

Initial Environmental Examination

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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.

ABBREVIATION

ADB	- Asian Development Bank
DSC	- Design and Supervision Consultancy
EAC	- Expert Appraisal Committee
GSI	- Geological Survey of India
IEE	- Initial Environmental Examination
IPMC	- Investment Program Management Consultancy
IPMU	- Investment Program Management Unit
JNNURM	- Jawaharlal Nehru National Urban Renewal Mission
LSGD	- Local Self-Government Department
MFF	- Multitranches Financing Facility
MLD	- Million liter Per day
MOEF	- Ministry of Environment and Forests
NAAQS	- National Ambient Air Quality Standards
PHED	- Public Health Engineering Department
PMU	- Project Management Unit
RCC	- Reinforced Cement Concrete
ROW	- Right of Way
RPCB	- Rajasthan State Pollution Control Board
RSPM	- Respirable Suspended Particulate Matter
RUIDP	- Rajasthan Urban Infrastructure Development Project
RUSDIP	- Rajasthan Urban Sector Development Investment Program
SPM	- Suspended Particulate Matter
STP	- Sewerage Treatment Plant
TOR	- Terms of Reference
UIDSSMT	- Urban Infrastructure Development Scheme for Small and Medium Towns
uPVC	- Unplastized Poly Vinyl Chloride
USEPA	- United States Environmental Protection Agency

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 Multitranchise 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 Project Management Unit (PMU) 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 Churu Urban Drainage Subproject as part of RUSDIP Phase II – Tranche 3. The main components of the subproject are cleaning, de-silting and reclamation of Ginanies (local ponds) – 7 nos., construction of drains – 6477m, construction of silt chambers and manholes – 231 nos., construction of drainage pumping station – 1 no. and construction of pumping main and outfall to Gajsar disposal point – 5000m. Additional work of Package 02 of the subproject are cleaning, de-silting and reclamation of Ginani (local ponds) – 1 no., construction of drains – 4530m, construction of silt chambers – 9 nos., construction of drainage pumping station – 1 no. and construction of pumping main and outfall to Gajsar disposal point – 2500m.
 3. An Environmental Management Plan (EMP) is proposed as part of this report which includes (i) mitigation measures for significant environmental impacts during implementation, (ii) environmental monitoring program, and the responsible entities for mitigation, monitoring, and reporting; (iii) public consultation and information disclosure; and grievance redress mechanism.
 4. Detailed design has begun in the 1st quarter of 2011 and been completed in September 2011. Implementation will be started in 2012 and likely to be completed by middle of 2013.
 5. The subproject sites are located in the built-up area of Churu town. The subproject sites, being located in the town area, are generally flat. Due to scanty rains in the region, natural drainage system has not been so far evolved. The subproject sites naturally drains to existing 6 Ginanies (local ponds) located all around the town. Part of the nallah/ginanies 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/ginanies. The subproject sites are (i) not located in areas prone to water-logging, salinisation, and flash flood; and (ii) not located in the mentioned groundwater zone. The subproject sites do not have mineral resources. Visual observation of the subproject sites indicates relatively increased dust levels compared to other parts of the town due to pedestrians and vehicles. Trees, vegetation (mostly shrubs and grasses), and faunal species observed are those commonly found in urban areas.
 6. Potential negative impacts were identified in relation to construction and operation of the improved infrastructure. No impacts were identified as being due to either the project design or location. Mitigation measures have been developed to reduce all
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negative impacts to acceptable levels. A number of impacts and their significance have already been reduced by amending the designs.

7. Special measures were also developed to protect workers and the public from exposure to carcinogenic asbestos fibres in the event that Asbestos Cement pipes used in the existing water supply system are uncovered accidentally during excavation work.
 8. It is proposed that the subproject will employ in the workforce people who live in the vicinity of the construction sites to provide them with a short-term economic gain and replace three trees for every each tree that will be required to cut.
 9. Once the drainage works are complete, it will operate with routine maintenance (such as occasional removal of blockages, desilting, and minor works), which will be small-scale, infrequent and short in duration and should not affect the environment. The only mitigation required in this period is to plan any maintenance work with the municipal authorities and police to ensure precautions are taken to mitigate disturbance to residents and businesses. An Occupational Health and Safety Plan for the workers employed in the maintenance works should also be implemented.
 10. The main impact of the new drainage system will be beneficial as the unhygienic pools of wastewater at present will gradually drain away; and the improved drainage and repair of leaks in the water supply system provided by the water supply subproject will ensure that similar pools do not re-form in the future. This will improve the appearance and environment of the town.
 11. Mitigation will be assured by a program of environmental monitoring conducted during construction and operation to ensure that all measures in the EMP are implemented and to determine whether the environment is protected as intended. This will include observations on-and off-site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported to the IPMU.
 12. 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
 13. 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)
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I. INTRODUCTION

A. Purpose of the Report

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. 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).
2. RUSDIP Phase II is being implemented over a seven year period beginning in 2008, and being funded by a loan via a Multitranches Financing Facility (MFF) of 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 Project Management Unit (PMU) of the Rajasthan Urban Infrastructure Development Project (RUIDP).
3. This Initial Environmental Examination (IEE) has been prepared for the Churu Urban Drainage Subproject as part of RUSDIP Phase II. The Subproject covers rehabilitation and desilting, strengthening, and extension of existing drains in Churu town.
4. This IEE covers the general environmental profile of Churu 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 as 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 (2009, SPS) and the Government's Environmental Impact Assessment (EIA) Notification of 2006.

1. ADB Policy

6. 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.
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 impacts are assigned to one of the following four categories:

- (i) Category A: Projects could have significant adverse environmental impacts. An environmental impact assessment (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; and
- (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

2. National Law

10. The Government's 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 an 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 EC 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 EC 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, where an environmental clearance is required for all Common¹ Municipal Solid Waste Management Facilities (CMSWMF).

3. Review and Approval Procedure

14. For Category B projects the Draft Environmental Status report and its summary (SIEE) are reviewed by ADB's Regional Department sector division and Environment and Social Safeguards Division, and by the Executing Agency, and additional comments may be sought from project affected people and other stakeholders. All comments are incorporated in preparing the final documents, which are reviewed by the Executing Agency. The EA then officially submits the IEE and SIEE reports to ADB for consideration by the Board of Directors. Completed reports are made available worldwide by ADB, via the depository library system and the ADB website.

4. Scope of Study

15. This is the IEE for the sub-project Urban Drainage Subproject as part of RUSDIP Phase II of Churu town". It discusses the generic environmental impacts and mitigation measures relating to the location, design, construction and operation of physical works proposed under this subproject.

¹ "For the purpose of EIA Notification, common municipal solid waste management facilities may be referred as centralized MSW facility for an given town, city, region. It is further to mention a common facility need not have surrounding ULBs included."

(Technical EIA Guidance Manual for CMSWMF)

II DESCRIPTION OF THE PROJECT

A. Type, Category and Need

16. **Type.** This is an urban drainage subproject intended to improve the current situation in Churu town in terms of providing improved drainage system.
17. **Category.** Environmental examination indicates the proposed subproject falls within ADB's environmental Category B 2 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.
18. **Need.** The subproject is needed because the present drainage system is inadequate for the needs of growing population. The existing open drain alongside the roads in the town remains blocked and overflowing. 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 Churu town and the other urban centres to those expected of modern Asian towns.

B. Location and Implementation Schedule

19. **Location.** The subproject is located in Churu town, the headquarters town of Churu district, in the north eastern part of Rajasthan in north western India. The proposed infrastructures will be located in and around the town, where new concrete nallahs (drainage channels) will be built to carry stormwater for final disposal.
20. **Implementation Schedule.** Detailed design started from January of 2011 and completed in January 2011. Implementation will start in 2012 with construction of the infrastructure and procurement of equipment to be completed in 1.5 years.

C. Description of the Subproject

21. The subproject consists of rehabilitating, de-silting, strengthening, and extension of the existing drainage system in Churu town which will involve cleaning of *nallahs/ginanies*, construction of drainage, culverts, box culverts and covering of *nallahs* wherever required. The details are given below:

Scope of Work under package-DR-01

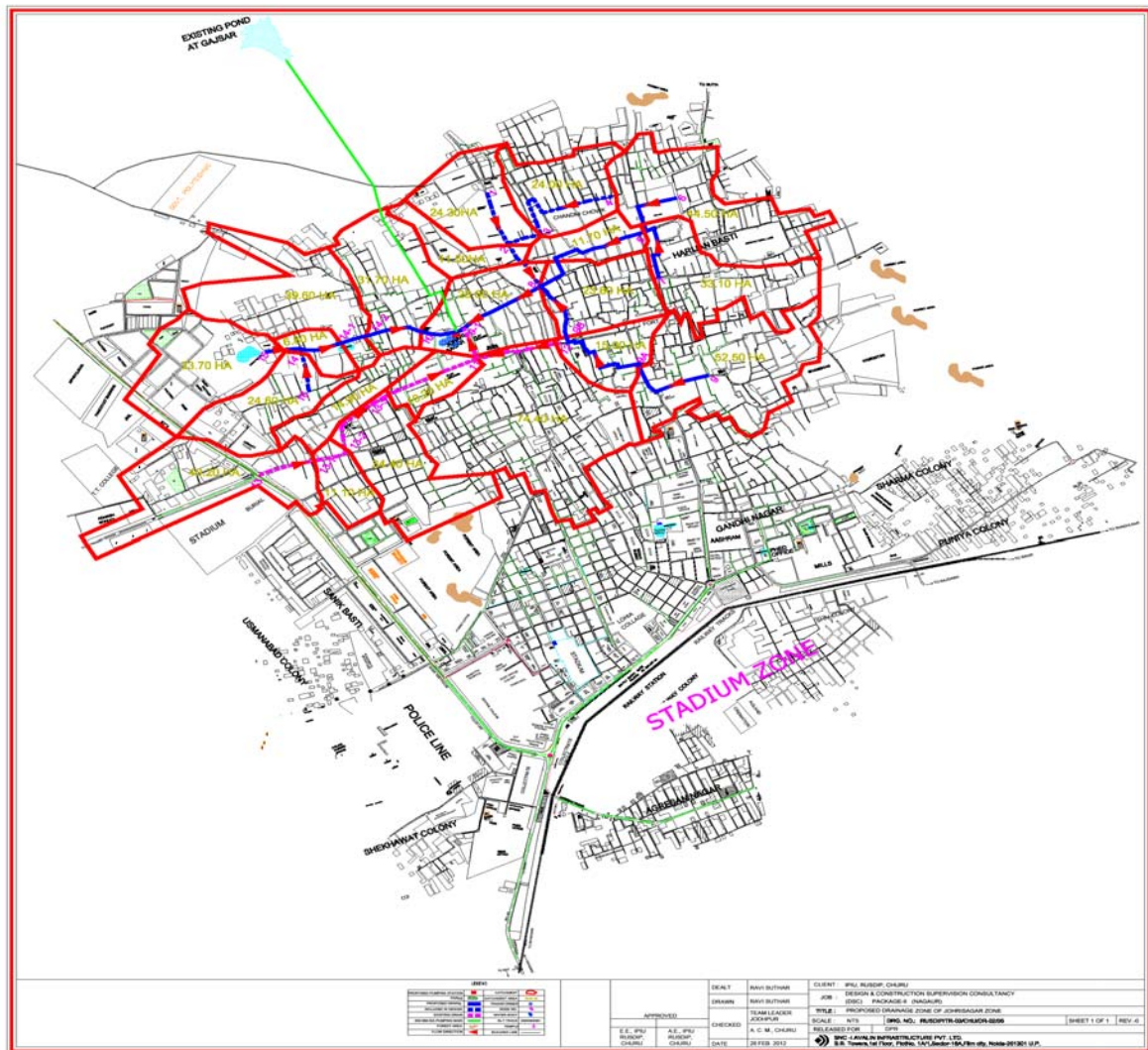
- (i) Cleaning, de-silting and reclamation of Ginanies (local ponds) and connecting existing drains i.e. 7 nos. namely Taju Shah Takia, Prem printer, Gandhi Nagar Park, Lohiya college ground, Om colony, Chandni Chowk and Johari Sagar.
- (ii) Construction of small and large silt chambers at the entrance of Taju Shah Takia, Prem printer, Gandhi Nagar Park, Lohiya college ground, Om colony i.e. 80 nos. small and 5 large nos.
- (iii) Construction of various types of drains. Length - 6477m
- (iv) Construction of 146 nos. of R masonry manholes.
- (v) Construction of drainage pumping station at Lohiya college ground.

- (vi) Construction of GRP pumping main and outfall to Gajsar disposal point. Length – 5000m.

Additional Scope of Work under package-DR-02

- (vii) Cleaning, de-silting and reclamation of Chandni Chowk Ginani (local pond) and connecting existing drains.
- (viii) Construction of Nine (09) silt chambers at Chandni Chowk and Safed Ghanatghar and Pankha Circle.
- (ix) Construction of various types of drains. Length - 4530m. Areas are as follows:
Chandni Chowk, Behind Circuit House, Gayatri Nahar Ginani, Behind Municipality, Safed Ghanatghar and Pankha Circle.
- (x) Construction of rain water harvesting wells at Pankha Circle.
- (xi) Construction of drainage pumping station at Johri Sagar.
- (xii) Construction of GRP pumping main and outfall to Gajsar disposal point. Length – 2500m.

Figure 2.1 : Map showing the location for proposed project



III. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

1. Administrative Boundaries.

22. Churu district is located in the north-eastern Rajasthan. It is surrounded by Hanumangarh district in the north, Nagaur, Sikar and Jhunjhunu districts in the south. Hissar (Haryana) district in the east and Bikaner in the west. The total area of the district is 16,830 sq.km. (4.92% of the State). Churu city is the administrative headquarter of the district.

2. Topography, Drainage, and Natural Hazards

23. **Topography.** Churu the district headquarter. It is located in the eastern part of the "Thar" Desert and in the middle portion of the north-east Rajasthan at latitude 28°18' north and longitude 74°58' east, at a height of about 286m above the mean sea level.
24. **Drought:** Low rainfall coupled with erratic behaviour of the monsoon in the State makes Rajasthan the most vulnerable to drought. Based upon the discussion with PHED officials the water table in the City continuously decreases by 1-2 meter on an annual basis combined with significant drawdown conditions.
25. **Natural Hazards.** - Earthquake: Churu town lies in Low damage risk Zone – II. The area is less prone to earthquakes as it is located on relatively stable geological plains based on evaluation of the available earthquake zone information. **Figure 3.1** shows natural hazard zone.

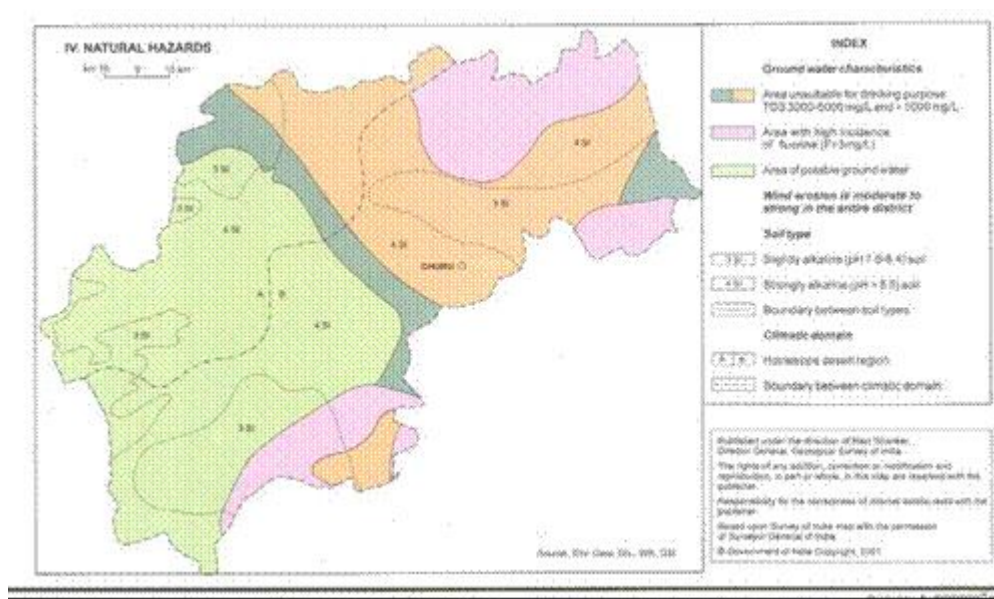
3. Geology, Geomorphology, and Soils

26. **Geology.** The Geology of the district is largely concealed by wind blown sand and has been worked out on the basis of scanty exposures and from dug well and borehole data. The area a part of the Thar desert , is basically a fluvio – aeolian depositional basin containing 255 m thick pile of Quaternary sediments.
27. **Geomorphology.** The area a part of the Thar Desert, is basically a fluvio – aeolian depositional basin containing 255 m thick pile of Quaternary sediments. It is characterized by an undulatory topography consisting of sand dunes interspersed with interdunal valley and linear depressions. The various rock types of the area belong to the Delhi Supergroup , Erinpura Granite, Malani Igneous Suite and the Marwar Supergroup and the tertiary sediments including the Palana Formation of Palaeocene age. The oldest rock sequence in the area belongs to the Punagarh Group comprising slate, phyllite, quartz-mica schist, ferruginous quartzite etc. of the Delhi Super Group. These rocks are well exposed south of Bidasar and east of Pandurai .The metasediments of the Punagarh Group are intruded by Granite, Pegmatite and amphibolite. The youngest Malani Igneous Suite is represented by Porphyritic rhyolite and granite.
28. **Soils.** Soil of the region falls within rainfall zone of 100-350 mm. The soil is desert type. Sand dunes Aeolian soil is loamy coarse in texture and calcareous. The Churu soil including area coverage of sodic soil. The nutrient status of the Churu soil is graded as very low to medium level.

4. Climate

29. The climate of Churu city is hot and arid with large variation in temperature. Rainfall is scanty. The average temperature variation in summers and winters are 37.54° to 24.94° C and 29.05° to 9.15° C respectively. The maximum and minimum temperature recorded is 47.2° C in summer and 0.5° C in winter. The south-west monsoon is active in the region from July to mid September, recording an annual rainfall of 377 mm. Dust storm and thunder storm occur all through the summer and are particularly active in pre-monsoon period. In summer mean humidity as 60%. The predominant wind direction is from west and south-west.

Figure 3.1: Natural Hazard Map of Churu



5. Air Quality

30. The Ambient air quality of Churu Town is presented in table 3.1. The ambient air quality monitoring has been conducted in May - June 2012 at four locations in Churu to determine status and trends of ambient air quality. It may be observed from the table below that Particulate Matter (PM₁₀) has been found higher than the permissible limit at all locations in the study area. It is because of the locations are in desert of Rajasthan. Sand covered road due to storm and arid climate of the town increases the fugitive dust particles due to heavy traffic. There are no major industries in Churu town. Traffic is only significant source of pollution in Churu, so levels of oxides of sulphur and nitrogen are likely to be well within the National Ambient Air Quality Standards (NAAQS).

Table 3.1: Ambient Air Quality of Churu town (Avg.:24 Hrs)

SN	Sampling Location	RPM or PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	CO (mg/m ³)
1	Near Aggarsen Nagar	346.6	21.9	7.3	9.3	<1.15
2	Gajsar Village	223.1	21.7	4.2	7.5	<1.15
3	Jahari Sagar Talab, Near Pump house	249.3	26.0	4.6	7.8	<1.15
Permissible limits as per CPCB		100	60	80	80	02* ,

SN	Sampling Location	RPM or PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	CO (mg/m ³)
	Notification, New Delhi, 18 th November, 2009 (24 Hours)					04 [#]

Where: * = Maximum limits for 8 hourly monitoring, # = Maximum limits for 1 hourly monitoring

6. Noise level

The Ambient Noise level of Churu Town is presented in table 3.2. The noise quality monitoring has been conducted in May 2012 at four locations in Churu.

Table 3.2: Noise Quality of Churu town

SN	Location	Leq (Day) dB (A) (6 A.M – 10 P.M.)	Leq (Night) dB (A) 10 P.M. – 6 A.M.)
1	Near Aggarsen Nagar	57.5	49.6
2	Gajsar Village	53.5	46.0
3	Jahari Sagar Talab, Near Pump house	58.5	48.0
Ambient Air Quality Standards in respect of Noise, Limits in dB(A) Leq, [THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000]		55	45

7. Groundwater

31. The entire Churu city is considered dark zone from groundwater exploitation point of view. As far as groundwater condition is concerned, it is available at a depth of approximately 45-50 m and that too is brackish with TDS level is in the range of 1890 to 4,200 ppm, Chloride level is between 320 to 1160 ppm, Nitrate between 70 to 230 ppm and Fluoride between 1.2 to 1.9 ppm

8. Surface Water Quality

Table-3.3: Surface Water Quality of Churu town

SN	Water Quality Parameters	Gagraj Nagar Kund Water
1.	Turbidity in (N.T.U)	1
2.	pH (at 28 ^o C)	7.62
3.	Conductivity at 25 ^o C in ms/cm	0.5
4.	Total Suspended Solid (TSS) in mg/L	<2
5.	Total Dissolved Solids in mg/L	332
6.	Total Hardness (as CaCO ₃) in mg/L	126.48
7.	Sodium (as Na) in mg/L	42
8.	Potassium (as K) in mg/L	10.82
9.	Calcium (as Ca) in mg/L	43.16
10.	Magnesium (as Mg) in mg/L	4.46
11.	Dissolved Oxygen in mg/L	4.60
12.	Biochemical Oxygen Demand (for 3 days at 27 ^o C) in mg/L	9.48
13.	Chemical Oxygen Demand in mg/L	36.8
14.	Chloride as Cl in mg/L	36.78
15.	Sulphate (as SO ₄) in mg/L	24.16

SN	Water Quality Parameters	Gagraj Nagar Kund Water
16.	Nitrate (as NO ₃) in mg/L	5.64
17.	Iron (as Fe) in mg/L	1.6
18.	Manganese (as Mn) in mg/L	<0.02
19.	Cadmium (as Cd) in mg/L	<0.002
20.	Arsenic (as As) in mg/L	<0.01
21.	Chromium (as Cr) in mg/L	<0.1
22.	Copper (as Cu) in mg/L	<0.02
23.	Mercury (as Hg) in mg/L	<0.005
24.	Lead (as Pb) in mg/L	<0.005
25.	Selenium (as Se) in mg/L	<0.005
26.	Aluminium (as Al) in mg/L	<0.01
27.	Zinc (as Zn) in mg/L	0.025
28.	Boron (as B) in mg/L	<0.5
29.	Fluoride (as F) in mg/L	0.16
30.	Chlorine in mg/L	NIL
31.	Phenolic Compounds (as C ₆ H ₅ OH) in mg/L	<0.001
32.	Cyanide (as CN) in mg/L	<0.01
33.	Phosphate as PO ₄ in mg/L	0.16
34.	Total Coliform Organism (MPN)/100 ml	4
35.	Faecal Coliforms / 100 ml	ABSENT

B. Ecological Resources

32. Churu town has been converted for agricultural use and there are no remaining natural habitats in the area. There are no protected areas nearby the subproject site.
33. **Flora.** Natural vegetation is very limited, and consists of mainly sparse, scattered shrubs and grasses
34. **Fauna.** The fauna comprises domesticated animals (cows, goats, pigs and chickens), plus other species able to live close to man (urban birds, rodents and some insects). No classified, endangered or extinct species is found in Churu town.

C. Economic Development

35. Churu being a desert district generally faces famines & drought. The bulk of population depends upon agriculture & animal husbandry. Being district headquarter, Churu 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.

1. Land Use

36. The Municipal Limits of Churu cover an area of about 30 sq.km. In 1983 only 1450 acres or about 20% of Municipal Area could be called as Urban Area. The rest is mostly forest area, agriculture or vacant land. Out of the 1450 acres of urban area only 81.04% i.e. 1175 acres is developed area. The core of the town

(old walled city area) is densely built up whereas fringe areas of the town are comparatively open.

37. Within the developed area about 71.5% is under residential use. Only 0.60% is under industrial use. The Trade and Commerce and Governmental activity comprises 2.80% and 1.45% respectively. Whereas 7.65% fall under public and semi-public use.

2. Commerce, Industry and Agriculture

38. **Commerce.** The main Most of the commercial activities in Churu are along the major roads, which are concentrated mainly around the old fort area and clock tower area. These markets are locally known as 'Gudri Bazar', Katla Bazar (which extends from fort to clock tower) and 'Utrada Bazar'. The road width of these markets is too narrow to meet the volume of traffic in these areas.
39. **Industries.** Churu town is industrially undeveloped, though a good number of industrialists hail from Churu region. Because of shortage of water, raw materials and infrastructural facilities, industrial activities are not picking-up. As per information collected, there were 247 registered industrial units in the town, which, in all, employ about 1,000 workers. There is not a single large scale industry in the town. Only a few small scale units like woollen mill, saw mill and a few casting industries have been established on Churu- Jhunjhunu road and near the railway station. There are also some small units of dyeing and printing, guar gum, cement work, metal industries, whose main products are nails, steel furniture, steel almirahs etc., which are scattered all over the town. Besides, some cottage industries also exist in the town, which deal in silver utensil, potteries and shoe making.
40. **Agriculture.** In and around the Churu town area there are about 50-60% of lands used for agricultural purpose.

3. Infrastructure

41. **Water supply:** Water supply to Churu is from groundwater source 10.38 MLD (54 Tube wells and 29 Open wells) and surface water sources 0.820 MLD in the city. The city is divided into 8 water supply zones covering 41 municipal wards. The approximate total length of the existing water supply distribution network is 57.14 km and includes all localized distribution networks. Approximately 3.92 ML of water is stored in 8 Service reservoirs and 7 clear water reservoirs. Poor households are served by 86 public stand posts. Present level of water supply is about 106 LPCD.
42. **Sewerage:** Churu town does not have underground sewerage system. Wastewater from toilets overflows into the municipal drains and eventually to *nallah* causing unsanitary conditions.
43. **Sanitation:** Only 50% - 60% 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 Churu Municipal Board however, is being indiscriminately discharged to open spaces, agricultural lands in an manner.

44. **Drainage:** The topography of Churu town is cup shaped, the town being surrounded by sand dunes. Due to scanty rains in the region, natural drainage system has not been evolved. In fact there is no river/rivulet in the entire Churu district. In Churu town itself no natural drainage system exists to drain away the rainwater or wastewater from the town. Presently there exists a minimal network of storm water drains in the city. The existing network of (roadside) storm water drains in Churu has been identified under three broad categories as follows: (i) open pucca (concrete drains) and (ii) closed pucca. (iii) Kutchha.
 45. **Industrial Effluents.** Small industries exist in under RIICO, which is outside the city area and small amount of effluent disposed scattered in local nallahs. As reported by the local MC, the responsibility of effluent disposal is under RIICO's own and could not be connected to the proposed sewer network. The individual industry should treat their effluent to bring it to the required standard before final disposal.
 46. **Transportation.** Churu is well-connected to all the cities within Rajasthan.
- D. Social and Cultural Resources**
47. **Demography.** The population of the district is more than 1.92 million. The population density 114 persons per sq.km,
 48. **Health and Educational Facilities.** As the district headquarters town, Churu is the main centre for health facilities in the area and there is a district general hospital, 11 general hospital, 55 primary health centers are in the Churu. There are good educational facilities in Churu district, which serve both townspeople and inhabitants of surrounding villages and towns in the hinterland. There are 1122 primary schools, 214 secondary schools and 109 higher secondary schools, plus eleven general degree colleges.
 49. **History, Culture and Tourism.** Churu has moderate tourist inflows with main attractions being Jain Temple , Ganga Mata Temple , Balaji Temple , Satya Narain Temple . The tourist attractions within the city are places Nagar Shree Museum , Taknet Chhatri , Nath Ji ka Dhora , Bagla Dharmshala , Sethani ka Jhohra , Aath Khamba ki Chhatri.

IV. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

50. 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 drainage sites to be rehabilitated and de-silted; (ii) drainage sites to be strengthened and extended; (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 Churu area outside of the delineated primary impact area; and (ii) entire Churu district in terms of over-all environmental improvement.
51. The ADB REA Checklist for Drainage found 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.
52. 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 of Churu, 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

53. **Drainage Design Considerations.** Developments are to be located and laid out to minimize the velocity of overland flow, allow maximum opportunity for infiltration of storm water into the ground, preserve and utilize existing and planned streams, channels, detention basins, retention basins, and include wherever possible, streams and floodplains within parks and other public grounds. Streets, curbs and gutters, parking areas, enclosed conveyance systems, detention basins, retention basins, and other generally accepted practices and methods for storm water control may be a part of the overall storm water runoff management systems for a particular site. To the maximum extent possible, these facilities are concurrently designed to effectively manage storm water runoff in accordance with GOI regulations. Calculations will be submitted as part of the plan set. These plans show the alignment, drainage areas, size of facilities, and grades. Storm drainage plans will include at a minimum, a drainage area map, plan-profile sheets, and channel cross-sections, if applicable.
54. **Utilities.** Telephone lines, electric poles and wires, water and sewer lines within the existing right-of-way (ROW) may be damaged. 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.

55. **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 in and around existing ROWs, so it could be that there is a low risk of such impacts. Nevertheless, 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.
56. **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 tiger reserves, wetlands, swamps, or in areas which will inconvenience the community. All locations would be included in the design specifications and on plan drawings.
57. The excavated silt from the existing drain will be disposed of in the dumpsite selected at Bhutia Road on government owned land which is out side the town and 3.2 km away from the nearest habitation. The site is being used already by the local municipality for the same purpose. A map showing the location of the disposal site is presented in **Appendix-4**.
58. **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 centers, 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 Churu local government. 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 Churu local government.

B. Construction

1. Screening of No Significant Impacts

59. The construction work is expected not to cause major negative impacts, mainly because:
- (i) Most of the activities will be on the existing government land thus could be constructed without causing major disruption to road users and any commercial establishments and residential areas;
 - (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 18 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 and excavation. 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.
60. 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 4.1**. These environmental factors are screened out presently but will be assessed again before starting of the construction activities.

Table 4.1: 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	No protected areas nearby the sub project at Churu
Flora and Fauna	No rare or endangered species.
Economic Development	Activities are not large enough to permanently affect this feature.
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.
Health and education facilities	Activities are not large enough to affect this feature.
Religious sites	No religious sites within the subproject area.
Historical, Archaeological,	No scheduled or unscheduled historical, archaeological,

Field	Rationale
Paleontological, or Architectural sites	paleontological, or architectural sites within the subproject area

2. Construction method

61. The new drains will be random rubble masonry channels with reinforced cement concrete bed to increase the velocity of water in the drain which will consequently increase the water carrying capacity of that particular section. Each will be located alongside main roads, on government land on which ROWs have been granted for this work.
62. Trenches for each drain will be dug by a backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed nearby. To attain better flow conditions inside the drains, plastering of the random rubble masonry walls will be done. Loose soil will then be shovelled in to fill any space remaining between the wall and the edge of the trench.

3. Anticipated Environmental Impacts and Mitigation Measures

63. Although construction of drains involves quite simple techniques, the invasive nature of excavation, and in this case the relatively large size and length of the drains, means that there will be quite a lot of physical disturbance in the built-up areas of Churu town where there are a variety of human activities.
64. Physical impacts will be reduced by the method of working, whereby the drains will be constructed by small teams working on short lengths at a time, so impacts will be mainly localised and short in duration.
65. **Sources of Materials.** Significant amount of gravel, sand, and cement will be 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 Investment Program Implementation Unit (IPIU);
 - (iii) If additional quarries will be required after construction has started, obtain written approval from PMU; and
 - (iv) Submit to DSC on a monthly basis documentation of sources of materials.
66. **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;
 - (i) 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;
 - (ii) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather;
 - (iii) 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.
67. **Surface Water Quality.** Construction activities will be conducted on drains flowing to *nallah/ginanies*, although dried up during the summer period, has significant amount of silt materials. Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants 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:
- (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
 - (iii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with IPIU/DSC on designated disposal areas;
 - (iv) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
 - (v) Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
 - (vi) Dispose any wastes generated by construction activities in designated sites; and
 - (vii) Conduct surface quality inspection according to the Environmental Management Plan (EMP).
68. **Noise Levels.** There are no health facilities, religious sites (temples and churches), scheduled or unscheduled historical, archaeological, paleontological, or architectural sites near the construction sites. However, construction works will be on settlements and areas with small-scale businesses. The sensitive receptors are the general population 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.
69. **Existing Infrastructure and Facilities.** Excavation works can damage existing infrastructure located alongside roads, in particular water supply pipes and sewer lines. It will be particularly 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 Asbestos Cement Pipes Management Plan

70. **Landscape and Aesthetics.** The construction works will produce sludge from desilting the drains, 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 sludge from desilting and immediately dispose to designated areas;
 - (iii) Transport the silt in covered carrier after brought it into semi solid state;
 - (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 (such as buildings, shelters, and latrines) 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.
71. **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 Churu 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.
72. **Socio-Economic – Income.** The drains and outfall are all located on government land and ROWs, so there will be no need to acquire land, and thus there will be no impacts on the assets or income of landowners or tenants. However construction works will impede the access of residents and customers to 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.
73. **Socio-Economic – Employment.** Manpower will be required during the 18-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:

- (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.

74. **Occupational Health and Safety.** Workers need to be mindful of the occupational hazards which can arise from working in close contact with contaminated soil or sludge from desilting and cleaning the drains. 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&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&S Training² 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&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
- (viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
- (ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- (x) Ensure moving equipment is outfitted with audible back-up alarms;
- (xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and
- (xii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

75. **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:

² 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.

- (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.
76. **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 (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.
77. **Social and Cultural Resources.** For this subproject, excavation will occur in and around existing ROWs, so it could be that there is a low risk of such impacts. Nevertheless, 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

78. O&M of the drains will be the responsibility of the Churu Municipality Board (CMB). The drainage system have a design life of 30 years, during which shall not require major repairs or refurbishments. The stability and integrity of the drainage system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs to the *nallahs* will be small-scale, involving manual replacement of bricks and mortar, and will be carried out in the dry season to avoid the need to divert the water in the drains.

1. Screening out areas of no significant impact

Although the drains will need regular maintenance when they are operating, with a few simple precautions this can be conducted without major environmental impacts there are therefore several environmental factors which should be unaffected by this system when it to function. These are identified in **Table 4.2** below, with an

explanation of the reasoning in each case. These factors are thus screened out of the impact assessment and will not be discussed further.

Table 4.2: Fields in which operation and maintenance of the completed drains are not expected to have significant impact.

Field	Rationale
Climate, topography, geology, seismology	Because of the low population and low rainfall, the drainage system will not carry enough water to significantly affect these factors.
Fisheries & aquatic biology	No natural surface water bodies will be affected by operation of the drainage system
Wildlife, forests, rare species, protected areas	There are none of these features around the proposed project site
Coastal resources	Churu is not located in a coastal area

2. Anticipated Environmental Impacts and Mitigation Measures

80. The new drains will contribute to an improvement in the physical appearance and condition of the town by helping to remove the large and unsightly pools of water that are an almost permanent feature of the town. In combination with the repair of leaks in the water supply system under the Churu Water Supply Subproject, the new *nallahs* should also help to ensure that similar pools do not re-form in the future. With these projects implemented the quality of the town environment would then improve significantly.
81. **Occupational Health and Safety.** Removal of blockages in the *nallahs* and other drains, if left stockpiled alongside the drains, will have adverse impacts on the appearance of the area. Not only is this unhygienic, but it is also inefficient, as much of this material inevitably returns to the drains, where it may cause further blockage. Workers are also exposed to contaminated materials. Thus, it is very important for CMB to end this practice by ensuring that persons employed to clean drains will be provided with suitable equipment (such as shovels and wheelbarrows) and will be instructed to ensure that all removed material must be deposited in the municipal waste storage bins.
82. **Ecological Resources.** Although the new drains will improve the environment of the town, there are unlikely to be significant ecological benefits as there are no natural habitats or rare or important species.
83. **Economic Development.** Maintenance and repair of the *nallahs* will be small in scale and infrequent, and if carried out as described above, should have no effects on business, traffic or other economic activities. The overall improvements in the appearance and hygiene of the town provided by this and other subprojects should make the area more attractive to tourists, and in time this should bring financial benefits by helping the economy of the town to grow.
84. **Social and Cultural Resources** Repairs to the *nallahs* will require no new excavation, in which case there should be no need for precautions to protect undiscovered archaeological or historical material. Repair work will be small in scale

and conducted from inside the *nallah* so there should also be no disturbance of activities in or around any schools, hospitals, temples, tourist sites or other social or cultural resources in the vicinity. Contractors employed to conduct any repair work should be required to operate the same kind Health and Safety procedures as used in the construction phase to protect workers and the public.

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

V. CONSULTATION, INFORMATION DISCLOSURE, AND PARTICIPATION

A. Project Stakeholders

86. The primary stakeholders are:

- (i) Residents, shopkeepers and business people who live and work alongside the drains 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.

87. 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, GoI, and Ministry of Finance.

B. Consultations and Disclosures Conducted

88. 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) Necessity of tree felling etc. at project sites;
- (vi) Water logging and drainage problem if any;
- (vii) Drinking water problem;
- (viii) Forest and sensitive area nearby the project site; and
- (ix) Movement of wild animal near project site

89. Public consultations and group discussion meetings were conducted by RUIDP on 24 Feb 2012 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, and widening of roads prior to construction activities. The issues and comments have been

considered and incorporated in the design of the bridges and mitigation measures for the potential environmental impacts raised during the public consultations.

90. Informal discussions were held with the local people during site visits for the preparation of this IEE. Issues discussed were:
- (i) Awareness and extent of the subproject and its components;
 - (ii) Benefits of the subproject for the economic and social upliftment of the community;
 - (iii) Labour availability in the subproject sites or requirement of outside labour involvement;
 - (iv) Local disturbances due to the construction activities;
 - (v) Necessity of tree felling and vegetation clearing at the subproject sites;
 - (vi) Water logging and drainage problems, if any;
 - (vii) Drinking water problem; and
 - (viii) Forest and sensitive area within or nearby the subproject site.
91. 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

92. 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 program. The Non-Government Organisation (NGO) 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.
93. For this subproject, the NGO (Community Awareness Participation Program, CAPP consultant) 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 programs 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;

(iii) Project disclosure:

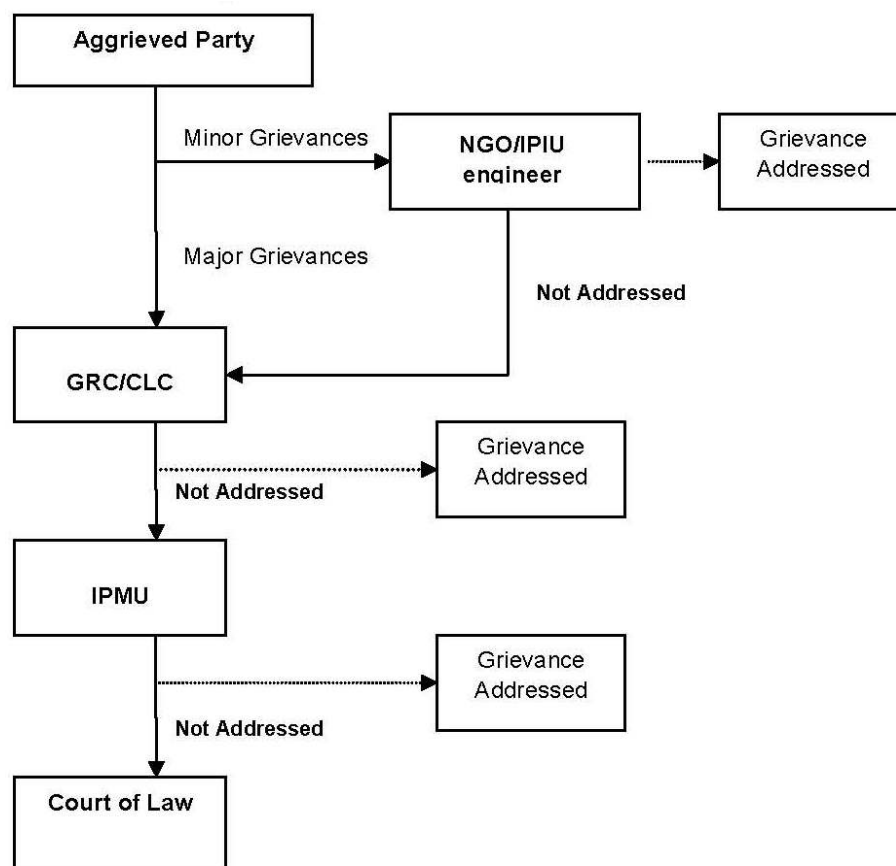
- (a) Public information campaigns (via newspaper, TV and radio) to explain the project to the wider town population and prepare them for disruption they may experience once the construction program is underway;
- (b) Public disclosure meetings at key project stages to inform the public of progress and 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.

94. 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

95. 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 non-government organizations (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 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, failure at this level will be referred 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 6.1.
96. All costs involved in resolving the complaints will be borne by the IPMU. The GRCs will continue to function throughout the project duration.

Figure 6.1: Grievance Redress Mechanism - RUSDIP



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

97. 1. 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 Committee³ (EC) assists LSGD in providing policy guidance and coordination across all towns and subprojects.; and
 - (vii) City Level Committees⁴ (CLCs) have also been established in each town to monitor project implementation in the town and provide recommendations to the IPIU where necessary.
98. **Figure 7.1** shows institutional responsibility for implementation of environmental safeguard at different level.
- 1. Responsible for carrying out mitigation measures**
99. During construction stage, implementation of mitigation measures is the construction contractor's responsibility while during operation stage, CMB will be responsible for the conduct of maintenance or repair works.
100. 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 Investment Program Implementation Unit (IPIU).

³ 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.

⁴ 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.

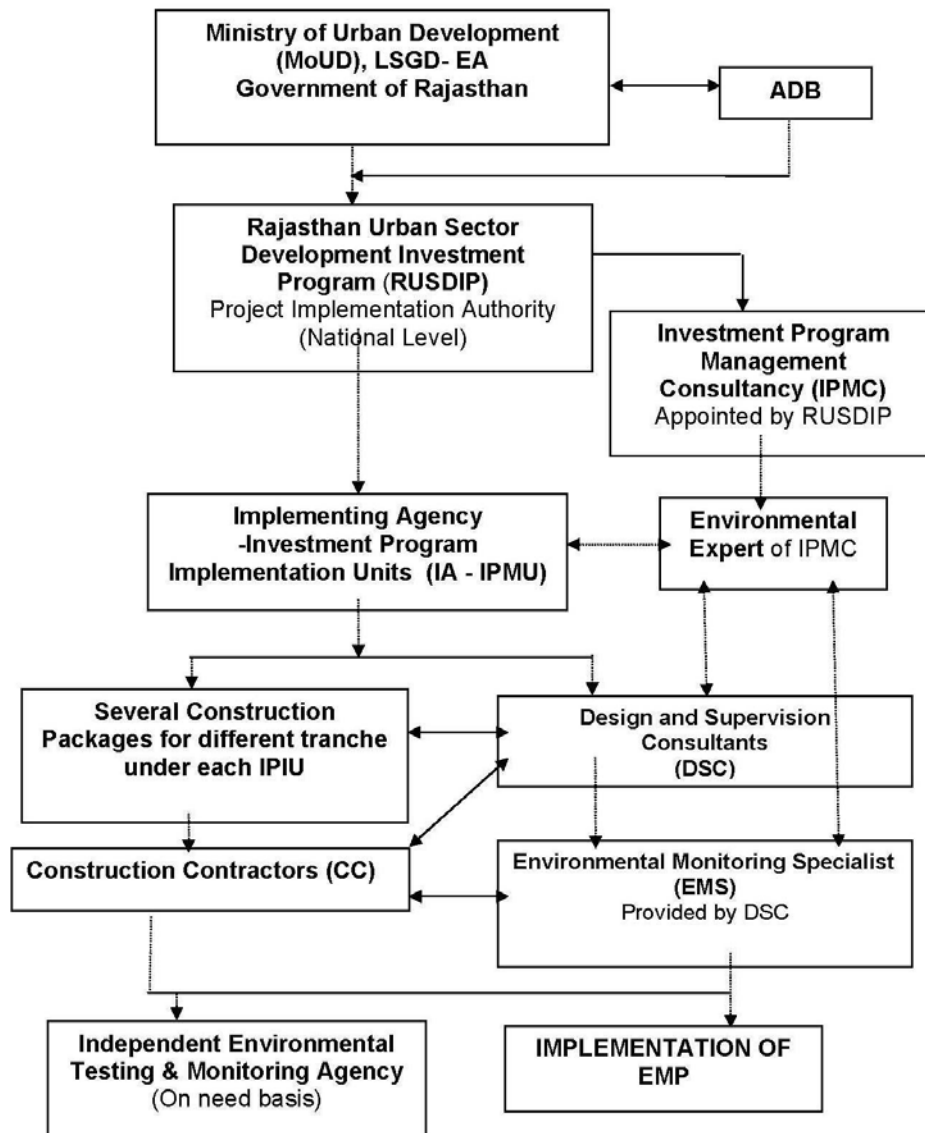
2. Responsible for carrying out monitoring measures

- 101. During construction, DSC’s Environment Safeguards Officer and the designated representative of IPIU will monitor the construction contractor’s environmental performance.
- 102. During the operation stage, monitoring will be the responsibility of CMB.

3. Responsible for reporting

- 103. LGSD 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.

Figure 7.1: Institutional Responsibility - RUSDIP



B. Environmental Mitigation Plan

104. **Tables 7.1 to 7.3** 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

105. **Tables 7.4 to 7.6** shows the proposed environmental monitoring program for this subproject. 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 from 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 7.1: Anticipated Impacts and Mitigation Measures – Pre-construction Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Utilities	Telephone lines, electric poles and wires, water and sewer lines within the existing bridge right-of-way (ROW) may be damaged.	(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
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical remains	(i) Consult Archaeological Survey of India (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	IPIU and DSC	Chance Finds Protocol

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.		
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the subproject sites; (ii) If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; (iii) Do not consider residential areas; (iv) Take extreme care in selecting sites to avoid direct disposal to nallah or in areas which will inconvenience the community.	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 drainage patterns, ponding and water logging, and water pollution.	(i) Prioritize sites already permitted by the Mining Department; (ii) If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of IPIU; and (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PMU.	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.

Table 7.2: 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 from nallah may cause general scouring resulting in endangerment of bridges and	(i) Use quarry sites and sources permitted by government; (ii) Verify suitability of all material sources and obtain approval of Investment Program	Construction Contractor	Construction Contractor documentation

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	continuous degradation of nallah regime.	Implementation Unit (IPIU); (iii) If additional quarries will be required after construction has started, obtain written approval from PMU; and; (iv) Submit to DSC on a monthly basis documentation of sources of materials.		
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; (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.	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) PM 2.5 & 10 (SPM); (iv) vehicular emissions such as sulphur dioxide (SO ₂), nitrous oxides (NO _x), carbon monoxide (CO), and hydrocarbons
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from 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	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

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		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).		coliforms.
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	(i) Plan activities in consultation with 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.	Construction Contractor	(i) Complaints from sensitive receptors; (ii) use of silencers in noise-producing equipment and sound barriers; (iii) equivalent day and night time levels
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure located alongside roads, in particular water supply pipes and sewer lines.	(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	Construction Contractor	(i) Existing Utilities Contingency Plan; (ii) Asbestos Cement Pipes Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		Asbestos Cement Pipes Management Plan		
Landscape and Aesthetics	Solid wastes as well as excess construction materials	(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; (iv) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (v) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.	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.
Accessibility	Traffic problems and conflicts in right-of-way (ROW)	(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 Churu 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	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
		informing nature and duration of construction works and contact numbers for concerns/complaints.		
Socio-Economic – Income.	Impede the access of residents and customers 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, disposal of silt etc	(i) Develop and implement site-specific Health and Safety (H&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&S Training for all site personnel; (d) documented procedures to be followed for all site	Construction Contractor	(i) Site-specific Health and Safety (H&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

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&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-up alarms;</p> <p>(xi) Mark and provide sign boards for hazardous areas such as energized electrical</p>		<p>hazardous or noxious substances;</p> <p>(vii) record of H&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>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>(xii) 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. (xiii) transport silt excavated from existing drain covered with tarpaulin and put on the polythene sheet (xiv) transport the silt in semi solid state (xv) dispose the silt away from the habitation</p>		
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians	<p>(i) Plan routes to avoid times of peak-pedestrian activities.</p> <p>(ii) Liaise with IPIU/DSC in identifying high-risk areas on route cards/maps.</p> <p>(iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.</p> <p>(iv) Provide road signs and flag persons to warn of dangerous conditions.</p> <p>(v) Erect barriers to protect public from entering construction site.</p>	Construction Contractor	<p>(i) Traffic Management Plan;</p> <p>(ii) complaints from sensitive receptors</p>
Work Camps	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents,	<p>(i) Consult with IPIU/DSC before locating project offices, sheds, and construction plants;</p> <p>(ii) Minimize removal</p>	Construction Contractor	<p>(i) Complaints from sensitive receptors;</p> <p>(ii) water and sanitation facilities for employees; and</p> <p>(iii) IPIU/DSC report</p>

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	and lubricants	<p>of vegetation and disallow cutting of trees;</p> <p>(iii) Provide water and sanitation facilities for employees;</p> <p>(iv) Prohibit employees from poaching wildlife and cutting of trees for firewood;</p> <p>(v) Train employees in the storage and handling of materials which can potentially cause soil contamination;</p> <p>(vi) Recover used oil and lubricants and reuse or remove from the site;</p> <p>(vii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;</p> <p>(viii) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and</p> <p>(ix) Request IPIU/DSC to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.</p>		in writing that the camp has been vacated and restored to pre-project conditions
Social and Cultural Resources	Risk of archaeological chance finds	<p>(i) Strictly follow the protocol for chance finds in any excavation work;</p> <p>(ii) Request IPIU/DSC or any authorized person with archaeological field training to observe excavation;</p> <p>(iii) Stop work immediately to allow further investigation if any finds are suspected; and</p> <p>(iv) Inform IPIU/DSC if a find is suspected, and take any action they require ensuring its removal or protection in situ.</p>	Construction Contractor	(i) Records of chance finds

Table 7.3: Anticipated Impacts and Mitigation Measures – Operation and Maintenance Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Occupational Health and Safety	adverse impacts on the appearance of surrounding environment and exposure of workers to hazardous debris	(i) Ensure persons employed to clean drains will be provided with suitable equipment (such as shovels and wheelbarrows); and (ii) Ensure all removed material will be deposited in the municipal waste storage bins.	CMB	complaints from sensitive receptors
Social and Cultural Resources	damage to structures	Operate the same kind Health and Safety procedures as used in the construction phase	CMB	complaints from sensitive receptors

Table 7.4: Pre-construction Environmental Monitoring Program

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Utilities		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	PMU
Social and Cultural Resources	not applicable	IPIU and DSC	Chance Finds Protocol	checking of records	Chance Finds Protocol provided to construction contractors prior to commencement of activities	once	PMU
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	checking of records	List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and	once	PMU

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
			disposal areas.		disposal areas provided to construction contractors prior to commencement of works.		
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	PMU
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

Table 7.5: Construction Environmental Monitoring Program

Mitigation Measures	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
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) PM 2.5 & 10; (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
Water Quality	(i) construction sites; (ii) areas for stockpiles, storage of fuels and lubricants and waste materials;	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	visual inspection	(i) designated areas only; (ii) silt traps installed and functioning; (iii) no noticeable increase in suspended solids and silt from construction activities (iv) GOI Standards for Water Discharges to Inland Waters and Land for Irrigation	monthly	DSC

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
			grease, biological oxygen demand (BOD), and coliforms.				
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 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
Existing Infrastructure and Facilities	(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; (ii) areas for stockpiles, storage of fuels and lubricants and waste materials; (iii) work camps	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.	(i) checking of records; (ii) visual inspection	(i) no accumulation of solid wastes on-site; (ii) implementation of Waste Management Plan; (iii) complaints from sensitive receptors satisfactorily addressed.	monthly	DSC
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-	construction	Construction	(i) complaints	visual	(i) complaints	quarterly	DSC

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
economic - Income	n sites	Contractor	from sensitive receptors; (ii) number of walkways, signages, and metal sheets placed at subproject sites.	inspection	from sensitive receptors satisfactorily addressed; (ii) walkways, ramps, and metal sheets provided (iii) signages visible and located in designated areas		
AC Pipes	construction sites	Construction Contractors	(i) records of trainings; (ii) AC Management Plan approved by PIU/DSC	checking of records	no exposure to AC pipes	as needed	PIU and DSC
Socio-Economic - Employment	construction sites	Construction Contractor	(i) employment records; (ii) records of sources of materials	checking of records	number of employees from Churu equal or greater than 50% of total work force	quarterly	DSC
Occupational Health and Safety	construction sites	Construction Contractor	(i) site-specific Health and Safety (HandS) 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 HandS orientation trainings (viii) personal protective equipments; (ix) % of moving equipment outfitted with audible back-up alarms; (xi) sign	(i) checking of records; (ii) visual inspection	(i) implementation of HandS 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

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
			boards for hazardous 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 (iii) fences set up to keep public out of construction site.	quarterly	DSC
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
Social and Cultural Resources	construction sites	Construction Contractor	records of chance finds	checking of records	Implementation of Chance Finds Protocol	as needed	DSC

Table 7.6: Operation and Maintenance Environmental Monitoring Program

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Community and Occupational Health and Safety	subproject sites	CMB	complaints from sensitive receptors	checking of records	complaints from sensitive receptors satisfactorily addressed	as needed	PMU

D. Environmental Management Costs

106. 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.
107. The remaining actions in the EMP are the various environmental monitoring activities to be conducted by the Environmental Monitoring Specialist. These have not been budgeted elsewhere, and their costs are shown in **Table 7.7**. The figures show that the total cost of environmental management and monitoring for this subproject as a whole (covering design and construction) is INR 0.72 million, ie US\$ 15,652.

Table 5.7: Environmental management and monitoring costs (INR)

Item	Quantity	Unit Cost	Total Cost	Sub-total	Source of Funds
1. Implementation of EMP (2 years)					
Domestic Environmental Monitoring Specialist of DSC	1 x 3 month	140,000 ⁵	420,000		DSC
Survey Expenses- data generation on Air, drain silt, noise etc	Lump Sum	200,000	200,000	620,000	DSC
2. Environmental mitigation measures specifically tree plantation	Lump sum	100,000	100,000	100,000	Contractor
TOTAL				720,000	

(Air Quality- Once in a week for 2 weeks 2 locations for each drain , semi-annually for the parameters like RSPM, PM_{2.5}, SO₂ NO_x, CO, H₂S; Noise level- Once (6 times in a day in 6 working hours) for 2 days at 2 locations for each drain, measurement semi-annually, Silt quality one time 2 samples from each drain – toxic & hazardous parameters like pH, lead, cadmium, chromium, zinc, copper, nickel etc)

⁵ Unit costs of domestic consultants include fee, travel, accommodation and subsistence

VIII. FINDINGS AND RECOMMENDATIONS

108. The process described in this document has assessed the environmental impacts of the infrastructure proposed under the Churu Drainage Subproject. Potential negative impacts were identified in relation to both construction and operation of the improved infrastructure, but no impacts were identified as being due to either the project design or location. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. These were discussed with specialists responsible for the engineering aspects, and as a result some measures have already been included in the outline designs for the infrastructure. This means that the number of impacts and their significance has already been reduced by amending the design.
109. During the construction phase, impacts mainly arise from the need to dispose of large quantities of waste soil and import sand, and other building materials; and from the potential disturbance of businesses, traffic and important buildings by the construction work. These are common impacts of construction in urban areas, and there are well developed methods for their mitigation.
110. Although there will be no need to acquire land or relocate people, some structures (such as shop fronts) that are encroaching into the easement may have to be removed, and roadside businesses may lose some income as access will be difficult for customers when work is in their vicinity. These are addressed through the Resettlement Plan.
111. Special measures were also developed to protect workers and the public from exposure to carcinogenic asbestos fibres in the event that Asbestos Cement pipes used in the existing water supply system are uncovered accidentally during excavation work.
112. There were limited opportunities to provide environmental enhancements, but certain measures were included. For example it is proposed that the subproject will employ in the workforce people who live in the vicinity of construction sites to provide them with a short-term economic gain.
113. CMB will establish a program for the regular visual inspection of the condition and functioning of the drains; and ensure that blockages are cleared and repairs are conducted promptly and effectively. If this is done any repairs will be small-scale and infrequent, involving the manual replacement of small areas of brick and concrete, which can be done from within the drain area and should therefore not have significant environmental impacts.
114. The main impact of the new *nallahs* will be beneficial as the unhygienic pools of wastewater that are an unsightly feature of the town at present should gradually drain away; and the improved drainage and repair of leaks in the water supply system provided by the water supply subproject should ensure that similar pools do not reform in the future. This will improve the appearance and environment of the town, as well as protecting the ancient buildings and sites from the water damage which is an important concern at the moment. If, as expected, this attracts more tourists to the area, then there could be economic benefits for the town and its citizens.
115. 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

116. Mitigation will be assured by a program of environmental monitoring conducted during both construction and operation to ensure that all measures are provided as intended, and to determine whether the environment is protected as envisaged. This will include observations on and off site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported to the IPIU.

IX. CONCLUSIONS

117. 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.
118. 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

Country/Project Title: India/Rajasthan (Churu) Urban Sector Development Investment Programme (Tranche-III).

Sub-Project: Drainage project at Churu

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the project area...			
Densely populated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed outfall site is situated in the revenue limit of Gajsar village by the side of Churu-Taranagar road about 6 km from Churu town towards Northern side of the main town of Churu. The Churu town is having 30.sq. km Municipal Area and the population of Churu Urban Agglomeration is 1,01,874 according to 2001 census.
Heavy with development activities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No significant development activity is recorded in the vicinity of proposed landfill site.
Adjacent to or within any environmentally sensitive areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
• Cultural heritage site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
• Protected Area	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
• Wetland	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
• Mangrove	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
• Estuarine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
• Buffer zone of protected area	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
• Special area for protecting biodiversity		<input checked="" type="checkbox"/>	No
• Bay	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No
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 checked="" type="checkbox"/>	<input type="checkbox"/>	Sanitation and solid waste disposal system will also be considered
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 checked="" type="checkbox"/>	<input type="checkbox"/>	This is natural process. Environmental safeguard should be part of daily activity
Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable
Dislocation or involuntary resettlement of people	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temporary displacement due to the construction activities. People may lose their access for short period. People will be informed about the activities well in advance during the pre construction consultation. Compensation will be paid

SCREENING QUESTIONS	Yes	No	REMARKS
			as per R&R policy.
Degradation of cultural property, and loss of cultural heritage and tourism revenues?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No such impact anticipated.
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"/>	<input checked="" type="checkbox"/>	Not Applicable
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"/>	<input checked="" type="checkbox"/>	The proposed drainage work is to improve the drainage condition of the town. It is not discharging into any receiving water body.
Air pollution due to urban emissions?	<input checked="" type="checkbox"/>		Impact will be mitigated by application of EMP
Social conflicts between construction workers from other areas and local workers?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not expected
Road blocking and temporary flooding due to land excavation during rainy season?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Partial impact during monsoon- no excavation permitted during monsoon
Noise and dust from construction activities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mitigation measures to be provided & will be taken care in EMP
Traffic disturbances due to construction material transport and wastes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mitigation measures to be provided & will be taken care in EMP
Temporary silt runoff due to construction?	<input checked="" type="checkbox"/>		Mitigation measures to be provided & will be taken care in EMP.
Hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable
Water depletion and/or degradation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable
Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable
Contamination of surface and ground waters due to improper waste disposal?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Waste disposal of drainage work will be taken care in EMP
Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The proposed drainage work is to improve the drainage condition of the town. It is not discharging into any receiving water body.
A. Categorization			
<p>[] Category A: It is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Impacts may affect an area larger than the sites or facilities subject to physical works. An EIA including an EMP is required</p> <p>[<input checked="" type="checkbox"/>] Category B: It has less adverse environmental impacts than Category A. Impacts are site-specific, few are irreversible, and in most cases mitigation measures can be designed more readily than Category A. An IEE, including an EMP is required.</p> <p>[] Category C: It is likely to have minimal or no adverse environmental impacts. Environmental implications should be reviewed.</p>			

APPENDIX – 2 : PUBLIC CONSULTATION- ENVIRONMENT

Drainage Project at Churu

Issues discussed

- Awareness and extent of the project and development components
- Benefits of Project for the economic and social Upliftment of Community
- Labour availability in the Project area or requirement of outside labour involvement
- Local disturbances due to Project Construction Work
- Necessity of tree felling etc. at project sites
- Water logging and drainage problem if any
- Drinking water problem
- Forest and sensitive area nearby the project site
- Movement of wild animal if any

Date & time of Consultation **25.02.2012, 11:00 AM**

Location **Khensara Sati Marg, Churu**

Table 1 : Issues of the Public Consultation- Design Phase

Sr. No.	Key issues/Demands	Perception of community	Action to be Taken
1.	Awareness of the project – including Project Coverage area	Some People are aware of the proposed Project	An NGO is appointed for awareness programme in this town
2.	In what way they may associate with the project	They want to engage with the project as a job opportunity	Contractor will engage 50 % labour from the nearby location
3.	Presence of any forest, wild life or any sensitive/ unique environmental components nearby the project	There is no such environmental sensitive components in the vicinity of project area	
4	Presence of historical/cultural/ religious sites nearby	There is one Bala Ji Temple nearby the proposed project but away from project area.	All preventive measures will be taken to avoid damage to such sensitive sites.
5	Un favorable climatic condition	Churu is dry area with very high temperature during summer creating unfavorable condition for work	Contractor should make the working schedule as per climatic conditions of the area

Sr. No.	Key issues/Demands	Perception of community	Action to be Taken
6	Occurrence of flood	No flood is reported in this town till date	
7	Drainage and sewerage problem facing	Drainage and Sewerage are major problems in this area. These should be sort out immediately.	Sewerage problem will be solved because this project is already been taken in the scope.
8	Present drinking water problem- quantity and quality	Present water supply is from tube wells. The quality of water is poor, fluoride and TSS content is high.	The Water Supply project is proposed in this town and scarcity of water will be solved after completion of this project.
9	Present solid waste collection and disposal problem	Solid waste collection facility is poor in this area, Line department is not serious about the solid waste collection in this area	Solid Waste project has been taken in RUIDP scope
10	Availability of Labour during construction time	Sufficient labour is available in nearby communities.	Contractor will engage 50 % labour from nearby community.
11	Access road to project site	The proposed road project is along Jodhpur by pass to Uttarlai road.	
12	Perception of villagers on tree felling and a forestation	People are against the tree felling	There will be no need of tree cutting but if it happens then 3 trees will planted at cost of one tree.
13	Dust and noise pollution and disturbances during construction work	Contractor should use modern machinery to control dust and noise during construction phase.	All preventive measures will be taken to control dust and noise during construction phase. Regular maintenance of Noise producing machinery will be done.
14	Setting up worker camp site within the village/ project locality	There is enough space available nearby our project area to establish labour camp.	The locals will provide land for temporary set up of labour camp if necessary.
15	Safety of residents during construction phase and applying of vehicle for construction activities	The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion	Contractor should appoint a safety officer for looking after the Safety aspects during construction work.
16	Requirement of enhancement of other facilities	The locals feels that Parks, and Community halls are required in this town in addition to additional traffic management system	
17	Whether local people agreed to sacrifice their lands (cultivable or not) for beneficial project after getting proper compensation	Locals are not agree to sacrifice their land for benefits of the project if needed	

NAME AND POSITION OF PERSONS CONSULTED

Sr. No.	Name	Designation
1.	Deen Ram	Student
2.	Karim Khan	Student
3.	Rafiq	Labor
4.	Dhan Singh	Business
5.	Brijesh	Student
6.	Prakash	Business
7.	Hazari Ram	Business
8.	Dharam Pal	Service

SUMMARY OF OUT COME

Some Locals are aware of the project. The proposed project is a need to this town. Locals are very much in favour of the project and they wants that this should be completed as early as possible. These local people are suffering from present water supply, sewerage and solid waste disposal management in this town. The quality and quantity of present water supply is very poor. People are ready to extend all types of support to during execution of the project. Projects of Water Supply, Wastewater, Railway Over Bridge, Road and improvement of solid waste collection have been taken under RUIDP project. The local people in favour all type of co-operation for concerned project which should be finish as early as possible. According to locals' contractor should inform to them well in advance before start of construction work.

PHOTOGRAPHS



Back side of the Bhartia well- Naya bas



Back side of the Bhartia well- Naya bas



Kamat Sati Mandir during Public Consultation near Gandhi Nagar



During Public Consultation Kamat sati Mandir coli near Gandhi Colony

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 Investment Program Management Unit (IPIU);
- (iii) If additional quarries will be required after construction has started, obtain written approval from PMU; 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) 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.

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; and
- (vi) 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.

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. 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;
- (iv) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and
- (v) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

G. Transportation – 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 ChuruMunicipal 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.

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

- (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.

J. Occupational Health and Safety

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

K. 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.

L. 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.

M. 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.

Appendix-4

Location of Silt Disposal site at Churu

