

Initial Environmental Examination

Project Number: 40031
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India: Rajasthan Urban Sector Development Investment Program—Sawai Madhopur Heritage Site

Prepared by Local Self Government Department

For the Government of Rajasthan
Rajasthan Urban Infrastructure Development Project

The initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

ABBREVIATIONS

ADB	— Asian Development Bank
BOQ	— bill of quantity
CBO	— community-based organization
CGWB	— Central Ground Water Board
CLC	— City Level Committees
CLIP	— City Level Investment Plan
DSC	— Design and Supervision Consultants
EAC	— Expert Appraisal Committee
EARF	— Environmental Assessment Resettlement Framework
EIA	— Environmental Impact Assessment
EMP	— Environmental Management Plan
EMS	— Environmental Monitoring Specialist
EPA	— Environmental Protection Agency
GRC	— Grievance Redress Committee
H and S	— health and safety
IEE	— Initial Environmental Examination
IPIU	— Investment Program Implementation Unit
IPMC	— Investment Program Management Consultants
IPMU	— Investment Program Project Management Unit
ITI	— industrial training institutes
JNNURM	— Jawaharlal Nehru National Urban Renewal Mission
LSGD	— Local Self Government Department
MFF	— multitranches financing facility
MLD	— million liters per day
MOEF	— National Ministry of Environment and Forests
NAAQS	— National Ambient Air Quality Standards
NGO	— nongovernmental organization
RRRP	— National Resettlement and Rehabilitation Policy
O and M	— operation and maintenance
OHSA	— Occupational Health and Safety Administration
OHSR	— overhead storage reservoirs
OMC	— Operations and Maintenance Contractors
PHED	— Public Health Engineering Department
PIU	— Project Implementation Unit
PMU	— Project Management Unit
ROW	— right of way
RPCB	— Rajasthan State Pollution Control Board
RUIDP	— Rajasthan Urban Infrastructure Development Project
RUSDIP	— Rajasthan Urban Sector Development Investment Programme
SEIAA	— State Environment Impact Assessment Authority
SPS	— Safeguard Policy Statement
STP	— sewage treatment plant
TDS	— total dissolved solids
TOR	— terms of reference
UIDSSMT	— Urban Infrastructure Development Scheme for Small and Medium Towns
ULB	— urban local body
USEPA	— United States Environmental Protection Agency
WTP	— water treatment plant

WEIGHTS AND MEASURES

lakh	–	100 thousand = 100,000
crore	–	100 lakhs = 10,000,000
$\mu\text{g}/\text{m}^3$	–	micrograms per cubic meter
km	–	kilometer
lpd	–	liters per day
m	–	meter
mg/l	–	milligrams per liter
mm	–	millimeter
ppm	–	parts per million

NOTE{S}

- (i) In this report, "\$" refers to US dollars.
- (ii) "INR" and "Rs" refer to Indian rupees

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EXECUTIVE SUMMARY

1. Rajasthan Urban Sector Development Investment Program (RUSDIP) is intended to optimize social and economic development in 15 selected towns in the State, particularly district headquarters and towns with significant tourism potential. RUSDIP Phase II is being implemented over a seven year period beginning in 2008, and being funded by a Multitranche Financing Facility (MFF) loan from the Asian Development Bank (ADB). The Executing Agency is the Local Self-Government Department (LSGD) of the Government of Rajasthan; and the Implementing Agency is the Investment Program Management Unit (IPMU) of the Rajasthan Urban Infrastructure Development Project (RUIDP). ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for Environmental Assessment are described in ADB's SPS. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, loans involving financial intermediaries, and private sector loans.

2. This Initial Environmental Examination (IEE) has been prepared for the Sawai Madhopur Heritage Site-Bherun Darwaza Subproject as part of RUSDIP Phase II – Tranche 3. The main aspect for the scope of work at this site is area development and restoration of the heritage building Bheru Darwaja and wall, which is not under Department of Archaeology & Museums or Archeological Survey of India (ASI).

3. The sub-project is in line with the Support Infrastructure Development Project¹ involving restoration of historic sites in Sawai Madhopur. The subproject site, Bheru Darwaja, is located at the meeting point of 'Sawai Madhopur town' (Old) and 'Man Town'. It is the entrance of to the old city from Man Town side. The subproject covers (i) removal of damaged plaster and replastering, painting, flooring, terracing & plinth protection works. (ii) repair of stone works i.e. Kangooras, steps, walls and platforms; and. (iii) repair of *chaukhat* and provision of door shutters; (iv) provision of display tablet; (v) provision of flood lighting to highlight the gate & adjoining areas.

4. The subproject is needed to (i) restore and preserve the historical structures of Bheru Darwaja; (ii) provide modern facilities to increasing number of tourists visiting the heritage sites; and (iii) preserve and maintain orderliness and cleanliness in the immediate vicinities of important monuments inside the heritage sites.

5. Detailed design began in the year 2010 and completed middle of 2010. Construction of all elements will begin in the year 2011, and work will be completed by 2012. ULB, as part of the City Level Committee, has been actively participating in the design process. The design will be presented to the local government for review and approval as both the structures and their premises do not come under ASI or Rajasthan Department of Archaeology and Museums.

6. The subproject site is not located in areas prone to water-logging, salinisation, and flash flood. There are no protected areas, wetlands, mangroves, or estuarines inside the fort. Trees, vegetation (mostly shrubs and grasses), and animals are those commonly found in urban areas.

7. Potential negative impacts were identified in relation to construction and operation of the improved infrastructure. No impacts were identified as being due to the subproject design or location. An Environmental Management Plan (EMP) is proposed as part of this IEE which includes (i) mitigation measures for significant environmental impacts during implementation, (ii) environmental monitoring program, and the responsible entities for

¹ Project supported by govt. of India for improvement of heritage site

mitigation, monitoring, and reporting; (iii) public consultation and information disclosure; and grievance redress mechanism. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. A number of impacts and their significance have already been reduced by amending the designs.

8. During the construction phase, impacts mainly arise from the need to excavate small areas which can result to disturbance to tourists, residents, businesses, traffic, and important buildings. These are common impacts of construction in built-up areas, and there are well developed methods for their mitigation.

9. One field in which impacts are much of interest in the subproject is archaeology, and series of specific measures have been developed to avoid damaging important remains during construction.

10. There were limited opportunities to provide environmental enhancements, but certain measures were included. For example it is proposed that the project will employ in the workforce people who live in the vicinity of construction sites to provide them with a short-term economic gain; and ensure that people employed in the longer term to maintain and operate the new facilities are residents of nearby communities.

11. Once the system is operating, most facilities will operate with routine maintenance, which should not affect the environment. The toilet facilities and water stations need regular maintenance but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. It will also be conducted in areas that have already been excavated, so there will be not much need to protect historic materials.

12. Mitigation will be assured by a program of environmental monitoring to be conducted during construction and operation stages. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. The Investment Program Implementation Unit (IPIU) and Design and Supervision Consultants (DSC) will work closely in implementing the program. Any requirements for remedial action will be reported to the Investment Program Management Unit (IPMU).

13. The main impacts of the operating improved heritage sites facilities will be beneficial as visitors of Sawai Madhopur will be provided with a glimpse of history, which will lead to economic gains of Sawai Madhopur.

14. The stakeholders were involved in developing the IEE through face-to-face discussions on site and a large public meeting held in the town, after which views expressed were incorporated into the IEE and the planning and development of the project. The IEE will be made available at public locations in the town and will be disclosed to a wider audience via the ADB website. The consultation process will be continued and expanded during project implementation, when a nationally-recognized NGO will be appointed to handle this key element to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

15. The subproject is unlikely to cause significant adverse impacts. The potential adverse 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, the classification of the Project as Category "B" is confirmed, and no further special

study or detailed EIA needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006).

I. INTRODUCTION

A. Purpose of the Report

1. Rajasthan Urban Sector Development Investment Program (RUSDIP) is intended to optimize social and economic development in fifteen selected towns in the State, particularly district headquarters and towns with significant tourism potential. This will be achieved through investments in urban infrastructure (water supply; sewerage and sanitation; solid waste management; urban drainage; urban transport and roads), urban community upgrading (community infrastructure; livelihood promotion) and civic infrastructure (art, culture, heritage and tourism; medical services and health; fire services; and other services). RUSDIP will also provide policy reforms to strengthen urban governance, management, and support for urban infrastructure and services. The assistance will be based on the State-level framework for urban reforms, and institutional and governance reforms recommended by the Government of India through the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT).

2. RUSDIP Phase II is being implemented over a seven year period beginning in 2008, and being funded by a loan via the Multitranche Financing Facility (MFF) of Asian Development Bank (ADB). The Executing Agency is the Local Self-Government Department (LSGD) of the Government of Rajasthan; and the Implementing Agency is the Project Management Unit (PMU) of the Rajasthan Urban Infrastructure Development Project (RUIDP).

3. This Initial Environmental Examination (IEE) has been prepared for the Sawai Madhopur Heritage Site Subproject as part of RUSDIP Phase II Tranche 3. The subproject covers (i) removal of damaged plaster and replastering, painting, flooring, terracing & plinth protection works. (ii) repair of stone works i.e. Kangooras, steps, walls and platforms; and. (iii) repair of *chaukhat* and provision of door shutters; (iv) provision of display tablet; (v) provision of flood lighting to highlight the gate & adjoining areas.

4. This IEE report covers the general environmental profile of Sawai Madhopur and includes an overview of the potential environmental impacts and their magnitude on physical, ecological, economic, and social and cultural resources within the subproject's influence area during design, construction, and operation stages. An Environmental Management Plan (EMP) is also proposed as part of this report which includes mitigation measures for significant environmental impacts during implementation of the Project, environmental monitoring program, and the responsible entities for mitigation and monitoring.

B. Extent of the IEE Study

5. This IEE report was prepared on the basis of detailed screening and analysis of all environmental parameters, field investigations and stakeholder consultations to meet the requirements for environmental assessment process and documentation per ADB's Safeguard Policy Statement (SPS, 2009) and Government of India Environmental Impact Assessment (EIA) Notification of 2006.

1. ADB Policy

6. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for Environmental Assessment are described in ADB SPS 2009. This states that ADB requires environmental assessment of all project loans, program

loans, sector loans, sector development program loans, loans involving financial intermediaries, and private sector loans.

7. **Screening and Categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact are assigned to one of the following four categories:

- (i) **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- (ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- (iii) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- (iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all Projects will result in insignificant impacts.

8. **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.

9. **Public Disclosure.** ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

- (i) For environmental category A projects, 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 Investment Program Implementation Unit (IPIU) during project implementation upon receipt.

2. National Law

10. 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 categorised as A or B depending on the scale of the project and the nature of its impacts.

11. Categories A projects require Environmental Clearance from the National Ministry of Environment and Forests (MOEF). The proponent is required to provide preliminary details of the project in the form of a Notification, after which an Expert Appraisal Committee (EAC) of the MOEF prepares comprehensive Terms of Reference (TOR) for the EIA study, which are finalized within 60 days. On completion of the study and review of the report by the EAC, MOEF considers the recommendation of the EAC and provides the Environmental Clearance if appropriate.

12. Category B projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorises 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.

13. The only type of infrastructure provided by the RUSDIP that is specified in the EIA Notification is solid waste management thus EC is not required for this subproject.

3. Others

14. The subproject site is not located in any protected monument² of Archaeological Survey of India (ASI). Therefore, The Ancient Monuments and Archaeological Sites and Remains (AMASR) Act³, 1958, which requires approval from ASI for any construction and any other operations within the protected area, is not applicable to this subproject.

II. DESCRIPTION OF THE PROJECT

A. Type, Category and Need

15. **Type.** This is a restoration and simple construction subproject intended to improve the current situation in Sawai Madhopur in terms of improved conditions of the historic site. This is one of a series of subprojects designed by the RUSDIP that are intended to raise the standards of the municipal infrastructure and services of Sawai Madhopur town and the other urban centres to those expected of modern Asian towns.

16. **Category.** Environmental examination indicates the proposed subproject falls within ADB's environmental Category B projects. The Project components will only have small-scale, localized impacts on the environment, and can be mitigated. Under ADB procedures such projects require an IEE to identify and mitigate the impacts, and to determine whether further study or a more detailed EIA may be required.

17. **Need.** The subproject is needed to (i) support infrastructure development to enhance the historic/heritage Darwaja and wall; (ii) provide modern facilities for increasing number of tourists visiting the Sawai Madhopur; and (iii) preserve and maintain orderliness and cleanliness in the immediate vicinities of important monuments in and around the site.

B. Location and Implementation Schedule

18. The subproject site, Bheru Darwaza is one of the historical gateways located on the boundary of old Sawai Madhopur city and 'Man Town (later developed around Railway station)'. Bheru Darwaza is the main entrance of the old city of Sawai Madhopur from 'Man Town' side. Works under this subproject will (i) be limited on vacant lots and spaces allocated for general public; (ii) not directly on nor encroach any of the monuments in and around Historic site; and (iii) be closely supervised and monitored by LSGD.

² Included in Archaeological Survey of India's List of Ancient Monuments and Archaeological Sites and Remains of National Importance

³ This Act provides for the preservation of ancient and historical monuments and archaeological sites and remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.

19. Detailed design began in the year 2010 and completed in middle of 2010. Construction of all elements will begin in 2011, and work will be completed in 2012.

C. Description of the Subproject

1. Existing Condition

20. Urban Local bodies have kept Bheru Darwaja, Sawai madhopur in a presentable condition. Bheru Darwaja is very popular because of its rich cultural and heritage values and Kala Gaura Bhairav temple located close to it which attracts a large number of visitors every day. Increase in number of domestic as well as foreign visitors are expected in the coming years. The current challenges are: (i) Heavy traffic passing through the gate & posing risk for the gate structure. Due to the hillocks on both the sides, the alternative routing for heavy traffic does not seem to be feasible. (ii) Due to the existence of Bheru Darwaza, the possibility of widening the road is almost nil. (iii) On the old town side some shops have been built on private property very close to the gate blocking the view of gate and boundary wall. (iv) On the Man Town side PHED office is located on the left side of the gate and the boundary wall and store of PHED office block the view of Bheru Darwaza and wall. (v) The wall being heritage structure need adequate safety & special protection from any kind of damage, some suitable arrangement is required.

2. Subproject Components

21. The subproject will involve restoration work:

Restoration of Bheru Darwaja (Gate) and Wall

- (i) Removal of existing damaged plaster
- (ii) Replastering with Lime Surkhi Plaster
- (iii) Painting with Colour washing of all shades to give an even shade including all scaffolding.
- (iv) Pink colour wash with Khameera mixed with pigment including making gola, gardana, Kangooras, ornamental lining etc.
- (v) Providing & laying 40 mm thick rubbed stone flooring
- (vi) Providing and laying lime Dhar on roofing as per Rajasthan, Jaipur traditional practice with lime, Surkhi, old lime powder.
- (vii) Dismantling of old deteriorated roofing.
- (viii) Making plinth protection 50mm thick of cement concrete
- (ix) Providing and laying 25 mm thick Ruby red colour polished granite Display Tablet.
- (x) Painting work with lime including making ornamental lining and design work over lime base on Mehrab with colour & paint as per approved Jaipur style and pattern complete in all respects.
- (xi) Consolidation & strengthening of the masonry wall
- (xii) Repair of the Kangoora masonry.
- (xiii) Repair of the damaged sections of the wall with masonry following the traditional material and technique.
- (xiv) Replastering fort wall with traditional material & technique

22. **Table 1** summarizes the subproject components for each location covered by the subproject. The descriptions shown in the table are based on the present proposals, which are expected to be substantially correct, although certain details may change as development of the subproject progresses.

Table 1: Present Condition of the Subproject and Proposed Components

	Location	Description	Existing Condition	Proposed Improvement
1	View Point	- Situated at the entrance of the Sawai Madhopur Fort Complex; and - Popular with tourists for its breathtaking view of Sawai Madhopur town.	- maintained by ULB - open space near View Point being used as parking space - lacks good street furniture	(i) road surfaces (ii) street furniture (iii) landscaping (iv) storm water disposal (v) area improvement
2	Bheru Darwaza	-It is called the gateway of Sawai Madhopur. - linking point between the old city and man town. - situated near the :kala Gaura “ temple.	- Maintained by ULB - damaged wall section -damaged kangaroo masonry - some shops are present near the entrance of the wall gate	(i) Repairing of damaged wall (ii) Repair of damaged kangaroos (iii) re-plastering (iv) strengthening of masonry wall

III. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

1. Administrative Boundaries

23. Sawai Madhopur District is located about 180 km in the north-eastern of Jaipur along the rolling hills of Vindhyas and Aravali ranges. It is about 428 kms from Delhi. The total area of the district is 504,299 square kilometre (km²). The district has been divided into four subdivisions: Sawai Madhopur town (also the district headquarters), Bonli, Gangapur, and Bamanwas. The subproject sites are located in the built-up area of Sawai Madhopur town.

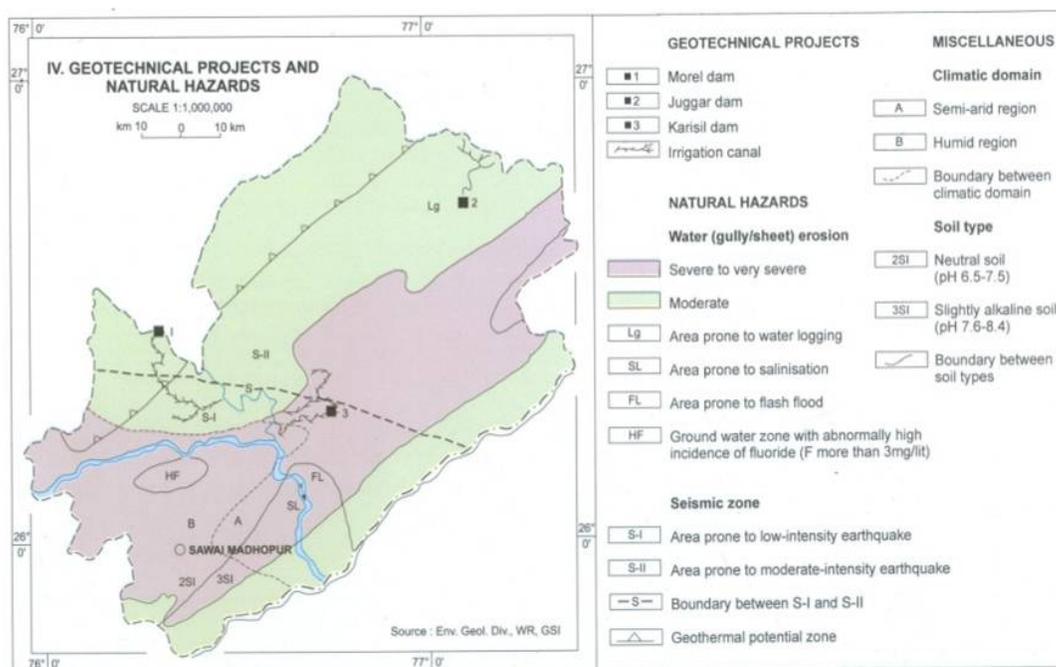
2. Topography, Drainage, and Natural Hazards

24. **Topography.** Sawai Madhopur is located at latitude 25°45' north and longitude 75°59' east, at a height of about 400 to 600 meters above the mean sea level. The topography of Sawai Madhopur city is cup shaped which ranges from flat to rugged terrains. The subproject site being located in the town area, are generally flat.

25. **Drainage.** Due to scanty rains in the region, natural drainage system has not been so far evolved. In fact there is no river/rivulet in the entire Sawai Madhopur district. In Sawai Madhopur town itself no natural drainage system exists to drain away the rainwater or wastewater from the town. The subproject site naturally drains to Latiya nallah.

26. **Natural Hazards.** Based on the evaluation of the Earthquake Zones of Rajasthan, Sawai Madhopur lies in a low damage risk zone and is less prone to earthquakes because it is located on relatively stable geological plains. Natural hazard zone of Sawai Madhopur district is shown in **Figure 1**. Evaluation of the map shows water (gully/sheet) erosion in the town ranges from moderate to severe, with some areas prone to water-logging, salinisation, and flash-flood. A small portion of the district has a groundwater zone with abnormally high incidence of fluoride (more than 3 milligrams per liter (mg/L)). The contour map/level sheet of the district shows that major flood prone areas are Masaldar Mohalla, Koli Mohalla, near Krishi Mandi office, Telipara and near Nagar Palika office. The subproject site is (i) not located in an area prone to water-logging, salinization, and flash flood; and (ii) not located in the mentioned groundwater zone.

Figure 1: Sawai Madhopur District Natural Hazard Map



3. Geology, Geomorphology, Mineral Resources, and Soils

27. **Geology.** The various rocks type exposed in the area belong to Bhilwara, Delhi and Vidhyan Supergroups. A major part of the district is occupied by thick alluvium related to the various river systems.

28. **Geomorphology.** The district is classified into bad land, sand sheet, alluvial plain, pediment, structural and denudational plateau and hills, and valleys belonging to Vindhyan and pre-Vindhyan hills. The area classified into three hydro-geological domains of unconsolidated porous Quaternary formation, consolidated fissured formation, and hilly area with ground water potential ranging from less than 1 to 10 liters per second (lps).

29. **Mineral Resources.** Sizeable reserves of limestone, soapstone, silica sand china clay and building stones are found in the district. However, the subproject site does not have mineral resources.

30. **Soils.** The soil is generally alluvial in nature which prone to water logging. Sawai Madhopur soil is classified as saline and sodic. The soil nutrient status (referring to levels of nitrogen, phosphorus, and potassium) is graded as low to medium level.

4. Climate

31. The climate of Sawai Madhopur is hot and arid with large variations in temperature. The average temperature in summers ranges from 25 to 45 degree Celsius while winters temperatures are 4 to 20 degree Celsius. The rainfall over Sawai Madhopur is scanty (annual average is 837.40 millimeters) and is concentrated in four months only, i.e., during south-west monsoon in June to September. Dust storms and thunderstorms occur all through the summer and are particularly active in pre-monsoon period. The predominant wind direction is from west and south-west.

5. Air Quality

32. Data on ambient air quality in Sawai Madhopur is not available because the district is not subject to monitoring⁴ by the Rajasthan Pollution Control Board (RPCB). There are no major industries thus vehicles and fugitive dusts are the possible air pollutants in Sawai Madhopur. Levels of oxides of sulphur and nitrogen within the district are likely to be well within the National Ambient Air Quality Standards (NAAQS). Visual observation of the subproject sites indicates relatively increased dust levels compared to other parts of the town due to pedestrians and vehicles.

6. Surface Water

33. Latiya *nallah* is the surface water crossed by the two bridges the subproject sites. However, data on water quality is not available because the *nallah* is not subject to monitoring. Part of the *nallah* dries up during the summer period. Increase in total suspended solids (TSS) is expected during the monsoon period because rainfall in the town area naturally drains to this *nallah*.

7. Geohydrology and Groundwater

34. Evaluation of the Geohydrological Map of Sawai Madhopur shows the district is composed of (i) Quaternary unconsolidated formations with groundwater potential of 1 to 10 lps; (ii) consolidated fissured formations with groundwater potential of 1 to 5 lps; and (iii) hilly areas with groundwater potential of less than 1 lps. Approximately 60 to 70% of the district (mostly south and eastern part of the district) is covered with consolidated fissured formation.

35. The Central Ground Water Board monitors several national hydrographic monitoring stations in and around Sawai Madhopur. Records of monitoring conducted from May 2005 to January 2006 shows ground water table ranged between 10 to 20 meters below ground level.

36. Records of groundwater quality monitoring from Public Health Engineering Department (PHED) show groundwater quality in Sawai Madhopur town does not conform with the set norms of Government of Rajasthan. It has been noted that groundwater contains high level of total dissolved solids and nitrates.

B. Ecological Resources (Protected Areas including Buffer Zones)

1. National Parks

37. Ranthambore National Park in Sawai Madhopur District, which is famous for the tigers, is one of the biggest national parks in India. The Government of India established it as the Sawai Madhopur Game Sanctuary in 1955 and was declared as one of the Project Tiger reserves in 1973. Ranthambhore became a national park in 1980 and in 1991 the tiger reserve was enlarged to include the nearby Sawai Man Singh and Keladevi sanctuaries. It covers an area of 1,334.64 km² (core area of 274.50 km² and buffer area of 1,060.14 km²). The subproject site is located about 13 km from the Ranthambore National Park.

2. Wetlands, Mangroves, and Estuarine

38. There are no wetlands, mangroves, or estuarines in Sawai Madhopur.

3. Flora and Fauna

⁴ Ambient air quality monitoring is conducted by Rajasthan Pollution Control Board (RPCB) only in areas with industries.

39. **Flora.** The principal species found in Sawai Madhopur is Dhok (*Anogeis pendula*). Some other species sparsely scattered are Raunj (*Acacia leucophloea*), Tendu (*Diospyros melanoxylon*). *Acacia Cataechu* Scrub: These scrubs exclusively occur in Deoli blocks of Uniara range in Tonk district. Small patches also occur in Rawanjna Doongar main and Sawai Madhopur 'B' blocks. The growing stock chiefly consists of stunted and crooked Khair (*Accacia catechu*), Raunj (*Acacia leucophloea*) and Krail (*Capparies deciduas*). The undergrowth is scanty and consists of Ber-Jhari (*Zizyphus nummulana*) and Papadhani (*Fluggea Viscosa*).

40. The subproject site is in the built-up area of Sawai Madhopur town therefore trees and vegetation (mostly shrubs and grasses) are those commonly found in urban areas.

41. **Fauna.** Sawai Madhopur district, having the Ranthambore National Park, has a large variety of animals, birds, and fishes. Tigers, leopards, panthers, wild dogs (Dhole), deers, wild pigs are found in the area. The lakes in the national park attract many water birds and forest birds which include peafowls, doves, parakeets, owls, egrets, herons, among many other bird varieties.

42. The subproject site is in the built-up area of Sawai Madhopur town therefore faunal species observed are those commonly found in urban areas (such as domesticated dogs, cows, pigs, and insects).

C. Economic Development

43. The economic condition of people in Sawai Madhopur is not satisfactory. Most recent data available is for 1998 which shows about 28% of the population is comprised of families below poverty line. These people are mostly labour class working in industries, shops, restaurant, construction, transport and other manual labour. The bulk of population depends upon agriculture and animal husbandry.

44. Being district headquarter, Sawai Madhopur town is the main regional centre for the entire district and is working as service centre for providing services like trade and commerce, transport, commercial and other higher level public facilities for the entire district.

45. Total workers in the districts as per 2001 census are 469,164 out of which 366,794 are main workers and 102,370 are marginal workers and 647,893 are non workers. The Work Participation Rate is 42%.

46. The occupational structure of people in Sawai Madhopur town shows that town is a commercial centre as well as service town. A number of district level offices are located in the town and as such about 23% workers are engaged in service sector. Industrial activity is not very significant due to lack of water and power. Therefore, employment in industrial sector is only 16%. It may be mentioned that Sawai Madhopur is famous for mason and construction workers. They are not only worked at Sawai Madhopur or other neighbouring states, but also in Gulf countries. The high percentage of workers of about 11.25% in construction justifies this fact.

1. Land use

47. Total area within municipal limits of Sawai Madhopur town is 59 km². Out of which only 4.94 km² is the developed area and the rest consists of water bodies hills, agricultural lands, and other uses. Out of the total developed area, 40.05% is classified as residential use, 4.1% as commercial use, 15.4% is industrial (which is mainly a cement manufacturing facility), 1.2% as land under Government offices, 3.3% as Government reserved areas, 2.9%

as recreational use, 12.8% as public and semi-public, and the remaining 19.8% as circulation use.

2. Commerce, Industry, and Agriculture

48. **Commerce.** The main retail and wholesale business activities of the city are still carried out in the market of old Sawai Madhopur town. These traditional markets are the principle business areas of the city. Originally planned straight roads in this area have become narrower because of the continuous *Chabutara* type encroachments in front of the shops, bus stand and the business allied to transportation is located along khandar road in this area.

49. The newly development "Bazaria" is the main market street of main town where retail and transport oriented business is located. This causes overcrowding and congestion on this road because of intermingling of traffic. There is no parking facility for vehicles in these markets.

50. **Industrial Development.** Sawai Madhopur town is a fast developing industrial town because of its nodal location at the junction of broad gauge railway lines. The town has only one large scale industrial unit (Jaipur Udyog Cement Limited) which is located in the north town. There are two planned industrial areas by Rajasthan State Industrial Development & Investment Corporation Ltd (RIICO) for small scale units; Kherda Industrial area is located on Tonk road in the west in an area of about 100 acres with 137 plots. The other industrial area is located on Ranthambhore road in the east in about 57 acres with 62 plots. Both industrial areas have been fully developed.

51. **Agriculture.** About 60% of land in Sawai Madhopur is used for agricultural purposes. Main crops include cereals, pulses, food grains, and oilseeds. The subproject sites are not located in these agricultural areas.

3. Infrastructure

52. **Water supply.** Water is being sourced from a surface source (Banas River) and groundwater sources (extraction thru 63 tubewells and 10 open wells). Total production from all these sources is 8.0 million liters per day. The gross water supply through the piped system is estimated 67.79 liters per capita per day (lpcd) which is much less than the standard norm of 135 lpcd. The existing water supply system comprises mainly of asbestos cement (AC) pipes.

53. **Sewerage System.** Sawai Madhopur town does not have underground sewerage system. Wastewater from toilets overflows into the municipal drains and eventually to Latiya *nallah* causing unsanitary conditions.

54. **Sanitation.** Only 50% of the total households reportedly have septic tanks and soak-well systems for sewerage disposal. The remaining households practice open defecation which is an unacceptable and unhygienic practice. The raw settled sewage from septic tanks is periodically flushed out by sanitary workers of the Sawai Madhopur Municipal Board however, is being indiscriminately discharged to open spaces, agricultural lands in an manner.

55. **Drainage.** The existing flood drainage system of Sawai Madhopur town is mainly through Latiya *nallah* which ultimately drains into the Surwal Dam through a diversion channel. In the old town, though lateral drains are constructed, they are of insufficient capacity for flood drainage. Analysis of existing storm water drainage system indicates that the main drains do not have sufficient capacities and requisite sections. Subsidiary drains

are almost absent. The main problems with the existing system are that the drains were poorly designed and built with ineffective gradients, and have been inadequately maintained over the years. As a result many are blocked with discarded garbage and are overflowing and leaking, and there are large areas of unsightly and unhygienic standing water around the town.

56. **Solid Waste.** Sawai Madhopur Municipal Council (SMMC) is responsible for solid waste management in Sawai Madhopur town. The estimated quantity of solid waste generation is 31 metric tons per day. The major sources of municipal solid waste are domestic, fruits and vegetable markets, hotels and restaurants, markets, street sweepings, hospitals, office/institutions, and construction and demolition waste (debris). Presently, a systematic and scientific system of primary collection of waste is practically non-existent and yet to be developed. Most of the citizens merely dump the wastes in nearby open drains/bins or open space available adding to the piling up of waste along road sides and clogging of drains. The waste is collected from 145 different places in town and transported by the SMMC and disposed without any treatment on available open/barren areas.

57. **Transportation.** Sawai Madhopur has a road network of 109 km, consisting of 35 km bituminous roads, 54 km cement concrete roads, 10 km wet mix macadam (WMM) road and 10 km earthen road. SMMC and the Public Works Department (PWD) are responsible for planning, construction, and maintenance of the road and transport network while the traffic police is responsible for traffic control and daily traffic management issues.

D. Social and Cultural Resources

58. **Demography.** The population of the district is more than 1.11 million. The population density of Sawai Madhopur is 248 persons per km², which is more than the state's population density of 165 persons per km². The literacy rate of the district is 56.67%, which is slightly lower than the state literacy rate (60.41%).

59. **Health and Educational Facilities.** There are good educational facilities in Sawai Madhopur district, which serve both townspeople and inhabitants of surrounding villages and towns in the hinterland. There are 688 primary schools, 161 secondary schools and 58 higher secondary schools, plus 21 degree colleges and one industrial training institute (ITI).

60. As the district headquarters town, Sawai Madhopur is the main centre for health facilities in the area and there is a district general hospital, four community health centres, 22 primary health centres, 194 sub-health centres, a TB clinic, and 14 private hospitals.

61. **History, Culture, and Tourism.** Sawai Madhopur has moderate tourist inflows with main attractions being Ranthambore National Park, Ranthambore Fort, Ganesh Temple, Kala-Gaura Bhairwa Temple, Chamatkarji Jain Mandir, Man Sarovar Dam, Chouth Mata Temple, Shiwad Temple, Bhagwatghar Kunda, Ambreshwaram Temple, Rameshwaram, Khandar Fort., Persian inscriptions in a Baori. Sawai Madhopur functions as an ideal weekend resort for inhabitants of the Delhi Metropolis in addition to being a place of interest for foreign tourists. No historical, cultural, or tourist attractions in or within the vicinity of the subproject sites.

62. **Religious Sites.** Kala Gaura Bhairav temple is located near the subproject site.

63. **Recreational Areas and Other Public Places.** No recreational areas or other public places in or within the vicinity of the subproject site..

IV. ANTICIPATED IMPACTS AND MITIGATION MEASURES

64. This section of the IEE reviews possible subproject-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 subproject's area of influence. As defined previously, the primary impact areas are (i) the construction sites; (ii) adjacent monuments, temples, and buildings; (iii) main routes/intersections which will be traversed by construction vehicles; and (iv) quarries and borrow pits as sources of construction materials. The secondary impact areas are: (i) entire Sawai Madhopur area outside of the delineated primary impact area; and (ii) entire Sawai Madhopur district in terms of over-all environmental and socio-economic improvement.

65. The ADB Rapid Environmental Assessment Checklist for Urban Development in http://www.adb.org/documents/guidelines/environmental_assessment/eaguidelines002.asp was used to screen the subproject for environmental impacts and to determine the scope of the IEE investigation. The completed Checklist is found in **Appendix 1**. All the proposed subproject components will interact physically with the environment.

66. In the case of this subproject (i) most of the individual elements are relatively small and involve straightforward construction and operation, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in the built-up area near Sawai Madhopur Fort, will not cause direct impact on biodiversity values. The subproject will be in properties held by the local government and access to the subproject area is thru public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

A. Pre-construction – Location and Design

67. **Design of the proposed components.** The design of the subproject components will be presented to the local government review and approval as both the structures and their premises do not come under ASI or Department of Archaeology and Museums.

68. **Environmentally-sensitive Areas.** Location impacts are not significant as there are no environmentally sensitive areas within the subproject area. No cutting of trees will be there due to the nature of the project.

69. **Utilities.** Telephone lines, electric poles and wires, water and sewer lines within the project locations will be shifted. To mitigate the adverse impacts due to relocation of the utilities, DSC will (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 done in case of unintentional interruption of services.

70. **Asbestos Cement (AC) Pipes.** An additional, particularly acute health risk presented by this subproject derives from the fact that, the existing water supply system comprises mainly AC pipes, so there is a risk of contact with carcinogenic material if these pipes are uncovered in the course of the work. However unlikely, the design consultant will develop a protocol to be applied in any instance that AC pipes are found, to ensure that

appropriate action is taken. This will be based on the approach recommended by the United States Environmental Protection Agency (USEPA),⁵ and amongst other things, will involve:

- (i) Develop reporting procedures to inform management immediately if AC pipes are encountered; and
- (ii) Require construction consultants to develop and apply an AC Management Plan, as part of the over-all health and safety (H and S) plan, to protect both workers and citizens in case accidental uncovering of AC pipes. This AC Management Plan should also contain national and international standards for safe removal and long-term disposal of all asbestos-containing material encountered.

71. **Social and Cultural Resources.** Rajasthan is an area of rich and varied cultural heritage which includes many forts and palaces from the Rajput and Mughal periods, and large numbers of temples and other religious sites, so there is a risk that any work involving ground disturbance can uncover and damage archaeological and historical remains. For this subproject, excavation will occur near archaeological monuments, so it could be that there is a very risk of such impacts. IPIU/DSC will:

- (i) Consult ASI to obtain an expert assessment of the archaeological potential of the site;
- (ii) Consider alternatives if the site is found to be of medium or high risk;
- (iii) Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available; and
- (iv) Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.

72. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Priority is to locate these in the existing dumpsite area. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered 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 the monuments, temples, buildings, or in areas which will inconvenience the community and visitors. All locations would be included in the design specifications and on plan drawings.

73. **Site selection of sources of materials.** Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be included in the design specifications and on plan drawings. Priority would be sites already permitted by Mining Department. If other sites are necessary, these would to be located away from population centres, drinking water intakes and streams, cultivable lands, and natural drainage systems; and in structurally stable areas even if some distance from construction activities. It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Sawai Madhopur

⁵ In the USA, standards and approaches for handling asbestos are prescribed by the Occupational Health and Safety Administration (OHSA) and the Environmental Protection Agency (EPA) and can be found at <http://www.osha.gov/SLTC/asbestos>

Municipal Council (SMMC). 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 SMMCB.

B. Construction

1. Screening of No Significant Impacts

74. The construction work is expected not to cause major negative impacts, mainly because:

- (i) Most of the activities will be on the built-up areas of the Heritage/Historic Site of Sawai Madhuopur thus could be constructed without causing impacts to biodiversity;
- (ii) The site is located on an government-owned land which is not occupied or used for any other purpose;
- (iii) Overall construction program will be relatively short and is expected to be completed in 12 months with activities to be conducted by small teams working on short lengths at a time so most impacts will be localized and short in duration; and
- (iv) Most of the predicted impacts associated with the construction process are produced because the process is invasive, such as involving earth-moving. However the routine nature of the impacts means that most can be easily mitigated and the impacts are clearly a result of the construction process rather than the design or location, as impacts will not occur if excavation or other ground disturbance is not involved.

75. As a result, there are several aspects of the environment which are not expected to be affected by the construction process and these can be screened out of the assessment at this stage as required by ADB procedure. These are shown in **Table 2**. These environmental factors are screened out presently but will be assessed again before starting of the construction activities.

Table 2: Fields in which construction is not expected to have significant impacts

Field	Rationale
Topography, Drainage, and Natural Hazards	Activities are not large enough to affect these features.
Geology, Geomorphology, Mineral Resources, and Soils	Activities are not large enough to affect these features. No mineral resources in the subproject sites.
Climate	Activities are not large enough to affect this feature.
Air Quality	Short-term production of dust is the only effect on atmosphere
Geohydrology and Groundwater	Activities will not be large enough to affect these features
Protected Areas	The gate is not archeologically protected area
Flora and Fauna	No rare or endangered species.
Land Use	No change in land use.
Socio-economic	Subproject site is located entirely on government-owned land so there is no need to acquire land from private owners.
Commerce, Industry, and Agriculture	Activities are not large enough to affect these features
Population	Activities are not large enough to affect this feature.

2. Construction method

76. Works will involve (i) common civil works like restoration and construction of Gate (Bheru Darwaja), boundary wall construction.

3. Anticipated Impacts and Mitigation Measures

77. Although construction of the subproject components involves quite simple techniques, the invasive nature of excavation, and in this case the relatively proximity to historically- and archaeologically-sensitive areas means that there will be quite a lot of disturbance where there are a variety of human activities.

78. Physical impacts will be reduced by the method of working, whereby the works will be conducted by small teams working on short lengths at a time.

79. **Sources of Materials.** Approximately 15-20 m³ of materials (sand, soil, and gravel) is required for this subproject. The construction contractor will be required to:

- (i) Use quarry sites and sources permitted by government;
- (ii) Verify suitability of all material sources and obtain approval of IPIU;
- (iii) If additional quarries will be required after construction has started, obtain written approval from IPMU; and
- (iv) Submit to DSC on a monthly basis documentation of sources of materials.

80. **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, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons) but temporary and during construction activities only. To mitigate the impacts, construction contractors will be required to:

- (i) Consult with IPIU/DSC on the designated areas for stockpiling of clay, soils, gravel, and other construction materials;
- (ii) Excavate the bridge foundations at the same time as the access roads are built so that dug material is used immediately, avoiding the need to stockpile on site;
- (iii) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather;
Use tarpaulins to cover sand and other loose material when transported by trucks; and
- (iv) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly.

81. **Surface Water Quality.** Run-off from stockpiled materials and chemical contamination from fuels and lubricants, paints during construction works can contaminate downstream surface water quality. These potential impacts are temporary and short-term duration only and to ensure these are mitigated, construction contractor will be required to:

- (i) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
- (ii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with IPIU/DSC on designated disposal areas;
- (iii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- (iv) Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
- (v) Dispose any wastes generated by construction activities in designated sites; and
- (vi) Conduct surface quality inspection according to the Environmental Management Plan (EMP).

82. **Noise Levels.** Construction works will be on busy areas near the gate. The sensitive receptors are the general population and visitors in these areas. Increase in noise level may be caused by earth-moving and excavation equipment, and the transportation of equipment, materials, and people. Impact is negative, short-term, and reversible by mitigation measures. The construction contractor will be required to:

- (i) Plan activities in consultation with IPIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
- (ii) Require horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
- (iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and
- (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s.

83. **Existing Infrastructure and Facilities.** Excavation works near project site can damage existing infrastructure. It is notably important to avoid damaging existing water pipes as these are mainly manufactured from Asbestos Cement (AC), which can be carcinogenic if inhaled, so there are serious health risks for both workers and the public. It is therefore important that construction contractors will be required to:

- (i) Obtain from IPIU and/or DSC the list of affected utilities and operators;
- (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of services. and
- (iii) Develop and implement an AC Pipes Management Plan

84. **Landscape and Aesthetics.** The construction works will produce less than 10 m³ of excess excavated soils, excess construction materials, and solid waste such as removed concrete, wood, trees and plants, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. These impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

- (i) Prepare and implement Waste Management Plan;
- (ii) Avoid stockpiling of excess excavated soils;
- (iii) Coordinate with SMMC for beneficial uses of waste materials 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
- (vii) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

85. **Accessibility.** Hauling of construction materials and operation of equipment on-site can cause traffic problems and conflicts in ROW. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

- (i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
- (ii) Schedule transport and hauling activities during non-peak hours;
- (iii) Locate entry and exit points in areas where there is low potential for traffic congestion;

- (iv) Keep the site free from all unnecessary obstructions;
- (v) Drive vehicles in a considerate manner;
- (vi) Coordinate with Sawai Madhopur Municipal Traffic Office for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- (vii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

86. **Socio-Economic – Income.** The subproject components will be located on government lands and ROWs, so there will be no need to acquire land, and thus there will be no impacts on the asset or landowners or tenants. However construction works will impede the access of tourists to the temples, monuments and nearby shops. The potential impacts are negative and moderate but short-term and temporary. The construction contractor will be required to:

- (i) Leave spaces for access between mounds of soil;
- (ii) Provide walkways and metal sheets where required to maintain access across trenches for people and vehicles;
- (iii) Increase workforce in front of critical areas such as institutions, 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.

87. **Socio-Economic – Employment.** Manpower will be required during the 12-month construction stage. This can result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and long-term. The construction contractor will be required to:

- (vi) 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
- (i) Secure construction materials from local market.

88. **Occupational Health and Safety.** Workers need to be mindful of the occupational hazards which can arise from working in construction. Potential impacts are negative and long-term but reversible by mitigation measures. The construction contractor will be required to:

- (i) Develop and implement site-specific Health and Safety (H and 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) H and S Training⁶ for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;

⁶ 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.

- (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
- (iii) Provide medical insurance coverage for workers;
- (iv) Secure all installations from unauthorized intrusion and accident risks;
- (v) Provide supplies of potable drinking water;
- (vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
- (vii) Provide H and S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, use personal protective equipments, and preventing injuring to fellow workers;
- (viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
- (ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- (x) Ensure moving equipment is outfitted with audible back-up alarms;
- (xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate;
- (xii) Use chemical during chemical wash as directed by the manufacturer in Material Safety Data Sheet (MSDS), use appropriate personal protective equipments such as suitable hand gloves, safety goggles, apron etc,
- (xiii) Only trained and experienced worker should be deployed for chemical washing
- (xiv) Use proper stairs, staging, platforms, barricades and Personal Protective Equipments (PPEs) such as safety belt, while working at height more than 1.5 meters.
- (xv) 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.

89. A particular acute health risk presented by this subproject the risk of contact with carcinogenic material if the AC pipes are uncovered in the course of work. Precautions have already been introduced into the design of the subproject to avoid uncovering of these AC pipes. However unlikely, the construction contractor will be required to:

- (i) Train all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognise them in situ;
- (ii) Report to management immediately if AC pipes are encountered;
- (iii) Develop and apply AC Management Plan.

90. **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:

- (i) Plan routes to avoid times of peak-pedestrian activities.
- (ii) Liaise with IPIU/DSC in identifying high-risk areas on route cards/maps.
- (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
- (iv) Provide road signs and flag persons to warn of dangerous conditions.

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

- (i) Consult with IPIU/DSC before locating project offices, sheds, and construction plants;
- (ii) Minimize removal of vegetation and disallow cutting of trees;
- (iii) Provide water and sanitation facilities for employees;
- (iv) Prohibit employees from poaching wildlife and cutting of trees for firewood;
- (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 following preference hierarchy: reuse, recycling and disposal to designated areas;
- (viii) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- (ix) Request IPIU/DSC to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

92. **Social and Cultural Resources.** For this subproject, if any excavation will occur near important historical and archaeological sites so that there is a risk of chance finds during excavation work. The construction contractor will be required to:

- (i) Strictly follow the protocol for chance finds in any excavation work;
- (ii) Request IPIU/DSC or any authorized person with archaeological field training to observe excavation;
- (iii) Stop work immediately to allow further investigation if any finds are suspected; and
- (iv) Inform IPIU/DSC if a find is suspected, and take any action they require ensuring its removal or protection in situ.

C. Operation and Maintenance

1. Screening out areas of no significant impact

93. Infrastructure will be used with minor repair and routine maintenance; there are several environmental sectors which should be unaffected once the new system becomes operational. These are identified in **Table 3** below, with an explanation of the reasoning in each case. These factors are thus screened out of the impact assessment and will not be mentioned further.

Table 3: Fields in which Operation and Maintenance of the Completed Infrastructures are Expected Not to have Significant Impacts

Field	Rationale
Atmosphere	Activities are not large enough to affect these features.
Wildlife, forests, rare species, protected areas	There is no wildlife or rare or endangered species nearby the subproject components.
Coastal resources	Sawai Madhopur is not located in a coastal area

2. Operation and Maintenance of the historic site

94. O and M of the infrastructures will be the responsibility of O and M contractor for 3 yrs and later by LSGD.

95. The infrastructures are designed such that they shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the area clean. These 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 servicing.

3. Anticipated Environmental Impacts and Mitigation Measures

96. **Physical Resources.** Physical impacts will be negligible and rather positive. Repair works will not be conducted during monsoon period so there will be no effect on drainage or other surface water body. Generated dust will be suppressed by water sprinkling.

97. **Ecological Resources.** There are no significant ecological resources in or around the project site, so any repairs or maintenance work can be conducted without ecological impacts.

98. **Economic Development.** The provision of improved infrastructure will definitely encourage tourism which will result in overall improved economic condition of the Sawai Madhopur town.

99. **Social and Cultural Resources.** There is a low risk of chance finds during O and M since all work will be conducted in areas that have already been disturbed when the infrastructure was installed. However, repair works could cause some temporary disruption of activities so the same precautions as employed during the construction period should be adopted. O and M contractor will need to:

- (i) Complete work in these areas quickly;
- (ii) Provide access for pedestrians and metal sheets for vehicles where required; and; and
- (iii) Consult municipal authorities, 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.

V. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Project Stakeholders

100. The primary stakeholders are:

- (i) Residents, shopkeepers and businesspeople who live and work alongside the roads/project location in which improvements will be provided and near sites where facilities will be built;
- (ii) Custodians and users of socially and culturally important buildings in affected areas;
- (iii) State and local authorities responsible for the protection and conservation of archaeological relics, historical sites and artefacts; and
- (iv) State and local tourism authorities.

101. The secondary stakeholders are:

- (i) LSGD as the Executing Agency;
- (ii) Other government institutions whose remit includes areas or issues affected by the subproject (state and local planning authorities such as Public Health

- Engineering Department, Local Government Department, Ministry of Environment and Forests, Roads and Highways Division);
- (iii) Non-government organizations (NGOs) and community-based organizations (CBOs) working in the affected communities;
- (iv) Other community representatives (prominent citizens, religious leaders, elders, women's groups);
- (v) The beneficiary community in general; and
- (vi) ADB, Gol, and Ministry of Finance.

B. Consultations and Disclosures Conducted

102. Some informal discussion was held with the local people during site visit. Issues discussed are:

- (i) Awareness and extent of the project and development components;
- (ii) Benefits of Project for the economic and social upliftment of community;
- (iii) Labour availability in the Project area or requirement of outside labour involvement;
- (iv) Local disturbances due to Project Construction Work;
- (v) Water logging and drainage problem if any;
- (vi) Drinking water problem;
- (vii) Forest and sensitive area nearby the project site; and
- (viii) Movement of wild animals nearby the project site.

103. Public consultations and group discussion meetings were conducted by RUIDP on 30 June 2009 after advertising in local newspapers. The objectives were to appraise the stakeholders about the program's environmental and social impacts and present safeguards to mitigate any potential significant impacts. Records of public consultations are attached as **Appendix 2**. The major issues raised are related to traffic interferences and possible dust and noise problems during construction phase. Other comments include construction vehicles creating some disturbances to the local people daily activities, necessity of proper safety arrangements. The issues and comments have been considered and incorporated in the design of the subproject and mitigation measures for the potential environmental impacts raised during the public consultations.

104. Informal discussions were held with the local people during site visits for the preparation of this IEE. Issues discussed were:

- (i) Executive agency should give preference to engage internationally reputed contractor like Gammon, Hindusthan Construction Company (HCC), etc as people do not faith about the local contractors in respect of quality of works as well as timely completion of work;
- (ii) Livelihood affected households should be given assistance in the mode of cash compensation;
- (iii) Local people should be employed by the contractor during construction work;
- (iv) Adequate safety measures should be taken during construction work;

105. Hindi versions of the Environmental Framework were provided during workshops to ensure stakeholders understood the objectives, policy, principles, and procedures. Likewise, English and Hindi versions of the Environmental Framework have been placed in Urban Local Body (ULB) offices, Investment Program Project Management Unit (IPMU) and IPIU offices, and the town library.

C. Future Consultation and Disclosure

106. LSGD extended and expanded the consultation and disclosure process significantly during implementation of RUSDIP. They have appointed an experienced NGO to handle this key aspect of the programme. The NGO (Community Awareness Participation Program, [CAPP]) continuously (i) conducts a wide range of activities in relation to all subprojects in each town; and (ii) ensures the needs and concerns of stakeholders are registered and are addressed in subproject design.

107. For this subproject, CAPP will develop, in close coordination with IPIU and DSC, a public consultation and disclosure program which is likely to include the following:

- (i) Consultation during detailed design:
 - (a) Focus-group discussions with affected persons and other stakeholders (including women's groups, NGOs and CBOs) to hear their views and concerns, so that these can be addressed in subproject design where necessary; and
 - (b) Structured consultation meetings with the institutional stakeholders (government bodies and NGOs) to discuss and approve key aspects of the project.
- (ii) Consultation during construction:
 - (a) Public meetings with affected communities to discuss and plan work programmes and allow issues to be raised and addressed once construction has started; and
 - (b) Smaller-scale meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in subproject monitoring and evaluation;
- (ii) Project disclosure:
 - (a) Public information campaigns (via newspaper, TV and radio) to explain the project to the wider town population and prepare them for disruption they may experience once the construction programme is underway;
 - (b) Public disclosure meetings at key project stages to inform the public of progress and future plans, and to provide copies of summary documents in Hindi; and
 - (c) Formal disclosure of completed project reports by making copies available at convenient locations in the study towns, informing the public of their availability, and providing a mechanism through which comments can be made.

108. Based on ADB requirements, the following will be posted on ADB website: (i) this IEE, upon receipt; (ii) a new or updated IEE, if prepared, reflecting significant changes in the Project during design or implementation; (iii) corrective action plan prepared during Project implementation to address unanticipated environmental impacts and to rectify non-compliance to EMP provisions; and (iv) environmental monitoring reports, upon receipt.

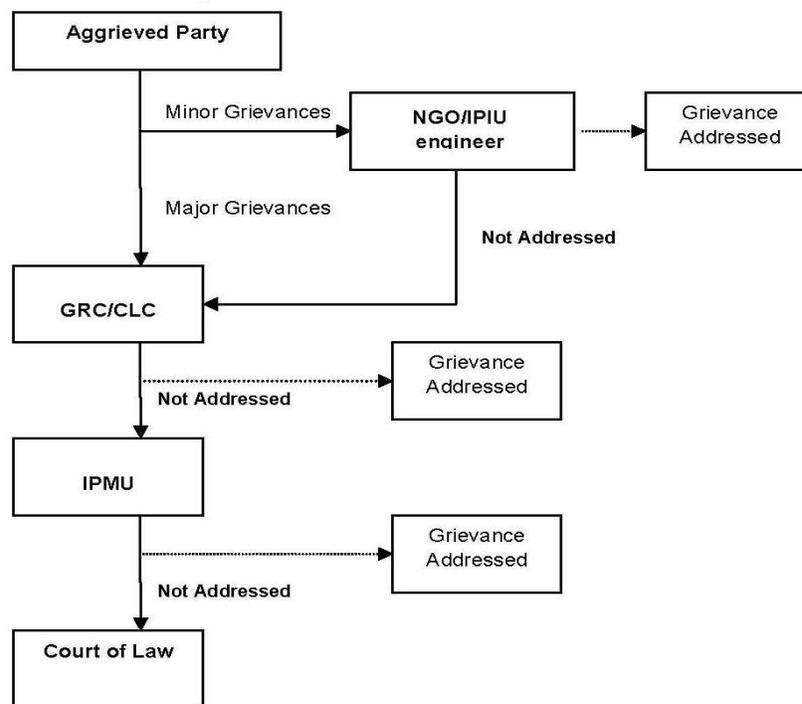
VI. GRIEVANCE REDRESS MECHANISM

109. Grievances of affected persons will first be brought to the attention of the implementing NGO or IPIU engineer. Grievances not redressed by the NGO or IPIU will be brought to the City Level Committees (CLC) set up to monitor project implementation in each town. The CLC, acting as a grievance redress committee (GRC) is chaired by the District Collector with representatives from the ULB, state government agencies, IPIU, community-based organizations (CBOs) and NGOs. As GRC, the CLC will meet every month. The GRC

will determine the merit of each grievance, and resolve grievances within a month of receiving the complaint, failing which the grievance will be addressed by the inter-ministerial Empowered Committee. The Committee will be chaired by the Minister of Urban Development and Local Self Government Department (LSGD), and members will include Ministers, Directors and/or representatives of other relevant Government Ministries and Departments. Grievance not redressed by the GRC will be referred to the IPMU for action failing which grievances will be referred by DPs/APs to the appropriate courts of law. The IPIU will keep records of all grievances received including: contact details of complainant, date that the complaint was received, nature of grievance, agreed corrective actions and the date these were effected, and final outcome. The grievance redress process is shown in **Figure 2**.

110. All costs involved in resolving the complaints will be borne by the IPMU. The GRCs will continue to function throughout the project duration.

Figure 2: Grievance Redress Mechanism



CLC = City Level Committee, GRC = Grievance Redress Committee, IPIU=Investment Program Implementation Unit, IPMU = Investment Program Management Unit, NGO = nongovernmental organization,

VII. ENVIRONMENTAL MANAGEMENT PLAN

A. Institutional Arrangements

111. The main agencies involved in managing and implementing the subproject are:

- (i) LSGD is responsible for management, coordination, and execution of all activities funded under the loan;
- (ii) IPMU is responsible for coordinating construction of subprojects across all towns, and for ensuring consistency of approach and performance;
- (iii) IPMC assists IPMU in managing the program and assures technical quality of design and construction;

- (iv) DSCs design the infrastructure, manage tendering of Contractors and supervise the construction process;
- (v) IPIUs appoint and manage Construction Contractors to build elements of the infrastructure in a particular town.
- (vi) An inter-ministerial Empowered Committee⁷ (EC) assists LSGD in providing policy guidance and coordination across all towns and subprojects.; and
- (vii) City Level Committees⁸ (CLCs) have also been established in each town to monitor project implementation in the town and provide recommendations to the IPIU where necessary.

112. **Figure 3** shows institutional responsibility for implementation of environmental safeguard at different level.

1. Responsible for carrying out mitigation measures

113. During construction stage, implementation of mitigation measures is the construction contractor's responsibility while during operation stage, O and M contractor and Urban Local Body will be responsible for the conduct of maintenance or repair works.

114. To ensure implementation of mitigation measures during the construction period, contract clauses (**Appendix 3**) for environmental provisions will be part of the civil works contracts. Contractors' conformity with contract procedures and specifications during construction will be carefully monitored by IPIU.

2. Responsible for carrying out monitoring measures

115. During construction, DSC's Environment Safeguards Officer and the designated representative of IPIU will monitor the construction contractor's environmental performance. ULB local staff will also closely monitor works.

116. During the operation stage, monitoring will be the responsibility of SMMC.

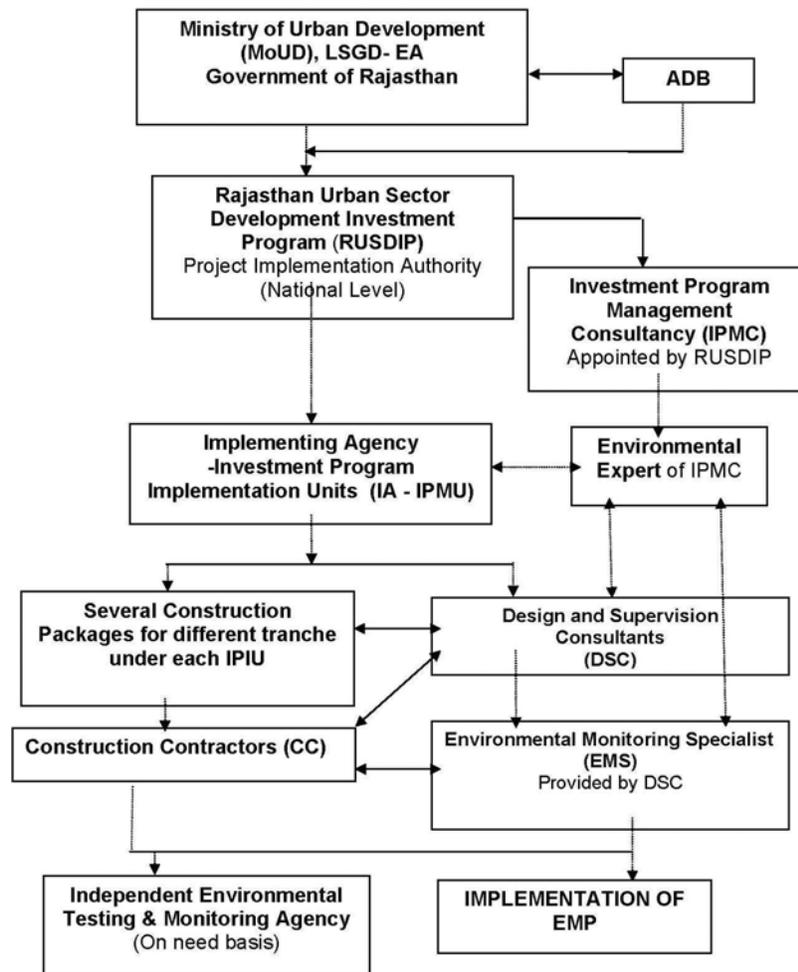
3. Responsible for reporting

117. LSGD will submit to ADB quarterly reports on implementation of the EMP and will permit ADB to field annual environmental review missions which will review in detail the environmental aspects of the Project. Any major accidents having serious environmental consequences will be reported immediately.

⁷ The EC is chaired by the Minister of Urban Development and LSG, and members include Ministers, Directors and/or representatives of other relevant Government Ministries and Departments.

⁸ CLCs are chaired by District Collectors, with members including officials of the ULB, local representatives of state government agencies, the IPIU, and local NGOs and CBOs.

Figure 3: Institutional Arrangement



B. Environmental Mitigation Plan

118. **Tables 4 to 6** shows the potential adverse environmental impacts, proposed mitigation measures, responsible parties, and estimated cost of implementation. This EMP will be included in the bid documents and will be further reviewed and updated during implementation.

C. Environmental Monitoring Program

119. **Tables 7 to 9** shows the proposed environmental monitoring program for this sub project. It includes all relevant environmental parameters, description of sampling stations, frequency of monitoring, applicable standards, responsible parties, and estimated cost. Monitoring activities during the detailed engineering design stage will form part of the baseline conditions of the subproject sites and will be used as the reference for acceptance of restoration works by the construction contractors.

Table 4: Anticipated Impacts and Mitigation Measures – Pre-construction Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Design Consideration	Unacceptable design for the existing heritage sites	Obtained “No Objection Certificate” from local government	IPIU and DSC	“No Objection Certificate” from local government
Utilities	Telephone lines, electric poles and wires, water and sewer lines if any within the working 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 done in case of unintentional interruption of services.	DSC	(i) list of affected utilities and operators; (ii) bid document to include requirement for a contingency plan for service interruptions
Asbestos Cement Pipes	Risk of contact with carcinogenic materials	(i) Require DSC to develop AC Protocol; (ii) Develop reporting procedures to inform management immediately if AC pipes are encountered; and (ii) Require construction consultants to develop and apply an AC Management Plan, as part of the over-all health and safety (H and S) plan, to protect both workers and citizens in case accidental uncovering of AC pipes. This AC Management Plan should also contain national and international standards for safe removal and long-term disposal of all asbestos-containing material encountered.	IPIU and DSC	(i) Asbestos Cement Protocol; (ii) requirement for AC Management included in bid documents
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical remains	(i) Consult ULB to obtain an expert assessment of the archaeological potential of the site;	IPIU and DSC	Chance Finds Protocol

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		<p>(ii) Consider alternatives if the site is found to be of medium or high risk;</p> <p>(iii) Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available; and</p> <p>(iv) Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.</p>		
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	<p>(i) Prioritize areas within or nearest possible vacant space in the subproject sites;</p> <p>(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;</p> <p>(iii) Do not consider residential areas;</p> <p>(iv) Take extreme care in selecting sites to avoid direct disposal to water body or in areas which will inconvenience the community.</p>	IPIU and DSC to determine locations prior to award of construction contracts.	List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural	<p>(i) Prioritize sites already permitted by the Mining Department;</p> <p>(ii) If other sites are necessary, inform</p>	IPIU and DSC to prepare list of approved quarry sites and sources of materials	(i) list of approved quarry sites and sources of materials; (ii) bid document to include requirement for verification of suitability of sources and

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	drainage patterns, ponding and water logging, and water pollution.	construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of IPIU; and (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PMU.		permit for additional quarry sites if necessary.

Table 5: Anticipated Impacts and Mitigation Measures – Construction Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Sources of Materials	Extraction of rocks and material may cause ground instability	(i) Use quarry sites and sources permitted by government; (ii) Verify suitability of all material sources and obtain approval of Investment Program Implementation Unit (IPIU); (iii) If additional quarries will be required after construction has started, obtain written approval from IPMU; and; (iv) Submit to DSC on a monthly basis documentation of sources of materials.	Construction Contractor	Construction Contractor documentation
Air Quality	Emissions from construction vehicles, equipment, and machinery used for excavation and construction resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons)	(i) Consult with IPIU/DSC on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; (ii) Excavate the bridge foundations at the same time as the access roads are built so that dug material is used immediately, avoiding the need to stockpile on site; (iii) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather;	Construction Contractor	(i) Location of stockpiles; (ii) complaints from sensitive receptors; (iii) heavy equipment and machinery with air pollution control devices (iii) ambient air for respirable particulate matter (RPM) and suspended particulate matter (SPM); (iv) vehicular emissions such as sulphur dioxide (SO ₂), nitrous oxides (NO _x), carbon monoxide (CO), and hydrocarbons

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		(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.		
Surface water quality	Run-off from stockpiled materials, and chemical contamination from chemicals, fuels and lubricants during construction works can contaminate downstream surface water quality.	(i) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (ii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with IPIU/DSC on designated disposal areas; (iii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iv) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (v) Dispose any wastes generated by construction activities in designated sites; and (vi) Do not dispose spent of left chemical after chemical washing in any water body or drain, dispose according to Material Safety Data Sheet (MSDS) of the chemical and (vii) Conduct surface quality inspection according to the Environmental Management Plan (EMP).	Construction Contractor	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) number of silt traps installed along drainages leading to water bodies; (iii) records of surface water quality inspection; (iv) effectiveness of water management measures; (v) for inland water: suspended solids, oil and grease, biological oxygen demand (BOD), and coliforms. (vi) Physical inspection for use and disposal of chemical used
Noise Levels	Increase in noise level due to earth-moving and excavation	(i) Plan activities in consultation with IPIU/DSC so	Construction Contractor	(i) Complaints from sensitive receptors; (ii) use of silencers

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	equipment, and the transportation of equipment, materials, and people	that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; (ii) Require horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach; (iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s.		in noise-producing equipment and sound barriers; (iii) Equivalent day and night time noise levels
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure located at project area	(i) Obtain from IPIU and/or DSC the list of affected utilities and operators; (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of services; and (iii) Develop and implement an AC Pipes Management Plan	Construction Contractor	(i) Existing Utilities Contingency Plan; (ii) Asbestos Cement Pipes Management Plan
Landscape and Aesthetics	solid wastes as well as excess construction materials	(i) Prepare and implement Waste Management Plan; (ii) Avoid stockpiling of excess excavated soils; (ii) Coordinate with SMMC for beneficial uses of excess excavated soils or immediately dispose to designated areas; (iv) Recover used oil and lubricants and reuse or	Construction Contractor	(i) Waste Management Plan; (ii) complaints from sensitive receptors; (iii) IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		<p>remove from the sites;</p> <p>(v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;</p> <p>(vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and</p> <p>(vii) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.</p>		
Accessibility	traffic problems and conflicts in right-of-way (ROW)	<p>(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;</p> <p>(ii) Schedule transport and hauling activities during non-peak hours;</p> <p>(iii) Locate entry and exit points in areas where there is low potential for traffic congestion;</p> <p>(iv) Keep the site free from all unnecessary obstructions;</p> <p>(v) Drive vehicles in a considerate manner;</p> <p>(vi) Coordinate with Sawai Madhopur Municipal Traffic Office for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; and</p> <p>(vii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works</p>	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors; (iii) number of signages placed at subproject sites.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		and contact numbers for concerns/complaints.		
Socio-Economic – Income.	impede the access of tourists to nearby shops	(i) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required to maintain access across trenches for people and vehicles; (iii) Increase workforce in front of critical areas such as institutions, 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.	Construction Contractor	(i) complaints from sensitive receptors; (ii) number of walkways, signages, and metal sheets placed at subproject sites.
Socio-Economic Employment	- generation of contractual 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; and (ii) Secure construction materials from local market.	Construction Contractor	(i) employment records; (ii) records of sources of materials
Occupational Health and Safety	occupational hazards which can arise from working in infrastructures like roads and bridges	(i) Develop and implement site-specific Health and Safety (H and 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) H and S Training for all site personnel; (d) documented procedures to be followed for all site	Construction Contractor	(i) site-specific Health and Safety (H and S) Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances;

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		<p>activities; and (e) documentation of work-related accidents;</p> <p>(ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;</p> <p>(iii) Provide medical insurance coverage for workers;</p> <p>(iv) Secure all installations from unauthorized intrusion and accident risks;</p> <p>(v) Provide supplies of potable drinking water;</p> <p>(vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;</p> <p>(vii) Provide H and 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;</p> <p>(viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;</p> <p>(ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;</p> <p>(x) Ensure moving equipment is outfitted with audible back-</p>		<p>(vii) record of H and S orientation trainings</p> <p>(viii) personal protective equipments;</p> <p>(ix) % of moving equipment outfitted with audible back-up alarms;</p> <p>(xi) sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.</p>

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		<p>up alarms;</p> <p>(xi) Use chemical during chemical wash as directed by the manufacturer in Material Safety Data Sheet (MSDS), use appropriate personal protective equipments such as suitable hand gloves, safety goggles, apron etc,</p> <p>(xii) Only trained and experienced worker should be deployed for chemical washing</p> <p>(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</p> <p>(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.</p>		
Asbestos Cement Pipes	health risk	<p>(i) Train all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognise them in situ;</p> <p>(ii) Report to management immediately if AC pipes are encountered;</p>	Construction Contractor	(i) records of trainings; (ii) AC Management Plan approved by PIU/DSC

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Community Health and Safety.	traffic accidents and vehicle collision with pedestrians	(iii) Develop and apply AC Management Plan. (i) Plan routes to avoid times of peak-pedestrian activities. (ii) Liaise with IPIU/DSC in identifying high-risk areas on route cards/maps. (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (iv) Provide road signs and flag persons to warn of dangerous conditions.	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors
Work Camps	temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants	(i) Consult with IPIU/DSC before locating project offices, sheds, and construction plants; (ii) Minimize removal of vegetation and disallow cutting of trees; (iii) Provide water and sanitation facilities for employees; (iv) Prohibit employees from poaching wildlife and cutting of trees for firewood; (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 following preference hierarchy: reuse, recycling and disposal to designated areas;	Construction Contractor	(i) complaints from sensitive receptors; (ii) water and sanitation facilities for employees; and (iii) IPIU/DSC report in writing that the camp has been vacated and restored to pre-project conditions

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		(viii) Remove all wreckage, rubbish, which are no longer required; and (ix) Request IPIU/DSC to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.		
Social and Cultural Resources	risk of archaeological chance finds	(i) Strictly follow the protocol for chance finds in any excavation work; (ii) Request IPIU/DSC or any authorized person with archaeological field training to observe excavation; (iii) Stop work immediately to allow further investigation if any finds are suspected; and (iv) Inform IPIU/DSC if a find is suspected, and take any action they require ensuring its removal or protection in situ. (v) Work closely with conservation authority to ensure monitoring of all works and compliance	Construction Contractor/ULB field staff	(i) records of chance finds

Table 6: Anticipated Impacts and Mitigation Measures – Operation and Maintenance Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Economic Development and Social and Cultural Resources	temporary disruption of activities	(i) Complete work in these areas quickly; and (ii) Provide wooden bridges for pedestrians and metal sheets for vehicles to allow access across where required; and (iv) Consult municipal authorities, custodians of 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.	SMMC and O and M Contractors in close coordination with ASI	complaints from sensitive receptors
Solid wastes	If not removed frequently – garbage dumping near the	Regular removal of waste	SMMC and O and M Contractors in close	(i) frequency of collection; (ii)

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	gate resulting nuisance and unhygienic condition		coordination with ASI	complaints from sensitive receptors

Table 7: Pre-construction Environmental Monitoring Program

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Baseline Environmental Condition – Ambient Air Quality	Subproject sites	DSC	Establish baseline values of respirable particulate matter (RPM) and (ii) suspended particulate matter (SPM)	Air sample collection and analyses by in-house laboratory or accredited 3rd party laboratory	GOI Ambient Air Quality Standards	Once prior to start of construction	IPMU
Baseline Environmental Condition - Water Quality	Subproject sites	DSC	Establish baseline values of suspended solids (TSS), (iii) pH (iv) biological oxygen demand (BOD), (v) fecal coliform	Air sample collection and analyses by in-house laboratory or accredited 3rd party laboratory	GOI Water Quality Standards	Once prior to start of construction	IPMU
Sources of Materials	not applicable	DSC	(i) list of affected utilities and operators; (ii) bid document to include requirement for a contingency plan for service interruptions	checking of records	(i) list of affected utilities and operators prepared; (ii) requirement for a contingency plan for service interruptions included in bid documents	once	IPMU
Asbestos Cement Pipes	not applicable	IPIU and DSC	(i) Asbestos Cement Protocol; (ii) requirement for AC Management included in bid documents	checking of records	(i) AC Protocol prepared; (ii) bid documents include requirements for AC Management Plan	once	IPMU
Social and Cultural	not applicable	IPIU and DSC	Chance Finds Protocol	checking of records	Chance Finds Protocol provided	once	PMU

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Resources					to construction contractors prior to commencement of activities		
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	not applicable	IPIU and DSC to determine locations prior to award of construction contracts.	List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	checking of records	List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas provided to construction contractors prior to commencement of works.	once	PMU
Sources of Materials	not applicable	IPIU and DSC to prepare list of approved quarry sites and sources of materials	(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.	checking of records	(i) list of approved quarry sites and sources of materials provided to construction contractors (ii) bid document included requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	once	IPMU

Table 8: Construction Environmental Monitoring Program

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Sources of Materials	quarries and sources of materials	Construction Contractor	Construction Contractor documentation	(i) checking of records; (ii) visual inspection of sites	(i) sites are permitted; (ii) report submitted by construction contractor monthly (until such time there is excavation work)	monthly submission for construction contractor as needed for DSC	DSC in consultation of municipal body
Air Quality	construction sites and areas designated for stockpiling of materials	Construction Contractor	(i) Location of stockpiles; (ii) complaints from sensitive receptors; (iii) heavy equipment and machinery with air pollution control devices (iii) ambient air for respirable particulate matter (RPM) and suspended particulate matter (SPM); (iv) vehicular emissions such as sulphur dioxide (SO ₂), nitrous oxides (NO _x), carbon monoxide (CO), and hydrocarbons (HC)	(i) checking of records; (ii) visual inspection of sites	(i) stockpiles on designated areas only; (ii) complaints from sensitive receptors satisfactorily addressed; (iii) air pollution control devices working properly; (iv) GOI Ambient Quality Standards for ambient air quality; (iv) GOI Vehicular Emission Standards for SO ₂ , NO _x , CO and HC.	monthly for checking records	DSC in co-ordination with municipal body
Surface Water Quality	(i) construction sites; (ii) areas for stockpiles, storage of fuels and lubricants	Construction Contractor	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii)	visual inspection; Sample collection and laboratory analyses	(i) designated areas only; (ii) silt traps installed and functioning; (iii) no noticeable	Monthly	DSC in co-ordination with municipal body

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
	and waste materials;		number of silt traps installed along drainages leading to water bodies; (iii) records of surface water quality inspection; (iv) effectiveness of water management measures; (v) for inland water: suspended solids, oil and grease, biological oxygen demand (BOD), and coliforms.		increase in suspended solids and silt from construction activities (iv) GOI Standards for Water Discharges to Inland Waters and Land for Irrigation		
Noise Levels	(i) construction sites; (ii) areas for stockpiles, storage of fuels and lubricants and waste materials; (iii) work camps	Construction Contractor	(i) Complaints from sensitive receptors; (ii) use of silencers in noise-producing equipment and sound barriers; (iii) Equivalent day and night time noise levels	(i) checking of records; (ii) visual inspection	(i) complaints from sensitive receptors satisfactorily addressed; and (ii) silencers in noise-producing equipment functioning as design; and (iii) sound barriers installed where necessary	Monthly	DSC in co-ordination with municipal body
Existing Utilities and Infrastructure	(i) construction sites; (ii) alignment of affected utilities	Construction Contractor	(i) Existing Utilities Contingency Plan; (ii) Asbestos Cement Pipes Management Plan	(i) checking of records; (ii) visual inspection	implementation according to Utilities Contingency Plan and Asbestos Cement Plan	as needed	DSC
Landscape and Aesthetics	(i) construction sites;	Construction Contractor	(i) Waste Management	(i) checking of records;	(i) no accumulation of	monthly	DSC

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
	(ii) areas for stockpiles, storage of fuels and lubricants and waste materials; (iii) work camps		Plan; (ii) complaints from sensitive receptors; (iii) IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.	(ii) visual inspection	solid wastes on-site; (ii) implementation of Waste Management Plan; (iii) complaints from sensitive receptors satisfactorily addressed.		
Accessibility	(i) construction sites; (ii) traffic routes	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors; (iii) number of signages placed at subproject sites.	visual inspection	(i) implementation of Traffic Management Plan; (ii) complaints from sensitive receptors satisfactorily addressed; (iii) signages visible and located in designated areas	Monthly	DSC
Socio-Economic - Income	construction sites	Construction Contractor	(i) complaints from sensitive receptors; (ii) number of walkways, signages, and metal sheets placed at subproject sites.	visual inspection	(i) complaints from sensitive receptors satisfactorily addressed; (ii) walkways, ramps, and metal sheets provided (iii) signages visible and located in designated areas	Quarterly	DSC
Asbestos Cement Pipes	construction sites	Construction Contractors	(i) records of trainings; (ii) AC	checking of records	no exposure to AC pipes	as needed	IPIU and DSC

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
			Management Plan approved by IPIU/DSC				
Socio-Economic - Income	construction sites	Construction Contractor	(i) employment records; (ii) records of sources of materials	checking of records	number of employees from Bundi equal or greater than 50% of total workforce	quarterly	DSC
Occupational Health and Safety	construction sites	Construction Contractor	(i) site-specific Health and Safety (H and S) Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) record of H and S orientation trainings (viii) personal protective equipments; (ix) % of moving equipment outfitted with audible back-up alarms; (xi) sign boards for hazardous	(i) checking of records; (ii) visual inspection	(i) implementation of H and S plan; (ii) number of work-related accidents; (iii) % usage of personal protective equipment; (iv) number of first-aid stations, frequency of potable water delivery, provision of clean eating area, and number of sign boards are according to approved plan; (v) % of moving equipment outfitted with audible back-up alarms	Quarterly	DSC

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
			areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.				
Community Health and Safety	construction sites	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors	visual inspection	(i) implementation of Traffic Management Plan; (ii) complaints from sensitive receptors satisfactorily addressed	Quarterly	DSC in co-ordination with municipal body
Work Camps	work camps	Construction Contractor	(i) complaints from sensitive receptors; (ii) water and sanitation facilities for employees; and (iii) IPIU/DSC report in writing that the camp has been vacated and restored to pre-project conditions	visual inspection	(i) designated areas only; (ii) complaints from sensitive receptors satisfactorily addressed	quarterly	DSC in co-ordination with municipal body
Chance Finds	construction sites	Construction Contractor	records of chance finds	checking of records	Implementation of Chance Finds Protocol	as needed	DSC in co-ordination with municipal body
Disposal and use of Chemical/ acids	Construction sites	Construction Contractor	(i) Disposal of used chemical/ acids (ii) personal protective equipments;	(i) checking of records; (ii) visual inspection	Records of proper disposal	As needed	DSC in coordination with Municipality

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Storage of chemical and acids	Storage site	Construction Contractor	(i) record of H and S orientation trainings (ii) personal protective equipments; (iii) sign boards for hazardous substances and areas for storage and disposal.) checking of records; (ii) visual inspection	Records of proper storage	As needed	IPIU and DSC

Table 9: Operation and Maintenance Environmental Monitoring Program

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Economic Development and Social and Cultural Resources	subproject sites	SMMC and O and M Contractors	complaints from sensitive receptors	checking of records	complaints from sensitive receptors satisfactorily addressed	as needed	IPMU
On-site Solid Waste Management	subproject sites	SMMC and O and M Contractors in close coordination with conservation authority	complaints from sensitive receptors	checking of records	complaints from sensitive receptors satisfactorily addressed	as needed	IPMU

D. Environmental Management Plan Costs

120. Most of the mitigation measures require the Construction Contractors to adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. Regardless of this, any costs of mitigation by the construction contractors or DSC are included in the budgets for the civil works and do not need to be estimated separately here. Mitigation that is the responsibility of LSGD will be provided as part of their management of the project, so this also does not need to be duplicated here.

121. The remaining actions in the EMP are the various environmental monitoring activities to be conducted by the Environmental Monitoring Specialist (EMS) in the DSC. These have been budgeted elsewhere but budget is listed below in the event additional person months are required and found necessary by DSC, and their costs are shown in **Table 10**. The figures show that the total cost of environmental management and monitoring for the subproject is INR 300,000.

Table 10: Environmental Management and Monitoring Costs (INR)

Item			Quantity	Unit Cost	Total Cost	Source of Funds
1. Implementation of EMP (1 year)						
Domestic Specialist	Environmental	Monitoring	1 x 2 month	150,000 ⁹	300,000	DSC
TOTAL					300,000	

EMP = Environmental Management Plan.

VIII. FINDINGS AND RECOMMENDATIONS

122. The process described in this document has assessed the environmental impacts of all elements of the renovation proposed under the Sawai Madhopur Heritage Site Subproject. Potential negative impacts were identified in relation to construction and operation of the improved infrastructure. No impacts were identified as being due to either project design or location. These were discussed with LSGD and specialists responsible for the subproject engineering aspects, and as a result mitigation measures have been developed to reduce all negative impacts to acceptable levels. Some measures have already been included in the designs submitted for approval by LSGD.

123. During the construction phase, impacts mainly arise from the disturbance of residents, businesses, traffic and important buildings by the construction works. These are common impacts of construction in built-up areas, and there are well developed methods for their mitigation.

124. The use of AC pipes in the existing water distribution network presents a particular problem, as workers and the public will need to be protected from inhalation of asbestos dust, which can be carcinogenic. This has been addressed in the EMP.

125. It is proposed that the project will employ in the workforce people who live in the vicinity of construction sites to provide them with a short-term economic gain; and ensure that people employed in the longer term to maintain and operate the new historic structure are residents of nearby communities.

⁹ Unit costs of domestic consultants include fee, travel, accommodation and subsistence

126. Once the structure is renovated, most facilities will operate with routine maintenance, which should not affect the environment. The infrastructure will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. It will also be conducted in areas that have already been excavated.

127. Mitigation will be assured by a program of environmental monitoring to be conducted during construction and operation stages, with assistance from ASI. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. The Investment Project Implementation Unit (IPIU) and Design and Supervision Consultants (DSC) will work closely with Municipality in implementing the program. Any requirements for remedial action will be reported to the IPMU.

128. The main impacts of the subproject will be beneficial to the citizens of Sawai Madhopur as improved infrastructure in the gate area will lead to socio-economic gains for the town through more tourist mobilization.

129. The stakeholders were involved in developing the IEE through face-to-face discussions on site and a large public meeting held in the town, after which views expressed were incorporated into the IEE and the planning and development of the project. The IEE will be made available at public locations in the town and will be disclosed to a wider audience via the ADB website. The consultation process will be continued and expanded during project implementation, when a nationally-recognised NGO will be appointed to handle this key element to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation

IX. CONCLUSIONS

130. The subproject is not anticipated to cause significant adverse impacts. The potential adverse 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.

131. Based on the findings of the IEE, the classification of the Project as Category "B" is confirmed, and no further special study or detailed EIA needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006).

Appendix 1 – Rapid Environmental Assessment (REA) Checklist - Sawai Madhopur Heritage Site

(Restoration of Bheru Darwaja, Sawai Madhopur)

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting			
Is the project area...			
<ul style="list-style-type: none"> ▪ Densely populated? 	<input type="checkbox"/>	√	Bheru Darwaja is located at the meeting point of the 'Sawai Madhopur City' (Old) and 'Man Town' and is the entrance of the old city from Man Town side.
<ul style="list-style-type: none"> ▪ Heavy with development activities? 	<input type="checkbox"/>	√	Since Sawai Madhopur is one of the least developed areas of Rajasthan, hence it is not loaded with developmental activities. It is infact an effort to develop the same.
<ul style="list-style-type: none"> ▪ Adjacent to or within any environmentally sensitive areas? 			
<ul style="list-style-type: none"> • Cultural heritage site 	√	<input type="checkbox"/>	As the Bheru Darwaja is situated in the mid of Sawai Madhopur town and is the gateway for Ranthambhore National Park and Fort and tiger reserve, it is an important spot through which a large number of tourists pass, its rich heritage and historic values, Kala Gaura temple located very close to it on a hillock forming its backdrop and its walls stretching upto hillocks on both sides makes the whole scene quite picturesque. Ranthambore Fort is also near to the Bheru darwaja. The gate is not listed as ASI heritage site
<ul style="list-style-type: none"> • Protected Area 	<input type="checkbox"/>	√	Ranthambore National Park is within a distance of around 12 km.
<ul style="list-style-type: none"> • Wetland 	<input type="checkbox"/>	√	There is no wetlands area present near to the project area.
<ul style="list-style-type: none"> • Mangrove 	<input type="checkbox"/>	√	There is no mangrove area present near to the project area.
<ul style="list-style-type: none"> • Estuarine 	<input type="checkbox"/>	√	There is no estuarine area present near to the project area.
<ul style="list-style-type: none"> • Buffer zone of protected area 	<input type="checkbox"/>	√	Site is not within buffer zone of the protected area of Ranthambore National Park but close to it (with in 12 Km)
<ul style="list-style-type: none"> • Special area for protecting biodiversity 	<input type="checkbox"/>	√	The proposed project doesn't falls

SCREENING QUESTIONS	Yes	No	REMARKS
	<input type="checkbox"/>	<input type="checkbox"/>	within any special area for protecting biodiversity.
• Bay	<input type="checkbox"/>	√	Not Applicable
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.	<input type="checkbox"/>	√	No such impacts on the associated sanitation and solid waste disposal systems are expected.
▪ 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?	<input type="checkbox"/>	√	Improvement of surrounding environmental conditions is expected due to the up-gradation of this heritage site.
▪ degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?	<input type="checkbox"/>	√	No, there will be no degradation of land and ecosystems
▪ dislocation or involuntary resettlement of people	<input type="checkbox"/>	√	No dislocation and involuntary resettlement will be there as the work involves only the restoration of an existing darwaza (door).
▪ degradation of cultural property, and loss of cultural heritage and tourism revenues?	<input type="checkbox"/>	√	This project will upgrade the quality of cultural property.
▪ 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 pollutive industries?	<input type="checkbox"/>	√	No such impacts are expected.
▪ water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters)?	<input type="checkbox"/>	√	No such problems will be observed due to this restoration project.
▪ air pollution due to urban emissions?	<input type="checkbox"/>	√	Air pollution due to urban emissions is not expected to degrade.
▪ social conflicts between construction workers from other areas and local workers?	<input type="checkbox"/>	√	Preference will be given to the local workers in order to prevent any social conflicts between workers from other areas and local workers.
▪ road blocking and temporary flooding due to land excavation during rainy season?	<input type="checkbox"/>	√	No such kind of problems will be there.
▪ noise and dust from construction activities?	√	<input type="checkbox"/>	There may be a moderate generation of noise and dust from construction activities, which will be mitigated by providing adequate

SCREENING QUESTIONS	Yes	No	REMARKS
			measures during the constructional phase.
<ul style="list-style-type: none"> ▪ traffic disturbances due to construction material transport and wastes? 	√	<input type="checkbox"/>	<p>Slight disturbances may be there as the gateway with its boundary walls located in the valley is stretched between two parallel hills and main road to Ranthambhore fort and National Park passes through it and which further connects Sawai Madhopur to Gwalior and Jhansi etc. via Shivpuri, there by all type of traffic passes through Bheru Darwaja.</p> <p>Scheduling of the work period will be done in consultation with traffic & police department</p>
<ul style="list-style-type: none"> ▪ temporary silt runoff due to construction? 	<input type="checkbox"/>	√	There is no considerable runoff could be caused during the constructional activities.
<ul style="list-style-type: none"> ▪ hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation? 	<input type="checkbox"/>	√	No such hazards to public health will be there.
<ul style="list-style-type: none"> ▪ water depletion and/or degradation? 	<input type="checkbox"/>	√	Ground water requirement is very less for restoration work , so there is no need to exploit the ground water
<ul style="list-style-type: none"> ▪ overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization? 	<input type="checkbox"/>	√	Not applicable as per nature of work
<ul style="list-style-type: none"> ▪ contamination of surface and ground waters due to improper waste disposal? 	<input type="checkbox"/>	√	Proper waste handling facilities will be utilized in order to prevent any contamination.
<ul style="list-style-type: none"> ▪ pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems? 	<input type="checkbox"/>	√	Not applicable

Appendix 2 Public Consultation- Environment

Sub Project:- Heritage Site (Sawai Madhopur)

Issues discussed

- General Observations
- Awareness and extent of the project and development components
- Benefits of the Project for the economic and Socio-cultural development
- Labour availability in the Project area or requirement of outside labour involvement
- Local disturbances due to Project Construction Work
- Local disturbances during project operation work.
- Necessity of tree felling etc. at project site
- Water logging and drainage problem if any
- Major environmental problems expected,
- Forest and sensitive area nearby the project site
- Other problems, encountered, if any

1. Date & time of Consultation:- 21.10.10 at 10.00 AM , Location :- Govt. Hospital Tiraha

2. Date & time of Consultation:- 21.10.10 at 12.00 PM, Location :- Khandar Choraha

Table: Issues of the Public Consultation- Design phase

Sr. No.	Key Issues/Demands	Perception of community	Action to be Taken
1	Awareness of project – including coverage area	The people of the town are well versed with the proposed project of restoration of Bheru Darwaja. As per the local people, the DSC consultants have informed them by open houses and discussions regarding the proposed projects and its benefits. People were in favour of the project and they are ready to provide help as and when required. Some of them had very sound information's regarding the project.	The nearby residents should be associated at the most by proper discussions with them.
2	In what way they may associate with the project	<ul style="list-style-type: none"> • The local people are of the view that local people should be hired depending upon their efficiency and expertise. • The local people wanted that they should be involved from the initial decision making phase onwards so that they can participate at every stage. • The local people said that they should be well informed on time regarding the areas where the work will initiate so that they can accustom themselves. 	<p>Preference will be given to the local labour during the implementation of the project as per the requirement.</p> <p>People will be informed well before time before the execution starts.</p>
3	Presence of any	During the consultation, it was found that	Scientific application of mitigation

Sr. No.	Key Issues/Demands	Perception of community	Action to be Taken
	forest, wild life or any sensitive / unique environmental components nearby the project area	there will be no impact as the area is not surrounded by any reserve forest. Ranthambore National Park, a Tiger reserve forest is located nearby the site	measures will be provided to avoid any impact on the forest area.
4	Presence of historical/ cultural/ religious sites nearby	Kala Gaura Temple is the only site of cultural/ historic/ religious importance which were found in the close proximity of the proposed project site.	Preventive measures will be taken in order to avoid any negative impacts on the Temple.
5	Unfavorable climatic condition	As per the local people's view, the summer season is not appropriate to commence the work as the temperature reaches about 47°C. During the heavy rains, there might arise some problems in the execution of the project as the drainage facilities in the area are extremely poor due to which overflowing of drains is a common problem encountered by the people.	Suitable climatic conditions will be considered during the planning and execution stage. The points raised by the local people should be taken into consideration.
6	Occurrence of flood	Not applicable as per the nature of work.	Proper actions should be taken during the execution of the project in order to prevent flood situation.
7	Drainage and sewerage problem facing	Due to poor drainage condition people suffer from water stagnancy in their areas either at the time of rainy season or when some pipeline etc breaks away. Proper sewerage system is not available in the project area. Some of them also said that they have to face severe odour related problems during the summer season. They said that the drains are open and not cleaned periodically due to which they get choked easily. They also complained that as there is no waste management system, the solid waste finds its way in the drains and on the roads which gives an un-aesthetic view to the surroundings.	The work on the improvement of drainage system will be initiated soon, which will certainly improve the problem related to stagnancy of water. Proper sewerage system should be installed to improve the sewerage conditions.
8	Present drinking water problem	Some of the areas are supplied water by PHED. A large number of houses have their	Construction of CWRs and OHSRs should be made in order to reduce

Sr. No.	Key Issues/Demands	Perception of community	Action to be Taken
	quantity and quality	own tube-wells and hand-pumps.	the drinking water problem. Proper treatment of water should take place and the supply of water should be through PHED so that indiscriminate use of water can stop.
9	Present solid waste collection and disposal problem	The Municipal Council takes care of the solid waste management of Sawai Madhopur town. Sweeping and waste collection facilities are irregular and inappropriate. Infact it can be said that there is no waste collection facility in the whole town.	Proper solid waste management system should be implemented.
10	Availability of labour during construction time	Sufficient labour is available in this area.	Availability of labour is not a problem here, if required labour from nearby areas will be hired.
11	Access road to project site	The site is accessible via road. The roads are only 4 m wide at present. Also the conditions of the roads are extremely bad, the roads possess big holes which creates problems for the local people as in the rainy season, it paves a way for the numerous road accidents that take place in this area.	The upcoming project will certainly reduce the problems of the local people.
12	Perception of villagers on tree felling afforestation	The local people were of the view that trees should not be cut; if urgent it should be minimum in number and number of trees cut should be replaced by planting trees in the nearby areas. Since the nature of the project does not call for tree felling, so the general people had no obstructions with this point.	It has been explained that during the construction phase, no tree is going to be affected.
13	Dust and noise Pollution and disturbances during construction work	People are aware of the fact that during construction work some amount of dust and noise will arise. But they wanted that should be minimized as much as possible. It has been explained that as per Safeguard policy of the project for abatement of pollution, control system will be considered. Vehicles movement will be controlled & appropriate measure will be taken to combat the same.	PUC certified vehicles should be used during material handling and transportation activities. Sprinkling of water should be done in order to minimize the fugitive dust emissions.
14	Setting up worker camp site within the village/ project locality	As per the people, local laborers should be will minimize the requirement of setting of work shelter.	Preference will be given to the local labour during the implementation of the project as per the requirement.
15	Safety of residents	People were of the view that safety measures like cautionary boards, signals,	Safeguard policy should be Implemented in order to minimize

Sr. No.	Key Issues/Demands	Perception of community	Action to be Taken
	During construction phase and plying of vehicle for construction activities	barricades should be used at the project site in order to minimize any mishap.	the accidents.
16	Requirement of enhancement of other facilities	The people were of the thought that this town should be raised to the levels that of other developed cities like better road connectivity, proper solid waste management, rainwater harvesting etc should be implemented in order to raise the standard of living.	Actions should be taken in order to improve the standard of living.

NAME AND POSITION OF PERSONS CONSULTED:

Gaurav Rai Sharma: Management Representative, Sawai Madhopur
 Samrendra Singh, Shopkeeper, Near Govt. Hospital, Sawai Madhopur
 Abhijit Sharma, Local resident, Sawai Madhopur
 Dinesh Bagda: Businessman, Bal Mandir Colony, Sawai Madhopur
 Shubham Agarwal: Shubham Medicos, Near Rly Station, Sawai Madhopur.
 Jogaram: Departmental store, Near Govt. Hospital, Sawai Madhopur
 J.K.Jain: Civil Engineer, Indira Colony Sawai Madhopur
 Anoop Kumar: Local Resident, Ram Nagar, Sawai Madhopur
 Surendra Kumar, Government Servant, , Sawai Madhopur
 Manish Srivastav: College Student, Sawai Madhopur
 Meenakshi Jain: House wife, Near. Govt. Hospital, Sawai Madhopur
 Jai Mathur: CAD Operator, Sawai Madhopur

Appendix 3 Recommended Contract Clauses

- A. Sources of Materials
- (i) Use quarry sites and sources permitted by government;
 - (ii) Verify suitability of all material sources and obtain approval of IPIU;
 - (iii) If additional quarries will be required after construction has started, obtain written approval from IPMU; and;
 - (iv) Submit to DSC on a monthly basis documentation of sources of materials.
- B. Air Quality
- (i) Consult with IPIU/DSC on the designated areas for stockpiling of clay, soils, gravel, and other construction materials;
 - (ii) Excavate the bridge foundations at the same time as the access roads are built so that dug material is used immediately, avoiding the need to stockpile on site;
 - (iii) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather;
 - (iv) Measurement of air quality at heritage site as per EMP
 - (v) Use tarpaulins to cover sand and other loose material when transported by trucks; and
 - (vi) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly.
- C. Surface Water Quality
- (i) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
 - (ii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with IPIU/DSC on designated disposal areas;
 - (iii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
 - (iv) Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
 - (v) Dispose any wastes generated by construction activities in designated sites
 - (vi) Do not dispose spent or left chemical after chemical washing in any water body or drain, dispose according to Material Safety Data Sheet (MSDS) of the chemical and
 - (vii) Conduct surface quality inspection according to the Environmental Management Plan (EMP).
- D. Noise Levels
- (i) Plan activities in consultation with IPIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
 - (ii) Require horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
 - (iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and
 - (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s.
 - (v) Measurement of noise level at sub-project locations as per EMP
- E. Existing Infrastructure and Facilities
- (i) Obtain from IPIU and/or DSC the list of affected utilities and operators;
 - (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of services; and
 - (iii) Develop and implement an Asbestos Cement Pipes Management Plan

- F. Accessibility
- (i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
 - (ii) Schedule transport and hauling activities during non-peak hours;
 - (iii) Locate entry and exit points in areas where there is low potential for traffic congestion;
 - (iv) Keep the site free from all unnecessary obstructions;
 - (v) Drive vehicles in a considerate manner;
 - (vi) Coordinate with Sawai Madhopur Traffic Office for temporary road diversions and with provision of traffic aids if transportation activities cannot be avoided during peak hours; and
 - (vii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
- G. Landscape and Aesthetics
- (i) Prepare and implement Waste Management Plan;
 - (ii) Recover used oil and lubricants and reuse or remove from the sites; (iii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
 - (iii) Remove all wreckage, garbage from lake, silt, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and
 - (iv) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.
- H. Socio-Economic – Income
- (i) Leave spaces for access between mounds of soil;
 - (ii) Provide walkways and metal sheets where required to maintain access across trenches for people and vehicles;
 - (iii) Increase workforce in front of critical areas such as institutions, 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.
- I. Socio-Economic – Employment
- (vi) 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
 - (vii) Secure construction materials from local market.
- J. Occupational Health and Safety
- (i) Develop and implement site-specific Health and Safety (H and 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) H and S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
 - (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
 - (iii) Provide medical insurance coverage for workers;
 - (iv) Secure all installations from unauthorized intrusion and accident risks;
 - (v) Provide supplies of potable drinking water;
 - (vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
 - (vii) Provide H and S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;

- (viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
 - (ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
 - (x) Ensure moving equipment is outfitted with audible back-up alarms;
 - (xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and
 - (xii) Use chemical during chemical wash as directed by the manufacturer in Material Safety Data Sheet (MSDS), use appropriate personal protective equipments such as suitable hand gloves, safety goggles, apron etc,
 - (xiii) Only trained and experienced worker should be deployed for chemical washing
 - (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) Use proper stairs, staging, platforms, barricades and Personal Protective Equipments (PPEs) such as safety belt, while working at height more that 1.5 meters.
- K. Asbestos Cement Pipes
- (i) Train all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognise them in situ;
 - (ii) Report to management immediately if AC pipes are encountered;
 - (iii) Develop and apply AC Management Plan.
- L. Community Health and Safety.
- (i) Plan routes to avoid times of peak-pedestrian activities.
 - (ii) Liaise with IPIU/DSC in identifying high-risk areas on route cards/maps.
 - (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
 - (iv) Provide road signs and flag persons to warn of dangerous conditions.
- M. Work Camps
- (i) Consult with IPIU/DSC before locating project offices, sheds, and construction plants;
 - (ii) Minimize removal of vegetation and disallow cutting of trees;
 - (iii) Provide water and sanitation facilities for employees;
 - (iv) Prohibit employees from poaching wildlife and cutting of trees for firewood;
 - (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 following preference hierarchy: reuse, recycling and disposal to designated areas;
 - (viii) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and
 - (ix) Request IPIU/DSC to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.
- N. Social and Cultural Resources
- (i) Strictly follow the protocol for chance finds in any excavation work;
 - (ii) Request IPIU/DSC or any authorized person with archaeological field training to observe excavation;
 - (iii) Stop work immediately to allow further investigation if any finds are suspected; and
 - (iv) Inform IPIU/DSC if a find is suspected, and take any action they require ensuring its removal or protection in situ.