTO and copy should be collected from third party and submitted in PIU	Construction and operation
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.	Shakambari Conservation Reserve, is situated in Nawalgarh at approx. 24 Km aerial distance from municipal boundary of Nawalgarh. 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

Law	Description	Requirement	Relevance to Project Phase
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 RSTDSP, and are listed below	Construction and operation
Environmental Standards (ambient and discharge).	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	**Appendix C-2** provides ambient air quality standards; **Appendix C-5** provides emission limits for vehicle exhaust and **Appendix C-7** provides emission limits of DG sets and **Appendix C-4** provided emission stack height requirements for diesel generators	Construction and operation
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 of as per the Construction and Demolition Waste Management Rules, 2016; (iii) No waste generator shall throw, burn or burry the solid	Contractor to follow all the rules during construction works	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.		
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 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;	Disposal site shall be identified and allotted by Municipal Council 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 disposed according to this Rules	Construction
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	Contractor to comply all the requirements of this Act during construction works.	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	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 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 Archaeologic	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).	In Nawalgarh there is No ASI and State protected monuments exists .	Not applicable

Law	Description	Requirement	Relevance to Project Phase
al Sites and Remains (Amendment and Validation) Act, 2010.			
The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961; the Rajasthan Monuments, Archaeological Sites and Antiquities (amendment) Act 2007	Any construction/excavation work in the 'protected area' (as declared by GoR under the Act) requires prior permission of Department of Archaeology & Museums -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 et–.	None of project components falls within the protected areas of any of the state protected monuments because of No ASI and state protected monument exists.	Not applicable
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	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	Construction

Law	Description	Requirement	Relevance to Project Phase
	explosives • Safety in operation of transporting equipment and appoint competent person to drive or operate such vehicles and equipment • 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 metres 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	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 tunnelling 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	• Applicable to all construction works in the project • Principle employer (RUDSICO-EAP) to obtain	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	by the Principal 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.,	Certificate of Registration from 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	This Act makes the basis for declaration of Reserved Forests, constitution of village forest	Not applicable; none of the components / alignment are	Construction

Law	Description	Requirement	Relevance to Project Phase
Rajasthan Forest Rules, 1962	committees, management of reserved forests and penalties and procedures.	in reserved or community forest areas.	
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 Nawalgarh. Not applicable to subproject. Beautification, Conservation and Allied Works of Integrated Storm Water Management Project.	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 Hydrochlorofluorocarbon 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 fibres is classified as hazardous waste.	Not applicable

Law	Description	Requirement	Relevance to Project Phase
Convention on Migratory Species of Wild Animals (CMS), 1979 (Bonn convention)	CMS, also known as Bonn convention, was adopted in 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.	Not applicable to this project as no migratory species of wild animals are reported in the project areas.	Not applicable

64. **Clearances / permissions to be obtained prior to start of construction**. **Table 10** 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 10: 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 Municipal body (NOC already taken refer **Appendix 6**)	Municipal Council
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
6	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
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
11	Use of highway ROW for construction area/ crossing	National Highway Authority of India	PIU

65. 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 Resources

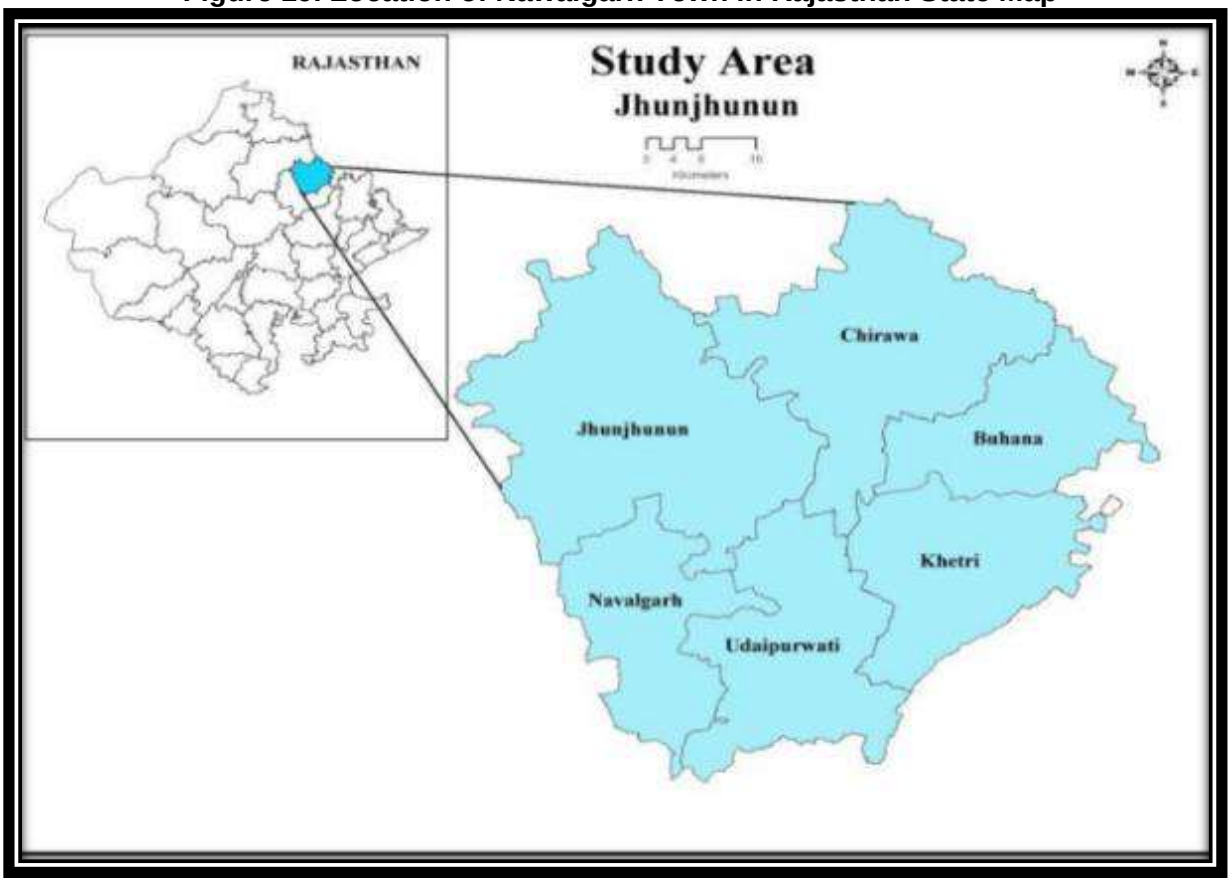
1. Location, Area & Connectivity

66. Nawalgarh is a Municipal town in Jhunjhunu district of Rajasthan state. Jhunjhunu district is on north western side of Rajasthan. Nagar Palika Nawalgarh is 39 Km away from district head quarter. This town was considered as Nagar Palika on 1st January 1945. It situated on Jaipur - Jhunjhunu and Sikar Loharu route.

67. Nawalgarh is famous for grand Havelies with fresco, celebrated water bodies like Wells & step wells which are specialty of Shekhawati region. It has some of the preserved Havelies and finest frescoes in Shekhawati. Nagar Palika has taken up this scheme to improve infrastructure facility in the coming years. Nawalgarh city is situated between 26°38'59"N North Latitude and 74°1'48"E East Longitude. The geographical area of the city is about 15.24 Sq. Km. The entire region is exposed to hot, dry winds and sand storms are quite common during the summer months The Aravalli hill range spreads in southwest side of the town as of 2011 census of India, Nawalgarh had a population of 94487 souls.

68. This city is well connected with road & rail transportation. It is located 200 km away from Jaipur and from Sikar 40 Km and from Delhi 250 KM. This town was the famous business centre mandi of ancient Rajasthan The climate is semi dry.

Figure 19. Location of Nawalgarh Town in Rajasthan State Map



2. Topography and Drainage

69. Nawalgarh is situated at 27.05° N 74.72° E,. The topography of the district displays hilly area in the eastern and south eastern part which belong Aravalli range, running in NE-SW direction. Rest of the district has broad undulating plains. The general slope of the terrain in the district is from southeast to northwest. The general topographic elevation in the district is between 250 m to 500 m above mean sea level in most of the blocks. Elevation ranges from a minimum of 259.6 m above mean sea level in Surajgarh block in the NE part of the district to maximum of 1,035.0 m above mean sea level in Nawalgarh in SW part of the district.

70. The area is drained mainly by Shekhawati, Kantli and by the Chandrawati Rivers with their tributaries like Udhapur Ohagarh, Dongar, Sukh etc.

3. Physiography

71. Shekhawati falls in a semi-arid zone of North Eastern Rajasthan bordering Haryana. The Aravalli ranges running from northeast to the southwest divide the Shekhawati region. The eastern fringe of the region is comparatively fertile and well-watered as compared to the western segment, which is largely a desert with shifting dunes and sparse vegetation. Kantli, the only river in the region, cuts across the geography passing through the Aravalli ranges flowing from the South East to the North West. Water is scarce in this semi desert part of Rajasthan. Over the years, as a result of ground water mining the ground water table has gone down considerably

4. Soil

72. In Nawalagarh the soil is Red desertic type. These are pale brown to reddish brown colour, structure less, loose and well drained having texture from sandy loam to sandy clay loam. Suitable for agriculture but suffers from adverse climatic conditions.

73. Also Older alluvium is found in Nawalgarh block. They are derived from alluvium and are non-calcareous, semi-consolidated to unconsolidated brown soils, loamy sand to sandy loam in texture. Well drained and occupy gently sloping terrains.

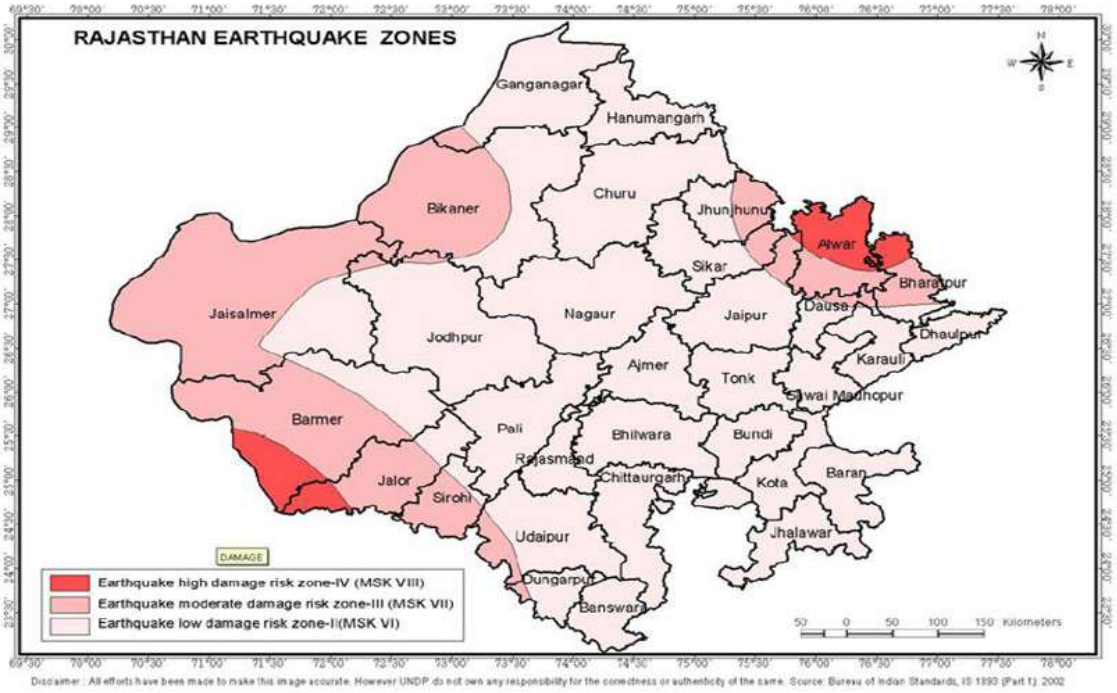
5. Geology

74. Geologically, the district is mostly covered by blown sand. Apart from these, small isolated outcrop of the rocks of Delhi Super Group and Malani igneous suite are found in Khetri, Udaipurwati, Buhana and Jhunjhunun blocks of the district. The Alwar Groups of rocks are exposed in the southeastern part (around Udaipurwati) and northeastern part (around Khetri), with Ajabgarh Group of rocks, but here they as thin and narrow outcrops only. The Alwar Groups are represented by quartzite, schist, grit, arkose etc. These have been intruded by Post Delhi intrusives such as amphibolites, granite, pegmatite, quartz veins etc. The Ajabgarhs are represented by phyllites, biotite schists, calc gneisses etc. intruded by Post Delhi intrusives viz. amphibolite, granite, albitites, pegmatites, epidiorite, quartz veins etc. The basic intrusives include epidiorite, diorite amphibolite etc.

6. Seismology

75. As per the seismic zoning map of India, Nawalgarh 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 20

Figure 20. Rajasthan Earthquake Zones



7. Climatic Conditions/Rainfall

76. The climate of Nawalgarh is hot and dry. The maximum temperature during summer months rises up to 45^{o}C quiet frequently and during winter months temperature downs up to 5 degrees Celsius. The mean annual rainfall is around 491 mm and takes place between July-Septembers. Winds blow manly in April to September from south west & from October to March from North East. In summers humidity is lowest i.e., 20-25%. The monsoon season lasts from June to September. The place gets a reasonable amount of rainfall during the monsoon season, and the conditions are much milder. The months of October and November experience mild conditions, which is the best time to visit the place.

8. Ground Water

77. Quaternary alluvium is the principal water bearing formation in Jhunjhunu District. Besides, hard rocks of Delhi Super Group including post Delhi Intrusive form ancillary aquifers in Jhunjhunu. Alluvium (composed of sand, silt, clay, kankar and gravel) forms the principal and potential aquifer in the area. Area and thickness of sediments varies widely from 15 to 140 m whereas saturated thickness varies from 30 to 70 m. Ground water occurs under unconfined to semi-confined conditions in the primary porosity i.e. pore spaces. Aquifer system is present to a depth of 100 m in general. The depth to water level varies from 7.53 to 75m below ground level. In Jhunujhunu town, groundwater occurs under alluvial conditions and thickness of alluvium ranges from 80 to 100 m. Groundwater table is very deep in the town, and ranges between 70 to 80 m.

78. The stage of ground water development for the Jhunujhunu district is 200.05%. The stage of ground water development in Nawalgarh block is 288.66 % and have been categorized under over-exploited category. No recommendation is extended for additional ground water development.

79. According to Central Ground Water Board (CGWB) Report of Jhunjhunu District (2008), ground water is alkaline in nature. The electrical conductivity ranges between 450 and 3000 ms/cm. Fluoride, Nitrate and Iron concentration is more than permissible limit (1.5 mg/l,45 mg/l and 1.0 mg/l respectively) in some of parts of the district.

9. Noise Level

80. There are no industrial or heavy development activities in the municipal areas of Nawalgarh town, therefore noise quality in town is almost good though due to vehicular movements noise is increased as compared to prescribed limits. Noise level quality of Nawalgarh is not available and contractor is required to conduct noise level monitoring of Nawalgarh; at prominent project sites, in the pre-construction phase and will update in IEE report.

10. Air Quality

81. Air quality in Rajasthan is monitored by Rajasthan Pollution Control Board. However, at present there is no monitoring station in Nawalgarh, and therefore no data on ambient air quality available. The roads are not in good condition, traffic on these roads and winds are the main source of dust generation. Pollutants exist in the air during dry seasons. Air quality monitoring will be conducted in nearby location of SWPSs, Disposal Point and Pipe laying Sites during the pre-construction phase by the contractor.

B. Ecological resources

82. **Flora**: Vegetation cover in the Shekhawati region is mostly sparse with the eastern part of the region being more fertile. Vegetation cover mostly comprises of grasses, trees and shrubs. Among forest species Khejri is the most important. Other species are Babul, Sheesham, Neem, Peepal, Bargad etc. scrublands are mostly covered with Phog (Calliganum polygonoides).

83. **Fauna:** Animals found in Jhunjhunu district are Baghera, Soor, Langur, Lakkar Bagha, Bhedia, Gidar, Ban Bilau, Lomri, Neelgai, Jhadi Undra, Khargosh, Gilheri, Nevla and Jhau Musa. As per Divisional Forest Officer, Jaipur birds commonly found in the area are Chiri, Kavwa, Kagla Bada, Kabutar, Holda, Baya, Tota, Khati Chira, Peelak, Ghughoo, Ghurel, Mor, Titar, Bhat Titar, Titar Kala and Lawa. Snakes both poisonous and non-poisonous are found.

84. There are no protected areas, forest blocks, wetlands, mangroves, or estuaries in or near the project locations. Screening of project area based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected area within 50 km of Nawalgarh town (Appendix 7). There are total 38 species of IUCN Red List potentially found within 50km of area of interest in IBAT assessment. IUCN Red List species are categorized mainly 21 nos. are vulnerable, 11 nos. are endangered and 6 nos. are critically endangered.

85. However, there are five conservation reserves[7] declared by State forest department within the 50 km radius of project area (i) Shakambari Conservation Reserve, which is about 24 km of Nawalgarh city, (ii) Beed Jhunjhunu Conservation Reserve, which is about 42 km (iii) Bansiyal Kethadi Conservation Reserve, which is about 44 km (iv) Bansiyal - Khetri Bagore Conservation Reserve which is about 42 km and (v) Mansa mata Conservation Reserve which is about 40.2 km from Nawalgarh City (Project area). Cutting of tree will be minimized by aligning drains in such a manner that least number of trees wii be required to be cut and measures like compensatory

[7] Conservation reserves are a type of protected area intended to protect significant natural and cultural features

plantation, transplantation of trees with girth less than 50 cm in the ratio of 1: 3 will be implemented.

C. Economic Development

1. Land Use Pattern

86. Under the Rajasthan Urban Improvement Act, 1959, the Master plan for Nawalgarh is prepared for the year 2011-2031. The state Government issued a notification, under Sec 3 (1) of Rajasthan Urban Improvement Act, 1959 and required preparation of the Nawalgarh Master Plan. This was required to ensure that housing schemes and industrial development should occur in a concurrent manner with efficient provision of basic urban facilities such as housing, schools, dispensaries, parks and recreation centre etc. The Draft Master Plan was notified in year 2011 for public objections and suggestions. The existing land use pattern in Nawalgarh Municipality area for Nawalgarh Urbanized Area map for the year 2031 has been taken as a base for finalization of this land-use pattern. It shows the total Nawalgarh Municipality area is subjected to mixed land uses like Residential, Commercial, Industrial, Government, Recreational, Public and Semi-public, Agricultural, Circulation (Transportation) etc. The table 11 shows the Land Use Plan for Nawalgarh town for the year 2031.

Table 11: Existing and Proposed Land Use of Nawalgarh

Sr. No.	Land Use	Present Land Use - 2010		Proposed Land Use - 2031		% Age of urban Usable area
		Area in Hectares	% Age of developed area	Area in Hectares	% Age of developed area	
1	Residential	275	56.9	1047.71	54.58	52.00
2	Commercial	48	9.9	81.11	4.23	4.00
3	Industrial	10.5	2.2	20.00	1.04	1.00
4	Governmental	11	2.3	31.00	1.62	1.50
5	Public & Semi Public	68	14.1	240.65	12.54	11.90
6	Recreational	12.5	2.6	247.00	12.87	12.30
7	Circulation	58	12.0	252.00	13.13	12.50
8	Developed Area	483	100%	1919.47	100%	95.20
9	Govt. Reserved (Vacant)	74				0.00
10	Agriculture, Forests & Hills	37		93.53		4.64
11	Water Bodies	2		3		0.15
12	Urbanised Area	596		2016		100%

*Source: Master Plan Nawalgarh 2011-2031

2. Transportation Connectivity

87. **Rail:** Nawalgarh is connected through broad gauge railway line and situated on the Sikar-Loharu railway line section. The broad-gauge section passes through the western corner of the city where the main city railway station situated. Now the city has direct connectivity through broad gauge line section to Delhi via Loharu and to Kota, Jaipur via Sikar and Ringus.

88. **Road:** Nawalgarh city starts from Ghoom chakkar on the state highway 8. Recently Nawalgarh got its own bus depot which is situated on the north-west side of the city along with state highway 8. State Highway-8 passes through centre of city which connects city to Sikar and Jhunjhunu. Buses for all the major cities of Rajasthan like Jaipur, Ajmer, Kota, Bikaner, Jodhpur and Delhi and other cities also operated from here. All the buses operated from Sikar and Jhunjhunu depot passes through Nawalgarh as well as other depot buses also passes through Nawalgarh.

89. **Air:** The nearest airport to Nawalgarh city, Jaipur International Airport, is 154 km (96 mi) away which operate daily flights to Delhi, Mumbai, Hyderabad, Bangalore, Pune, Indore, Ahmedabad, Chennai, Guwahati, Kolkata, Udaipur, Dubai, Sharjah, Muscat. Recently another airport at Kishangarh has started operations is 184 km (114 mi) away from Nawalgarh.

3. Commerce and Industries

90. In Shekhawati trading was the primary economic activity and even today a number of top businessmen in India belong to this region. Regional economy of Shekhawati which relied heavily on trade in medieval times has since Independence got diversified and relies on a mix of trade, construction services, agriculture and Tourism. Cottage industry in the region particularly Bandhini (Tie and dye), Jooti making, Gota-work, Traditional lace making, Pottery, Lac Bangles, Janaiyu (ritual thread) and artistic jewelry thrived until early years of this decade. Changing tastes, shrinking raw-material base and new logistics has hit the cottage industry badly.

91. Nawalgarh which may have emerged as a hub of trade in Shekhawati in the past is now an agriculture market town catering to the needs of the hinterland. Agriculture has picked up in the virgin sandy loams of the region thanks to the advent of heavy duty pumps and efficient modes of irrigation (drip and sprinkler). The soil is un-spoilt and lends easily for organic farming. Farmers have innovated and have been practicing high value commercial farming. Primary sector (agriculture) still employs a significant portion of population of the town. Those employed n secondary sector are also catering to agriculture. Service sector is dominated by education, agriculture extension services, administration (government jobs) and tourism.

92. Manufacturing has remained modest with low water dependent Medium Scale Enterprises setting up shop in large towns like Jhunjhunu, Sikar and Churu. The region is rich in mineral resources particularly limestone, clay, building material and Metal ores (Copper, iron ore and others). Khetri with its copper mines and smelter houses the only Large-Scale Industrial Enterprise in the region.

4. Agriculture and Animal husbandry

93. Agriculture is advanced with high value crops such as floriculture (rose, marigold etc), organic farming, market gardening for fruits and vegetables. Wheat grown in the region is finds favour across the land with a major portion being exported outside. Other crops popular are Bajra, Gram, Gowar, Mustard, groundnuts. Use of sophisticated agriculture implements is common. Also, sensitive application of agriculture inputs is regularly being made. Drip and Sprinkler irrigation (345 sq Km area is irrigated) find favour in view of semi-arid climate. Single cropping is

popular with few areas practicing double cropping. Investment in agriculture is moderate and is being facilitated by a host of Cooperatives, NGOs particularly the M R Morarka Foundation. Agriculture market in Nawalgarh effectively caters to the demand for seeds, bio-fertilizers, bioinsecticides / pesticides, implements, irrigation systems, harvesting and processing machines, associated and miscellaneous. Major markets particularly around Podar Circle (Ghoom Chakkar) cater to a wide variety of such demands. Markets in the walled city also cater to such demand.

94. Animal husbandry is also dominant often providing secondary source of income to farmers. Dairying, Camel rearing, poultry and sheep/ goat rearing are prevalent. Nawalgarh hosts the second largest Camel Fair in Rajasthan twice annually a week before Dushehra and a week before Diwali. It is hosted near Badrana Johara a community Forest / water recharge area (Beed) under the patronage of a local merchant. Two dharamshalas also support servicing needs for animal husbandry in the region.

95. APMC Mandi in Nawalgarh attracts produce from far and wide, making it larger than neighbouring Sikar and Jhunjhunu mandis. It has only basic infrastructure and lacks organized warehousing and collateral management services. Other mandi services including intermediation, insurance, financing are available at the mandi.

5. Crafts and Utilitarian Products

96. Nawalgarh town was famous for its Gota (precious metal thread) industry. Wool was used for the manufacture of blankets, felts and Namdas (woolen carpets) by certain traditional families of weavers in Nawalgarh. Tanning of hides and skins and shoe making was pursued by Mochi community. Desi Jootis were manufactured in Nawalgarh using locally tanned leather for upper portion while the sole was sourced from Kanpur. Dhaap was also made. Pure lac bangles were manufactured in Nawalgarh by the local craftsmen. Bandhej was also practiced by the craftsmen. Traditional craftsmen like manihars, rangrez, neelgar, khateek, khati, blacksmiths, kumhars, chejaras, chiteras etc. lived in the town. The carpenters were known to be very good at wood carving and making common wooden furniture, like tables, chairs, cots, etc. as well as simple agricultural implements. Blacksmiths manufactured Phavra, Khurpa, Tawa, iron safes, Karahis, etc. Chejaras enaged in the making of buildings such as havelis, temples, wells, baoris and joharas. Chiteras did traditional wall paintings on the buildings.

97. Most of the above-mentioned crafts and utilitarian products are still being made in Nawalgarh though in a changed form. While leather jootis, dyeing of bandhej saarees and odhnis, utilitarian wood products and iron implements are still made in Nawalgarh, namdas, gota work, wood carving and wall paintings are no longer practiced. Craftsmen from chejara community are still engaged in the making of buildings but they have moved to modern construction techniques. Similarly chiteras make paintings but do not use the traditional techniques. Most of them also Fig 22: Vacant Tangible Heritage Assets Heritage Management Plan Nawalgarh 82 work outside Nawalgarh in parts of Rajasthan and surrounding states and also in the Middle East. Traditional culinary specialties especially Rajbhog, Pera, Dilkhushar, Kulfi and chaat are famous in Nawalgarh.

6. Service sector

98. Apart from agriculture extension and support services, services sector in Nawalgarh is however dominated by education, administration and tourism. Historically Nawalgarh is richly bestowed with several schools and colleges, supported by patron merchants. These schools and colleges attract students from neighbouring areas. Podar College and group of institutions have

been pioneering these efforts Apart from these there are four prominent hotels which cater to the demand of tourists. Other smaller hotels and dharamshalas add up to 250 rooms supported by a variety of actors. In view of the huge multiplier tourism is impacting lives of a significant number of residents of the town. These also include guides, caterers, banquets, specialist rural tourism and homestay operators.

99. The entire Shekhawati Region has been home to highly skilled construction workers who migrate to other parts of the country and even internationally giving rise to a large remittance economy for the region. Remittance economy in Nawalgarh remains strong and mainstay for a large proportion of families in the town. 500-700 families depend on construction workers which migrate seasonally or temporarily to earn handsomely for their skills and services.

Table 12. The Economic Structure of Nawalgarh

S.No.	Occupation	1991		2001		2010 (estimated)	
		No. s of Workers	% of Workers	No. s of Workers	% of Workers	No. s of Workers	% of Workers
1	Agriculture, mining and related activities	1499	13.8	623	4.8	1417	7.5
2	Cottage Industries	1126	10.3	1431	10.9	2268	12.0
3	Small & medium & large industries	1294	11.9	11069	8.3	2079	11.0
4	Construction	1626	14.9			2835	15.0
5	Business & commercial activities	2878	26.5			5103	27.0
6	Transportation & communication	465	4.3			1229	6.5
7	Others	1993	18.3			3969	21.0
	Total	10881	100%	13123	100	18900	100
	Participation Rate	**21.26**		**23.23**		**25.83**	

Source: Nawalgarh Master Plan 2010-2031

D. Socio Cultural Resources

1. Demographics

100. As of 2011 census of India, Nawalgarh had a population of 94487 souls. Males constitute 48745 of the population and females 45742. Nawalgarh has an average literacy rate of 64% which is higher than the state average of 66.11%, Male literacy is 74%, and female literacy is 53%. In Nawalgarh, 17.63% of the population is under 6 years of age group. Sex Ratio in the town is also higher than the state ratio which is 940 against state average of 928. Sex Ratio of child is 926 compared to Rajasthan state average of 888. The major regional languages spoken are Marwari, Hindi, English and Urdu.

101. **Population Growth Study.** The town has been growing steadily since 1951. The growth of the town has been phenomenal during 1971-81 when there was an influx of population of immigrants to this town. However, thereafter also the growth was not stable. The average decadal increase is 39.49%. However, the last decadal (2001-2011) growth is only 2.87%.

Table 13: Details of decadal population growth rate

Census Year	Population	Increase in Population	Growth rate (%)
1951	13943		
1961	17270	3327	23.86%
1971	23243	5973	34.59%
1981	40663	17420	74.95%
1991	59714	19051	46.85%
2001	91853	32139	53.82%
2011	94487	2634	2.87%
Average Increase		**13424**	**39.49%**

2. History, Culture and Tourism

102. Nawalgarh is an important town in Jhunjhunu district and the second most populous town after Jhunjhunu. Jhunjhunu district has been the hub of the business-magnets in India. It is one of the prosperous districts of Rajasthan. Most of the part of the district is semi-desert. The unique and diverse heritage of Shekhawati comprises of beautiful havelis, grand temples, magnificent chattris, palaces, forts, wells stepwells and water structures strewn all over in the semi-arid desert terrain bestowed with a unique flora and fauna and a vibrant living tradition of folk dances, music, cuisine, costumes, fairs and festivals. All these elements make Shekhawati a distinct Cultural Landscape. Marwaris as a community played an important role in the economic, political and cultural development of the Shekhawati region. They were great entrepreneurs and brought prosperity to the region. These merchants ensured the survival of the rich artistic tradition of the Shekhawati region. They also spent large sums on the welfare of their community – building, temples, bowris, reservoirs, dharamshalas, gaushalas, schools and colleges. Murarka, Jaipuria, Poddar, Chavsaria, Chowkhani, Patodiya, Birla, Baheti, Seksaria, Shah, Parasrampuria, Bhagat, Saravgi, Dangaich and More are the famous business families of Nawalgarh.

103. The town has a compact settlement plan with narrow streets and built to edge buildings. The town's urban fabric has a well-defined nucleus with a grid pattern of streets being defined by the fort while the rest of the town has grown in an organic manner around community spaces being governed by the process of land division and allotment. Various building types that can be found in the historic area are: baithak (reception space for guests), burj (bastion), chhatri (hindu cenotaph), darwaza (gate), deewar (fortification wall), dharamshala (caravan sarai), dukan (shop), garh (fort), haveli (house), johara (reservoir), kothi (bungalow), kuan (well), madarsa (islamic school), mandir (temple), masjid (mosque), mela sthal (fairground), nohra (service area/cattle shed), samadhi (cenotaph of Hindu saint) and stambh (commemorative pillar). Agriculture, Education and Tourism are the mainstays of the urban economy of Nawalgarh. The entire Shekhawati Region has been home to highly skilled construction workers who migrate to other parts of the country and even internationally giving rise to a large remittance economy for the region.

104. Rajasthan Monuments Archaeological Sites and Antiquities Act 1961 is the only act in the Rajasthan State pertaining to protection and conservation of heritage. Nawalgarh is not included in any regional plan, and there is no CDP prepared for the town. The master plan for Nawalgarh was initiated on 26-07-2010 when the State Government had decided to include 14 revenue villages under the planning area for Nawalgarh. The Master Plan is notified for a period up to year

2031. The total area of the Master Plan is 1800 Hectare, out of which developed area is 430 Hectare. The extent of existing land use was 625.25 Hectare.

105. Tourism in Shekhawati is a story of untapped and wasting potential. Average time spend is limited to about 1-1.5 days. Average spent per capita per day averages about Rs. 2,200. There is a marked seasonality in terms of foreign visitors visiting in winter months. Most foreign visitors come from continental Europe and UK. Nawalgarh with 11 Hotels is the second largest destination (hosting 7,500 visitors) of foreign tourists in Shekhawati. The town is also a popular destination for pilgrims in the region. The temple of Baba Ramdeoji in the town attracts pilgrims from the whole of Shekhawati.

106. Nawalgarh is a crowning glory for Tourism in Shekhawati. It boasts of the maximum number and variety for heritage properties. The grand havelis in the town attract visitors from all over the world. However, it is usually visited as a day tour for visitors staying elsewhere in Shekhawati. Most of these visitors come from Mandawa, Dundlod, Mukundgarh and Churi Ajitgarh. Some Domestic visitors especially from Delhi have been venturing to Shekhawati during Holiday season as an addition to Jaipur. These visitors prefer to stay in Hotels in Mandawa but make a stopover for a few hours in Nawalgarh. Nawalgarh is also a hub of local tourism within the Shekhawati Region. Local residents from around the region throng to Nawalgarh during Ramdeo Mela and also for the Camel Fair at Badrana Johara on the outskirts of Nawalgarh.

107. There is no State protected or ASI protected monument in Nawalgarh. However, heritage properties especially the famous havelis are being subject to a variety of pressures such as natural processes of weathering and decay, inadequate space usage, insensitive additions and alterations, improper visitor management, tourism, traffic and unplanned development. Innumerable frescoes covering havelis of Marwari merchants, temples, dharamshalas, wells and joharas as well as forts and chhatris of Rajput rulers lie in a state of obscurity and dilapidation. Their wealthy owner long gone, many of the valuable Heritage Management Plan Nawalgarh 62 frescoes in havelis are covered by layers of dust and grim or hidden away in locked rooms. Mostly built in the time period between 1850s and 1930s, Shekhawati havelis have withstood adverse conditions but today they face an uncertain future. Over the years havelis have been considerably impacted by a number of negative factors. The existing stock of havelis in the region is therefore steadily getting transformed. Since the construction of the majority of painted havelis was patronized by influential Marwari merchants, today in their absence havelis are in a derelict state. Majority of the owners of havelis no longer stay in them. Most of them and their heirs have settled far away in metropolitan cities. Significant number of havelis are locked. Several of havelis are in possession of caretakers and tenants, who neither have any emotional bonding nor have the requisite technical know-how and financial means to take care of them.

3. Fairs and Festivals

108. The functional unity and composite culture of India find adequate reflection in the fairs and festivals on the one hand and religious icons and heroes and saints on the other. Amongst the most widely celebrated fairs and festivals in Nawalgarh are Holi, Dasshera, Diwali, Teej and Gangaur. A procession was taken out during the Gangaur festival which comprised of soldiers mounted on horses, the royal insignia, musical instruments known as nagaras followed by the Thakur seated on the royal elephant with a band of his security guards on horses. The scene of this glittering procession has been painted with gold inside the burji in the Balaqila or Baragarh.

109. Apart from the legendary folk heroes like Ramdeoji (who has a temple dedicated to him in Nawalgarh) Tejaji, Shyamji of Khatu, places like Dargah built by Pathans at Narhad near Chirawa (also a Jain religious place) and Goga Medi in nearby Bhadra dedicated to Gogaji the folk hero (Tehsil of district Hanumangarh) are revered and these places considered sanctified equally by both Hindus and Muslims. Besides, a place called Kabir Tila near Chirawa was frequented by the followers of Kabir a Muslim craftsman turned saint. Hence the fairs held at these and other places in Jhunjhunu, Sikar districts and at Parbatsar (Nagaur) Ramdeora (Jaisalmer) are thronged and well attended by Muslim & and Hindus. These fairs served as the meeting place for trade and exchange of goods and varied social interaction and sports (e.g. Ramdeo fair, Nawalgarh) for all communities and castes.

110. Among the popular Hindu sects having influence in Shekhawati are the Jasnalthies (originally bear being in Bikaner), followers of Dadu in Fatehpur, Ramgarh, Sikar Jhunjhunu, Alakhia Sadhu in Mandawa of Dashnami sect in Nuan where Rao Raja, Laxmansingh had built and dedicated a temple to Budhgiri, who is alleged to have died in a live 'Samadi'. Finally a mention may be made of 'Nath' sect who had a great influence in the region by its teachings related to devotion as opposed to external & rituals of other sects.

111. Temple of Rani Sati at Jhunjhunu occupies a unique place in the folklore and legends of the region and it is believed that the annual fair held at this huge temple has a hoary history of 700 years of unbroken faith and following especially among Hindu business community of all sub castes.

112. In Nawalgarh fair dedicated to Ramdeoji, the folk-hero turned saint. Bhopi – Bhopa couple recites sonorous songs in the light of dimly-lit lamp or lantern relating the story of Ramdeoji, saviour equally of men, women and cattle, especially the sacred cows. This fair in size and sanctity is probably second only to fair held at Ramdeora in Pokaran Tehsil of Jaisalmer.

113. Ghoomar performed by women in various parts of Rajasthan is equally popular in Shekhawati. Geendad, another, important dance form of the region is performed by striking the rod-ends with the partners in a circle at night starting nearly a month before Holi festival and ending two days before the Holi (Sanctions five).

114. 'Gher' dance prominently painted in Havelis performed in a group by men and women is more popular in Bhilwara and Barmer districts of Rajasthan. Among other dance forms depicted in some paintings can be included Paniharin, Kachchi Ghodi (Horse dance from Kutch area of Gujarat). Lavandi Harvest and Chakri dances. These dances not only enliven the lives and life styles of common people but elevate their souls towards a higher social and spiritual order.

115. All in all, fairs and festivals which inspire and call forth songs and dances from the people constitute the fulcrum of cultural life and also continually enlighten the urban people and bring colour and light to their otherwise materialistic life. They also signify and communicate harmony and common acceptance of social and spiritual values permeating their daily life. Needless to add, the visual and performing acts equally benefited from fairs and festivals promoted as they were by the rich and the nobility.

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add, the visual and performing acts equally benefited from fairs and festivals promoted as they were by the rich and the nobility.

E. Environmental Settings of Investment Program Component Sites

117. There are no protected areas, forest blocks, wetlands, mangroves, or estuaries in or near the project locations. Screening of project area based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected area within 50 km of Nawalgarh town (Appendix 7).

118. However, there are five conservation reserves[8] declared by State forest department within the 50 km radius of project area (i) Shakambari Conservation Reserve, which is about 24 km of Nawalgarh city, (ii) Beed Jhunjhunu Conservation Reserve, which is about 42 km (iii) Bansiyal Kethadi Conservation Reserve, which is about 44 km (iv) Bansiyal - Khetri Bagore Conservation Reserve which is about 42 km and (v) Mansa mata Conservation Reserve which is about 40.2 km from Nawalgarh City (Project area). No tree cutting is envisaged as per preliminary design. If any tree felling is required measures like compensatory plantation in the ratio of 1: 3 will be implemented.

119. Site environmental features of all subproject sites and photographs are presented in the following Table 14. Photographs showing the proposed components chainage wise are given in Appendix 4.

[8] Conservation reserves are a type of protected area intended to protect significant natural and cultural features

Table 14: Environmental Features of Proposed Alignment

Sr. No	Subproject component	Environmental Features of the Site	Photographs
1.	Storm water pumping station (SWPS) of 18.68 mld capacity near fire brigade office,	○ Storm water pumping station (SWPS) of 18.68 mld capacity will be constructed in the adjacent land near existing sewerage treatment plant. ○ The proposed site is located near fire brigade office, which is owned by state government and presently under the possession of Municipal Board, Nawalgarh (Coordinates: Latitude 27°50.'53.89"N and Longitude75°16'05.27"E). ○ Presently storm water already getting disposed of near the proposed site. ○ Under this scheme, through pumping main, all the storm water of this location will be disposed of in the collection pond proposed at Derena Johad. • Water Logged low-lying area causing cause hazards to nearby habitation. • Few trees and shrubs in proposed area but no tree felling is envisaged.	 Proposed Land for SWPS  Existing collection point- near proposed SWPS site **Proposed site**
	Storm water Collection Chamber at Swamiyon ka Jav	• Storm water collection chamber of 11.77 mld at Swamiyon ka Jav is proposed in the adjacent land of sewerage pumping station (SPS). • The proposed storm water collection chamber requiring about 90 m^2 of land will be constructed within the remaining land parcel beside the existing SPS. • Identified site is adjacent to the existing pumping station and is reported vacant, unused and without any settlement/ squatter or other use (Latitude 27°51.'15.89"N and Longitude75°15'59.65"E). • Under this scheme, storm water of this zone 1 (Swamiyon Ka Jav) will be collected in this chamber and through pumping main this will be dispose of in the pond/Johad at Badrana. • Few Babool trees are there but no tree felling is envisaged	Land available for proposed collection chamber  Propose disposal site at johad at Bardana

Sr. No	Subproject component	Environmental Features of the Site	Photographs
		• Water Logged in the low-lying area at Swaliyon ka Jav. A large area flooded during the Rainy Season	
3.	Storm water collection chamber near Bakra Mandi,	• Storm water collection chamber of 20.09 mld is proposed in the adjacent land near Bakra Mandi, which is owned by state government and presently under the possession of Municipal Board, Nawalgarh. (Latitude 27°50.'49.41"N and Longitude75°16'36.13"E). • Land parcels currently serve as collection point for local wastewater discharge and are not under any other use by local community or government. • Sites are lying vacant, filled with storm and wastewater (free of encumbrances) and are not in use for any other purpose. • Land required for storm water collection chamber is approximately 500m^2 and available land is about 2,501,400 m^2. • Under this scheme, storm water of this zone 2 (near Bakra Mandi) will be collected in this chamber and through pumping main this will be disposed of in the existing sump at SWPS at Fire Brigade office. • No trees are present at site	 Land available for proposed collection chamber

Sr. No	Subproject component	Environmental Features of the Site	Photographs
4.	**Storm water collection chamber at Bhakton Ka Johad**	• Storm water collection chamber of 9.10 mld at Bhakton Ka Johad is proposed on land owned by private owner. • The land parcel is totally vacant and collection chamber is proposed here (Latitude 27°51.'37.91"N and Longitude75°16'58.96"E). • Approximately 90m^2 land will be required for the collection chamber and adequate space is available • . Land is classified as Gair Mumkin Johar (uncultivable wasteland or dam that capture and conserve rainwater) and site visit reveal that in the entire plot of 2116 m^2 is low laying and storm water and wastewater is getting accumulated. • The proposed collection chamber is to be constructed in the front of the Bhakton Ka Johad and through pumping main, all the water will be discharged in the Johad. • No tree cuttings are envisaged	 Proposed location of collection chamber at Bhakton Ka Johad  Proposed location of disposal of drain at Bhakton Ka Johad
5.	Storm water collection pond is at Dedhana Johad	• Storm water collection pond is proposed at Dedhana Johad (**Latitude** 27°49.'55.47"N **and Longitude**75°15'45.00"E). • Proposed land is classified as a Pasture land / land reserved for other general purposes and owned by state government and presently under the possession of Municipal Board, Nawalgarh. Municipal Board, Nawalgarh has already issued letter to District Collector, Jhunjhunu for allotment of said land for storm water collection pond. The process of conversion i.e. change in land use classification/transfer with the intervention of District Collector will be completed before start of civil work. • Proposed site is lying vacant (free of encumbrances) and is not in use for any productive or other purpose. • The land is not used for grazing cattle's by any community.	 Location of proposed collection pond-Derena Johad

Sr. No	Subproject component	Environmental Features of the Site	Photographs
		• Total land available is approximately 28,100 m^2 which is adequate for the collection pond. • The storm water from SWPS Fire brigade will be disposed into the Dedhana Johad location near Sikar Road outside the Nawalgarh town • Presently, the Derena Johad is on open land. In present proposal digging of Derena Johad, stone pitching and fencing are proposed. • No tree felling is envisaged.	
6	Laying of rising and gravity mains and road restoration	• **Rising and gravity main pipelines** are proposed for disposal of storm water from Storm Water Pumping Station (SWPS) and Storm Water collection chambers to designated disposal points respectively. The rising mains comprises laying of DI K-9 pipe of 1.75 km with diameter 600M and Gravity mains comprises laying of NP 4 pipe of 3.4 km of diameter 500-600 mm. • Rising and gravity main pipelines are proposed in the right of way (ROW) are proposed in the right of way (ROW) of government road, which is owned by Municipal board, Nawalgarh. • No commercial establishment - permanent shops or mobile vendors exist along the route and no economic impact or physical relocation and impact is anticipated. • The pipelines will be laid on the centre of the roads/either of left or right hand side on the road. • The stair cases and access ramps of the residences constructed over the existing drains will not be dismantled as pipelines will be laid through road cutting on the centre of the road. • No tree cutting is envisaged for construction of rising main/gravity mains. • Nawalgarh is a heritage town and is famous for its fresco and havelis. Some of the famous	 

Sr. No	Subproject component	Environmental Features of the Site	Photographs
		structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, Roop Niwas Palace etc. The proposed alignment of the rising main and gravity main pipelines are at considerable distance from such structures. No subproject activity will be conducted within the immediate vicinity of the heritage structures. • The roads will be restored to its original condition as was during pre-project phase.	

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

120. 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.

121. 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.

122. 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).

123. 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.

124. 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 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 (Municipal Council) 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.

B. Location Impacts

125. **Tree cutting at project sites:** As per preliminary survey, it was found that no tree cutting is required for implementation of the project.

126. 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). 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; and
(iv) Plant and maintain 3 trees for each tree that is removed.
(v) Community consultation will be conducted before and during tree cutting

127. **Distance from Protected Sites.** There are no protected areas, forest blocks, wetlands, mangroves, or estuaries in or near the project locations. Screening of project area based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected area within 50 km of Nawalgarh town (Appendix 7). However, there are five conservation reserves[9] declared by State forest department within the 50 km radius of project area (i) Shakambari Conservation Reserve, which is about 24 km of Nawalgarh city, (ii) Beed Jhunjhunu Conservation Reserve, which is about 42 km (iii) Bansiyal Kethadi Conservation Reserve, which is about 44 km (iv) Bansiyal - Khetri Bagore Conservation Reserve which is about 42 km and (v) Mansa mata Conservation Reserve which is about 40.2 km from Nawalgarh City (Project area).

128. **Heritage Structures**. Nawalgarh is a heritage town and is famous for its fresco and havelis[10] and considered as Golden City of Rajasthan. Nawalgarh town has no state protected monuments or ASI protected monuments. Some of the famous structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, Roop Niwas Palace etc. The proposed alignment of the rising main and gravity main pipelines are at considerable distance from such structures . No subproject activity will be conducted within the immediate vicinity of the heritage structures. Further, in general the project has in place measures to ensure impact to common property resources (CPRs) are avoided. This includes:

(i) unused, vacant government sites and existing project sites are preferred ensuring safe distance from the heritage structures, CPRs and other religious or cultural structures;

(ii) project design ensures that excavation and other construction works will not entail structural damage to the CPRs;

(iii) Contractors with the supervision of PMU will ensure that construction works particularly alignment for the rising/gravity mains works will not cause disturbance or damages to the CPRs,

(iv) providing proper signage, barricades etc. during construction works.

[9] Conservation reserves are **a type of protected area intended to protect significant natural and cultural features**
[10] Haveli is usually multi-storey, organized around two courtyards in India.

C. Pre-construction Impacts

129. **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-

- identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase;
- take prior permission from/intimation to concerned line agencies for shifting the existing utilities; and
- Instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

130. **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 avoid disposals near forest areas, water bodies, swamps or in areas which will inconvenience the community. Construction 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.

131. **Site selection of sources of materials.** Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural Storm water management project 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 Storm water management project 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.

132. **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 follow all the prescribed rules[11]during construction and adhering to following criteria (including but not limited to)-

- The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
- The local governing body and community shall be consulted while selecting the site.

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

- 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 Municipality through PIU for approval
- Debris disposal site shall be at least 200 m away from surface water bodies[12].
- No residential areas shall be located within 100 m downwind side of the site.
- The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.

D. Construction Impacts

133. 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.

134. 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

135. 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 stretch (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.

136. **Demolition works.** In the initial stage of project planning it is accessed that Road cutting will be required No demolition is required for implementation of project. However, if 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

[12] In the absence of site meeting the stipulated criteria, an alternate site can be selected specifying the reasons. In such a case, the construction camp management plan should incorporate additional measures specific to the site as suggested by the Construction Manager.

prior to start of demolition activities with prior permission/approval of PIU/ULB. All the safety measures should be adopted during demolition activities.

137. **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 leveling; 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[13] and shall identify a soil/debris disposal site in consultation with the PIU/ULB and adhering to following criteria:

- The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
- Debris disposal site shall be at least 200 m away from any surface water body.
- No residential areas shall be located within 200 m downwind side of the site.
- The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.
- The local governing body and community shall be consulted while selecting the site.
- Contractor is required to prepare plan for disposal of construction and demolition waste including excavated earth in the designated site/sites and submit the plan in PIU to be approved by Municipal Council as per Construction and Demolition Waste Rules 2016
- Soil storage site should be properly demarcated by fencing and information board should be placed at entrance
- At soil storage site soil should be covered by tarpaulin or regular water sprinkling should be done to reduce dust emission
- 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

138. **Silt and sludge removal** is regular activity conducted by ULB every year before start of monsoon. The Provision are considered in BOQ for silt 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:

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

[13] Construction and Demolition Waste Management Rules 2016 and Solid Waste Management Rules 2016

- identify beneficial uses or dispose at suitable disposal site in consultation with the PIU/ULB:

139. **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:

- Use material sources permitted by government[14];
- Verify suitability of all material sources and obtain approval of PIU;
- 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
- 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

140. **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:

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

141. **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 Storm water management project system of town. These potential impacts are temporary and

[14]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.

short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

- Prepare and implement a spoils management plan;
- 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
- Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
- Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
- Install temporary silt traps or sedimentation basins along the storm water leading to the water bodies;
- Place storage areas for fuels and lubricants away from any storm water leading to water bodies and provide impermeable lining under the storage yard of fuels and lubricants
- Dispose any wastes generated by construction activities in designated sites;
- 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
- Conduct surface water quality Monitoring according to the Environmental Management Plan (EMP)

142. **Noise and Vibration Levels.** Construction works will be conducted along the roads ROW and vacant lands in Nawalgarh 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:

- 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;
- Use road cutters instead of breaker/hammer for cutting the road before excavation on roads
- Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
- 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;
- DGs being used at site should have sound reducing (acoustic) enclosures, preferably silent DGs should be used at site;
- 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;
- Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
- 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.;

- Provide all workers appropriate PPEs like ear plug/muff, working in high noise conditions;
- Keep all vehicles and equipment in good conditions to avoid excessive noise generation;
- 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;
- Avoid noisy works in nights in inhabited areas to avoid any disturbance to habitants; and
- Consult in advance with habitants and inform them about the nature and duration of works
- Conduct noise monitoring according to the Environmental Management Plan (EMP)

143. **Management Plan for Night works.** If required , following requirements should be fulfilled for construction works at night hours-

- 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.
- Contractor should plan for night works only after directions from PMU/PIU/CMSC
- Contractor should submit plan for night works for approval from PIU.
- PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, resident's welfare association/business association/vyapar of the affected areas and their consents/permissions should be taken prior to start of night works.
- 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.
- Contractor is required to have following equipment/arrangements for night works-
    - ✓ Contractors should have hand held noise level meter for measurement of noise during night hours
    - ✓ Contractors should have hand held lux meter for the measurement of illumination during night hours
    - ✓ Preferably electrical connections is available for running equipment otherwise sound proof/super silent Diesel Generator set should be available
- Sound level should not increase as per following-

Type of area of work	Maximum noise level dB(A)
Industrial	70
Commercial	55
Residential	45
Silence zone	40

- 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

- 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
- All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time
- Workers engaged in night works should have adequate rest/sleep in day time before start of night works
- 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
- 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
- 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
- Horns should not be permitted by equipment and vehicles
- Workers should not shout and create noise
- First aid and emergency vehicles should be available at site
- Emergency preparedness plan should be operative during night works
- Old persons and pregnant women and women having small kids should not work in night time
- All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise
- All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works
- PIU/CMSC site engineers and contractor's safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and video graphic records as well as register the observations
- Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement
- After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians
- Drivers and workers should be alert and responsive during night works
- All the wages to workers working in night hours should be as per the applicable labour acts
- Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours
- Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

144. **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:

- Prepare and implement spoils management plan;
- Avoid stockpiling of excess excavated soils;
- Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas;
- Recover used oil and lubricants and reuse or remove from the sites;
- Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- Minimize removal of vegetation and minimize cutting of trees;
- If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and
- Plant three native trees for every one that is removed.
- Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

145. **Groundwater Quality**. Another physical impact that is often associated with excavation is the effect on storm water drains and the local water table if groundwater and surface water collect in the voids. 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:

- Prepare and implement a spoils management plan (**Appendix C-13**);
- Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
- Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
- Install temporary silt traps or sedimentation basins along the Storm water drains leading to the water bodies;
- Place storage areas for fuels and lubricants away from any Storm water drains leading to water bodies;
- Dispose any wastes generated by construction activities in designated sites; and
- Conduct periodical ground water quality monitoring according to the Environmental Management Plan (EMP).

146. **Accessibility.** Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. 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:

- Prepare and implement a Traffic Management Plan **(Appendix C-14**)
- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
- Schedule transport and hauling activities during non-peak hours;

- Locate entry and exit points in areas where there is low potential for traffic congestion;
- Keep the site free from all unnecessary obstructions;
- Drive vehicles in a considerate manner;
- Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
- Excavated roads to be wetted through water sprinkling to reduce dust emission
- Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts
- Providing and fixing OPEN including strutting, shoring and packing cavities (wherever required)
- Providing and fixing CLOSE timbering including strutting, shoring and packing cavities (wherever required)

147. **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:

- Prepare and implement spoils management plan (**Appendix C-13**);
- Leave spaces for access between mounds of soil;
- Provide walkways and metal sheets where required to maintain access across for people and vehicles;
- Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools;
- Consult businesses and institutions regarding operating hours and factoring this in work schedules; and
- Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
- Notify community/ water users in advance about likely interruptions in water supply.
- Provide alternate sources of clean water until water supply is restored.
- Provide all mitigation measures as given in resettlement plan (RP) prepared for the project to mitigate impacts on vendors and shopkeepers

148. **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:

- 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
- Secure construction materials from local market.

149. **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:

- Comply with all national, state and local labor laws (see **Appendix C-12**);
- 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[15] for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
- Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
- Provide medical insurance coverage for workers;
- Secure all installations from unauthorized intrusion and accident risks;
- 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
    c. Provide necessary medicine and facilities to take care of dehydration related health issues
- Provide supplies of potable drinking water;
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances.
- 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;
- 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;
- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- Ensure moving equipment is outfitted with audible back-up alarms;
- 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
- 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.

150. **Asbestos Materials.** No Asbestos containing material (ACM) is proposed to be used in the subproject construction. In the existing pipelines there are no asbestos cement (AC) pipes.

[15] 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.

151. **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. The construction contractor will be required to:

- Plan routes to avoid times of peak-pedestrian activities.
- Liaise with PIU in identifying risk areas on route cards/maps.
- Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
- Provide road signs and flag persons to warn of on-going trenching activities.
- Survey the surrounding vulnerable buildings for likely issues in structural stability/ differential settlement during the excavation works;
- Provide prior information to the local people about the nature and duration of work;
- 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.
- Do not park heavy construction machinery on roads
- Avoid storing excavated material on road.

152. Central part of the town is characterized by narrow roads. Particularly, the areas located on slopes have very narrow roads with sharp turns and are accessible only to pedestrians. Besides impeding the access, the trench excavation and pipe laying will pose safety risks to pedestrians, and the people living in these areas. The construction contractor will be required to:

(i) Trench excavation works shall be conducted in a safe manner; if the allowing public movement along the work sites (pedestrians or vehicles as the case may be) is likely to cause safety risks, movement should be blocked temporarily and work shall be conducted; in such areas, conducting night work or working in small stretches to avoid blockage of traffic/movement no more than few hours in due consultation with the local community and ULB shall be planned;
(ii) All trenches deeper than 1.5 m shall be provided with safety shoring/braces;
(iii) Survey the surrounding vulnerable buildings for likely issues in structural stability/ differential settlement during the excavation works;
(iv) Provide prior information to the local people about the nature and duration of work;
(v) Conduct awareness program on safety during the construction work;
(vi) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day; and
(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.

153. **Work Camps.** It is likely that the contract may employ workers from outside project area, and therefore may provide temporary workers accommodation during the construction phase. Proper provision and maintenance of facilities is necessary for proper living conditions and avoid health, environment and safety issues. Workers camps may also adverse impacts on surrounding communities. Operation of construction 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:

- Consult PIU before locating project offices, sheds, and construction plants;
- Minimize removal of vegetation and disallow cutting of trees;
- Provide drinking water, water for other uses, and sanitation facilities for employees;
- Provide temporary rest and eating area at all work sites;
- 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 accommodation16 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**);
- Prohibit employees from poaching wildlife and cutting of trees for firewood;
- Train employees in the storage and handling of materials which can potentially cause soil contamination;
- Recover used oil and lubricants and reuse or remove from the site;
- Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- Report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

154. **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. The contractor will require to follow the mitigation measures as given below-

- 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
- 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.
- 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,
- provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.

155. **Physical Cultural Resources.** There are no State or ASI protected monuments in Nawalgarh. However, notable or significant heritage structures (Havalies and others) monuments in Nawalgarh project area were considered for impact assessment. Some of the famous

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

structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, Roop Niwas Palace etc. The proposed alignment of the rising main and gravity main pipelines are at considerable distance from such structures and therefore, no impacts envisaged. Considering the historical background of Nawalgarh town, the 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

(iii) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
(iv) Stop work immediately to allow further investigation if any finds are suspected;
(v) Inform local Archaeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ; and
(vi) Prepare a chance find protocol (Appendix C-26)

156. **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:

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

E. Operation and Maintenance Impacts

157. The design year for all the civil structures of storm water drainage components is year 2055, 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.

158. 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. Local body will also ensure that no wastewater and sewage enter in to proposed drains. Local body will also conduct awareness programs to prevent disposal of solid waste into drains.

159. The new drainage system 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. Construction of three collection chambers, one collection pond and one pumping station to dispose of storm water from the collection chambers in flood / inundation prone areas will ensure that similar pools do not re-form in the future. With implementation of the project the quality of the town environment will improve significantly.

160. **Project Benefit:** The citizens of the Nawalgarh city will be the major beneficiaries of the improved Storm water drainage, 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

161. 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.

162. 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, Nawalgarh Nagar, 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

163. 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 December 2021. (**Appendix 3**).

1. Consultation during Project Preparation

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

165. 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.

166. Informal and formal consultation are conducted with local population of the area, about at 04 places along with proposed alignment with about 28 persons (25 male and 3 females) in December 2021. 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 Storm water management project works as they were suffering with poor Storm water management project 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 Storm water management project system, for its best functioning and to have the maximum health and aesthetic benefits. Details of public consultations are given in **Appendix 3**.

167. A town-level City Level Committee (CLC) has been formed in Jhunjhunu 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 under the Chairmanship of District Collector, Jhunjhunu, in Nawalgarh on dated. 16.09.2021 to discuss the matter of proposed Storm water management project works in Nawalgarh. The meeting was attended by, DPR consultants, RUDSICO-EAP officials, PHED officials, Municipal Council officials, Water Resource Department, PWD and other invitee members. Proposed scope of works and technology of proposed Storm water management project works in Nawalgarh 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, and minutes are attached in **Appendix 3**.

2. Consultation During Construction

168. Prior to start of construction, Nawalgarh Municipal Corporation (NMC) and Nawalgarh Development Authority (NDA) 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.

169. 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

170. Executive summary of the IEE will be translated in the local language and made available at the offices of NoDA/JMC, RUDSICO-EAP- PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Nawalgarh. 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 /NMB/RUDSICO-EAP after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

171. 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.

172. 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

173. 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)[17] the system was effective in timely resolution of grievances in

[17] 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.

a transparent manner.[18] 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.[19]

174. **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.

175. 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

176. 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[20] or by sending a WhatsApp message to the PIU[21] or by dialing the phone number of town level PIU/CAPPC or by dialing a toll-free number.[22] 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.[23] 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

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.

[18] 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.

[19] 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.

[20] 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.

[21] 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.

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

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

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)[24] 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; and

(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.[25] In its role as a GRC, the CLC will meet whenever there is an urgent, pending 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.

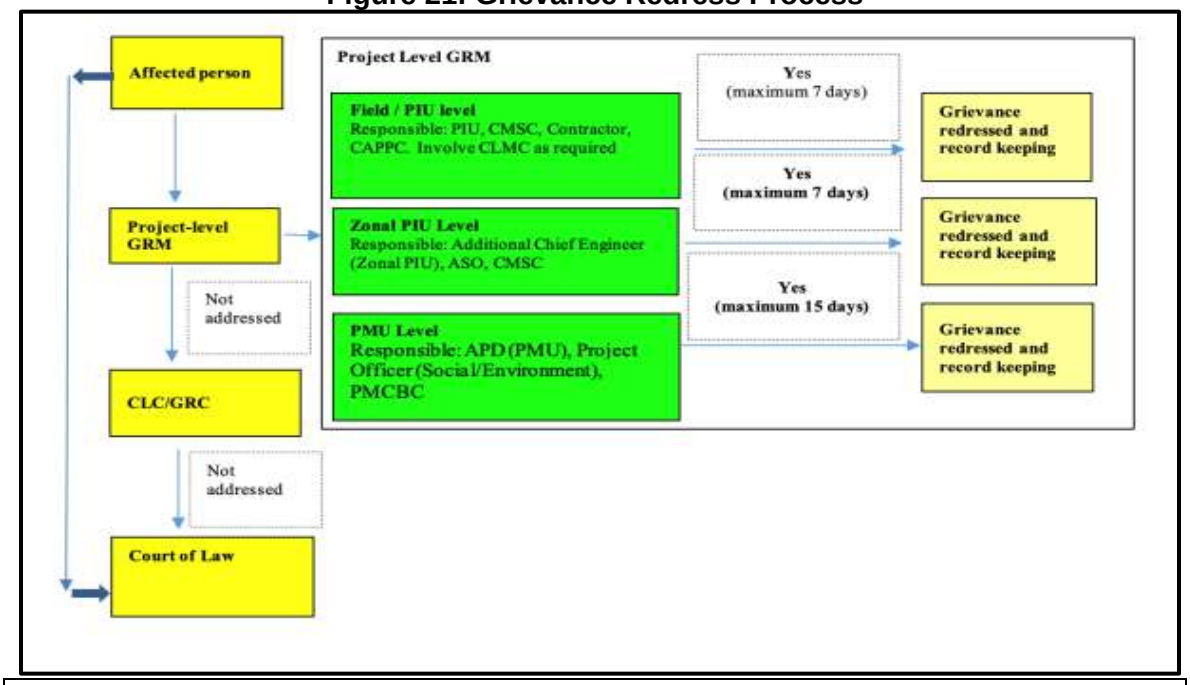
(v) The multi-tier GRM for the project is outlined below (**Figure 21**), each tier having time-

[24] 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.

[25] 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.

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 21: 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.

177. 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.[26]

178. 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[27].

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

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

179. **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 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.

180. **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.

181. **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.

182. 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 Nawalgarh) 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

183. 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.

184. 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.

185. 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.

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

Table 15: 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	(vii) 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
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 necessary plans to prepare and implement the health and safety requirements.	EMP included in Bid Document	PMU	Project Costs

Table 16: 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 A compliance checklist is appended to this report (**Appendix 2**)	Consents, permits, clearance, NOCs, etc.	PIU and Nawalgarh 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 Nawalgarh 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 wires, water lines and gas pipe line within proposed project area	(i) Identify and include locations and 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.	-List and maps showing utilities to be shifted (i) List of affected utilities and operators; (ii) Bid document to include requirement for a contingency	Contractor in collaboration with PIU and with approval of PMU	Consultant / PIU	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		(iii) Require contractors to prepare spoils management plan (**Appendix C-13**) and traffic management plan (**Appendix C-14**)	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**)			
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal 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 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 avoid direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, ensure (a) site shall be	-List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal -Waste management plan - Written consent of landowner/s (not lessee/s) for reuse of excess spoils	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 contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (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 settlements, ponds/lakes or other water bodies.	to agricultural land			
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural Storm water management project 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 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.	(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
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.	Consents, permits, clearance, NOCs, etc.	PIU and Consultants	PIU	No cost required. Cost of obtaining all consents,

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		(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 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	Incorporated in final design and communicated to contractors.			permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU. Mitigation measures are part of TOR of PIU and Consultants

Table 17: 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. (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	(i) Certificate of Completion (Safeguards Compliance Orientation) (ii) Posting of Certification of Completion at worksites (iii) Posting of EMP at worksites	Construction Contractor	CMSC/ PIU	Cost of EMP Implementation Orientation Training to contractor is responsibility of PMU. Other costs responsibility of contractor.
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,	(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.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	particulate matter, nitrous oxides, and hydrocarbons.					
Water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during construction can contaminate nearby surface water quality.	(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; (ii) Install temporary silt traps or sedimentation basins along the Storm water management project leading to the water bodies; (iii) Place storage areas for fuels and lubricants away from any Storm water management project 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)	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) Number of silt traps installed along trenches leading to water bodies; (iii) Records of surface water quality Monitoring; (iv)Effectiveness of water management measures; (v) No visible degradation to nearby Storm water management projects, Nalas or waterbodies due to civil works	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
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;	(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)-	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
		(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 distance of 10 m or more from the vehicle/s. (v) Quarterly environmental monitoring for ambient noise as per EMP	No complaints from sensitive receptors;			
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	(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	(i) desilting schedule and proposed method (ii) PPEs to workers	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
	community heath and safety	(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 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:	(iii) Reuse or disposal site identification			
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) Prepare and implement spoils management plan (**Appendix C-13**); (ii) Avoid stockpiling of excess excavated soils; (iii) Coordinate with ULB/PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas; (iv) Recover used oil and lubricants and reuse or remove from the sites; (v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and	(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 .	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
		(vii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.				
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;	(i) Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite	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
		(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; (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.	(ii) Complaints from sensitive receptors; (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 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,	(i) Complaints from sensitive receptors; (ii) 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
		place of worship, business establishment, hospitals, and schools; (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 best practice health and safety guidelines: IFC's General EHS Guidelines[28] and Sector Specific (Water and Sanitation) Guidelines[29]	(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;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

[28]https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[29] https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(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 followed for all site activities; and (e) documentation of work-related accidents; (ii) Conduct work in confine spaces, trenches, and at height with suitable precautions and using standards and safe construction methods; do not adopt adhoc methods; all trenches deeper than 1.5 m shall be provided with safety shoring/braces; (iii) Ensure that qualified first-aid can be 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,	(vi) 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
		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; (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				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		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 a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. (xv) 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	(i) Trench excavation shall be conducted in a safe manner; if the allowing public movement along the work sites (pedestrians or vehicles as the case may be) is	(i) Traffic Management Plan (**Appendix C-14**); (ii) Complaints from sensitive receptors	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	during material and waste transportation	likely to cause safety risks, movement should be blocked temporarily and work shall be conducted; in such areas, conducting night work or working in small stretches to avoid blockage of traffic/movement no more than few hours in due consultation with the local community and ULB shall be planned (ii) All trenches deeper than 1.5 m shall be provided with safety shoring/braces; (iii) Survey the surrounding vulnerable buildings for likely issues in structural stability / differential settlement during the excavation works (iv) Provide prior information to the local people about the (v) Plan routes to avoid times of peak-pedestrian activities. (vi) Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. (vii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (viii) Provide road signs and flag persons to warn of on-going trenching activities.				responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
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 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.	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
		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. 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	Trench excavation in in narrow streets will pose high risk to children and	(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	-H&S plan including appropriate signs for each hazard present -Construction vehicles condition in H&S plan.	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
pedestrians in narrow streets	elders in the locality	(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	Complaints from neighbourhood and monitoring of accidents			
Work Camps and work sites	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants Unsanitary and poor living conditions for workers	(i) Consult with 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) Ensure conditions of liveability 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.	(i) Complaints from sensitive receptors; (ii) Drinking water and sanitation facilities for employees – (iii)Condition in list of preapproved sites for construction work camps, areas for stockpile, storage and disposal prepared by the Contractor.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Impacts due to night works (if	Occupational hazards which	(i) Contractors should have hand held noise level meter for	As per Management Plan	Contractor	CMSC/ PIU	Cost for implementation

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
required as per nature of works and feasibility at site)	can arise during work at night in extreme and unavoidable cases	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 equipment otherwise sound proof/super silent Diesel Generator set should be available (iv) Sound level should not 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 equipment's 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	for night works (**Appendix – C-18**).			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
		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 and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests (xii) Horns should not be permitted by equipment 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 equipment's being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(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	(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 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, (iv) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.	Chance find protocol (**Appendix C-26**)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
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	As per monsoon preparedness plan& as per **Appendix-C-19** "Guidelines for Safety during	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) 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**	Monsoon/Heavy Rainfall"			
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 (vi) follow guidelines of WHO/Central/State/Local government and RUDSICO-EAP regarding COVID-19 (refer **Appendix C-23 & 24**)	Compliance of COVID-19 protocol and guidelines	Construction contractor	CMSC/ PIU	Contractor
Post-construction clean-up	Damage due to debris, spoils, excess	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and	PIU/Consultant report in writing that	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	construction materials	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 regressed 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.	(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.			responsibility of contractor.

Table 18 : 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 Storm water management project	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	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

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		scientific manner Ensure traffic management during cleaning of drains and transportation of silt and solid waste				
Illegal discharge of wastewater and solid waste into to drains	Contamination and creating insanitary conditions	Local body to ensure that no wastewater outlets are connected to or discharging into drains Create awareness, and conduct IEC activities on solid waste disposal into drains; display boards carrying the messages of DO's and Don'ts	Visual inspection	Nawalgarh Municipal Board	Nawalgarh Municipal Board	Nawalgarh Municipal Board
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	Nawalgarh Municipal Board	Nawalgarh Municipal Board	Nawalgarh Municipal Board
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	Nawalgarh Municipal Board	Nawalgarh Municipal Board	Nawalgarh Municipal Board
Safety precautions during Storm water management project cleaning	Health and safety risk to workers engaged in Storm water management project 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.	Nawalgarh Municipal Board	Nawalgarh Municipal Board	Nawalgarh Municipal Board

Table 19: 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
Ambient air quality	At 4 different locations to be decided by the Environment Specialist of PMCBC.	PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO	Once before start of construction and yearly 3 times excluding monsoon season during construction periods (18 months period considered).	Contractor	Cost for implementation of monitoring measures responsibility of contractor (24 samples)
Ambient noise	At 4 different locations to be decided by the Environment Specialist of PMCBC	Day time and night time noise levels	Once before start of construction and yearly 3 times excluding monsoon season during construction periods (18 months period considered).	Contractor	Cost for implementation of monitoring measures responsibility of contractor (24 samples)

Table 20 : 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	Nawalgarh Municipal Board	Nawalgarh Municipal Board
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	Nawalgarh Municipal Board	Nawalgarh Municipal Board
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	Nawalgarh Municipal Board	Nawalgarh Municipal Board

B. Institutional Arrangements

187. 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.

188. 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.

189. **Project Management and Capacity Building Consultant (PMCBC).** 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.

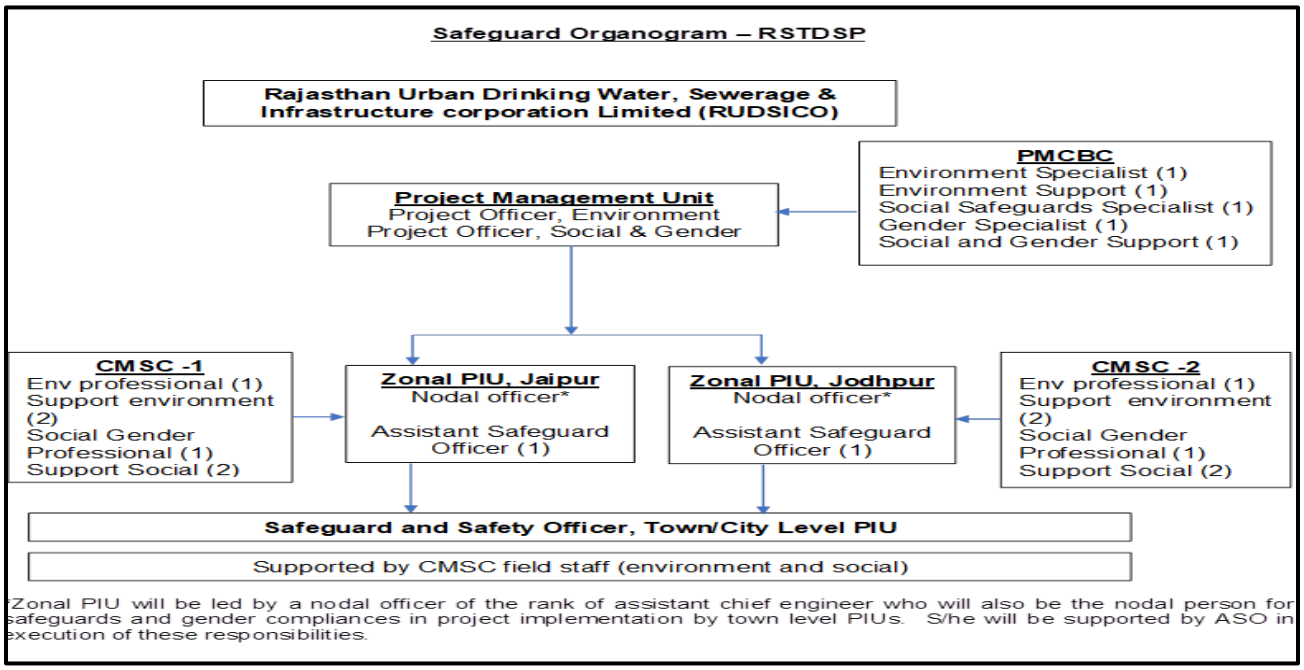
190. There are two zonal PIUs already established in Jaipur and Jodhpur. One PIU shall be established at every town before award of new projects. PIUs at the town-level shall be headed by a Superintending Engineer / Executive Engineer, who shall work as Project Manager and shall sign the contract documents,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

191. **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.

192. **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.

193. **Figure 22** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table 21** summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 22: Environmental Safeguards Implementation Arrangement



194. **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 Nawalgarh, 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 21**.

195. 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.

196. **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.

197. 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 21**.

198. **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 21**.

199. **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[30] consultations with interested/affected people, (iv) field-level grievance redress; and (iv) reporting.

200. 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.

201. 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.

202. 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.

Table 21: 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	(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	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

[30] 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.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	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. (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.	(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	
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	(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,	(i) Conducting environmental monitoring, as specified in the EMP. (ii) Issuance of clearance for contractor's post-construction activities as specified in the EMP.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	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.	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	
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 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	(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.	
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.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
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 workers and posted at visible places at all times.	(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-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.	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

C. Capacity Building and Development

203. 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.

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

220. 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 22.

Table 22: Capacity Building Program on EMP Implementation

Sr. 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	All staff and consultants involved in the project All contractors before start of construction works or during mobilization stage.	PMU cost Contractors cost as compliance to contract provisions on EMP implementation

	-Traffic management plan -Spoils management plan -Waste management plan - Chance find protocol - O&M plans - Post-construction plan	At PIU	
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

221. 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.

222. 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.

223. Quarterly report shall be prepared by CMSC and PIU and submitted to PMU for review and further actions.

224. 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.

225. 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.

226. 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

227. 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 23)**.

Table 23: Cost Estimates to Implement the EMP

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
A.	**Mitigation Measures**						
	Compensatory plantation measures*	Construction	per tree	30	4050	12,1500	Civil works cost
	Subtotal (A)					**121,500**	
B.	**Monitoring Measures**						
1	Air quality monitoring**	Pre-construction and Construction (quarterly)	per sample	24	4920	118,080	Civil works cost
2	Noise levels monitoring**	Pre-construction and Construction (quarterly)	Per sample	24	1980	47,520	Civil works cost
	Subtotal (B)					**165,600**	
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**						

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
1	Water Sprinkling for dust suppression	Construction	KL	1000	111	111,000	Civil works cost
2	**Barricading**						
	Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts	Construction	m	11000	48.1	529,100	Civil works cost
	Sub Total (D)					**640,100**	
E	**Grievance Redressed Mechanism**				Lump sum	50,000	Civil works cost
	Sub Total (E)					**50,000**	
	Total (A+B+C+D+E				**INR**	**1,302,200**	

* * During the preliminary survey, certain sites were not accessible, and as part of the EMP costing, a total of 10 trees on the higher side were taken into consideration. During service improvement Plan contractor will be required to confirm actual number of tree cutting. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works.

Summary of EMP Cost incurred by Institution:

Contractor Cost - INR 1,027,200/-
PMU Cost - INR 2,75,000/-
Total - INR 1,302,200/-

(In Words: Rupees Thirteen Lacs Two Thousand Two Hundred only)

X. CONCLUSION AND RECOMMENDATION

228. The process described in this document has assessed the environmental impacts of all elements of the Nawalgarh Storm water management project. 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 works 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. Nawalgarh initially had a natural system of drainage and governed by the physiographic profile. Over the years, the population grew and utilizing the available open space more intensely, which has changed the natural drainage physiographic system. As per discussion with Nawalgarh Municipal Board and as per preliminary survey, following locations namely, Fire Brigade, Bakra Mandi, Swaliyon ka Jav and Bhakton ka Johad are majorly flood affected areas in the town. It is causing considerable inconvenience to general public and economic losses as no business/marketing activity can be carried out in and around these areas during water logging period. This is a recurring problem for which a suitable surface drainage system needs to be developed. Presently, Municipal Board is managing the flooding situations with temporary arrangements by pumping the received runoff from these locations to other low-lying areas at the outskirt of the town.

231. Presently the roads in Nawalgarh town are provided with open drains, but most of the drains are silted resulting in overflow and resulting flooding in monsoon. As reported by Nawalgarh Municipal Board, the total length of drains is approximately 16 Km. An efficient network of storm water drains and outfall system is required to drain out storm water runoff. Deficiency of the existing system, i.e., water logging and lack of disposal arrangement prompt immediate need of upgrading / revamping existing drainage system.

232. The subproject is formulated to address gaps in storm water drainage infrastructure in a holistic and integrated manner. There is lack of outfall system in the project area. Therefore, to ensure proper disposal of surface runoff in order to avoid inundation of city areas and streets, construction of storm water collection chambers at three locations and a storm water pumping station, along with laying of rising and gravity mains from the pumping station/collection chambers up to the respective disposal points are proposed under the subproject.

233. Nawalgarh has both urban areas surrounded by land that was converted for agricultural use many years ago. There are no protected areas, forest blocks, wetlands, mangroves, or estuaries in or near the project locations. Screening of project area based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected area within 50 km of Nawalgarh town.

234. Nawalgarh town has no state protected monuments or ASI protected monuments. Nawalgarh is a heritage town and is famous for its fresco and havelis and considered as Golden City of Rajasthan. Some of the famous structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, Roop Niwas Palace etc. The proposed alignment of the rising main and gravity main

pipelines are at considerable distance from such structures . No subproject activity will be conducted within the immediate vicinity of the heritage structures. Further, in general the project has in place measures to ensure impact to common property resources (CPRs) are avoided.

235. 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.

236. Anticipated impacts of proposed Storm water drainage project during operation and maintenance will be related to check and repair of blocks, overflows and leakages in pipelines. 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.

237. 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.

238. The Environmental Management Plan (EMP) 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. Total estimated cost for EMP implementation is INR.1,302,200/- (Rupees Thirteen Lacs Two Thousand Two Hundred only).

239. 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.

240. The project will benefit the general public by contributing to the long-term improvement of Storm water drainage system and community livability in Nawalgarh. The citizens of the Nawalgarh city will be the major beneficiaries of the improved storm water drainage, 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.

241. The proposed project is unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of

recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and 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).

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

- Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
- Include this IEE in bid and contract documents;
- Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation
- Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location;
- Conduct safeguards induction to the contractor after award of contract;
- Ensure contractor appointed qualified environment, health and safety (EHS) officers prior to start of works;
- Timely disclosure of information and establishment of GRM;
- Involvement of contractors, including subcontractors, in first level GRM;
- Strictly supervise EMP implementation;
- Continuous consultations with stakeholders;
- Urban local body will ensure that no industrial wastewater and sewerage enter in storm water drainage system.
- 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)/Nawalgarh Storm water management project, Distt. Jhunjhunu, 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?		√	
Adjacent to or within any environmentally sensitive areas?		√	There are no environmental sensitive areas near the proposed sites.
Cultural heritage site		√	Nawalgarh is a heritage town and is famous for its fresco and havelis[31] and considered as Golden City of Rajasthan. Nawalgarh town has no state protected monuments or ASI protected monuments. Some of the famous structures are Morarka Haveli, Poddar Haveli, Sheesh Mahal, Roop Niwas Palace etc
Protected Area		√	There are no protected areas, forest blocks, wetlands, mangroves, or estuaries in or near the project locations.Screening of project area based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected area within 50 km of Nawalgarh town (**Appendix 7**).
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	

[31] Haveli is usually multi-storey, organized around two courtyards in India.

SCREENING QUESTIONS	Yes	No	REMARKS
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 Storm water management project 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?	√		Nawalgarh is predominantly semi-arid and rainfall is moderate
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), Nawalgarh Storm water management project, District - Jhunjhunu, Rajasthan
Sector : Urban Development
Subsector: Urban Storm water management project
Division/Department: **SARD/SAUW**

Screening Questions		Score	Remarks[32]
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 be envisaged in future which likely affect the performance of project output

Options for answers and corresponding score are provided below:

[32] 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.

Response	Score
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 Nalos and the anticipated environmental impacts are very marginal and the construction activity does not impose any threat to the existing climatic conditions.

Appendix 2: Compliance with Environmental Criteria for Subproject Selection

Components	Criteria	Compliance
All subprojects		
	Subproject will avoid potentially significant adverse impacts that are diverse, irreversible or unprecedented (ADB SPS Category A for environment).	Complied- Sub project is not having significant adverse impacts, anticipated impacts are temporary and reversible and can be mitigated through mitigation plans suggested in IEE
	Comply with all requirements of ADB SPS 2009 and follow procedures set in this EARF.	Complied- Sub project complies all the requirements of ADB SPS 2009
	Comply with relevant national, and local laws, rules and regulations regarding EIA, environmental protection, pollution prevention (water, air, noise, solid waste, etc.), wildlife protection, core labor standards, physical cultural resources, health and safety, and other laws in specific sectors as indicated below	Complied- Sub project complies all relevant national and local laws, rules and regulations applicable to this type of sub projects
	Reflect inputs from public consultations	Complied- Stakeholder's consultations are conducted in the project planning phase and suggestions are incorporated in project designs
Location	Avoid involuntary resettlement by prioritizing rehabilitation over new construction using vacant government land where possible, and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts	Complied- All components of sub project are planned on government land only. No land acquisition is done to avoid any involuntary resettlement.
	Avoid or minimize the cutting of trees	Will be Complied- Tree cutting will avoided as far as possible and if tree cutting is unavoidable, it has been minimized to lowest level and If any tree cutting is required for construction works, prior permission from local administration for tree cutting will be required and compensatory plantation as per RUDSICO-EAP policy will also be required
Biodiversity	Avoid locating subprojects in critical habitats, such as, but not limited to, wildlife/bird sanctuaries, national parks, tiger reserves, elephant reserves, conservation reserves or core zone of biosphere reserves. **Appendix 7** provides preliminary analysis using the International Biodiversity Assessment Tool (IBAT) key biodiversity areas, protected areas, IUCN red list species and likelihood of critical habitats per town.	Not applicable- There are no any environmentally protected areas, core zones of biosphere reserves and highly valued habitat within the impact area of project components.

	Should not directly affect environmentally protected areas, core zones of biosphere reserves and highly valued habitat	
	If work is proposed with the aim of improving the conservation or management of designated subproject sites (e.g. improved Storm water management project), this must only be undertaken: (i) after a comprehensive study and development of management plans and criteria; and (ii) with the direct involvement and approval of national and local bodies responsible for the subproject site.	Not applicable
Physical Cultural Resources	Should not result in the destruction/damage of or encroachment onto physical cultural resources (PCR) [33] such as archaeological monuments; heritage sites and movable or immovable objects, sites, structures, group of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance.	In Nawalgarh No ASI or state protected monument exists
Existing Facilities to be rehabilitated or expanded	Conduct environmental audit of existing facilities[33] per ADB SPS	Not applicable to this sub project
Associated Facilities[34]	Analyze environmental impacts and risks to be included in the IEE	Not applicable to this sub project
Asbestos-containing materials (ACM) including, but not limited to, pipes, roofing, ceilings, insulation materials, excess pipes stored in PHED campuses, walls, etc.	Avoid handling or removing any ACM. Ensure asbestos concrete (AC) pipes facilities containing asbestos will not be disturbed and left in-situ. **Appendix C-20** (of EARF) provides asbestos management plan. RUDSICO shall include AMP in all contracts.	Not applicable to this sub project
	When designing subproject infrastructure that involves excavation in urban areas the relevant authorities must be consulted to ascertain the location of any ACM prior to any subproject activity. Locations of new infrastructure must	Not applicable to this sub project

[33] Physical cultural resources as defined as “movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground or under water. Their cultural interest may be at the local, provincial, national, or international level.”

[34] ADB SPS Appendix 1 para 6 defines associated facilities as “not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project”

	then be designed to avoid excavating or disturbing any ACM.	
Right-of-way	Locate water supply pipelines within the right of way (ROW) of other linear structures (roads, irrigation canals) as far as possible, to reduce new land acquisition.	Not applicable to this sub project
	Ensure that pipelines ROW do not require land acquisition from individual farmers that is a significant proportion of their total land holding (>10%).	Not applicable to this sub project

Appendix 3: Summary of Public Consultations Conducted During Project Preparation

A. Consultations during Conducted During Project Preparation

Consultations were done during project preparation with residents of the town at various locations to understand their views and opinions about the present drainage 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-

Location/ Date	Total Number of Participants	Topic Discussed	Outcome
08.12.2022 Near Bakra Mandi, Nawalgarh	Total-12 Male-11 Female 01	Awareness of the project-including Project Coverage area. Present condition of Sewerage, Drainage and Solid Waste facilities and problem in the town. In what way people may associate with the project and can improve Health and Hygiene conditions in the town	People were not aware about the subproject proposed in the town. People were concerned about the poor sewerage and drainage conditions in the town. Issues related to drainage and sewerage are the major problems in this area and solid waste collection facility is also poor in the area. As per proposed drainage project in the town, health and hygiene condition will be improved. The consulted population is keenly interested to provide all support to municipality for execution of this subproject. 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.
08.12.2021 Swamiyon Ka Jav, Nawalgarh	Total-06 Male-05 Female 01	Project components under RSTDSP-additional financing and the benefits to the community. Present status and access of waste water and drainage facilities in the town and other concerned issues and challenges. Process of logging grievance and its mechanism under the project.	Drainage works are proposed in the area and it was informed by nearby habitation that there is no drainage facilities is available in the town and water logging and choking is general problem in low laying areas of the town. Other issues related to drainage and sewerage are the major problems in this area and solid waste collection facility is also poor in the area. People expressed their willingness to provide all support to municipality for execution of this subproject. Process of grievance mechanism was also briefed to participants for lodging of suggestions/complaints.
08.12.2021 Near Ganesh Pura, Nawalgarh	Total-07 Male-06 Female 01	Awareness of the project-including Project Coverage area. Present condition of Sewerage, Drainage and Solid Waste	People are not aware about the subproject proposed in the town. People are concerned about the poor sewerage and drainage conditions in the town. It was informed by the nearby households that they want to engage with the project as a job opportunity and want to become beneficiaries under the project.

Location/ Date	Total Number of Participants	Topic Discussed	Outcome
		facilities and problem in the town. In what way people may associate with the project and can improve Health and Hygiene conditions in the town Process of logging grievance and its mechanism under the project.	Issues related to drainage and sewerage are the major problems in this area and solid waste collection facility is also poor in the area. Process of grievance mechanism was discussed with participants for lodging suggestions/complaints. People expressed their interest to provide all support to municipality for execution of this subproject.
09.12.2021 Near Ganesh Pura, Nawalgarh	Total-09 Male-07 Female 02	Project components under RSTDSP-additional financing and the benefits to the community. Present status and access of waste water and drainage facilities in the town and other concerned issues and challenges. Process of logging grievance and its mechanism under the project.	Drainage work is proposed in the area and it was informed by nearby habitation that there is no structured drainage facilities is the town and water logging and choking is general problem in low laying areas of the town. Other issues related to drainage and sewerage are the major problems in this area and solid waste collection facility is also poor in the area. Process of grievance redress mechanism was also briefed with participants for lodging of suggestions/complaints. Participants are happy with proposed subproject.
09.12.2021 Near Fire Station, Nawalgarh	Total-08 Male-06 Female 02	Project components under RSTDSP-additional financing and the benefits to the community. Present status and access of waste water and drainage facilities in the town and other concerned issues and challenges. Process of logging grievance and its mechanism under the project. Willingness of local public to pay for improved services.	Drainage work and waste water works are proposed in the area and it was informed by nearby habitation that there is no structured waste water and drainage facilities is the town and water logging and choking is general problem in low laying areas of the town. Other issues related to drainage and sewerage are the major problems in this area and solid waste collection facility is also poor in the area. Process of grievance mechanism was also briefed with participants for lodging of suggestions/complaints. Participants were happy with proposed subproject and hoped that the problem of water logging would be reduced. 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 Nawalgarh because during monsoon 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

Public Consultation Photographs

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Public Consultation with local residents regarding proposed drainage and Pumping station works at SWPS Fire Station, Nawalgarh</td><td>Group Meeting regarding proposed drainage and Pumping station works at SWPS Fire Station, Nawalgarh</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Public Consultation with local residents regarding proposed drainage and Pumping station works at SWPS Fire Station, Nawalgarh</td><td>Public Consultation with local residents regarding proposed drainage and Pumping station works at Ganesh pura - Derena Johad, Nawalgarh</td></tr>
</table>

	
Public Consultation with local residents regarding proposed drainage and pumping station works Swamio Ka Jav drainage area, Nawalgarh.	Public Consultation with local residents regarding proposed drainage and pumping station works Swamio Ka Jav drainage area, Nawalgarh
	
Public Consultation with local residents regarding proposed drainage and pumping station works at SWPS Fire Station, Nawalgarh.	Public Consultation with local residents regarding proposed drainage and pumping station works at Bakra Mandi, Nawalgarh.

	
Public Consultation with local residents regarding proposed drainage and Pumping station works at Site Babri area Swamion Ka Jav, Nawalgarh.	Public Consultation with local residents regarding proposed drainage and Pumping station works at Bakra Mandi drainage Site, Nawalgarh.

List of Participants

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)

Consultations with Stakeholders

Project Town: Nawalgarh

Date: 08/12/21

Name of Project: Nawalgarh drainage pumping station project

Place of Consultation: Fire station SPS

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Sheetal Band	Shop	9549703327	[illegible]
2	Aamin	workshop	8003722145	आमीन
3	Ishak	Aata chakki	9928757729	[illegible]
4	Sabir	Washing	9636747584	[illegible]
5	Kailash	Contractor	9950528971	[illegible]
6	Ashok	Service	9269621039	[illegible]
7	Birpal singh	Fire man	9828212800	[illegible]
8	Krishn kumar	[illegible]	8502378252	[illegible]
9	Naveen Sain	[illegible]	8426897267	[illegible]
10	Gomti devi	Fireman	9571259153	[illegible]
11	Mansi devi	Fireman	9057251390	[illegible]
12	Anwar	driver	8107585426	[illegible]
13				
14				

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)

Consultations with Stakeholders

Project Town: Nawalgarh

Date: 08/12/21

Name of Project: Drainage pumping

Place of Consultation: [illegible] Swami ji Jowar

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Sayub	Shop	9950627637	[illegible]
2	Altaf	Shop		अल्ताफ
3	Shahid	Shop	6367741479	[illegible]
4	Shiv bhagwan	Shree ji in India	9828247156	[illegible]
5	Khetaram saini	farmer	7568621546	[illegible]
6	Subhash chand	Shadi	7597254147	[illegible]
7				
8				

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)

Consultations with Stakeholders

Project Town. Nawalgarh **Name of Project:** Drainage bunding

Date: 08/12/21 **Place of Consultation** Nawalgarh

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	श्री शोयेब खत्री	Chairman		
2	प्रधान कालोरिया	JEN		
3	[illegible]	Consultant		
4	[illegible]	SI		
5				
6				

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)

Consultations with Stakeholders

Project Town. Nawalgarh **Name of Project:** Drainage bunding

Date: 08/12/21 **Place of Consultation** Nawalgarh

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Shivarth	Shop	9694769731	
2	Divyansh	Job	7691042894	
3	Deepak	Shop	8875681279	दीपक
4	Nathmal	Shop		
5	Ramprasad	Carpenter	7878771826	रामप्रसाद
6	Nandlal	Shop	9460844211	
7				

Jasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)

Consultations with Stakeholders

ject Town Nawalgarh
Dist- Jhunjhunu.

Name of Project: Integrated Storm Water Management.

e: .....

Place of Consultation Municipal Board Nawalgarh. Dist- Jhunjhunu.

Attendance Sheet

N.	Name	Occupation	Mobile Number	Signature
1	श्रीमहेन्द्र सैनी	पार्षद	9785458398	
2	श्री राजकुमार सैनी	पार्षद	9461538831	
3	प्रदीप कुमार (वार्ता	पार्षद	9660270990	प्रदीप कुमार वार्ता
4	मुश्ताक	पार्षद	7014103610	
5	आमिर रंगरेज	पार्षद	8003872052	आमिर रंगरेज
6	उर्मिला चौटिया	पार्षद	9983652500	उर्मिला चौटिया
7	कैलाश चौटिया	पार्षद	9983652500	
8	नईमा	पार्षद	9828778242	नईमा
9	लोकेश राजौरिड़	पार्षद	9413030075	
10				
11				
12				
13				
14				
15				
16				

City Level Committee Minutes of Meetings on 08.02.2022

Office of SuperintendingEngineer
Project Implementation Unit(RSTDSP),
RUIDP, PIU, Ratangarh

No. RUIDP/PIU/RTG/PH-IV/Nawalgarh/2021-22/ 8084-88 Date: ~~03.09.2021~~ 08-11-2021

A city level Committee was held under the chairmanship of District Collector, Jhunjhunu at Nagar Palika Meeting Hall, Nawalgarh on 16.09.2021 to discuss the Storm Water and Heritage work under RUIDP Phase-IV for Nawalgarh town. List of members/officials attended the meeting is at Annexure-A.

1. It was apprised that the DPR of the Storm Water and Heritage work is prepared by the Consultant M/S Exceltech Consultant private limited, Jaipur engaged by Municipal Board, Nawalgarh, which will be considered under RUIDP Phase-IV. The suggestions from state holders of city level Committee will be considered in the project.
2. The basic scope of works & provision in DPRs were briefed to the Committee by power point presentation. The estimated cost of DPR is of about Rs39.47Cr (capital cost) for works proposed under Storm Water and Heritage work. The capital cost for execution of works will be borne by the stake Government financed by ADB under RUIDP Phase-IV. The O & M cost for Storm Water is to be borne by Municipal Board. The O & M payment will be performance based under the contract. After completion of project works the whole town will be benefitted with Storm Water drainage system and Heritage work.
3. The brief scope of works are as follows: -

   Storm Water Works: - Four depression point where rain water filled are found out namely Swamiyo ka jav, Bakra mandi, Bhagto ka johad and near fire station. Storm water collected at Swamiyo ka jav will be taken to Badrana johad by gravity flow, storm water collected at Bakra mandi will be taken to fire station by gravity flow after this water will be pumping to Dedhana johad and storm water collected at Bhagto ka johad will be takne to Baori by gravity flow. One pumping station will be constructed at fire station and four depression area will be filled by soil and developed these areas estimated cost Rs. 12.95 Cr.

   Heritage Works: -

   A. Old dedhana johad will be developed and public facilities work estimated cost 8.43 Cr.
   B. Old Bhadrana johad will be developed estimated cost Rs. 1.25 Cr.
   C. Historical and religious place Baba Ramdev Temple area developed estimated cost 2.56 Cr.
   D. Heritage gate Nansa Gate, Podar Gate, Baori Gate and Mandi Gate & Heritage walk in Nawaglarh Town will be renovated estimated cost 7.26 Cr.
   E. Entry gate in heritage look near Krishi Upaj Mandi will be constructed estimated cost 1.50 Cr.
   F. Play ground near Mela ground will be developed and providing play facilities to public and players estimated cost 4.22 Cr.

4. The representative of the Municipal Council suggested to take up the excavation of trenches for Storm water work in such a way, that trench excavated for laying Drainage pipe should not be laying longer without restoration.
5. It was assured that suggestions and directions of the city level committee will be incorporated in the proposed detailed project report.

After deliberation, the project was agreed by the committee for further course of action at RUIDP level. Meeting ended with vote of thanks to chair.

Junior Engineer
N.P. Nawaglarh

Assistant Engineer
N.P. Nawaglarh

Executive Engineer
RUIDP, PIU

Superintending Engineer
RUIDP, PIU Jaipur

Executive Officer
Nagarpalika Nawaglarh

Chairman
Nagarpalika Nawaglarh

Ad. Distt. Collector
Jhunnjhunu

Distt. Collector
Jhunjhunu

Appendix 4: Photographs of Proposed Component Locations

FIRE BRIGADE OFFICE TO DERANA JOHAD BY PUMPING MAIN

CHAINAGE-0

CHAINAGE-0 - 100

CHAINAGE 100-200

CHAINAGE 200- 300

CHAINAGE 300-350

CHAINAGE 350-400

CHAINAGE 500-600

CHAINAGE 600-700

CHAINAGE 700-800

CHAINAGE 800-900

CHAINAGE 900-1000

CHAINAGE 1000-1050

	
CHAINAGE 1050-1100	CHAINAGE 1100-1150
	
CHAINAGE 1150-1200	CHAINAGE 1200-1250
	
CHAINAGE 1250-1300	CHAINAGE 1300-1350
	
CHAINAGE 1350-1400	CHAINAGE 1400-1450

CHAINAGE 1450-1500

CHAINAGE 1500-1550

CHAINAGE 1550- 1600

CHAINAGE 1600- 1650

CHAINAGE 1650- 1710

CHAINAGE 1710

CHAINAGE 1710

CHAINAGE 1750

BAKRA MANDI TO FIRE BRIGADE OFFICE BY GRAVITY MAIN	
	
CHAINAGE 0	CHAINAGE 100-200
	
CHAINAGE 200- 250	CHAINAGE 250-300
	
CHAINAGE 300- 350	CHAINAGE 350- 400

CHAINAGE 400- 500

CHAINAGE 500- 600

CHAINAGE 600-650

CHAINAGE 650- 700

CHAINAGE 700 -800

CHAINAGE 800- 900

CHAINAGE 900-1000

Chainage 1000-1100

Chainage 1100- 1150

Chainage 1150- 1200

Chainage 1300

SWAMIYON KA JAV TO BADRANA JOHAD BY GRAVITY MAIN	
	
CHAINAGE 0	CHAINAGE 100-200
	
CHAINAGE 200-600	CHAINAGE 600-800
	
CHAINAGE 800-1000	CHAINAGE 1000-1200

CHAINAGE 1200 - 1400

CHAINAGE 1400-1600

CHAINAGE 1600-1700

CHAINAGE 1700-1750

CHAINAGE 1750 - 1850

Chainage- 1850 **BADRANA JOHAD Disposal point**

BHAKTON KA JOHRA TO BAWADI -Gravity line

CHAINAGE 0- 50

CHAINAGE 50 - 100

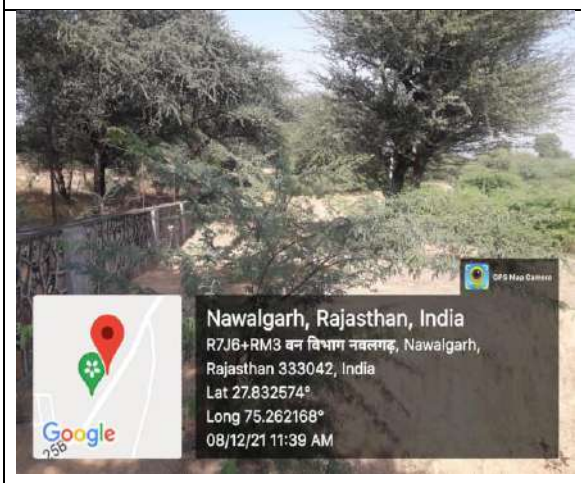
CHAINAGE 100-150

CHAINAGE 150- 200

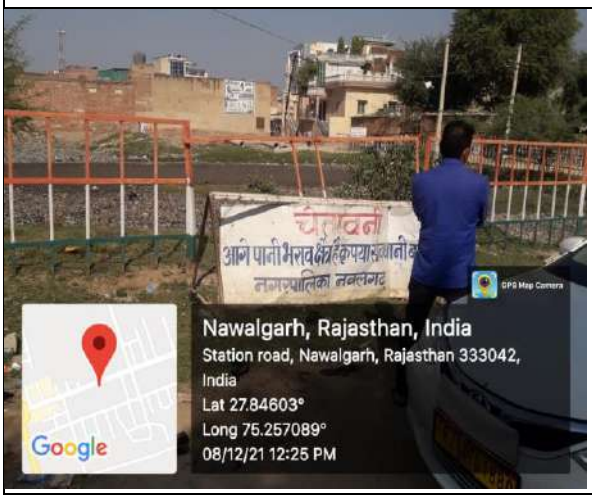
CHAINAGE 200 - Disposal point at BAWADI

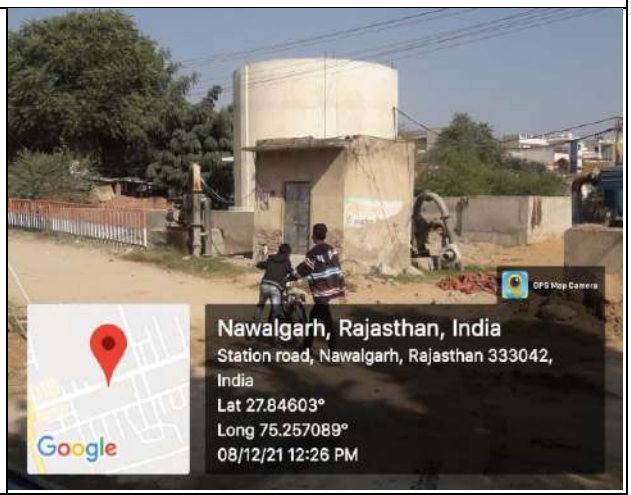
DETAILS OF THE AREAS WHERE DRAINAGE WORKS

SPS Fire Station, Nawalgarh



Water storage reservoir Dedana Johar, Nawalgarh





Bakra Mandi drainage Site, Nawalgarh

Bhakto ke johad drainage area, Nawalgarh

Baddi area Bhakto ke Johad, Nawalgarh

Baddi area Bhakto ke Johad road , Nawalgarh

Swamio ka jav drainage area, Nawalgarh

Site Badrana Johada

Appendix 5: Environmental Monitoring Plan - Ambient Air, Noise, Water and Soil

Under RSTDSP works Environmental Monitoring will done for ambient air, noise, and soils with following parameters-

A. **Ambient Air Quality-** Particulate Matters PM_{10}, Particulate Matter $PM_{2.5}$, SO_x, NO_x, Carbon Monoxide (CO) as per methods and norms approved by CPCB
B. **Ambient Noise Quality-** L_{day} and L_{night} (in Leq dBA) 24 hrs basis as per methods and norms approved by CPCB

1. During pre-construction stage monitoring is required to establish baseline at following sites-

Environmental Monitoring Locations and required samples

S.N.	Type of monitoring	Location of monitoring and no. of samples	Total No. of samples
1	Ambient Air Monitoring	Swamiyon Ka Jav , Bhakton Ka Johad ,Bakra Mandi, Fire Brigade-	4 Nos
2.	Ambient Noise monitoring	Swamiyon Ka Jav , Bhakton Ka Johad ,Bakra Mandi, Fire Brigade-	4 Nos

Note -

i. All the tests should be done by labs approved by CPCB and/or RSPCB and should be accredited by NABL
ii. All the tests should be done as per the norms and methods approved by CPCB/RSPCB
iii. All the meteorological data like weather, wind, location, nearby features etc. should be recorded during sampling and indicated in the report for ambient air quality
iv. For air quality monitoring, if any two sites are within the distance of 2 km from each other, only one sampling can be done at any site

* Sensitive receptors are hospitals, schools, any major religious place etc

Appendix 6: No-Objection and confirmation of Municipal Board Nawalgarh regarding land availability of proposed drain works

दूरभाष : 01594–222040

कार्यालय नगर पालिका मण्डल नवलगढ़ (झुन्झुनूं)

रेलवे स्टेशन रोड़, प्रेमप्रकाश टॉकीज के पास नवलगढ़, कार्यालय e-mail–navalgarh.jaipur@gmail.com

क्रमांक: न.पा.न./2022/749 दिनांक: 6/5/2022

श्रीमान् मुख्य अभियन्ता
आर.यू.आई.डी.पी., जयपुर

विषयः–नवलगढ़ शहर की जल निकासी की समस्या एवं जल भराव के निराकरण हेतु आर.यू.आई.डी.पी. चतुर्थचरण के अन्तर्गत प्रस्तावित ड्रेनेज कार्य हेतु भूमि उपलब्धता बाबत् में।

महोदय,

उपरोक्त विषयान्तर्गत निवेदन है कि प्रस्तावित ड्रेनेज कार्य हेतु एक पंपिंग स्टेशन फायर ब्रिगेड ऑफिस (अग्निशमन कार्यालय) में प्रस्तावित है एवं तीन जल संग्रहण जो स्वामियों का जांव, बकरामण्डी एवं भक्तों का जोहड़ में प्रस्तावित है तथा साथ ही साथ 6 कि.मी. का ड्रेन जो स्वामियों का जांव, बकरा मण्डी एवं फायर ब्रिगेड ऑफिस (अग्निशमन कार्यालय) के पास प्रस्तावित है। उपरोक्त स्थलों के स्वामित्व के संबंध में सूचना निम्नानुसार है :–

1. नगरपालिका फायर स्टेशन के पास पम्पिंग स्टेशन हेतु आरक्षित भूमि खसरा नं. 1332 (निवास या चारागाह के लिए नहीं) क्षेत्रफल 250.1400 हैक्टर किस्म गैर. मु. आबादी भूमि जिसके भूमिधारक राज. सरकार है जो नगरपालिका के स्वामित्व की भूमि है।
2. डेराना जोहड़ की भूमि ख0नं0 479/390 रकबा 2.8100 हैक्टर किस्म गैर मु. की जोहड़ की भूमि है जिसको नगरपालिका के लिए आवंटन हेतु श्रीमान् जिला कलेक्टर, झुन्झुनूं को प्रस्ताव भिजवाया जा चुका है।
3. स्वामियों का जांव की भूमि मंदिर श्री ठाकुर जी बिहारी जी ख0नं0 1334–135 में से सीवरेज पम्पिंग स्टेशन हेतु आवश्यकतानुसार **400 वर्गमीटर** भूमि उपलब्ध करवाने हेतु संबंधित द्वारा सहमति प्रदान की जा चुकी है। उपरोक्त में से पर्याप्त भूमि रिक्त है जो ड्रेनेज कार्य हेतु प्रस्तावित है। **(प्रति संलग्न) है।**
4. भगतों के जोहड़ में पम्पिंग स्टेशन हेतु आरक्षित भूमि के सम्बन्ध में राजस्व रिकॉर्ड में दर्ज खातेदारान् (विजय कुमार भगत) द्वारा उक्त भूमि पालिका के पक्ष में सीवरेज योजना हेतु सीवरेज ट्रीटमेन्ट प्लांट स्थापित किये जाने हेतु आवश्यकतानुसार **2116 वर्गमीटर भूमि** के सहमति पत्र के जरिये सहमति प्रदान कर दी गई है। उपरोक्त में से पर्याप्त भूमि रिक्त है जो ड्रेनेज कार्य हेतु प्रस्तावित है। **(प्रति संलग्न है)**
5. बदरांणा जोहड़ की भूमि में संबंधित बदरीदास चौधरी (गोयनका चेरीटेबल ट्रस्ट) जरिये गोकुलचन्द गोयनका में संबंधित खातेदारान द्वारा भूमि नगरपालिका के नाम किये जाने हेतु सहमति प्रदान की जा चुकी है।

उपरोक्त के अतिरिक्त ड्रेनेज कार्य हेतु भूमि अधिग्रहण की आवश्यकता नहीं है। प्रस्तावित ड्रेनेज नेटवर्क रोड़ के (मार्ग–अधिकार) में है जो नगरपालिका के स्वामित्व में आता है।

(अनिल कुमार)
अधिशाषी अधिकारी
नगरपालिका नवलगढ़

दो गज की दूरी– मास्क लगाना है जरूरी

Transcript in English

Letter no: N.P.N/2022/749 Date: 06.05.2022

To,
Chief Engineer,
RUIDP, Jaipur
Sub: regarding land allotment for proposed drainage work for removing drainage and water logging problems in Nawalgarh town under RUIDP-Phase IV
Sir,
With reference to the above cited subject, a pumping station in the Fire Brigade office and three water collection chambers Swamiyaon Ka Jav, Bakra Mandi and Bahakto Ka Johad are proposed in drainage works under RUIDP-Phase IV. Along with, a 6 km drain is also proposed near Swamiyon Ka Jav, Bakra Mandi and Near Fire Brigade office. Land ownership detail of following location is as under;

1. The land for pumping station near fire station of Khasra number 1332 (for residence or pasture use) with 250.1400 hectare, non-possible population is under possession of Rajasthan Government and the ownership of the land belongs to Municipal Board.
2. The land of Derana Johad of Khasra no 479/390 with 2.8100 hectare, non-possible population is allotted for Johad. A proposal has been sent to the district collector for allotment of such land to Municipal Board.
3. The land with Khasra Number 1334-35 of Swamiyon Ka Jav is under possession of Mandir Trust of Shri Thakur Ji Bihari. Mandir trust has been given the approval for providing 400 square meter land for construction of Sewerage Pumping Station (SPS).
4. Construction of Sewerage Pumping Station (SPS) is proposed in Bhakton Ka Johad, as per revenue records, Mr. Vijay Kumar Bhagat is owner of such land and he has been given a consent to Municipal Board for proving 2116 square meter land for proposed construction under sewerage project.
5. Construction under sewerage project is proposed in Badrana Johad, proposed land is under possession of Mr. Baddri Das Choudhary (Goyanka Charitable Trust) and a consent letter is already given to Municipal Board for providing such land for sewerage project.

In addition to the above, no other land acquisition is required for drainage works and proposed drainage networks along with the road which is under possession of Municipal Board.

Anil Kumar
Executive Officer
Municipal Board, Nawalgarh

Appendix 7: Integrated Biodiversity Assessment Report (IBAT)

IBAT

Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
NAWALGARH DRAINAGE

Country: India

Location: [27.9, 75.3]

Date of analysis: 24 August 2022 (GMT)

Buffers applied: 10 km | 50 km

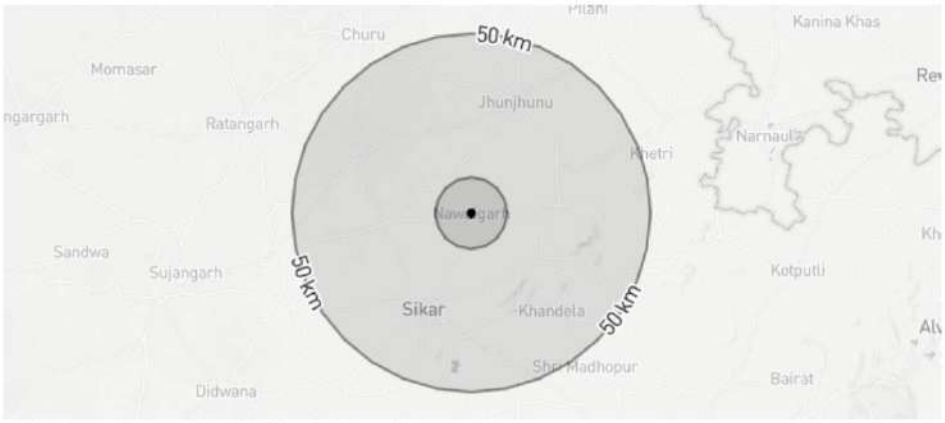
IUCN Red List Biomes: Freshwater, Terrestrial

Generated by: Govind Rathore

Organisation: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	38



Displaying project location and buffers: 10 km, 50 km

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About this report

This report presents the results of [30102-33672] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 10 km, 50 km.

This report is one part of a package generated by IBAT on 24 August 2022 (GMT) that includes full list of all species, protected areas, Key Biodiversity Areas in CSV format, maps showing the area of interest in relation to these features, and a 'How to read IBAT reports' document.

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. 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.

Data used to generate this report

- UNEP-WCMC and IUCN, 2022. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net - August 2022.
- BirdLife International (on behalf of the KBA Partnership), 2022. Key Biodiversity Areas - April 2022.
- IUCN, 2022. IUCN Red List of Threatened Species - August 2022.
- IUCN. The IUCN Red List of Threatened Species. Version 2019-3. (2019). https://www.iucnredlist.org
- IUCN. Threats Classification Scheme (Version 3.2). (2019)
- Strassburg, B.B.N., Iribarrem, A., Beyer, H.L. et al. Global priority areas for ecosystem restoration. Nature 586, 724–729 (2020). https://doi.org/10.1038/s41586-020-2784-9

IBAT

Protected Areas

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

No protected areas within buffer distance

Key Biodiversity Areas

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

No KBAs within buffer distance

IUCN Red List of Threatened Species

The following threatened 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
Oxyura leucocephala	White-headed Duck	AVES	EN	Decreasing	Terrestrial, Freshwater

IBAT

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Sterna acuticauda	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
Haliaeetus leucoryphus	Pallas's Fish-eagle	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
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Panthera tigris	Tiger	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
Crocodylus palustris	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
Lutrogale perspicillata	Smooth-coated Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
Wallago attu		ACTINOPTERYGII	VU	Decreasing	Freshwater

IBAT

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Aythya ferina	Common Pochard	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Columba eversmanni	Yellow-eyed Pigeon	AVES	VU	Decreasing	Terrestrial, Freshwater
Grus antigone	Sarus Crane	AVES	VU	Decreasing	Terrestrial, Freshwater
Sterna aurantia	River Tern	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Clanga clanga	Greater Spotted Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Aquila rapax	Tawny Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Aquila heliaca	Eastern Imperial Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Lissemys punctata	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
Schizothorax plagiostomus	Snow Trout	ACTINOPTERYGII	VU	Decreasing	Freshwater
Bagarius bagarius		ACTINOPTERYGII	VU	Decreasing	Freshwater
Acinonyx jubatus	Cheetah	MAMMALIA	VU	Decreasing	Terrestrial
Panthera pardus	Leopard	MAMMALIA	VU	Decreasing	Terrestrial
Tetracerus quadricornis	Four-horned Antelope	MAMMALIA	VU	Decreasing	Terrestrial
Rusa unicolor	Sambar	MAMMALIA	VU	Decreasing	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Saara hardwickii	Indian Spiny-tailed Lizard	REPTILIA	VU	Decreasing	Terrestrial
Saxicola macrorhynchus	White-browed Bushchat	AVES	VU	Decreasing	Terrestrial
Chlamydotis macqueenii	Asian Houbara	AVES	VU	Decreasing	Terrestrial
Oryza malampuzhaensis		LILIOPSIDA	VU	Decreasing	Terrestrial

Recommended citation

IBAT Proximity Report. Generated under licence 30102-33672 from the Integrated Biodiversity Assessment Tool on 24 August 2022 (GMT). www.ibat-alliance.org

How to use this report

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns, and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorising investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a "first-step", providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.

IBAT

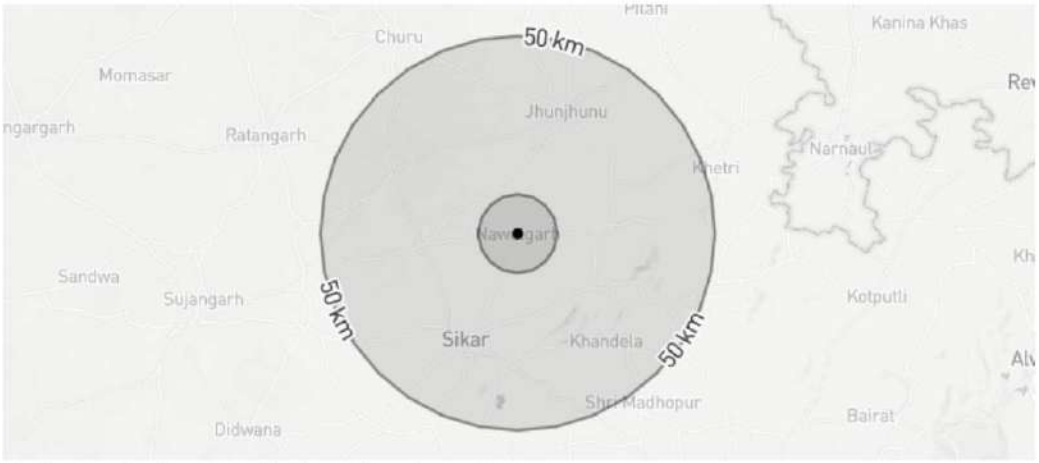
Integrated Biodiversity Assessment Tool
World Bank Group Biodiversity Risk Screen

NAWALGARH DRAINAGE

- **Country:** India
- **Location:** [27.9, 75.3]
- **IUCN Red List Biomes:** Freshwater, Terrestrial
- **Created by:** Govind Rathore

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: **0**	**0**
Alliance for Zero Extinction (AZE)	1 km: **0**	10 km: **0**	50 km: **0**	**0**
IUCN Red List				**17**
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.

This report identifies restricted range species according to the KBA Standard definition (hyperlink KBA Standard https://portals.iucn.org/library/sites/library/files/documents/2016-048.pdf):

Species having a global range size less than or equal to the 25th percentile of range-size distribution in a taxonomic group within which all species have been mapped globally, up to a maximum of 50,000 km2. If all species in a taxonomic group have not been mapped globally, or if the 25th percentile of range-size distribution for a taxonomic group falls below 10,000 km2, restricted range should be defined as having a global range size less than or equal to 10,000 km2. For coastal, riverine and other species with linear distributions that do not exceed 200 km width at any point, restricted range is defined as having a global range less than or 15 equal to 500 km linear geographic span (i.e. the distance between occupied locations furthest apart).

Note, sites supporting restricted range species can qualify as KBAs under criterion B2. These are sites that hold a significant proportion of the global population size of multiple restricted-range species, and so contribute significantly to the global persistence of biodiversity at the genetic and species level.

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

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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
Oxyura leucocephala	White-headed Duck	AVES	EN	Decreasing	Terrestrial, Freshwater
Sterna acuticauda	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
Haliaeetus leucoryphus	Pallas's Fish-eagle	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

IBAT

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
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
Panthera tigris	Tiger	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

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

There are no key biodiversity areas to show for this report.

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
AVES	283	22	6	7	9	15	246	0
REPTILIA	47	4	0	1	3	3	38	2
MAMMALIA	58	7	0	2	5	3	48	0
ACTINOPTERYGII	36	3	0	0	3	1	31	1
AMPHIBIA	10	0	0	0	0	0	10	0
INSECTA	46	0	0	0	0	0	44	2
GASTROPODA	18	0	0	0	0	0	18	0
POLYPODIOPSIDA	2	0	0	0	0	0	2	0
MAGNOLIOPSIDA	34	1	0	1	0	0	32	1
LILIOPSIDA	46	1	0	0	1	0	43	2
BIVALVIA	6	0	0	0	0	0	6	0
MALACOSTRACA	4	0	0	0	0	0	4	0

IBAT

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
AGARICOMYCETES	2	0	0	0	0	1	1	0
ARACHNIDA	1	0	0	0	0	0	1	0