Initial Environment Examination

Project Number: 42486-016
January 2020

IND: Madhya Pradesh Urban Services Improvement Project

Subproject : Rahatgarh - Water Supply Subproject (Package 6C)

Prepared by :
Project Management Unit, Madhya Pradesh Urban Development Company

Asian Development Bank

Mad hya Pradesh Urban Developm ent Company Lirrl ited
(CIN to. U75 11 tlMP2tll 5SGC034I 3'7)
(Depanment of Urban Det elopment and Housing,
Government of Madhya Pradesh)
S. Arera Hill s. J3hopal

No. PMU/ENG/ 2019/ 10300

Bhopal, Dated 26/12/2019

To,

The Country Director
India Resident Mission
Asian Development Bank, New Delhi

Sub: Loan 3528-IND: Final Updated IEE Report of Package 6C under Phase 1.

Please find attached final updated IEE report of Package 6C along with compliance matrix of ADB observations under Phase 1 for your review and approval please.

Encl. - As above

P.L Barange
Project Officer
M PU DC

ASIAN DEVELOPMENT BANK
INRM
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MK
30 DEC 2019
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Reply of ADB (Manila team) Comments received on dated 04.07.2019 on Final Updated IEE report Package 6C_ Rahatgarh Town WSS

S. No.	ADB Comments	Reply of ADB Comments
1	Please see the information / details I requested for the packages with weir proposal to updated IEEs. This package has a weir proposal. These details are required.	Complied with the required drawings/maps in final IEE Report. For further details, Refer Table 2 to Table 3, Para 71 to Para 74 and Appendix 4 & Appendix 20 in final IEE Report
2	In all the drawings/figures, change anicut, dam etc., to "weir"	Complied with the required drawings/maps in final IEE Report For further details, **Refer Appendix 20 (Figure A to Figure D**) in Final IEE Report
3	Figure 10 – provide proper cross section details of weir – height, RLs, sluices, and gates etc., shall be clearly visible;	Complied with the required details in final IEE Report. For further details, **Refer Appendix 20 (Figure A to Figure C**) in Final IEE Report
4	Provide separate figure for showing sluice gates	Complied with the required drawings/maps in final IEE Report. For further details, **Refer Figure C,** as shown in Appendix 20 in final IEE Report.
5	Figure 16 – Provide separate figures for hydraulic flow, and layout; WTP layout should be proper, and on the actual site map; all units shall be clearly visible;	Complied with the required drawings/maps in final IEE Report For further details, **Refer Appendix 20 (Figure E to Figure F)** in final IEE report
6	For OHTs, provide layout also using actual site map	Complied with the required layout drawings/maps in final IEE Report For further details, **Refer Appendix 20 (Figure G to Figure H)** in final IEE Report
7	Change in weir height – provide technical reason why it is increased, provide facts and figures, provide very detailed explanation; what is the submergence area before, what is submergence area now, provide maps	As per DPR and Contract document, weir height is 3m and length is 130 m. No change in weir height & length during detailed design by DBO Contractor **(Refer Table 3-Final IEE report).** However, weir height mentioned in IEE report as 2.5m has been rectified as 3m height. Submergence area is within the river course itself and it same as before and now as per detailed design by DBO Contractor
8	Is contour survey conducted for submergence area during the detailed design? this is required,	Yes, contour survey has been conducted for submergence area during the detailed design by DBO Contractor. Submergence is within the river course itself.

	and drawing to be provided showing the contour level, and river profile to confirm that submergence will be within the riverbank.	**Refer Figure 6 to Figure 7 in final IEE Report** For further details, **Refer Appendix 20** (**Figure D)** in final IEE Report
9	What is the size of under sluice gate? and how many gates in total?	Size of Under sluice gate is 1.0 m x 1.0 m and 02 nos. gates have been provided.

Final Initial Environmental Examination

December, 2019

IND: Madhya Pradesh Urban Services Improvement Project – Rahatgarh - Water Supply Subproject (Package 6C)

Prepared by

Project Management Unit
Madhya Pradesh Urban Development Company
Government of Madhya Pradesh for the Asian Development Bank

Note: This Final Initial Environmental Examination (IEE) updates the Draft IEE for Package 6C which has been cleared by ADB on April, 2016 and disclosed on http://www.mpudc.co.in/safeguardpolicies.aspx

CURRENCY EQUIVALENTS
(as on 27 Dec 2019)

Currency Unit	-	Conversion
INR 1.00	=	$ 0.014
$ 1.00	=	INR 71.29

Abbreviations

AC	–	Asbestos Cement
ADB	–	Asian Development Bank
ASI	–	Archeological Survey of India
ASO	–	Assistant Safeguards Officer
CFE	–	Consent for Establishment
CFO	–	Consent for Operation
CPCB		Central Pollution Control Board
EA	–	Executing Agency
EAC	–	Expert Appraisal Committee
EC	–	Environmental Clearance
EHS	–	Environmental Health & Safety
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan;
GOI	–	Government of India
GOMP	–	Government of Madhya Pradesh
IA	–	Implementing Agency
IEE	–	Initial Environmental Examination;
LPCD	–	Liters per Capita per Day
MLD	–	Million Liters per Day
MOEF	–	Ministry of Environment and Forest
MPPCB	–	Madhya Pradesh Pollution Control Board
MPUDC	–	Madhya Pradesh Urban Development Company
MPUSIP	–	Madhya Pradesh Urban Services Improvement
NOC	–	No Objection Certificate
OHT	–	Over Head Tank
PMC	–	Project Management Consultant
PHED	–	Public Health Engineering Department
PIU	–	Project Implementation Unit;
PMU	–	Project Management Unit
PO	–	Project Officer
PWD	–	Public Works Department
REA	–	Rapid Environmental Assessment Checklist
RNP	–	Rahagarh Nagar Parishad
RoW	–	Right of Way
SEIAA	–	State Environmental Impact Assessment Authority
SPS	–	Safeguard Policy Statement, 2009
UDHD	–	Urban Development and Housing Department
ULB	–	Urban Local Body
WTP	–	Water Treatment Plant

WEIGHTS AND MEASURES

˚C	Degree Celsius
km	kilometer
LPCD	liters per capita per day
m	meter
MLD	million liters per day
mm	millimeter
Nos	Numbers
sq.km	Square Kilometer
MCM	million cubic meter

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I. EXECUTIVE SUMMARY

1. Government of Madhya Pradesh with loan funding from Asian Development Bank (ADB) has proposed to implement Madhya Pradesh Urban Services Improvement Project (MPUSIP), herein after referred as 'the Project". Madhya Pradesh Urban Development Company Limited (MPUDC) is the Implementing Agency and the State Urban Development and Housing Department (UDHD) is the executing agency for the Project.

2. Tranche 1 of the project will cover water supply interventions for 69 towns and sewerage collection and treatment in 4 identified towns. Subproject for improvement of water supply system in the Rahatgarh town is proposed under Tranche 1. The ADB-approved initial environmental examination (IEE) report, April 2016 for the construction package 6C has been updated considering the detailed design completed for the sub-project.

3. The overall project components are as follows:

(i) Component 1: Improvements to water supply and sewerage services in identified towns

- Continuous, pressurized, safe and sustainable drinking water through private household metered connections to 350,000 households with about 1.7million population resident in sixty-nine towns in the State of Madhya Pradesh in Central India; and
- Sewage collection and treatment services proposed in four (4) identified towns (Anjad, Badwaha, Saikheda and Sanawad) servicing about 42,000 population resident in 8000 households;

(ii) Component 2: Institutional Strengthening

- Capacity Building of implementing agencies (IAs), participating Urban Local Bodies (ULBs) and service utilities in contract management and service delivery for ensuring long term sustainability of services;
- Setting up of geographic information system (GIS) based water and sanitation asset management and service delivery monitoring; and
- Structured behavioral change campaigns to ensure the improvement in public health and cost recovery of service delivery.

(iii) Component 3: Project Management and Administration Support. This component will support the smooth and effective implementation and operation of the Project which includes expert support in Project design and implementation (design, procurement and Contract and Project Management, safeguards etc.), and project administration through Executing and Implementing Agencies.

4. The key outcome envisaged from the project is "effective urban water service delivery model rolled out in selective urban clusters of the State with the objective of achieving the following performance indicators by the year 2022.

5. **The Subproject.** Rahatgarh is located in the districts of Sagar in the central part of Madhya Pradesh state. The population as per 2011 census was 31537. Improvement of water supply in Rahatgarh town will be implemented under a single Design-Build-Operate (DBO) contract package. The objective of the subproject is to achieve safe and sustainable water services both in terms of services to customers, cost recovery, providing 100% coverage with continuous, pressurized and safe drinking water services and achieving progressively increasing cost recovery by expanding the coverage and increasing operating efficiency. The subproject includes the following civil works: (i) Weir of 3 m height and 130m length on River Bina, (ii) Proposed

Intake well for 8.77 MLD (Diameter=6.50m, depth = 20.60 m, in Bina River near existing intake well, (iii) Raw water rising main of Length = 250 m & dia 400 mm DI pipes, from intake to WTP, (iv) Proposed Water Treatment Plant for 7.00 MLD, (v) Clear water Feeder main of Length = 2,096 m of dia 200mm to 300 mm DI pipes, (vi) Proposed Over Head tank of 1200 KL capacity for Zone-2 and 600 KL capacity for Zone-3, (vi) Distribution Network of Length = 48,906 m of dia 75 mm to 500 mm HDPE and DI pipes and (vii) Bulk flow meter – 8 nos. and house service connections – 5280 nos.

6. **Screening and assessment of potential impacts.** 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 Safeguard Policy Statement (SPS), 2009. As per the GoI EIA Notification, 2006, this subproject does not require EIA study or environmental clearance. The potential environmental impacts of the subproject have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply (Refer Appendix 3). Then potential negative impacts were identified in relation to pre-construction, construction and operation of the improved infrastructure.

7. **Categorization.** Based on results of the assessment and ADB SPS, 2009, the subproject classification pertaining to environmental safeguards continues to be "Category B", i.e., the subproject is judged to be unlikely to have significant adverse environmental impacts.

8. This final IEE report aims to (i) provide critical facts, significant findings, and recommended actions; (ii) present the national and local legal and institutional framework within which the environmental assessment has been carried out; (iii) provide information on existing geographic, ecological, social and temporal context including associated facilities within the subproject's area of influence; (iv) assess the subproject's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic, and physical cultural resources in the subproject's area of influence; (v) identify mitigation measures and any residual negative impacts that cannot be mitigated; (vi) describe the process undertaken during project design to engage stakeholders and the planned information disclosure measures and the process for carrying out consultation with affected people and facilitating their participation during project implementation; (vii) describe the subproject's grievance redress mechanism for resolving complaints about environmental performance; (viii) present the set of mitigation measures to be undertaken to avoid, reduce, mitigate, or compensate for adverse environmental impacts; (ix) to describe the monitoring measures and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures; and (x) identify indicative costs and who is responsible for carrying out the mitigation and monitoring measures.

9. **Description of the Environment.** The subproject components locations are in subproject town and their surroundings. The weir being constructed across the river Bina, intake is located close to river bank on government land, while the WTP including clear water sump are located close to the intake where sufficient government land is available. These facilities are located outside the town, and are mostly surrounded by ASI monument and vacant government land. None of the components however located on any forest land. Rest of the components – water tanks, distribution lines, connections etc., are located within the urban areas. The raw water transmission pipes, connecting intake and WTP, is very small i.e. approx. 250 m, and clear water transmission pipes, from WTP to distribution reservoirs, are partly outside and partly within the town. Project area experience a subtropical climate, typical to north India, hot summers, cold and dry winters and monsoon rains. While there is no natural habitat left within the town area, the areas near river intake are comparatively intact though most of the lands there too converted into agricultural use. There are no protected areas, like wildlife sanctuaries, national parks. Proposed WTP site is located within the regulated area around the monuments (300 m). NOC from ASI for construction of WTP has been obtained. Town is densely populated in the core/old town areas

with narrow lanes, and small and closely built houses, while most of the areas are undeveloped and are still under agricultural use. Commercial areas are along the main roads, which are mostly congested with activities, pedestrians and traffic.

10. **Potential environmental impacts.** The subproject is unlikely to cause significant adverse impacts because: (i) relatively small scale as the population and water demand is minimal, (ii) the components will involve straightforward construction and operation, so impacts will be mainly localized; and (iii) predicted impacts are site-specific and likely to be associated with the construction process and are produced because the process is invasive, involving excavation and earth movements.

11. Environmental impacts as being due to the project design or location are not significant. The proposed water supply schemes include design of new water source nearest surface water body, that include construction of weir. Considering good water availability and very small demand, it is assessed to be unlikely to have any significant issue of source sustainability. Given that weir is small structures with have limited & fixed height and submergence confined to river course with no direct water withdrawals, the impacts on downstream and ecosystem are likely to be insignificant. Water quality is good and there are no potential pollution sources in the vicinity that could affect the water quality. Although none of the components are located within the forest, conduct of construction works and presence of workers, vehicles may damage /disturb the sensitive areas. Necessary precautionary measures are suggested to avoid any impacts.

12. During construction, potential negative impacts mainly arise from disturbance of residents, businesses, increase in traffic, increase in noise level and dusts, and the need to dispose moderate quantities of waste soil during construction phase and generation of sludge from the WTP during operation and maintenance phase. However, there are well- developed methods for mitigation, minimization to acceptable levels. Operation phase impacts are likely to be insignificant.

13. **Environmental Management Plan.** An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels. Locations and siting of the proposed infrastructures were considered to further reduce impacts. These include (i) locating facilities on government-owned land to avoid the need for land acquisition and relocation of people; and (ii) laying of pipes in RoW alongside main/access roads, to reduce acquisition of land and impacts on livelihoods specifically in densely populated areas of the town.

14. The EMP includes design measures such as (i) design of weir; (ii) selection of construction methodology near protected monuments in discussion with the ASI, having the excavation observed by person with archaeological knowledge for chance finds, etc.; (iii) wash water recovery for the WTP to reduce effluent to be discharged and safe sludge disposal (iv) energy efficient pumping equipment and (v) quick leak detection and rectification to save the resources, etc. During construction, the EMP includes mitigation measures such as (i) implementation of traffic management plan in coordination with local traffic police to minimize traffic impacts; (ii) awareness campaigns and consultations to inform residents and businesses of potential disturbances; (iii) provision of walkways and planks over trenches to ensure access will not be impeded; (iv) use of noise-dampening measures in areas with sensitive receptors such as hospitals, schools, places of worships and other silence-zones; (v) use of dust-suppression methods such as watering and/or covering of stockpiles; and (vi) finding beneficial use of excavated materials to extent possible to reduce the quantity that will be disposed off. As for the O&M phase, facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. The design of the WTP includes dewatering and drying areas as part of sludge

management. The EMP includes mitigation measures and monitoring plan to ensure compliance to environmental standards during O&M phase.

15. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between Madhya Pradesh Urban Development Company (MPUDC), project management unit (PMU), project implementing unit (PIU), consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

16. The DBO contractor has prepared and submitted a site environmental plan (SEP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMP; and (iv) budget for EMP implementation to PMU/ADB for review and approval. No works are allowed to commence prior to approval of SEP. A copy of the updated EMP/approved SEP have been kept on site during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

17. **Consultation, disclosure and grievance redress mechanism.** The stakeholders were involved in developing the IEE through discussions on-site and public consultation at several places in the town, after which views expressed were incorporated into the final IEE report and in the planning and development of the project. The final IEE report will be made available at public locations and will be disclosed to a wider audience via the ADB, MPUDC and PMU websites. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation. A grievance redress mechanism is described within the IEE to ensure any public grievances are addressed quickly.

18. **Implementation Arrangements.** Urban Development and Housing Department (UDHD) of Government of Madhya Pradesh is the Executing Agency and Madhya Pradesh Urban Development Company (MPUDC) is the Implementing Agency. Project Management Unit (PMU) attached to MPUDC is responsible for implementation, and is being supported by Project Implementation Units (PIUs). Several teams of Design Consultants, and a Project Management Consultant (PMC), supports PMU & PIUs. Infrastructure have been designed, built, and operated by DBO contractor for 10 years, after which it will be transferred to ULBs. Project Officer (Environment) at PMU and Assistant Safeguard Officer (ASO) at each of the PIU is responsible for environment safeguards tasks, and is being supported by PMC. Contractor personnel include an Environment, Health and Safety (EHS) supervisor.

19. **Monitoring and Reporting.** The PMU and PMC is responsible for monitoring. The PMC submits quarterly and semi-annual monitoring reports to PMU, and the PMU after reviewing, send the semi-annual monitoring reports to ADB. ADB posts the environmental monitoring reports on its website.

20. **Conclusions and Recommendations.** The subproject is therefore unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the final IEE, there are no significant impacts and the classification of the project continues to be Category "B" is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006). Project require permission of (i). Water Resources Department (WRD) for water abstraction, weir/intake construction- which is already obtained, (ii) permission of ASI for works within 300 m of protected monuments-already obtained; and (iii). Consent to Establish from Madhya Pradesh Pollution Control Board (MPPCB) for WTP, which is already obtained.

21. This final IEE report is based on detailed design by the DBO contractor **"M/s Jay Varudi Construction Company & Ranjit Buildcone Ltd. (JV), Nagpur",** reflecting changes, amendments during implementation phase and has been reviewed and approved by PMU.

II. INTRODUCTION

A. Background

1. Government of Madhya Pradesh with loan funding from Asian Development Bank (ADB) has proposed to implement Madhya Pradesh Urban Services Improvement Project (MPUSIP), herein after referred as „the Project". Madhya Pradesh Urban Development Company Limited (MPUDC) is the Implementing Agency and the State Urban Development and Housing Department (UDHD) is the executing agency for the Project.

2. Tranche 1 of the project will cover water supply interventions for 69 towns and sewerage collection and treatment in 4 identified towns. Subproject for improvement of water supply system in the Rahatgarh town is proposed under Tranche 1. The ADB-approved initial environmental examination (IEE) report, April 2016 for the construction package 6C has been updated considering the detailed design completed for the sub-project.

3. The overall project components are as follows:

(i) Component 1: Improvements to water supply and sewerage services in identified towns

- Continuous, pressurized, safe and sustainable drinking water through private household metered connections to 350,000 households with about 1.7million population resident in sixty-nine towns in the State of Madhya Pradesh in Central India; and
- Sewage collection and treatment services proposed in four (04) identified towns (Anjad, Badwaha, Saikheda and Sanawad);

(ii) Component 2: Institutional Strengthening

- Capacity Building of implementing agencies (IAs), participating Urban Local Bodies (ULBs) and service utilities in contract management and service delivery for ensuring long term sustainability of services;
- Setting up of geographic information system (GIS) based water and sanitation asset management and service delivery monitoring; and
- Structured behavioral change campaigns to ensure the improvement in public health and cost recovery of service delivery.

(iii) **Component 3: Project Management and Administration Support.** This component will support the smooth and effective implementation and operation of the Project which includes expert support in Project design and implementation (design, procurement and Contract and Project Management, safeguards etc.), and project administration through Executing and Implementing Agencies.

4. The key outcome envisaged from the project is "effective urban water service delivery model rolled out in selective urban clusters of the State with the objective of achieving the following performance indicators by the year 2022.

(i) Access to piped water supply coverage increased to 95% of the households from 33% in 2015 in 69 towns;

(ii) Women's drudgery for fetching water reduced by 80% (from spending an average of 55 minutes in 2015 to 10 minutes);

(iii) Coverage of households with access to improved sanitation systems increased to 80% from 30% in 2015;

(iv) Wastewater collection and/or safe sanitation service coverage increased to at least 80% of the households from 0% in 2015 in two towns;

(v) Incidence of water logging/flooding reduced to two incidents per annum in

four towns; and

(vi) Women access to functioning sanitation systems increased to 95% from 25% in 2015 (in poor settlements) in four towns

5. The key outputs envisaged from the project are:

(i) **Output 1**: Water supply infrastructure improved in 69 project towns and flood and sanitation infrastructure improved in four project towns with the following measurable indicators:

- Improved water supply capacity of 135 MLD installed in 69 towns;
- 4,000 km water supply networks installed in 69 towns;
- 350,000 households provided with metered house connections including 100 government schools;
- Sewage or septage treatment plants construction; and
- Installation of sewer and networks.

(ii) **Output 2:** Sustained urban infrastructure operation and management

- 23 performance-based contract (PBC) operation and maintenance (O&M) water supply contracts for 69 ULBs signed and operated;
- ULBs institute volumetric water charges for recovery of water service O&M costs
- ULBs" water tariff collection ratio improved to 90% from 50% in 2014 based on the water meters" readings
- 100% operating cost recovery (excluding debt service) achieved;
- GIS system established for effective O&M of water services

6. Rahatgarh is located in the districts of Sagar in the central part of Madhya Pradesh state. The population as per 2011 census was 31537. Improvement of water supply in Rahatgarh town will be implemented under a single Design-Build-Operate (DBO) contract package. The objective of the subproject is to achieve safe and sustainable water services both in terms of services to customers, cost recovery, providing 100% coverage with continuous, pressurized and safe drinking water services and achieving progressively increasing cost recovery by expanding the coverage and increasing operating efficiency. The subproject includes the following civil works: (i) Weir of 130 m long with 3 m height across River Bina, (ii) Proposed Intake well for 8.77 MLD at Bina river, (iii) Proposed Water Treatment Plant for 7.00 MLD, (iv) Clear water Feeder main, (v) Proposed Over Head tank of 1200 KL capacity for Zone-2 and 600 KL capacity for Zone-3, (vi) Distribution Network; and (vii) Bulk flow meters and House service connections

B. Purpose of Final IEE Report

7. 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 Safeguard Policy Statement (SPS), 2009. The potential environmental impacts of the subproject have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply **(Refer Appendix 3).** Then potential negative impacts were identified in relation to pre-construction, construction and operation of the improved infrastructure, and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus, this final initial environmental examination (IEE) report has been prepared in accordance with ADB SPS"s requirements for environment category B projects.

8. This final IEE report is based on the detailed engineering design prepared by the DBO

contractor during implementation stage reflecting changes and latest subproject designs. This final IEE report covers the general environmental profile of Package 6C town, and includes an overview of the potential environmental impacts and the magnitude on physical, ecological, economic, and social and cultural resources within the subproject's influence are 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. Stakeholder consultation is an integral part of this final IEE report.

9. The objectives of this final IEE report for Package 6C are:

i. provide information on the detailed engineering design, significant findings, and recommended actions;
ii. provide information on national and local statutory requirements applicable to Package 6C;
iii. update information on environmental baseline conditions based on DBO contractor's pre-works documentations;
iv. report on package's impacts to physical, biological, socioeconomic and physical cultural resources if not yet covered in the Draft IEE;
v. report the mitigation measures, monitoring program, and any residual negative impacts that cannot be mitigated;
vi. describe engagement of stakeholders, information disclosure measures, and consultation plans during package/subproject implementation;
vii. describe the package/subproject's grievance redress mechanism for resolving complaints about environmental performance;
viii. submit the site-specific EMP; and
ix. provide the costs and who is responsible for carrying out the mitigation and monitoring measures.

C. Report Structure

10. This Report contains the following eleven (11) sections:

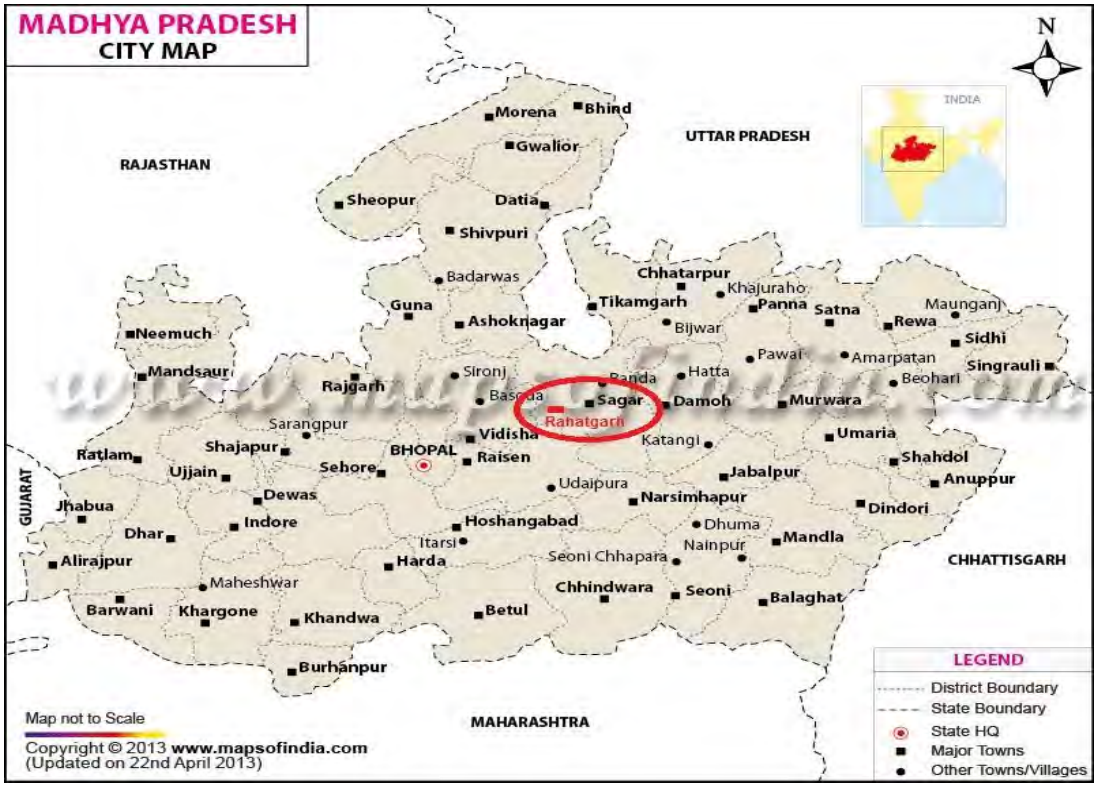
(i) Executive summary;
(ii) Introduction
(iii) Description of the project
(iv) Policy, legal and administrative framework
(v) Description of the environment;
(vi) Anticipated environmental impacts and mitigation measures;
(vii) Public consultation and information disclosure;
(viii) Grievance redress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

III. DESCRIPTION OF THE SUBPROJECT

A. Description of Project Area

11. Rahatgarh is Nagar Parishad and developing town of the District Sagar. It is situated on NH-86 and lays 40 km away from district Headquarter Sagar and 145 km away from its state capital Bhopal. The Economy of the town is mainly based on agricultural products, trade & Commerce and administrative Activities. Rahatgarh is located in the central parts of the Madhya Pradesh. The latitude extent of the town is 23º.47".13.42" North and the longitudinal extent is 78º 23"50.66"" East. Location map of Rahatgarh town is shown in **figure 1** as given below.

Figure 1: Location of Subproject Area



B. Existing Water Supply Situation

12. The Nagar Parishad is vested with the responsibility of the design and execution of water supply works, operation & maintenance of water supply system of the town. Water is supplied to the town through two sources

1) Surface water source: River Bina
2) Ground water source: Bore wells installed in the town.

13. The town is having two water works plant through which the water is extracted from surface and ground water sources.

- Old Water Works Filter Plant: Capacity of 0.67 MLD with filter plant (WTP)
- Existing Water Works Plant: Capacity of 2.15 MLD with rapid sand filter plant (WTP)
- Per capita present supply in the town is estimated is 33 LPCD with coverage of 95 percent population.

14. The filter plants are installed for treatment of raw water collected from the Bina River and ground water. Water is filtered and transmitted to the underground water reservoir. Water is then distributed to various water supply zones and areas through localized distribution networks. In the old water works system, underground reservoir of capacity 2.70 lakhs liters is constructed for storage purpose, where as in the new water works are with reservoir of capacity 7.00 lakhs liters used for water storage and Distribution. Existing intake and their source are shown in **figure 2** as given below.

Figure 2: Existing Intake & Source of Water Supply

- Water is filtered and transmitted to the underground water reservoir. Water is then distributed to separate water supply zones and areas through localized distribution networks. In the old water works system, underground reservoir of capacity 2.70 lakhs liters is used for storage purpose, where as in the new water works are reservoir of capacity 7.00 lakhs liters used for water storage. Water is distributed from these underground storage tanks to different water supply zones through localized distribution channel. Under the old water works scheme a round 8.75 km distribution pipes were laid with varying diameter of range 50 mm to 200 mm, whereas under new water works scheme a distribution system comprising of a network of 80-300mm diameter AC pipes were used. In this scheme, efforts had been made to retain the existing pipes of the old water works as far as possible. So presently it is found that in some stretch the main distribution line is a round 25-30 years old and need to be replaced with new one. The Existing A.C. pipe network cannot be use for the present proposed network in DPR for following reasons.

    1. A.C. Pipe is more than 15year old as per Previous Augmentation DPR by PHE for Rahatgarh Town. The expected life of our present network design is for next 30 years 2048. Hence this old pipe cannot be Expected give satisfactory result up to this project.
    2. The Existing network of Distribution system is design for an average (60% population for 70LPCD and 40%population for 40 LPCD) 55 LPCD and now the present distribution network in this project is to be design 140LPCD So, the size of existing network will be inadequate take the load of new design required.
    3. 3 As project are to be design for 24 by 7 and for this proposed guideline for preparation of project suggested to use HDPE/DI pipe only. Hence all so use of A.C. Pipe of Existing network is not feasible.
    4. 4 Normally leak ageing in A.C. pipe are more compare to use of HDPE/DI pipe hence design of 24 by 7 network use of A.C pipe is not advisable.

15. Overall, the current water supply systems in Rahatgarh town face similar issues predominantly resulting from receding groundwater sources, low coverage and unreliable supply, inadequate infrastructure and heavy water losses.

C. Updated Package Scope

16. Package 6C covers town of Rahatgarh. This is small town having the status of Municipal Council (Nagar Parishad). Improvement of water supply in the town will achieve safe and sustainable water services both in terms of services to customers and cost recovery by providing 100% coverage with continuous, pressurized and safe drinking water services. The subproject includes the civil works, project implementation and management and non-physical investments.

17. **Water Demand:** Table 1, provides details of water demand for Rahatgarh town WSS. The current (2016) gross water demand of Rahatgarh is estimated as 5.61 MLD, while the base year (2018), intermediate year (2033) and ultimate design year (2048) demands are projected at 5.81 MLD, 7.41 MLD and 9.15 MLD respectively.

Table 1: Projected Population and Water Demand

YEAR	2016	2018	2033	2048
PROJECTED POPULATION (SOULS)	34601	35852	45728	56462
PROJECTED WATER DEMAND (MLD)	5.61	5.81	7.41	9.15

18. Based on detailed engineering design, Table 2 and Figure 3 to Figure 8, show the civil works in the town. The detailed engineering design has been reviewed by the PMC and approved by the PMU.

Table 2: Package 6C Components based on Detailed Engineering Design

Infrastructure	Function	Description	Location
Weir facility	Weir Construction for Raw water storage	Weir of 130 m long with 3 m height	Across Bina River in Rahatgarh
Water intake facility	Intake Well construction for raw water abstraction from Bina river and supply to WTP	Intake well cum pump house (6.50 m diameter & 20.60 m deep in RCC)	Intake well cum pump house has been built near existing Intake well in Bina River in Rahatgarh
Raw water pumping station	To provide adequate pressure in the water supply system	Discharge = 323 m3 / hour, head = 34m, at intake well	As mentioned above
Raw water rising main	Raw water transmission to WTP	Length = 250 m of dia 400 mm DI pipes, from intake to WTP	Raw water pipeline have been laid underground from the intake to WTP site along an existing Kuccha road
Water Treatment Plant and Clear	Treatment of raw water to meet the	7 MLD capacity water treatment plant with	WTP site is located in existing WTP campus in Ward no. 7. Total area required is 1.5 ha; site

Water sump	drinking water standards	arrangements: • Alum coagulation & flocculation • Sedimentation, • Rapid gravity filtration, • Disinfection with chlorination • Wash water recovery • Sludge drying beds • Miscellaneous infrastructure (compound wall, landscaping, lighting, rest rooms etc.)	is owned by Nagar Parishad. WTP site is located within 300 m from ASI monument; this land is under possession of ULB, and construction has been done with the permission of ASI. Water from this pipeline will also be provided to ASI premises.
Clear water sump	For treated water storage	251 KL capacity at WTP	At WTP site
Clear water pumping station	To provide adequate pressure in the water supply system	Discharge =257 m3 / hour, head = 32m, at WTP clear water sump	As mentioned above
Clear water rising main (total)	Water transmission to service reservoirs	Length = 2,096 m of dia 200mm to 300 mm DI pipes 300mm dia – 1220 m 200 mm dia – 876m	Transmission pipelines being laid or will be mostly laid along the main roads. Pipes will be laid underground.
Overhead Tanks (OHTs)	To distribute clear water with standard pressure	• **2 Nos. RCC Tanks**: (i) 1200 KL capacity (ii) (ii) 600 Kl capacity	(i) in Ward No. 6, inside the campus of Nagar Parishad Office (ii) in Ward No. 3, Near Shamshan Ghat, Near Forest Department Office
Distribution network	To distribute water from service reservoirs to consumers	Length = 48,906 m of dia 75 mm to 500 mm HDPE and DI pipes **HDPE Pipes;** • 75 mm dia – 14152 m • 90 mm dia – 12633 m • 110 mm dia – 3881m • 125 mm dia – 3302m • 140mm dia – 1881m • 160 mm dia – 1812 m • 180 mm dia – 1352 m • 200 mm dia – 1289 m • 225 mm dia – 944m • 250 mm dia – 1028m • 280 mm dia – 891m • 315 mm dia – 1128m **DI Pipes;** • 350 mm dia – 1961m • 400 mm dia – 140m • 450mm dia – 102m • 500mm dia – 64m	Pipes being laid / will be laid underground along the public roads; this work will cover entire area of the town; in narrow roads, where there is no place, the pipeline will be laid within the tarmac; where the roads are very wide (15m or more), the pipelines will be laid on both sides of the road
Bulk Water Meters	Monitor water flow in the	8 numbers, 100 mm Dia to 500 mm Dia, at various	Fixed at strategic locations at source, OHTs, GLSR, DMA

	improved network	strategic locations in the system	inlets etc., bulk meters will be fixed with the pipe section
House service connections	Provide water to consumers and measure water usage	5,280 numbers	Water delivery pipe (MPDE of dia 20 - 25 mm) will be connected to distribution lines and meters will be attached to the delivery pipe at each house with a meter chamber

19. **Construction works.** Civil works in the project include linear excavation for laying pipes along the roads, placing pipes in the trench and refilling with the excavated soil. The trenches will be of 0.4 m – 0.7 m wide and 0.8 to 1 m depth. Subsequent to completion of works, road reinstatement will be undertaken by the contractor as part of the civil works. The roads in the core city area of the town are very narrow and congested with pedestrians and vehicles, while the roads in outer areas are wide. Other civil works in the subproject include construction of weir, intake well, water treatment plant, water tanks, pumping stations, at the identified sites. These works are confined to sites, and construction includes general activities like excavation for foundation, construction of foundations, columns, walls and roof in cement concrete and masonry, and fixing of mechanical and electrical fixtures, etc. Weir and Intake well cum pump house involve construction within the water body. A temporary enclosed area created using appropriate material and the water has been pumped out to make the area dry for construction. Once this is created, the rest of the construction follows the general construction procedures to create a RCC well of size 6.5 m diameter. Once the work is over, the temporary structure will be removed.

20. **Project benefits.** The subproject aims to achieve safe and sustainable water services both in terms of services to customers, cost recovery and conservation of precious water resources. The subproject will provide continuous, pressurized and safe drinking water services to entire population of the town (100% coverage). Besides achieving progressively increasing cost recovery by expanding the coverage and increasing operating efficiency, the subproject will improve the overall environmental quality of the town. It will reduce the reduced time and costs of households in accessing alternative sources of water, and will lead to better public health particularly reduction in waterborne and infectious diseases.

D. Implementation Schedule

21. After the approval of the detailed project report, bid has been prepared and tenders were invited by June 2016, and the contract has been awarded by December 2016. Construction is started in March 2017, and will take about 29 months.

Figure 3: Key Plan Showing Raw and Clear Water Mains and OHTS of Rahatgarh Town WSS

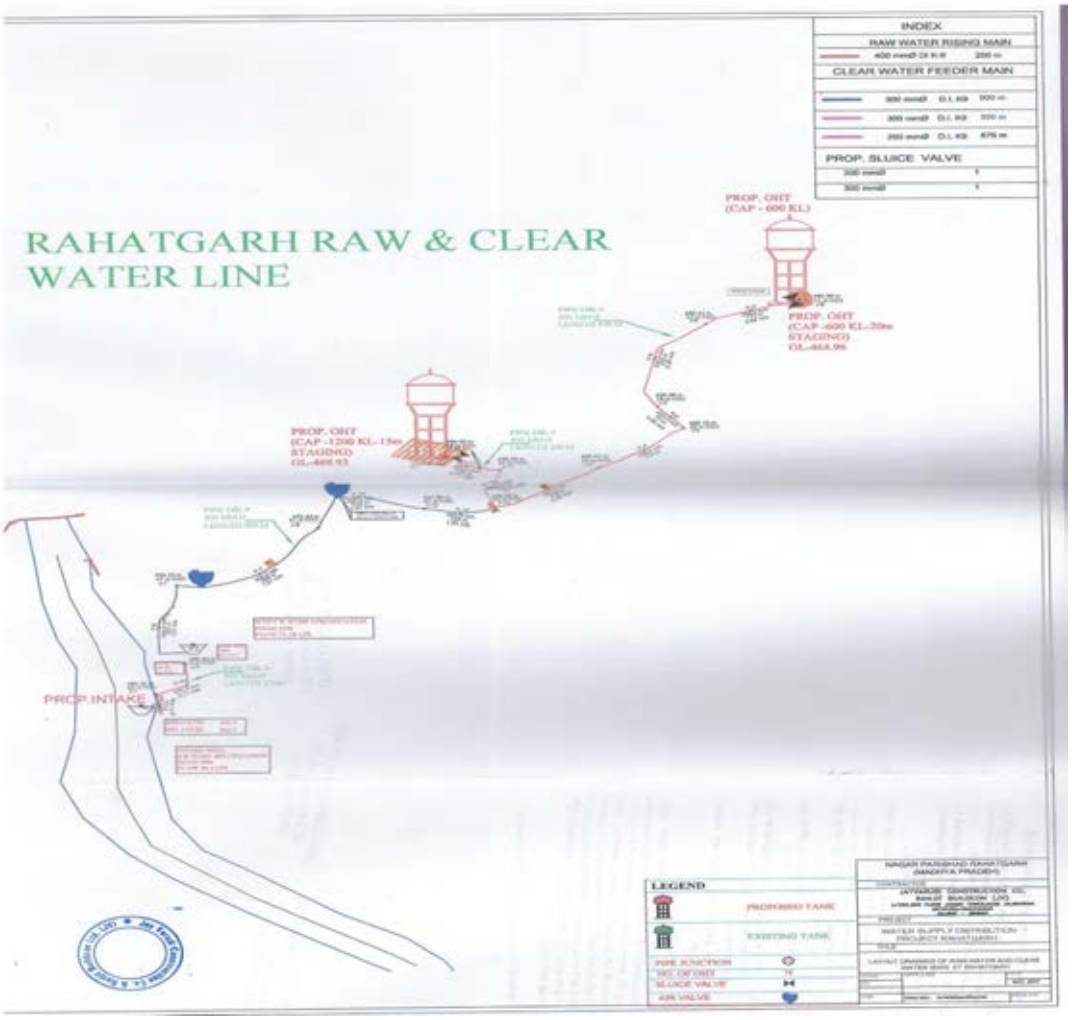


Figure 4: Google Map Showing Proposed Component Sites and Alignments of Package 6C – R ahatgarh WSS

Figure 5: Topo Sheet Showing Proposed Component Sites and Alignments of Package 6C - Rahatgarh WSS

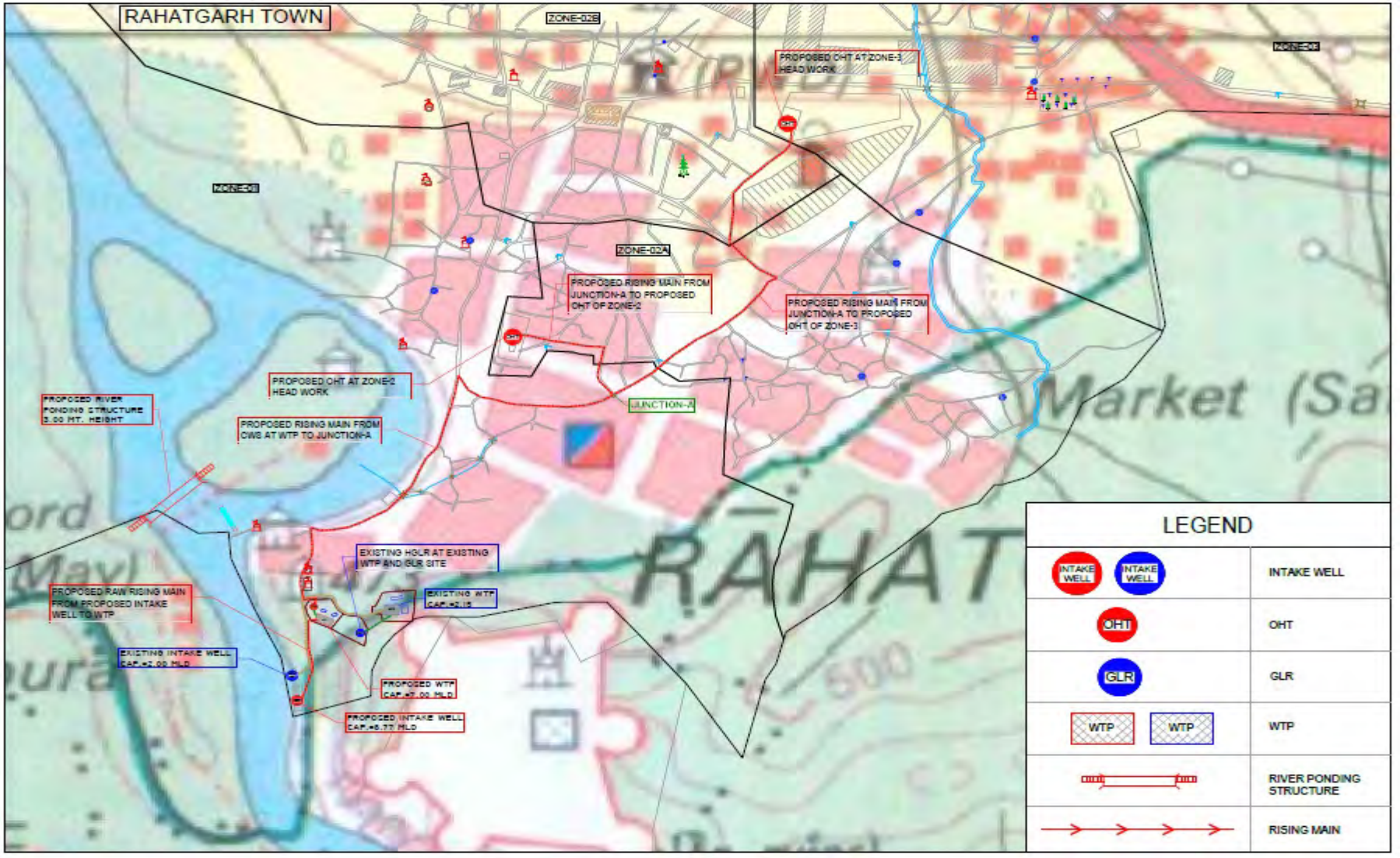


Figure 6: Submergence Contour Map of Proposed Weir Rahatgarh Super Imposed on Google Earth Map

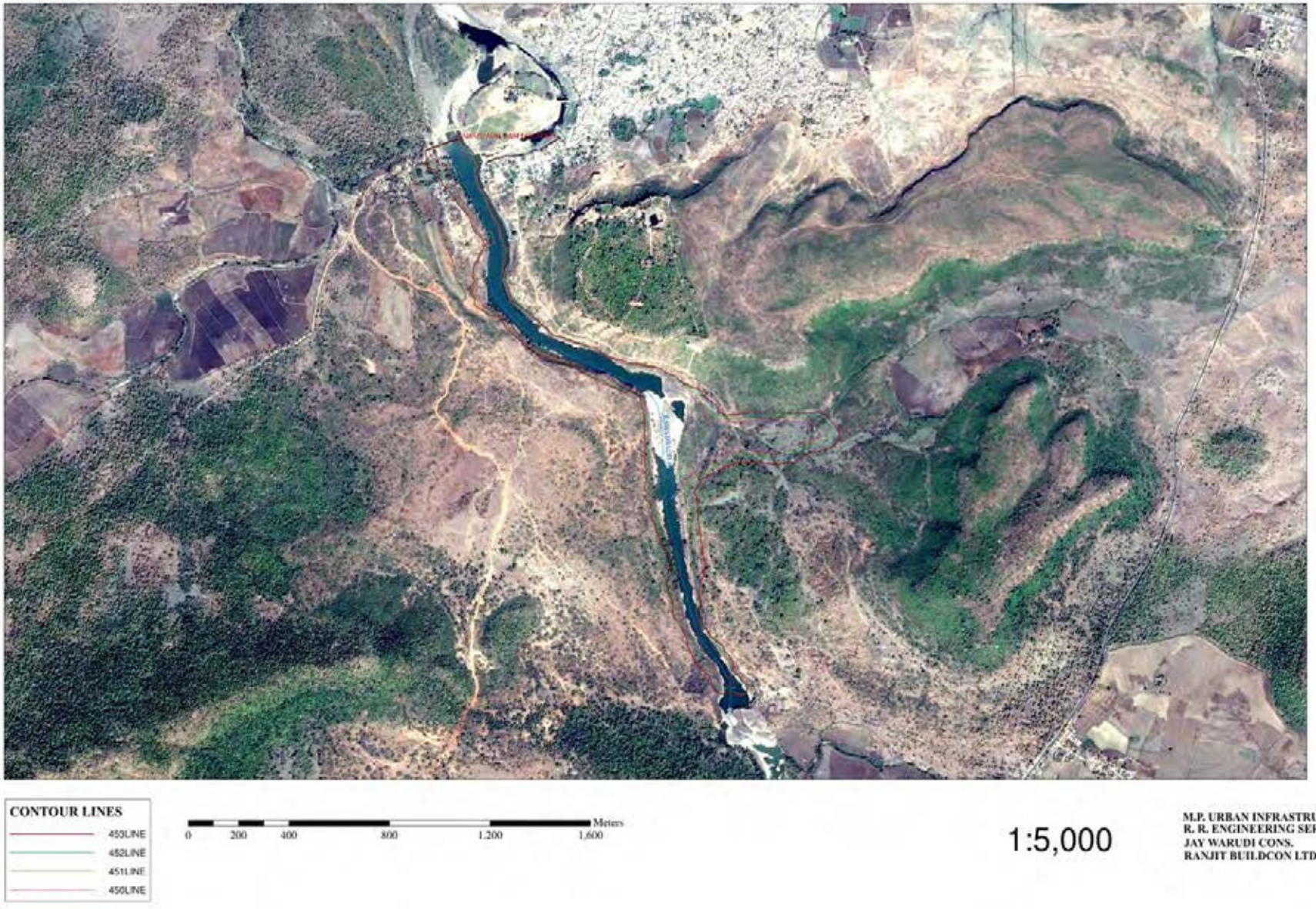


Figure 7: Submergence Contour Map for Rahatgarh Weir Site Showing on Topo Sheet

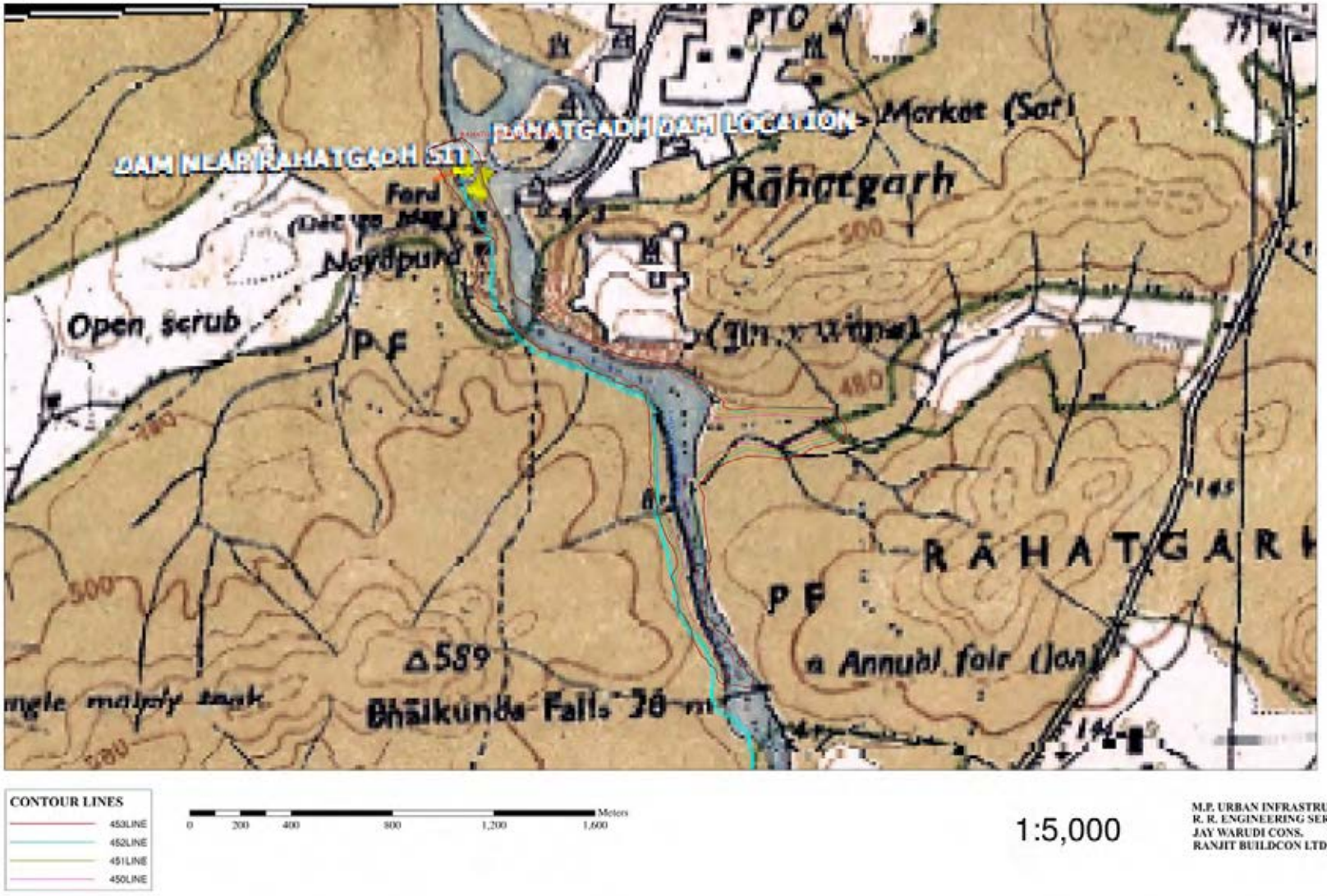
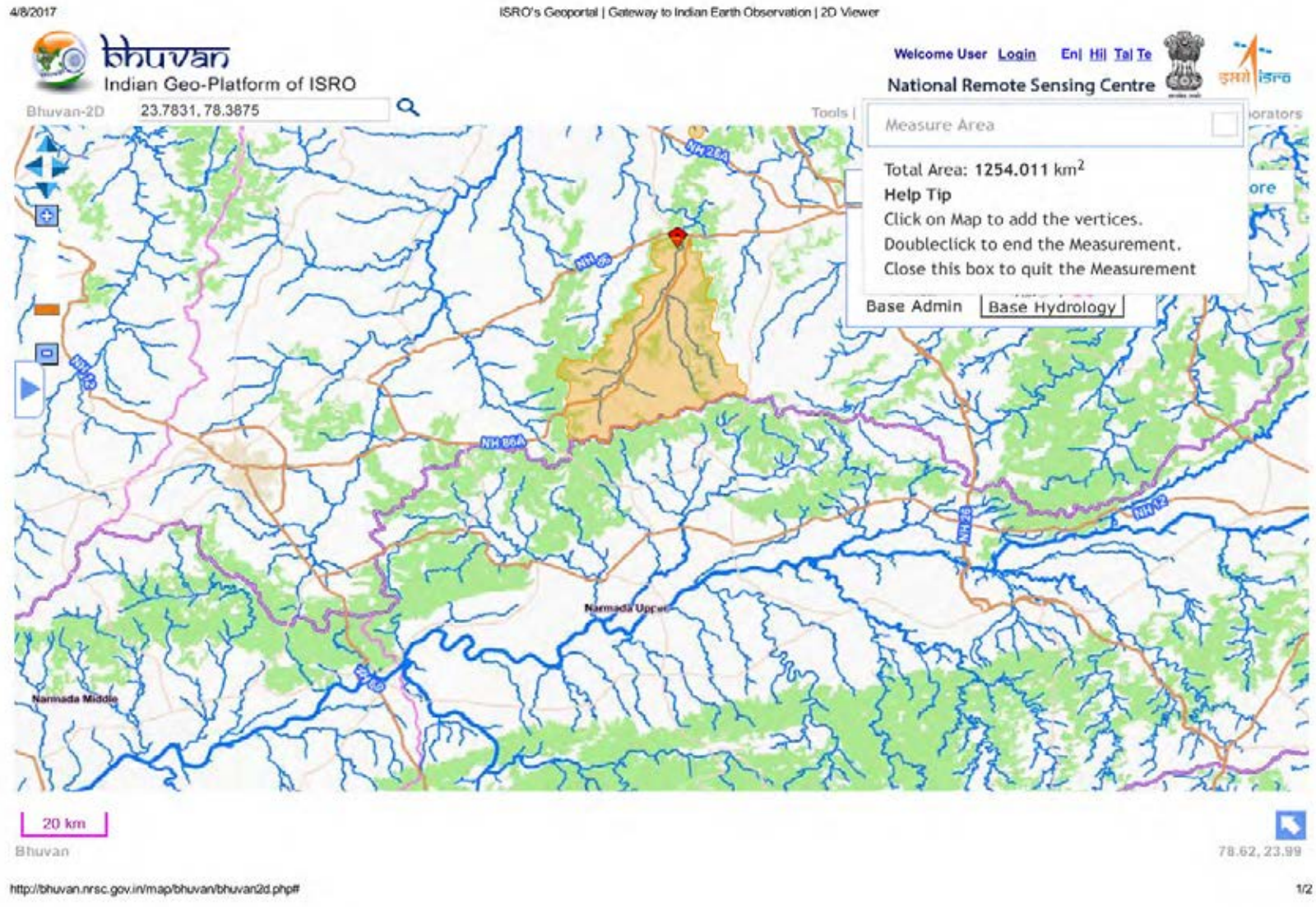


Figure 8: Catchment Area Map w.r.t. Proposed Rahatgarh Weir Site



22. Table 3 provides the comparison of components in the Draft IEE (preliminary design) and components in the detailed engineering design

Table 3: Comparison of Components in the Preliminary and Detailed Engineering Design

Infrastructure	**Details of Proposed component as per Preliminary Design**	**Details of component as per DBO Contractor's Detailed Engineering Design**	**Detailed reason for change in component design / quantity / location**
Weir	Height-3m & length-130m across Bina River in Rahatgarh	Height-3m & length-130m across Bina River in Rahatgarh	No change in weir location & size; in detailed engineering design.
Intake well	6m diameter and 35m depth in Bina River near existing intake well, Rahatgarh town **Location:** On upstream of proposed weir in Bina River near existing Intake well, Rahatgarh town	Diameter = 6.50m, depth = 20.60 m, in Bina River near existing intake well, Rahatgarh town **Location:** On upstream of proposed weir in Bina River near existing Intake well, Rahatgarh town	No change in intake location; in detailed engineering design, intake size changed to suit the local conditions and soil profile
Raw water transmission main	Length: 255m - 300 mm diameter Ductile Iron (DI) pipe **Alignment:** From Intake well to WTP along an existing Kuccha road	Length: 250m - 400 mm diameter DI pipe **Alignment:** From Intake well to WTP along an existing Kuccha road	No change in alignment Yes, change in dia from 300mm to 400 mm dia Length of pipeline decreased by 5m after detailed survey and design
Water Treatment Plant (WTP) and clear water sump (CWS)	7 MLD capacity WTP with arrangements: - Alum coagulation & flocculation - Sedimentation - Rapid gravity filtration - Disinfection with chlorine - Wash water recovery - Sludge drying beds - Miscellaneous infrastructure (compound wall, landscaping, lighting, rest rooms etc.) - 251 KL sump **Location:** in Ward No. 7, Near existing WTP, Rahatgarh Town, site owned by ULB, Rahatgarh. WTP site is located within 300 m from ASI monument;	7 MLD capacity WTP with arrangements: - Alum coagulation & flocculation - Sedimentation - Rapid gravity filtration - Disinfection with chlorine - Wash water recovery - Sludge drying beds - Miscellaneous infrastructure (compound wall, landscaping, lighting, rest rooms etc.) - 251 KL sump **Location:** in Ward No. 7, Near existing WTP, Rahatgarh Town, site owned by ULB, Rahatgarh. WTP site is located within 300 m from ASI monument;	No change in location No change in capacity
Raw Water	Pumping machinery at Intake Well- Discharge-323cum/hr,	Pumping machinery at intake well; - Discharge	No change in capacity

Infrastructure	Details of Proposed component as per Preliminary Design	Details of component as per DBO Contractor's Detailed Engineering Design	Detailed reason for change in component design / quantity / location
Pumping Station	Head-34.0 m, 2 Nos. **Location:** Intake well	=323 m3 / hour, head = 34m, at intake well, 2 Nos. **Location:** Intake well	
Clear Water Pumping Station	Pumping machinery at WTP; - Discharge-257 cum/hr, Head-32 m, 2 Nos. **Location:** WTP	Pumping machinery at WTP; - Discharge -257 m3 / hour, head - 32m, 2Nos. **Location:** WTP	No change in capacity
Overhead Tanks (OHTs)	1200 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** In Ward No. 6, inside the campus of Nagar Parishad Office, site owned by ULB, Rahatgarh 600 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** In Ward No. 3, Near Shamshan Ghat adjacent to Forest Department Office, site owned by ULB, Rahatgarh	1200 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** in Ward No. 6, inside the campus of Nagar Parishad Office, site owned by ULB, Rahatgarh 600 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** in Ward No. 3, Near Shamshan Ghat, adjacent to Forest Department Office, site owned by ULB, Rahatgarh	No change in location No change in capacity
Clear water Transmission Network	Clear water rising mains: 2061 m length and 200-300 mm dia pipes **Location:** Transmission pipelines will be mostly laid along the main roads. Pipes will be laid underground.	Clear water rising mains: 2,096m of dia 200mm to 300 mm DI pipes 300mm dia – 1220 m 200 mm dia – 876m **Location:** Pipes have been laid/will be laid underground along the main public roads in the town, which are wider.	Overall length of pipeline increased by 35 m after detailed survey and design.
Distribution Network	Distribution pipe line of total length 46564 m (HDPE & DI Pipes) • 75 mm dia PE– 14449 m • 90 mm dia PE – 10563 m • 110 mm dia PE - 2867m • 125 mm dia PE – 2217 m • 140 mm dia PE – 2398 m • 160 mm dia PE -1285 m • 180 mm dia PE- 3809 • 200 mm dia PE – 1213 m • 225 mm dia PE – 1222 m	Distribution pipe line of total length 48,906m (HDPE & DI Pipes); **HDPE Pipes;** • 75 mm dia – 14152 m • 90 mm dia – 12633 m • 110 mm dia – 3881m • 125 mm dia – 3302m • 140mm dia – 1881m • 160 mm dia – 1812 m • 180 mm dia – 1352 m • 200 mm dia – 1289 m	Overall length of network increased by 2,342 m after detailed survey and design.

Infrastructure	Details of Proposed component as per Preliminary Design	Details of component as per DBO Contractor's Detailed Engineering Design	Detailed reason for change in component design / quantity / location
	• 250 mm dia PE – 1016 m • 280 mm dia PE – 485 m • 315 mm dia PE- 2313 m • 300-500 mm dia DI – 2721 m **Location:** Pipes will be laid underground along the public roads; this work will cover entire area of the towns; in narrow roads, where there is no place, the pipeline will be laid in the center of the road; where the roads are very wide, the pipelines will be laid in the road shoulder.	• 225 mm dia – 944m • 250 mm dia – 1028m • 280 mm dia – 891m • 315 mm dia – 1128m **DI Pipes;** • 350 mm dia – 1961m • 400 mm dia – 140m • 450mm dia – 102m • 500mm dia – 64m **Location:** Pipes have been laid/ being laid or will be laid underground along the public roads; this work will cover entire area of the town; in narrow roads, where there is no place, the pipeline will be laid within the tarmac; where the roads are very wide (15m or more), the pipelines will be laid on both sides of the road	
Bulk Water Meters	8 Nos (100 mm Dia to 500 mm Dia) **Location:** Fixed with the pipe section at strategic locations like source, WTP, OHTs, DMA inlets etc.,	8 Nos (100 mm dia to 500 mm Dia) **Location:** Fixed with the pipe section at strategic locations like source, WTP, OHTs, DMA inlets etc.,	No change in location & quantity
Consumer connection with flow meters	7,890 numbers. **Location.** Water delivery pipe will be connected to distribution lines and meters will be attached to the delivery pipe at each house with a meter chamber	5,280 nos. **Location.** Water delivery pipe will be connected to distribution lines and meters will be attached to the delivery pipe at each house with a meter chamber	No change in location Number of connections reduced as per the household survey conducted by DBO Contractor

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

23. ADB requires the consideration of environmental issues in all aspects of ADB"s operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

24. **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, and are assigned to one of the following four categories:

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

25. **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.

26. **Public disclosure.** ADB will post the safeguard documents on its website as well as disclose relevant information in accessible manner in local communities:

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

B. National Environmental Laws

27. **Environmental assessment.** The GoI EIA Notification of 2006 (replacing the EIA Notification of 1994), sets out the requirement for Environmental Assessment in India. This states that Environmental Clearance (EC) is required for specified activities/projects, and EC must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B1 or B2 depending on the scale of the project and the nature of its impacts. None of the components of this water supply subproject falls under the ambit of the EIA Notification 2006, and, therefore no category assigned, and thus no EIA study and EC required for the subproject.

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

Table 4: Applicable Environmental Regulations

Law	Description	Requirement
Madhya Pradesh State Water Policy, 2003	Prepared in accordance with the National Water Policy, it states that "for environmental balance, skillful and planned management of all types of developmental activities, economic use on equitable basis and in view of the prime importance of water for all human and other living beings, an effective and sound water policy is necessary". Policy is detailed in 17 sections dealing with different aspects of water resources. No. 7 deals with Water Allocation Priorities, and according to which drinking water supply shall have the highest priority followed by irrigation, power, tourism, etc. Water Resource Department is nodal department for permitting different uses of water resources. Policy also states that "clear provision for reservation of drinking water shall be made in irrigation projects"	Permission of WRD, GoMP was obtained for: • Construction of weir and intake on River Bina • Water allocation / abstraction from River Bina
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring and assigning to CPCB/SPCBs powers & functions relating to water pollution control. Control of water pollution is achieved through administering conditions imposed in consent issued under to this Act. These conditions regulate the quantity and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the subproject having the potential to generate sewage or trade effluent will come under its purview. Such projects have to obtain Consent to Establish (CTE) & Consent to Operate (CTO) under Section 25 from Madhya Pradesh Pollution Control Board (MPPCB)	WTP require CTE (prior to start of constriction) and CFO (prior to start of operation) from MPPCB. Application has to be submitted online at http://www.mppcb.nic.in/xgn.html Applications to obtain CTE from Madhya Pradesh Pollution Control Board (MPPCB), which is mandatory for the WTP, has been obtained from MPPCB for Rahatgarh WTP.
Environment (Protection) Act, 1986 and CPCB Environmental Standards.	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	**Appendix 9** provides applicable standards for ambient air quality. **Appendix 11** provides vehicular emission norms
Noise Pollution (Regulation and	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different	**Appendix 10** provides applicable noise

Law	Description	Requirement
Control) Rules, 2000 amended up to 2010.	areas/zones.	standards.
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	The Act designates areas within 100 meters (m) of the "protected monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the National Monuments Authority (NMA).	Rahatgarh Fort is listed under ASI monument. Works required for provision of public water supply are exempted from the regulated list of "construction works". However, works near the monuments (within 300 m) can only be conducted with prior permission of NMA. Rahatgarh NP submitted application for permission to ASI; after scrutiny and site visit by Regional Director office Bhopal, application has been forwarded to NMA for grant of permission and the **ASI clearance for Rahatgarh town WTP has been issued on February 23, 2018.**
Municipal Solid Wastes Management Rules, 2016	Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing and disposal.	Solid waste generated at proposed facilities shall be managed and disposed in accordance with the MSWM Rules
Construction & Demolition Waste Management Rules, 2016	Rules to manage construction & to waste resulting from construction, remodeling, repair and demolition of any civil structure. Rules define C&D waste as waste comprising of building materials, debris resulting from construction, re-modeling, repair and demolition of any civil structure.	Construction & demolition waste generated from the project construction shall be managed and disposed as per the rules (**Appendix 15**)
Labor Laws	The contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The	**Appendix 13** provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.

Law	Description	Requirement
	contractor shall provide equal wages and benefits to men and women for work of equal value or type.	

29. **ADB SPS Requirements.** During the design, construction, and operation of the project the PMU and PIUs are required to apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines (IFC's General EHS Guidelines1 and Sector Specific (Water and Sanitation) Guidelines2).. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

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

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

V. DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

A. Methodology Used for Baseline Study

30. **Data collection and stakeholder consultations.** Data for this study has been primarily collected through comprehensive literature survey, discussion with stakeholder agencies, and field visits to the proposed subproject sites.

31. The literature survey broadly covered the following:

(i) Project details, reports, maps, and other documents prepared by technical experts of the Design consultant
(ii) Discussions with Technical experts of the design team, municipal authorities, relevant government agencies like ASI, MPPCB, WRD, etc.
(iii) Secondary data from previous project reports and published articles, and
(iv) Literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and other planning documents collected from Government agencies and websites.

32. **Ocular inspection.** Several visits to the project sites were made during final IEE report preparation period in 2018-2019 to assess the existing environment (physical, biological, and socioeconomic) and gather information with regard to the proposed sites and scale of the proposed project. A separate socioeconomic study was conducted to determine the demographic information, existing service levels, stakeholder needs and priorities.

33. The baseline environmental conditions as reported in the Draft IEE are still applicable as there are no significant change in locations and alignments. The package components are not located within nor adjacent to environmentally-sensitive areas.

B. Physical Environment

34. Rahatgarh is Nagar Parishad and developing town of the District Sagar. It is situated on NH-86 and lays 40 km away from district Headquarter Sagar and 145 km away from its state capital Bhopal. The Economy of the town is mainly based on agricultural products, trade & Commerce and administrative Activities. Rahatgarh is located in the central parts of the Madhya Pradesh. The latitude extent of the town is 23º.47".13.42"" North and the longitudinal extent is 78º 23"50.66"" East.

35. **Connectivity:** The town falls on the National highway-86 which provides connection to all major urban center through road. The town has good accessibility through road with the nearest airport at Bhopal in south west and in Khajuraho in North-East. The nearest Railway station is at Khurai which is 30 km from Rahatgarh. Thus, the connectivity with surrounding major towns through NH-86 has made this town to develop as regional trade & commerce center at block level. The road Provides inter-state connection which passes through major centers of Uttar Pradesh and Madhya Pradesh.

36. **Geography:** Much of the District's Geography consist of open pains with varying degrees of fertility, with low ranges and isolated heights breaking up the pattern.

37. **Climate**. The district has hot summer and general dryness around the year, except during the South-west monsoon season. The year can be divided into four seasons. The period from March to about the second week of June, is the summer. The succeeding period up to the end of September is the southwest monsoon season. October and November constitute the post monsoon or retreating monsoon season. The cold season is from December to February. The town experiences minimum temperature during winter months ranging from 9.1 to 26.3 degree Celsius, while maximum temperature is recorded during the summer ranging from 26.9 to 42.4 degree Celsius.

38. **Rainfall:** The average annual rainfall of the town is about 1234.8 mm. About 90% of the annual rainfall takes place during the southwest monsoon period i.e. June to September. Whereas, only 5.5

percent of annual rainfall takes place during winter and about 4.5 percent of rainfall occurs during the summer months.

39. **Topography.** The town is situated on the Bundelkhand massif and river Bina is flowing in the West of the Town. Hence the topography of this urban center is controlled by the streams. The general slope of the town is from South to West direction. The town is situated at an average 450m altitude above from the sea level. The natural drainage of the town, as a whole is flowing to western side and falls into River Bina.

40. **Surface Water.** The Rahatgarh town is situated on the bank of River Bina and River Bina is flowing in the west of the town. Hence the topography of Rahatgarh is controlled by the streams. Bina river is a major tributary of River Betwa in Bundelkhand region of Madhya Pradesh, which originates from Begumganj block of Raisen district and enters Sagar district at Rahatgarh block and traverse through Khurai and Bina Tehsil before confluence with river Betwa near Basoda town in Vidisha district. Presently domestic water supply. The geographical area of Bina basin upto Rahatgarh is about 1139 km2. Bina river basin which traverse through the fertile plain of Madhya Pradesh, is one of the important tributary of Betwa River, which is one of the important basin of Yamuna River. Bina River basin is situated at 24 10 to 24 42 N latitude and 78 09 to 78 23' E longitudes. The catchment area is highly undulating and covered by forest, barren lands, and localized rain-fed agriculture. The drainage density is more in the upper catchment as compare to the lower part of Bina river basin, the later is mostly gently sloping to plain topography mostly covered with agricultural fields. The streams are dry after monsoon months despite enough rainfall. The average annual rainfall in recent years over the basin is 1016.37 mm and 980.35 mm during monsoon months i.e. June to October. Therefore, ground water is exploited for domestic and agricultural uses during Rabi season causing depletion of the water table in most of the area.

41. **Ground Water.** Rahatgarh come under Bhundelkhand region. This region is covered by Bhundelkhand granite in northern part with thin soil cover. This region is very hard and compact with well-developed joints. These joints were open at the surface and persist to about 20m below the surface. Ground water in this region also occurs in weathered mantle in joints and fracture under water table condition and can sustain well having up to 2lps discharge. Ground water in the alluvium also occurs under water table conditions.

42. Ground water level in this region ranges from 4.5 to 14.57 mbgl during pre-monsoon. Shallow water level in the district is less than 6m in north eastern and south eastern part of the district. Whereas in northern and southern parts the deepest water level recorded was 14.5mbgl. whereas in the post monsoon period the water level ranges from 2.5mbgl to 12.5mbgl with a shallow water level of less than 5m.

43. **Air Quality.** There is no data on ambient air quality in Rahatgarh Town, which are not subject to monitoring by the Madhya Pradesh Pollution Control Board (MPPCB) as there are no major industries. Located in the semiarid drought prone Bundelkhand region, particulate matter is likely to be high, particularly during summer months. Traffic is the only significant pollutant, so levels of oxides of sulphur and nitrogen are likely to be well within the National Ambient Air Quality Standards (NAAQS).

44. During the construction and laying of water distribution network, ESR and WTP, there will be temporary increase in the level of suspended solids particle and other minute particles from the construction activity and construction material. The residual impact will not be significant and also a short term impact will not have an adverse impact on the residents. No field monitoring (environmental) survey was conducted however, the environmental monitoring program developed as part of the environmental management plan (EMP) will require the contractors to establish the baseline environmental conditions prior to commencement of civil works. The results will be reported as part of the environmental monitoring report and will be the basis to ensure no degradation will happen during subproject implementation.

C. Ecological Resources

45. Rahatgarh is surrounded by two reserved forest i.e. Rahatgarh Reserved Forest and Bhadurpur Reserved Forest. Common wild life animals like Deer, Monkey and Wild Boar are found in the forest area.

None of the proposed subproject components comes under forest area, since selected water source is located in the north of the town and location of Intake well and transmission main does not come under any forest area. Streams are seasonal, so there is no noticeable aquatic life. Flora and fauna found in the area is of local species. None of the proposed components located in the reserved forest area. WTP is located adjacent to Archeological monument.

D. Socio Cultural Resources

46. The Population of Rahatgarh Nagar Parishad as per 2011 census is 31537. The population details of the Rahatgarh town for the past four decades are as follows as given in table 5;

Table 5: Census population of the Town

S.no.	Year	Population
1	1971	8177
2	1981	13355
3	1991	19955
4	2001	25125
5	2011	31537

47. The sex ratio is an important indicator for assessment of social profile in a given area. It gives an overall distribution and ratio of male and female population. As per the 2011 census data, the sex ratio of the town (911) is more than the sex ratio of District Sagar i.e. 896 females per thousand males. However, the sex ratio of Rahatgarh Town is much less than the national average of 940.

48. The literacy level in the town represents the quality of life of the population along with their accessibility to their educational facilities.

49. The literacy rate of the town is 58.4 percent. In this about 65 percent male out of the total male population and 50 percent female out of total female population are literates as per Provisional figure 2011 given by Nagar Parishad.

E. Infrastructure Facilities

50. **Sewerage System.** Rahatgarh does not have any sewerage system. In the absence of comprehensive sewerage system, the waste water flows through the storm water drains, and is finally disposed off in River Bina and causes water pollution. In some areas, untreated sewage is let out in open lands and roads which get filled up and create nuisance.

51. **Solid Waste.** Rahatgarh Nagar Parishad is responsible for management of solid waste. Sanitary workers (17permanent and 35 on daily wages) collect and carry the waste in vehicles and dispose the same in the dumping ground at Bahardurpur village on Vidisha road. The waste generated from the town includes waste from households, commercial areas and health care facilities, of which waste from health care facilities is biologically hazardous.

52. Rahatgarh town generates around 7.88 metric tons of solid waste every day at a rate of 250 grams per capita per day. Other than residential sources, commercial and institutional establishments contribute nearly 60 percent to the total waste generated by the town. The waste of the town is collected by 4 vehicles (one 3- wheeler Ape Auto, one Tata Tipper and two nos. of Tractor trolley) and 25 hand carts on regular basis.

53. **Road Network.** As per primary data from Nagar Parishad, Rahatgarh has a total road length of 38.52 km including NH, PWD roads and nagar parishad roads. Out of the total road length, 88.26 percent of the total road length is under Nagar Parishad, 3.94 percent under PWD roads and rest is under NH. The traffic network of the town mainly functions through:

- National Highway-86 (Bhopal to Kanpur) connecting Rahatgarh to Sagar & Shahgarh in the North and Begamganj Vidisha, Sanchi & Bhopal in the south western.

- Nagar Parishad internal roads
  - o These roads provide the base for movement pattern in the town and almost all roads in the town connect to these roads.

54. **Existing Land Use.** Based on the primary and land use survey, it is found that about 244.47 ha land is developed i.e. the urban activities are going on in only 244.47 ha land out of the 633.844 ha of the town area. The residential area of the town is 64.65 percent. The commercial land use is spread on about 7.44 percent. About 5.29 percent land comes in public and semipublic land use. The transportation and movement is done on about 18.28 percent of land. The entertainment and recreational activities are using about 2.35 percent of land. Water bodies cover an area of around 1.98 percent. In the Nagar Parishad area, there is large chunk of land which is open, undeveloped and not under any use. The area of such land is 389.37 ha which is calculated to about 61.43 percent of total town area which is mainly agriculture and barren land. In this way, the total land is distributed under different uses and activities.

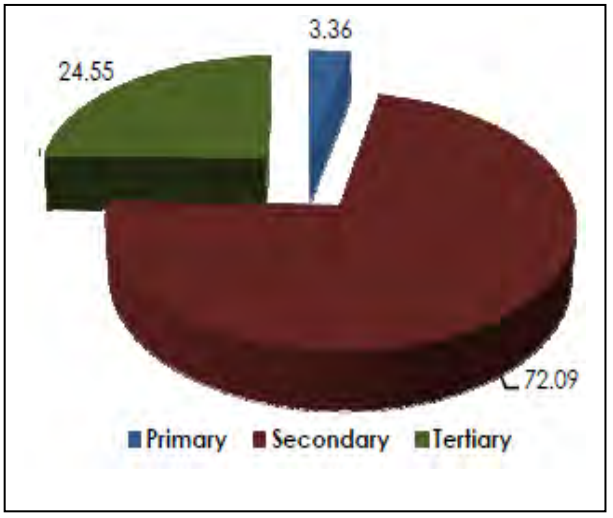
55. **Agriculture Trade.** In Rahatgarh, there is an agricultural mandi of grade "D" which is established under the Madhya Pradesh Krishi Upaj Mandi Adhiniyam 1972 and came into existence in March 1998. This mandi serves the whole Rahatagrh block of Sagar district/ division. The data regarding the trade of all type of agriculture produce has been collected and analyzed. It is found that the agriculture trade is showing an upward growth in last two years. It is seen that in 2009-2010, 145130 Quintal of agriculture produce had been traded which has increased to 197034 quintals in the year 2010-2011. Therefore, it is clear that the agriculture Mandi in the town has been playing the role of regional trade of agriculture produce in its vicinity.

56. **Commercial Trade.** The commercial activities have diffused along most of the main road of the town. Markets for specific commodities have flourished in groups along certain roads. The main commercial activities have developed along Rahatgarh – Vidisha road and in the town core area.

57. The economic wellness of any town has been assessed by analyzing the work participation rates in these sectors. According to census 2001, around 3.36 percent of total workforce involved in primary sector (Agriculture, Labour and Mining), 72.09 percent in secondary sector (household industries, production and construction activities) and 24.55 percent are working in tertiary sector (trade, transportation, collection of forest produce and services) **(Refer figure 9, below)**. It is clear from the analysis that the economics of the town is depending on the secondary sector activities or say depend on household industries which mainly includes the beedi making, production and construction activities.

58. The economy of the town is based on the secondary sector. Hence it may be stated that Rahagarh's economy has a household industry, production and construction based economy which includes the main occupation of the is making beedi.

Figure 9: Percentage of workers in different sectors in the year 2001



59. **History, Culture & Tourism.** Rahatgarh town is rich in natural as well as built heritage. The history of the town reveals that the Rahatgarh town was established during Parmar Era in 11th century. Some of the historical structures in the town belongs to that era. After the heroic end of the Valient Gond queen Durgawati, Chandrashah, uncle of ill-starred Bir Singh ceded it to the Mughal Emperor in lie of his claims to the throne. Aurangzeb granted it to a Mughal of his court. In the uprising of 1857 it was taken possession of by Fazal Mohammad Khan, a descrendent of Nawab of Garhi Ambapani. Apart from the heritage buildings, the town has some temples which have prime religious importance for people living in surrounding areas. The town is also famous for Shiv temple having "108 shivling" and the festival of shivratri is celebrated here with great enthusiasm. The town is situated on the bank of River Bina and having 50 feet high waterfall thus it is also famous for its natural resources, forest and mountains. **Refer figure 10** as given below.

60. **Fort / Garhi:** It is believed that during 11th century, King Parmar had built fort which is famous as Rahatgarh Fort. The fort is located on southern side of the townIt is picturesquely situated on the steep bank of River Bina. The outer wall consists of 26 enormous towers, encompasses an area of 66 acres. The fort is protected under heritage conservation act.

Figure 10: Photographs Showing Historic and Cultures Resources of Rahatgarh

Rahatgarh Fort

Shiv Temple | **Shivling**

Water Fall

F. Subproject Site Environmental Features

61. Features of the selected subproject sites are presented in the following table 6.

Table 6: Site Environmental Features

Infrastructure	Location & Environmental Features	Site Photograph
Weir & Water Intake Arrangements	No change in location and capacity of proposed weir and also no change in intake location; in detailed engineering design, intake size changed from 6m dia & 35 m depth to 6.5m dia & 20.60m depth to fulfill the required demand and suit the local conditions and soil profile. Weir and Intake has been built in Bina River, under the control of Water Resources Department, GoMP. There is no forest land involved in this. At proposed site, the tree cutting activity is also not involved during construction. Flora and fauna found in the River is limited to local species of fishes and aquatic plants. There are no notable sensitives features. Site is surrounded by agricultural land. There is no commercial fishing taking place in this stretch of the river. Boatmen and washer men were not observed near the proposed weir and intake well site.	 
Water Treatment plant	No change in location and capacity of proposed WTP site. WTP site is located in ward no. 7, within the boundary of Rahatgarh Nagar Parishad and in the premises of existing WTP campus. It also contains treated water balancing sump near WTP Head Work. The site is proposed on Govt. land owned by ULB. There is no involvement of forest land. One important aspect about the location of project is that it comes under ASI protected area i.e. within 300 m. Rahatgarh Nagar Parishad applied for the NOC for construction of water works and the ASI clearance for Rahatgarh town WTP has been issued on February 23, 2018. There are no additional impacts. Assessment in draft IEE approved by ADB is still applicable	

OHT-1 (1200 KL)	No change in location and capacity of proposed OHT site. Selected site is located in ward no. 6 inside the Nagar Parishad Office campus. Selected site is owned by ULB Rahatgarh. No tree cutting is required at proposed site of OHT during construction. Hence no impact envisaged. No additional impacts. Assessment in draft IEE approved by ADB is still applicable	
OHT-2 (600 KL)	No change in location and capacity of proposed OHT site. Selected site is located in ward no. 3, near Shamshan Ghat adjacent to forest office. Selected site is owned by ULB. No tree cutting is required at proposed site of OHT during construction. Trees are on the periphery of the site. Hence no impact envisaged. No additional impacts. Assessment in draft IEE approved by ADB is still applicable	
Raw Water Rising Main (RWRM) – 250 m	The RWRM leading from Intake well to WTP, have been laid along existing Kutcha roads within ROW. Pipes laid underground. Existing road belongs to ULB Rahatgarh. No change in alignment. Only change in dia from 300mm to 400 mm dia. Length of RWRM decreased by 5m after detailed survey and design No additional impacts. Assessment in draft IEE approved by ADB is still applicable	
Clear Water Rising Main (CWRM) – 2096 m)	The CWRM leading from WTP to OHTs are being laid or will be laid along existing main roads within ROW. Clear water Rising main will be laid along ULB road. There is no forest land involved in this. No trees cutting is required during laying of CWRM. No change in alignments or dia. Overall length of CWRM increased by 35 m after detailed survey and design. No additional impacts. Assessment in draft IEE approved by ADB is still applicable	

		
Distribution network (48906 m)	All distribution lines being laid or will be laid along the roads /streets in the town within the road right of way (ROW). In wider roads pipes will be laid in the road shoulder, and in narrow roads, where there is no space, pipes will be laid in the road carriage. The roads in the core city area are very narrow and congested with pedestrians and vehicles (mainly 2-wheelers), while the roads in outer areas are wide. The roads in town are wide enough to lay the pipelines. As per detailed survey and design by DBO contractor overall length of network increased by 2342m, which is minimal and insignificant. The network length increased due to the area missed out and error in measurement by DPR Consultant and continuous growth in population and construction of buildings in the town. The increased length of distribution network pipe lines are not being laid or will be laid in forest areas or along ASI site or water bodies as there is no involvement of forest land nor comes under ASI or along water bodies. There are no trees along the roads on which increased length being laid. Hence there is no environment impacts envisaged. However, in wider roads pipes are being laid or will be laid in the road earthen shoulder along the tarmac within the RoW, and in narrow roads, where there is no space, pipes are being laid or will be laid in the road carriage. Roads in the old part of the	  

	town are quite narrow (~3m), and in the rest of the town roads are wider. Roads are having open drains on both sides. There are no trees along the roads, except in some new colonies in the outer areas. In old town areas pipes are being laid or will be laid in the middle of the road, which may affect the traffic. Given the small diameter (about 75 mm) pipes, the trench excavation is very minimal (0.4 x 0.7m) wide and 0.8 to 1 m depth. There are no forest areas within the prescribed limit of the town. Hence there is no involvement of forest land or required any permission for pipe laying. There is no tree cutting involved during construction period. Most pipeline construction will be conducted by small teams working on short lengths at a time so most impacts will be localized and short in duration; No additional impacts. Assessment in draft IEE approved by ADB is still applicable	

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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

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

a. **Location impacts** include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.
b. **Design impacts** include impacts arising from Investment Program design, including technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.
c. **Construction impacts** include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
d. **O&M impacts** include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and occupational health and safety issues.

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

65. This section of the final IEE reviews possible project-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analyzed during pre-construction, construction, and operational stages in the context of the project's area of influence.

66. The ADB Rapid Environmental Assessment Checklist in http://www.adb.org/documents/guidelines/environmental_assessment/eaguidelines002.asp is used to screen project for environmental impacts and to determine the scope of the IEE.

67. In the case of this project (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) proposed water abstraction from the source is very small compared to overall water availability, and the proposed weir is so shallow that the submergence is confined to river course itself; (iii) 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 some works are located in the reservoir and (iv) being mostly located in an urban area, will not cause direct impact on biodiversity values. The project will be in properties held by the local government and access to the project location is through public rights -of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

A. Pre-Construction Impacts – Design & Location

68. Design of the Proposed Components. Technical design of the (i) Weir, (ii) intake facility, (iii) water treatment plant; (iv) raw water and clear water mains (v) storage reservoirs, and (vi) distribution network, connections, flow meters, etc., follows the relevant national planning and design guidelines, focusing on providing a robust system which is easy to operate, sustainable, efficient and economically viable. Besides, the project also included the following environmental considerations:

i. Discontinuation of current unsustainable groundwater source and enhancing existing water supply system based on nearest surface water source River Bina
ii. Limiting the height of water impounding structure (weir) in Rahatgarh to the height of the river banks so that the storage is limited to the river course
iii. Provision of sluice gate to allows heavy monsoon flow freely without any obstruction, and also avoids dam silting
iv. Design of apron to arrest erosion of the river bank of the downstream of dam
v. Appropriate location of weir and river intake to ensure water availability throughout the year
vi. Recovering backwash water from treatment process
vii. Treatment and reuse of sludge from treatment process
viii. Minimizing water losses from pipelines by perfect jointing and alignments
ix. using appropriate techniques (HDPE pipes up to 150 mm dia joined by electro fusion couplers using on-site electro fusion welding, and all higher dia pipes
x. by on site butt welding)
xi. Designing the entire system to maintain optimal flow and terminal pressure,
xii. and optimizing the overall energy usage
xiii. Reducing the incidence of water borne diseases by providing 100%
xiv. population including urban poor with potable water supplies
xv. Improve water use efficiency and reduce water wastage at household level by recording and monitoring the water usage, and charging the consumers as
xvi. per usage; due consideration to urban poor
xvii. Minimize unaccounted for water (UFW) losses using district metered area
xviii. approach with flow meter and pressure logging arrangements to identify and rectify the leaks, and unauthorized connections
xix. Using low-noise and energy efficient pumping systems

69. **Source Identification:** The Nagar Parishad is vested with the responsibility of the design and execution of water supply works operation & maintenance of water supply system of the town. Water is supplied to the town through two sources;

i. Surface water source: River Bina (Final source)
ii. Ground water source: Bore wells constructed with installed suitable capacity of pumping machineries in the town.

70. Rahatgarh town are having acute water problem. At present water supply to the town is based on both surface (River Bina) and ground sources. Ground water is the main source of water supply in the town. Considering the falling groundwater levels in the town, and also looking into future growing water demand, and sustainability of the proposed system, a surface water based system is proposed. Bina River, which flows in the west of Rahatgarh town, is the identified as source. The Bina river originates from Dahgaon village of Gairatganj tehsil of Raisen District. Bina river final meeting point with Betwa river is located at Padoccha in Vidisha District. River Bina is non-perennial and tributary of Betwa River. The weir is proposed at Banani ghat Rahatgarh is located about a distance of 48 KM away from River Bina origin point.

71. Source sustainability analysis has been conducted by DBO Contractor to select a feasible and sustainable source of water supply to meet the ultimate design demand, for Rahatgarh town based on the most feasible water source (Bina River) considering techno- economic and environmental considerations. The requirement of town is miniscule in comparison with the river flow. It is assessed to be unlikely to have any significant issue of source sustainability.

72. **Weir across River Bina:** As stated earlier, Bina River non-perennial and seasonal with wide seasonal variations in flow characteristics. During the monsoon period, from end of June to August-September, the flow in the river is very high. During the post monsoon season of October, flow in the river is considerably high, after which it gradually reduces, in the winter season of November to February, flows are very low and lower than the demand and in the summer season of March to June, river almost runs complete dry, up to the onset of monsoon. Thus, to meet the future requirement of water, raw water storage is required to meet the future demand of this lean flow/no flow period. Hence it has been proposed to create a storage in the Bina River by constructing a small

weir (130 m wide and 3 m height) at about 400m downstream of intake site across the Bina River on the western side of subproject town Rahatgarh. The period for storage has been taken from December to June i.e. 07 months (210) days, and the storage requirement is estimated as 1.827 MCM. The capacity calculations are done for different contour levels and the Area –Elevation – Capacity curve is drawn, **(Refer Appendix 4).**

73. This weir site is located at Latitude 230 46' N, and Longitude 780 22' E. across Bina river on the western side of Rahatgarh Town. The Total Catchment area of Bina River w.r.t. weir site is 1254.01 Sq. km marked on Bhuvan NRSC Image on Base Hydrology Map is attached **as Fig 8.** The height of the weir (3m) to store required water is fixed in such way that top level of structure (452m) is well below the High Flood Level of the river as the HFL (462.50m) of the river **(Refer Appendix 20 - Figure A to Figure D)**. On the basis of contour map and capacity calculation, the River Bed Level is kept as 449.00 M and Top Bund Level is kept 452.00 M and submergence/storage is confined to river course itself, hence there will not be submergence on the upstream. To keep in mind above data, in the upstream of the river, area of submergence is worked out with the help of survey contour map on SOI topo sheet along with application of Geographical Information System Technique on Satellite image **(Refer Fig 6 to Fig 7).**

74. Proposed weir is a concrete structure, with solid concrete foundation and up to required design height; 2 nos. under sluice gates have been provided, and it will be open during monsoon. This type of structure allows heavy monsoon flow freely without any obstruction, and also avoids dam silting. After construction of weir, surplus water will flow and shall meet with Betwa River as Bina River is the tributary of Betwa River. There are no notable water abstraction points on the downstream side of proposed weir site on River Bina. Both the sides of the river is covered with agriculture lands and forest lands. As the river is seasonal, and the proposed weir is very small and therefore there will be no significant change in the downstream flow regime. No impacts on river ecology anticipated, therefore impact of flow reduction will be negligible.

75. **Use of Chlorine as disinfectant.** It is proposed to use chlorine at WTP. There is invariably a safety risk when chlorine is handled. Although facilities are not located close to habitations, safety precautions are necessary to ensure the safety of workers and citizens. To avoid any risk, the chlorination facility will be provided with the following:

i. Chlorine neutralization pit with a lime slurry feeder
ii. Proper ventilation, lighting, entry and exit facilities
iii. Facility for isolation in the event of major chlorine leakage
iv. Personal protection and safety equipment for the operators in the chlorine plant
v. Provide training to the staff in safe handling and application of chlorine; this shall be included in the contract of Chlorinator supplier
vi. Supplier of Chlorinator equipment shall provide standard operating manual for safe operation and as well as maintenance and repairs; preferably these shall be provided both in English and Hindi Languages

76. **Utilities.** Telephone lines, electric poles and wires, water lines within the proposed project locations may require to be shifted in few cases. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with ULB will (i) identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase; and (ii) instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

77. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Priority is to locate these near the project location. 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 for setting up construction camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, or in areas which will inconvenience the community.

78. **Site selection of sources of materials.** Significant quantities of coarse aggregate and fine aggregate will be required for construction works. Requirement of gravel is limited. Contractor should procure these materials only from the quarries permitted/licensed by Mines and Geology Department. Contractor should, to the maximum extent possible, procure material from existing quarries, and creation of new quarry areas should be avoid as far as possible. It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Department of Mines & Geology and local revenue administration. **The construction materials shall be brought from the source complied with environmental regulations of India**.

79. **Social and Cultural Resources.** Rahatgarh is historical town, and any work involving ground disturbance can uncover and damage archaeological and historical remains. No components are located within any of the ASI protected monuments core zones. For this project, excavation will occur in WTP site, which is near to Rahatgarh fort. WTP site is located within 300 m from ASI monument within the premises of existing WTP campus, this land is under possession of ULB. No other suitable government land is available in the town. The allocated land parcel is approximately 1.5 hectares. Hence, as design consideration based on mitigation measures in the Draft IEE, has been ensured. Prior permission from the ASI is required. No works will be conducted until (i) ASI clearance to be obtained; and ASI clearance already obtained; and (ii) archaeological expert/s engaged to monitor execution of works. Appropriate steps should be taken according to the nature of the risk. This should involve:

(i) Obtain permission for construction of WTP within 300 m of protected monuments – It is already obtained
(ii) Include ASI as project stakeholder, Rahatgarh local representative of ASI should be included in the town level committee
(iii) Developing a protocol for use by the DBO contractor in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve:
    - Having excavation observed by a person with archaeological field training; contractor should employee a person with a formal certification course in archaeology from recognized (such as Institute of Archaeology, ASI, Delhi) during the ground excavation activities
    - Conduct awareness training to contractor & supervision staff prior to start of excavation
    - Stopping work immediately to allow further investigation if any finds are suspected;
    - Calling in the ASI if a find is suspected, and taking any action they require to ensure its removal or protection in situ

Figure 11: Location of Proposed Water works components with respect to protected monuments

Note: All the dimensions shown in above map are in meter (m)

B. Construction Impacts

80. **Pipe laying works.** The roads in the core city area of all the towns are very narrow and congested with pedestrians and vehicles (mainly 2-wheelers), while the roads in outer areas are wide. In some areas pipes will be laid in the middle of the road, which may affect the traffic. Civil works in the project include linear excavation for laying pipes along the roads, placing pipes in the trench and refilling with the excavated soil. The trenches are of 0.4 m – 0.7 m wide and 0.8 to 1 m depth. Subsequent to completion of works, road reinstatement will be undertaken by the contractor as part of the civil works.

81. **Other construction works.** Other civil works in the subproject include construction of weir and intake in Bina River, raw water pumping station, water treatment plants, water tanks (ground level / overhead), pumping stations at identified sites. These works are confined to sites, and construction includes general activities like excavation for foundation, construction of foundations, columns, walls and roof in cement concrete and masonry, and fixing of mechanical and electrical fixtures, etc. Weir and Intake well cum pump house involves construction within the water body. Works mostly conducted during the low – water level / no flow period, during which there is no submergence at the selected weir and intake sites. Works will be completed before onset of the monsoon flow into the river Bina.

82. With regard to the aspects of the subproject, i.e. the construction of the Weir, intake, water treatment plant, the clear water reservoirs, the pump houses, the overhead service reservoirs and the mains and other pipelines, no considerable impacts that can clearly be said to result from either the design or location. This is because:

i. Most of the individual elements of the subproject are relatively small and

ii. involve straight forward construction and operation, so impacts will be mainly localized and not greatly significant;

iii. Most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving trenching and other

excavation. However the routine nature of the impacts means that most can be easily mitigated;

83. It is clear that implementation of the project will affect quite long tracts of land both inside and outside the town where the distribution main and network extensions will be constructed, and also a series of specific locations (eg. the WTP and storage reservoir sites), some of which are quite large (clear water reservoir).

84. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project locations in water bodies (for intakes) and the built-up areas in town where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community. The following temporary and short duration impacts envisaged:

(i) Construction of weir and intake well in the River may lead to degradation of water quality, increase in turbidity and chemical contamination from fuels and lubricant used in construction work. This may the aquatic life, silting/chocking of spill ways/ canals etc., Though there are no notable aquatic life and also works are small scale, preventive measures will be required, and are suggested in the EMP.
(ii) Dust and air emissions from construction activities and equipment / vehicles affecting the ambient air quality
(iii) Impacts on natural drainage, surface water bodies due to disposal of construction waste and silt / chemical laden run off from work areas
(iv) Impacts on river eco-system due to river bed construction
(v) Impacts due to disposal of surplus soil, construction waste, debris etc.,
(vi) Impacts due to noise and vibration from consultation activities
(vii) Impacts due to collection of groundwater in trenches & disposal of the same
(viii) Impact / public inconvenience/ accessibility issues due to excavation on public roads (narrow old town roads), movement of trucks carrying construction material
(ix) Impacts on business, activities, people due to loss/restricted access to public/private/business/sensitive areas (schools, hospitals), etc.,
(x) Occupation health and safety impacts on workers
(xi) Health Impacts due to removal of existing AC (asbestos cement) pipes
(xii) Community health and safety impacts due to construction in an urban area
(xiii) Impacts due to establishment/operation of temporary construction camps

85. However, it is not expected that the construction work will cause major negative impacts. This is mainly because:

i. Pipelines will be mainly located on unused ground alongside existing roads and can be constructed without causing major disruption to road users and adjacent houses, shops and other businesses;
ii. New facilities within and outside the town (WTP, clear water reservoir, OHTs, etc.) will be located on government-owned land that is not occupied or used for any other purpose;
iii. Most pipeline construction will be conducted by small teams working on short lengths at a time so most impacts will be localized and short in duration;
iv. The overall construction project will be relatively short for a project of this nature, and is expected to be completed in 2 years.

86. The above impacts are typical for construction in urban areas. These are negative but short-term and reversible by mitigation measures. There are well-developed and proven measures and construction practices to avoid, mitigate and/or minimize these impacts to acceptable levels. These measures are given in the construction phase EMP **(Refer Table 10 & Table 17).**

87. The final IEE report assessed all potential impacts of the package/subproject based on detailed design by DBO Contractor. The final IEE report concluded that the package/subproject will not cause any significant adverse impacts due to: (i) scheme is relatively small and their effect will be local and site-specific which is manageable and controllable and (ii) impacts are site-specific and likely to be associated with the construction process and are produced because the process is invasive, involving excavation and earth movements.

88. Table 7 provides the assessment of the potential impacts of components based on detailed engineering design. Based on the results, the potential impacts identified in the Draft IEE report approved by ADB in April 2016 are similar in nature and remains as not significant. The findings have been verified by the PIU and PMC.

Table 7: Comparison of Impacts in the Draft IEE and as Per Detailed Engineering Design

	Particulars	Details of Proposed component as per DPR (preliminary design)	Details of component as per DBO Contractor	Any change recommended by DBO Contractor (If yes detail of that subcomponent with approval)	Land Details with Khasra No.	Whether any new impacts due to changes/impacts that were not assessed in the draft IEE	Mitigation measures
1.	Source	Bina River	Bina River	No Change	Not applicable (n/a)	n/a	Mitigation measures in draft IEE is still applicable
2	Weir	Height- 3.0 m & length-130m across Bina River in Rahatgarh	Height-3m & length-130m across Bina River in Rahatgarh	No change in weir location and size;	Khasra No. 156, Govt. Land, Binani ghat, Near Old Intake Well of Rahatgarh	No additional impacts Assessment in the Draft IEE is still applicable	Mitigation measures in draft IEE is still applicable
3	Intake well	6m diameter and 35m depth in Bina River near existing intake well, Rahatgarh town **Location:** On upstream of proposed weir in Bina River near existing Intake well, Rahatgarh town	Diameter = 6.50m, depth = 20.60 m, in Bina River near existing intake well, Rahatgarh town **Location:** On upstream of proposed weir in Bina River near existing Intake well, Rahatgarh town	No change in intake location; in detailed engineering design, intake size changed from 6m dia to 6.5m dia to fulfill the required demand and suit the local conditions and soil profile	Khasra No. 19, Govt. Land, Near Water Box, Ward no. 07, Rahatgarh	No additional impacts Assessment in the Draft IEE is still applicable	Mitigation measures in draft IEE is still applicable
	Raw Water Pumping Station	Pumping machinery at Intake Well-Discharge-323cum/hr, Head-34.0 m, 2 Nos. **Location:** Intake well	Pumping machinery at intake well; - Discharge =323 m3 / hour, head = 34m, at intake well, 2 Nos.	No change in capacity	Khasra No. 19, Govt. Land, Near Water Box, Ward no. 07, Rahatgarh	n/a	n/a

	Particulars	Details of Proposed component as per DPR (preliminary design)	Details of component as per DBO Contractor	Any change recommended by DBO Contractor (If yes detail of that subcomponent with approval)	Land Details with Khasra No.	Whether any new impacts due to changes/impacts that were not assessed in the draft IEE	Mitigation measures
			Location: Intake well				
	Raw water transmission main	Length: 255m - 300 mm diameter Ductile Iron (DI) pipe **Alignment:** From Intake well to WTP along an existing Kuccha road	Length: 250m - 400 mm diameter DI pipe **Alignment:** From Intake well to WTP along an existing Kuccha road	No change in alignment Only Change in dia from 300 m to 400 m Length of pipeline decreased by 5m	n/a	No additional impacts. Assessment in the Draft IEE is still applicable	Pipeline will be laid underground within RoW of existing Kuccha road
	Water Treatment Plant (WTP) and clear water sump (CWS)	7 MLD capacity WTP -251 KL sump **Location:** in Ward No. 7, Near existing WTP, Rahatgarh Town, site owned by ULB, Rahatgarh. WTP site is located within 300 m from ASI monument;	7 MLD capacity WTP - 251 KL sump **Location:** in Ward No. 7, Near existing WTP, Rahatgarh Town, site owned by ULB, Rahatgarh. WTP site is located within 300 m from ASI monument;	No change in location No change in capacity	Khasra No. 19/1/1, Govt. Land, Near Water Box, Ward no. 07, Rahatgarh	No additional impacts. Assessment in the Draft IEE is still applicable	Mitigation measures in draft IEE is still applicable
	Clear Water Pumping Station	Pumping machinery at WTP; - Discharge-257 cum/hr, Head-32 m, 2 Nos. **Location:** WTP	Pumping machinery at WTP; - Discharge - 257 m3 / hour, head - 32m, 2Nos. **Location:** WTP	No change in capacity	Khasra No. 19/1/1, Govt. Land, Near Water Box, Ward no. 07, Rahatgarh	n/a	n/a

	Particulars	Details of Proposed component as per DPR (preliminary design)	Details of component as per DBO Contractor	Any change recommended by DBO Contractor (If yes detail of that subcomponent with approval)	Land Details with Khasra No.	Whether any new impacts due to changes/impacts that were not assessed in the draft IEE	Mitigation measures
	Clear water Transmission Network	Clear water rising mains: 2061 m length and 200-300 mm dia pipes **Location:** Transmission pipelines will be mostly laid along the main roads. Pipes will be laid underground.	Clear water rising mains: 2,096m of dia 200mm to 300 mm DI pipes 300mm dia – 1220 m 200 mm dia – 876m **Location:** underground along the main public roads in the town, which are wider.	No change in alignments & dia of pipes Overall length of pipeline increased by 35 m as per detailed & actual survey.	n/a	No additional impacts. Assessment in the Draft IEE is still applicable	Mitigation measures in draft IEE is still applicable Pipeline will be laid underground within RoW of existing roads
	Overhead Tanks (OHT-1)	1200 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** In Ward No. 6, inside the campus of Nagar Parishad Office, site owned by ULB, Rahatgarh	1200 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** in Ward No. 6, inside the campus of Nagar Parishad Office, site owned by ULB, Rahatgarh	No change in location No change in capacity	Khasra No. 860, 861/1, Govt. Land, inside Nagar Palika Campus, Ward no. 06, Rahatgarh	No additional impacts. Assessment in the Draft IEE is still applicable	Mitigation measures in draft IEE is still applicable
	Overhead Tanks (OHT-2)	600 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** In Ward No. 3, Near	600 KL capacity Reinforced Cement Concrete (RCC) tank with compound wall **Location:** in Ward No. 3, Near	No change in location No change in capacity	Khasra no. 76/1, Govt. Land, Near Shamshan Ghat Campus, Ward no. 03, Rahatgarh	No additional impacts. Assessment in the Draft IEE is still applicable	Mitigation measures in draft IEE is still applicable

	Particulars	Details of Proposed component as per DPR (preliminary design)	Details of component as per DBO Contractor	Any change recommended by DBO Contractor (If yes detail of that subcomponent with approval)	Land Details with Khasra No.	Whether any new impacts due to changes/impacts that were not assessed in the draft IEE	Mitigation measures
		Shamshan Ghat, adjacent to Forest Department Office, site owned by ULB, Rahatgarh	Shamshan Ghat, site owned by ULB, Rahatgarh				
	Distribution Network	Distribution pipe line of total length 46564 m (HDPE & DI Pipes), 75 -500mm diameter **Location:** Pipes will be laid underground along the public roads; this work will cover entire area of the towns; in narrow roads, where there is no place, the pipeline will be laid in the center of the road; where the roads are very wide, the pipelines will be laid in the road shoulder.	Distribution pipe line of total length 48,906m (HDPE & DI Pipes), 75 – 500mm diameter **Location:** Pipes will be laid underground along the public roads; this work will cover entire area of the town; in narrow roads, where there is no place, the pipeline will be laid within the tarmac; where the roads are very wide (15m or more), the pipelines will be laid on both sides of the road	Overall length of network increased by 2,342 m	n/a	No additional impacts. Assessment in the Draft IEE is still applicable	Mitigation measures in draft IEE is still applicable There are no forest areas within the prescribed limit of the town. Hence there is no involvement of forest land or required any permission for pipe laying. There is no tree cutting involved during construction period. Most pipeline construction will be conducted by small teams working on short lengths at a time so most impacts will be localized and short

	Particulars	Details of Proposed component as per DPR (preliminary design)	Details of component as per DBO Contractor	Any change recommended by DBO Contractor (If yes detail of that subcomponent with approval)	Land Details with Khasra No.	Whether any new impacts due to changes/impacts that were not assessed in the draft IEE	Mitigation measures
							in duration; No additional impacts. Assessment in draft IEE approved by ADB is still applicable
	Bulk Water Meters	8 Nos (100 mm Dia to 500 mm Dia) **Location:** Fixed with the pipe section at at strategic locations like source, WTP, OHTs, DMA inlets etc.,	8 Nos (100 mm Dia to 500 mm Dia) **Location:** Fixed with the pipe section at at strategic locations like source, WTP, OHTs, DMA inlets etc.,	No change in location & quantity	n/a	n/a	n/a
	Consumer connection with flow meters	7,890 numbers. **Location.** Water delivery pipe will be connected to distribution lines and meters will be attached to the delivery pipe at each house with a meter chamber	5,280 nos. **Location.** Water delivery pipe will be connected to distribution lines and meters will be attached to the delivery pipe at each house with a meter chamber	Number of connections reduced as per the household survey conducted by DBO Contractor	n/a	n/a	n/a

89. **Mitigation Measures Considered in the Detailed Engineering Design.** Package 6C water supply scheme considered the location of the nearest surface water body i.e. Bina River. which is non-perennial and a tributary of River Betwa in Madhya Pradesh and River Bina is flowing in the west of the subproject town Rahatgarh. Clearance required from Water Resources Department for water abstraction and construction of Weir and intake in Bina River have been obtained. A regular water quality regime needs to be established for checking the raw water quality. The water supplied to the consumers at all-time must meet the drinking water **standards (Refer to Appendix 12).**

90. The construction of Weir and intake well in the river may lead to degradation of water quality due to increase in turbidity and chemical contamination from fuels and lubricant used in construction work. Increase in silt content and water turbidity, chemical quality can affect the aquatic life, silting/chocking of spill ways/ canals etc., Though there are no notable aquatic life, to ensure that any negative impacts are mitigation, the following are considered in the design:

- Construction methodology selected is least disturbing, and appropriate for the in-situ soil condition.
- Construction works have been scheduled during no flow period – late winter months to pre monsoon (February – June/July).
- Schedule will ensure works are completed to prior to onset of monsoon.
- Temporary barriers have been constructed to form enclosed area to minimize disturbance
- Allow adequate time settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the river; any silt laden water should be pumped to a silt pond

91. As the WTP will generates sludge from sedimentation, chemical flocculation, residuals of excess chemical dosage, plankton etc.; and wastewater from rinsing and back washing of filter. Final IEE includes design measures for proper management of sludge and wastewater. Wastewater will be collected and recirculated, resulting in zero waste discharge, and settled sludge will be dewatered, dried, and disposed by land filling/reused in beneficial purposes. Final IEE includes various design, operational and institutional measures to prevent groundwater source contamination. Various pollution prevention measures included in IEE for construction phase to control dust, noise, emissions from construction vehicles, silt-laden surface runoff during rains etc.

92. For the proposed WTP, enhancement measures like proper wash water recovery, sludge management, chlorine safety facilities and quick leak detection and rectification to save the resources, etc. are included are already included in the designs. CTE from MPPCB is mandatory for the WTP, have been obtained.

93. WTP in the ASI regulated zones have been clearly demarcated and designs have been optimized to ensure minimal disturbance to the area. No works will commence until (i) ASI clearance have been obtained, and (ii) archaeological experts are engaged to monitor the execution of works. Local representative of ASI in Rahatgarh have been considered as project stakeholders. The DBO contractor, with the assistance of the ASI representatives developed a protocol for use by the construction workers in conducting any excavation works. The protocol will ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. The workers and supervision staff will undergo awareness training and instructed to stop work immediately to allow further investigation if any finds are suspected.

94. The following table 8 to table 9, shows the anticipated environmental impacts, proposed mitigation measures to be implemented and complied by DBO Contractor during design and pre-construction stage.

Table 8: Design Phase Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures
Design of water supply system	Unsustainable source; resource & energy use	• Discontinuation of current unsustainable groundwater source and creating a new comprehensive water supply system based on

		a nearest surface water source i.e. (Bina River for Rahatgarh town WSS) • Appropriate weir and intake location to ensure year round water availability. • Limiting height of water impounding structure(weir) to the height of river banks, so that storage is limited to river course. • Provision of sluice gate to allows heavy monsoon flow freely without any obstruction, and also avoids dam silting • Design of apron to arrest erosion of the river bank of the downstream of dam • Recovering wash water from treatment process • Treatment and reuse of sludge from treatment process • Minimizing water losses from pipelines by perfect jointing and alignments using appropriate techniques (HDPE pipes up to 150 mm dia joined by electro fusion couplers using on-site electro fusion welding, and all higher dia pipes by on site butt welding) • Designing the entire system to maintain optimal flow and terminal pressure, and optimizing the overall energy usage • Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies • Improve water use efficiency and reduce water wastage at household level by recording and monitoring the water usage, and charging the consumers as per usage; due consideration to urban poor • Minimize unaccounted for water (UFW) losses using district metered area approach with flow meter and pressure logging arrangements to identify and rectify the leaks, and unauthorized connections • Using low-noise and energy efficient pumping systems • During the design, construction, and operation of the project, apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines (IFC's General EHS Guidelines3 and Sector Specific (Water and Sanitation) Guidelines4).
Water abstraction from Bina River	Source sustainability & water use conflicts	• Obtain permission from Water resources department, GoMP, for water abstraction from Bina River and construction of weir & intake prior to start of works and it is already obtained
Waste generation from WTP operations	Environmental pollution	• Obtain consent from MPPCB for WTP at Rahatgarh prior to start of construction and it

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

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

		is already obtained
Chlorine usage as disinfectant at WTP	Chlorine handling & application risk – health & safety risk to workers and general public	• **Provide the following measure at the chlorine application unit:** o Chlorine neutralization pit with a lime slurry feeder o Proper ventilation, lighting, entry and exit facilities o Facility for isolation in the event of major chlorine leakage o Personal protection and safety equipment for the operators in the chlorine plant o Provide training to the staff in safe handling and application of chlorine; this shall be included in the contract of Chlorinator supplier o Supplier of Chlorinator equipment shall provide standard operating manual for safe operation and as well as maintenance and repairs; preferably these shall be provided both in English and Hindi Languages
Socio cultural resource	Encroachment / damage to protected monuments and chance finds	• Obtain ASI permission for construction of WTP within 300 m of protected monuments prior to start of construction - this is already obtained • Include ASI as project stakeholder, local representative of ASI should be included in the town level committee • Proper procedures (protocol) shall be used by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve: o Having excavation observed by a person with archaeological field training; contractor should employee a person with a formal certification course in archaeology from recognized (such as Institute of Archaeology, ASI, Delhi) during the ground excavation activities o Conduct awareness training to contractor &supervision staff prior to start of excavation Stopping work immediately to allow further o investigation if any finds are suspected; o Calling in the ASI if a find is suspected, and taking any action they require to ensure its removal or protection in situ

Table 9: Pre Construction Phase Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures
EMP Implementation & reporting	Unsatisfactory compliance to EMP	• Appoint EHS supervisor and designate 1 EHS coordinator (among the technical staff) in each town • Ensure that all pre-construction activities are complete prior to start of construction work • Submission of Updated IEE / site specific EMP • Ensure timely submission of monitoring reports
Utilities	Telephone lines, electric poles and wires, water lines within proposed project area	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and

		• Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. • Require contractors to prepare spoils (waste) management plan (Appendix 14) and traffic management plan (Appendix 16)
Construction work camps, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; disruption to traffic flow and sensitive receptors	• Prioritize barren, waste, infertile, vacant lands within the area, • Shall not be located in productive agricultural lands, water bodies, natural drainage channels, flood plains & groundwater recharge areas, forests, vegetative lands, etc. • Prioritize areas within or nearest possible vacant space in the project location; • If it is deemed necessary to locate elsewhere, consider sites that will not promote instability flooding and result in destruction of property, natural drainage, vegetation, irrigation, and drinking water supply systems; • For private lands, obtain land owner's (not lessees) written consent; indicate the requirement for reinstatement to original • Do not consider residential areas; • Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. • For excess spoil disposal, ensure (a) site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (c) no residential areas shall be located within 50 m downwind side of the site; and (d) site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies. • Document site's pre-project conditions
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.	• Prioritize sites already permitted by the Department of Mines and Geology • No new borrow areas / quarries will be created for the work • If new new quarries sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and contractor shall be obtain all necessary permissions as per the law in force • If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU. • Maintain a construction material register at the site • A monthly report will be submitted to PIU on construction material quantity (sources-wise) • All clearance/license copies of quarries / borrow areas are provided to PIU for prior approval
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to award of civil works. • Ensure that all necessary approvals for construction to be obtained by contractor are in place including in compliance with labour laws,

	of works	before start of construction • Contractor to acknowledge in writing to PIU and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. • Copies of all permission / approvals are submitted to PIU prior to start of work • Include in detailed design drawings and documents all conditions and provisions if necessary
Asbestos Cement Pipes	Health risk due to exposure to asbestos materials	• Obtain details from PHED/NPs on location of underground AC pipes • Locate the new pipe/sewer carefully to avoid encountering AC pipes • Leave the AC pipes undisturbed in the ground.
Guidelines to be followed for establishing construction camps / labour camps	Establishing construction camps / labour camps	• Camp sites shall be away from residential areas (100 m), sensitive areas (schools, hospitals, etc. 250 m,), water bodies (500 m) and forests (more than 1 km) • Use unused, vacant lands; no trees shall be cut • Provide a proper fencing/compound wall • Prepare a site layout plan & display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Living quarters and construction camps shall be provided with standard materials; no shacks or huts • Adequate lighting and ventilation • Provide drinking water, water for other uses, and sanitation facilities; drinking water should be regularly tested • Provide clear pathways for safe movement • Provide cooking fuel (cooking gas); and a separate safe place to cook; fire wood not allowed • Construct septic tanks and soak pit arrangement for wastewater disposal • Solid waste shall be properly manager – provide separate bins, compost biodegradable waste; sell recyclable waste • Camp sites shall be cleared and restored to original after completion of work, all debris, wreckage cleared
	Work site management	• Provide a proper fencing/compound wall • Prepare a site layout plan & display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Provide clear pathways (for workers/staff) and roads (for vehicles) for safe movement in the work site
	Worker amenities at all work sites	• A temporary rest area for workers (for resting in break time, protection against rain/sun, eating etc.) • Drinking water • Wash area, toilets (separate for women); mobile toilets for linear work • Septic tank and soak pits for waste disposal

		• First aid

95. **Mitigation Measures Considered in the Construction Phase.**

96. **Pipe Laying Works.** Civil works include linear excavation for laying pipes along the roads, placing pipes in the trench and refilling with the excavated soil. The roads in town are wide enough to lay the pipelines. In wider roads pipes are being laid or will be laid in the road earthen shoulder along the tarmac within the RoW, and in narrow roads, where there is no space, pipes are being laid or will be laid in the road carriage. Roads in the old part of the town are quite narrow (~3m), and in the rest of the town roads are wider. In old town/core areas pipes are being laid or will be laid in the middle of the road, which may affect the traffic. The trenches are of 0.4 m – 0.7 m wide and 0.8 to 1 m depth. Given the small diameter (about 75 mm to 110 mm) pipes, the trench excavation is very minimal (0.4 x 0.7m). Earth work excavation are being undertaken manually where necessary as well as mechanically using an excavator machine (backhoe excavator) and include danger lighting and using barricades at every 100 m. Construction work area is demarcated with temporary soft barricades (reflective ribbons, traffic cones etc.,). Equipment, excavated soil, workers, and construction activities confined to the barricaded area; pipe jointing works, however, conducted on a vacant land.

97. Distribution pipeline work is being taken up in section-wise by DBO contractor daily; trench excavation, pipe laying, jointing, refilled, consolidated with a plate vibrator/ roller and levelled by the end of the day; this limits the public disturbance to a minimum time. Subsequent to completion of works, road reinstatement is being undertaken by the contractor as part of the civil works. The mitigation measures are discussed in the EMP **(Refer Table 10 & Table 17).**

98. Sufficient care being taken while laying so that existing utilities and cables are not damaged and pipes are not thrown into the trenches or dragged, but carefully laid in the trenches. As trenches are a maximum of 1.2 m, there is no risk of collapse of trenches or risk to surrounding buildings. Once they are laid, pipes being joined as per specification and then tested for any cracks of leakages.

99. **Other construction works.** Other civil works in the subproject include construction of weir and intake cum pump house in Bina River, raw water pumping station, water treatment plant, water tanks (ground level / overhead), pumping stations at identified sites. These works are confined to sites, and construction includes general activities like excavation for foundation, construction of foundations, columns, walls and roof in cement concrete and masonry, and fixing of mechanical and electrical fixtures, etc. Weir and Intake well cum pump house involves construction within the water body. An enclosed area has been created at the selected site using temporary barriers with appropriate material like sand bags or sheet piles and the water have been pumped out to make the area dry for construction. Once this is created, the rest of the construction follow the general construction procedures to create a RCC well of size 6.5 m diameter. Once the work is over, the temporary structure has been removed. For construction of Weir the river water being diverted by construction of cofferdam to make the area dry and the concreting has been done. Works mostly conducted during the low – water level / no flow period, during which there is no submergence at the selected weir & intake sites. Works will be completed before onset of the monsoon flow into the Bina River.

100. The minimum working hours are 8 hours daily, the total duration of each stage depends on the soil condition and other local features.

101. About 95% of the excavated soil will be used for refilling the refilling the trench after placing the pipe and therefore residual soil after pipe laying and refilling is not significant. This excess soil being used for construction.

102. Total earthwork excavation is 8000 cum, of which about 6000 cum of the excavated soil will be used for refilling the trench after placing the pipe and therefore residual soil after pipe laying and refilling is 2000 cum, which is not significant. This excess soil shall be used for construction and site maintenance also. Material will be sourced from existing licensed quarries. An estimated 4256 m3 of aggregate and 2659 m3 of sand will be used in the construction. The construction materials shall be brought from the sources complied with environmental regulations of India.

103. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project locations in the built-up areas of the town where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. The mitigation measures are discussed in the EMP (**(Refer Table 10 & Table 17)**.

104. PMU, with assistance of PMC, has developed updated EMP, which has been shared with all DBO Contractors. This updated EMP includes specific mitigation measures and monitoring checklists applicable to construction activities common in all tranche 1 works. The contractors of package 6C has submitted the status report pertaining to environment safeguard.

105. The EMP includes the design measures for (i) selection of construction methodology near protected monuments in discussion with the ASI, having the excavation observed by person with archaeological knowledge for chance finds, etc.; (ii) wash water recovery for the WTP to reduce effluent to be discharged; (iii) safe disposal of sludge coming out of wash water tanks from WTP (iv) beneficial use of treated sludge; and (v) energy efficient pumping equipment and (vi) quick leak detection and rectification to save the resources, etc. During execution phase, the EMP includes mitigation measures such as (i) implementation of traffic management plan in coordination with local traffic police to minimize traffic impacts (ii) awareness campaigns and consultations to inform residents and businesses of potential disturbances; (iii) provision of walkways and planks over trenches to ensure access will not be impeded; (iv) use of noise-dampening measures in areas with sensitive receptors such as hospitals, schools, places of worships and other silence-zones; (v) use of dust-suppression methods such as watering and/or covering of stockpiles; and (vi) finding beneficial use of excavated materials to extent possible to reduce the quantity that will be disposed off. As for the O&M phase, facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. The design of the WTP includes dewatering and drying areas as part of sludge management. The EMP includes mitigation measures and monitoring plan to ensure compliance to environmental standards during O&M phase.

106. **Environmental standards (IFC's EHS Guidelines):** The Final IEE report including updated EMP provides specific information on how DBO contractor (i) applies pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines and (ii) adopts cleaner production processes and good energy efficiency practices. If less stringent levels or measures are appropriate in view of specific project circumstances, the DBO contractor will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

107. The Final IEE report including updated EMP shows how (i) design provides for pollution prevention from WTP, prevent contamination of groundwater sources, and (ii) how dust noise, air emissions, and water pollution will be controlled during the construction. Also the Final IEE including updated EMP provides specific information on (i) how DBO contractor will implement occupational health and safety.

108. The Final IEE report including updated EMP covers detailed checklists such (i) contractors twice a week EHS Checklist; (ii) contractors monthly EMP Implementation Report; and (iii) PIU environmental safeguards compliance. The subproject will not add any incremental impacts to the environment. **Site monitoring checklists and formats are given in Appendix 17.**

109. A copy of the approved 'updated EMP' has been kept onsite during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

110. For civil works, the contractor will be required to (i) carry out all of the mitigation and monitoring measures set forth in the approved updated EMP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this final IEE including updated EMP. The budget has been allocated for compliance with these EMP measures, requirements and actions.

111. The following paras and table 10, below shows the anticipated environmental impacts, proposed mitigation measures to be implemented and complied by DBO Contractor during construction stage by DBO Contractor.

112. **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 UDED and ULB; and
(iii) Submit to MPUDC on a monthly basis documentation of sources of materials

113. **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. These however will be temporary, limiting to construction activities only. To mitigate the impacts, construction contractors will be required to:

(i) Damp down exposed soil and any stockpiled material on site by water sprinkling;
(ii) Use tarpaulins to cover sand and other loose material when transported by trucks;
(iii) Clean wheels and undercarriage of haul trucks prior to leaving construction site;
(iv) Disallow access in the work area except workers to limit soil disturbance and prevent access by barricading and security personnel;
(v) Fit all heavy equipment and machinery with air pollution control devices which are Operating correctly

114. **Surface Water Quality.** Run-off from stockpiled materials and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality of the streams. As the rainfall in the project areas is mostly confined to monsoon, these potential impacts are short-term and temporary. However, to ensure that these are mitigated, construction contractor will be required to:

(i) All earthworks be conducted during the dry season to prevent the problem of soil run-off during monsoon season;
(ii) Avoid stockpiling of earth fill especially during the monsoon season unless
(iii) covered by tarpaulins or plastic sheets;
(iv) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used;
(v) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies:
(vi) Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
(vii) Dispose any wastes generated by construction activities in designated sites;
(viii) Conduct surface quality inspection

115. Construction of Weir and intake well in the Bina River may lead degradation of water quality due to increase in turbidity and chemical contamination from fuels and lubricant used in construction work. Increase in silt content and water turbidity, chemical quality can affect the aquatic life, silting/chocking of spill ways/ canals etc., Though there are no notable aquatic life, to ensure that any negative impacts are mitigation, the contractor will be required to:

(i) Do not disturb river bed except the actual work area; no equipment, machinery shall be operated outside the work area
(ii) Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition, and able to complete the construction work prior to onset of monsoon.
(iii) Schedule the construction works during low water level period – late winter months

to pre-monsoon (February – June/July); ensure that works are completed during the same period to prior to onset of monsoon; confirm with dam authorities on release of water; avoid scheduling the works during water release period.

(iv) Erect temporary barriers to form enclosed construction area with least disturbance

(v) Allow adequate time settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the reservoir; any silt laden water should be pumped to a silt pond.

(vi) Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage.

(vii) Clean up the area after the completion & prior to the onset of monsoon flow

116. **Generation of Construction Wastes.** Solid wastes generated from the construction activities are excess excavated earth (spoils), discarded construction materials, cement bags, wood, steel, oils, fuels and other similar items. Domestic solid wastes may also be generated from the workers" camp. Improper waste management could cause odor and vermin problems, pollution and flow obstruction of nearby watercourses and could negatively impact the landscape. The following mitigation measures to minimize impacts from waste generation shall be implemented by the contractor:

(i) Prepare and implement a Construction Waste Management Plan

(ii) Stockpiles, lubricants, fuels, and other materials should be located away from steep slopes and water bodies;

(iii) Avoid stockpiling any excess spoils. Excess excavated soils should be dispose to approved designated areas;

(iv) Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site

(v) Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed in disposal sites approved by local authorities;

(vi) Prohibit burning of construction and domestic waste;

(vii) Ensure that wastes are not haphazardly dumped within the project site and adjacent areas.

(viii) Get approval of PIU in writing that the necessary environmental restoration work had been adequately performed before acceptance

117. **Noise and Vibration Levels:** Except water intake and WTP, all the construction work will be conducted at selected sites and along the roads in Rahatgarh urban areas, where there are houses, schools and hospitals, religious & historical places and small - scale businesses. The sensitive receptors are the general population in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads, operation of construction equipment like concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearby buildings and monuments. This impact is negative but short-term, and reversible by mitigation measures. The construction contractor will be required to:

(i) Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;

(ii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;

(iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor; and

(iv) Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s.

(v) Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;

118. **Surface and Ground Water Quality.** Another physical impact that is often associated with

excavation is the effect on drainage and the local water table if ground water and surface water collect in the voids. In Rahatgarh groundwater is deeper than the proposed excavation depths, and drains are limited to monsoon. However, to ensure that water will not pond in pits and voids near project location, the construction contractor will be required to conduct excavation works in non-monsoon season to the maximum extent possible.

119. **Accessibility.** Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Roads in the core/old town areas of Rahatgarh is very narrow. However, most of the roads are used by pedestrians and two wheelers, and four wheelers vehicles are very limited. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

(i) Confine work areas along the roads to the minimum possible extent; all the activities, including material & waste/surplus soil stocking should be confined to this area. Proper barricading should be provided; avoid material/surplus soil stocking in congested areas immediately removed from site/ or brought to the as and when required

(ii) Leave spaces for access between mounds of soil;

(iii) Provide walkways and metal sheets where required to maintain access across for people and vehicles;

(iv) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;

(v) Schedule transport and hauling activities during non-peak hours;

(vi) Locate entry and exit points in areas where there is low potential for traffic congestion;

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

(i) Comply with all national, state and local labour laws (see Appendix 13);

(ii) IFC's General EHS Guidelines5 and Sector Specific (Water and Sanitation) Guidelines6

(iii) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OH&S Training1 for all site personnel (d) documented procedure to be followed for all site activities and (e) Documentation of work-related accidents;

(iv) Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;

(v) Provide medical insurance coverage for workers;

(vi) Secure all installations from unauthorized intrusion and accident risks;

(vii) Provide supplies of potable drinking water;

(viii) Provide clean eating areas where workers are not exposed to hazardous or

(ix) noxious substances;

(x) 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;

(xi) 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;

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

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

(xii) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;

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

(i) Consult PIU before locating project offices, sheds, and construction plants;

(ii) Minimize removal of vegetation and disallow cutting of trees;

(iii) Provide drinking water, water for other uses, and sanitation facilities for employees;

(iv) Ensure conditions of live ability at work camps are maintained at the highest standards possible at all times;

(v) Prohibit employees from poaching wildlife and cutting of trees for firewood;

(vi) Train employees in the storage and handling of materials which can potentially cause soil contamination;

(vii) Recover used oil and lubricants and reuse or remove from the site;

(viii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;

(ix) Remove all wreckage, rubbish, or temporary structures which are no longer required;

(x) Confirm to PMU report in writing that the camp has been vacated and restored to pre- project conditions before acceptance of work.

Table 10: Construction Phase Environmental Management Plan

Field	**Anticipated Impact**	**Mitigation Measures**
EMP Implementation Training	Irreversible impact to the environment, workers, and community	• Project manager, staff and all key workers will be required to undergo training on EMP implementation including spoils/waste management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc. prior to start of work
Air Quality	Emissions from construction vehicles, equipment, and machinery used for installation of pipelines resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons.	**Vehicle emissions;** • Fit all heavy equipment, and machinery with air pollution control devices which are operating correctly; all the vehicle shall meet the emission norms and shall have valid pollution under control (PUC) certificate (Appendix 11) • Pollution under control (PUC) certificate will be obtained for all vehicles, equipment, and records maintained **Dust Control;** • Dust screen will be provided around work sites (OHT, GLSR, WTP, intake etc.) • Loose soil on work sites, vehicle and worker movement areas will be properly rammed and stabilized to minimize dust generation; it will be ensured that no loose soil surface at working places • Access to work area will be controlled; unnecessary movement of vehicles, workers and public in work areas will be controlled to minimize soil disturbance • Prior to any leveling or earth moving activity, water will be sprinkled to avoid dust

		• Damp down exposed soil and any stockpiled material on site by water sprinkling; • Water will be sprinkled adequately (at least daily 3 times in dry weather) to maintain surface in stabilized and damp condition • Material stocks will be covered with tarpaulins/covers at the sites • Use tarpaulins to cover sand and other loose material when transported by trucks; • Loose material from trucks will be unloaded in a barricaded area and with water sprinkling • Clean wheels and undercarriage of haul trucks prior to leaving construction site • Disallow access in the work area except workers to limit soil disturbance and prevent access by barricading and security personnel **Dust control from pipeline works;** • Construction area will be barricaded on both sides using hard barricades of 2m height • Site clearance and excavation work will be commenced only after barricading the site • Works and all associated activities (material, soil, debris, equipment, machinery) will be confined to barricaded area • Excavated soil storage will be removed from the site immediately & stored/disposed at identified site • Work will be undertaken section wise (100-500 m) at various places; these sections will be demarcated and barricaded and trench filled • Work will be conducted work sequentially - excavation, pipe laying, backfilling; testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done • Excavated soil will be removed section-wise, and used for filling the previous section, this is to avoid stocking of excavated soil • Road restoration will be taken up immediately after backfilling by proper consolidation
Surface water quality	Water pollution / works in rainy season, Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	• No earthwork will be conducted during rainy season • All earthworks be conducted during the dry season to prevent the problem of soil run-off during monsoon season; • Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; • Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used; • Disposal sites will be selected prior to start of construction following the EMP guidelines • Dispose any wastes generated by construction activities in designated sites; and • Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies to control water pollution; • Place storage areas for fuels and lubricants away from any drainage leading to water bodies; • Temporary drains or bunds will be created

		around the periphery of work area to avoid flooding, and entry of runoff • Accumulated water in work areas / excavated pits will be pumped to some temporary ponds / sedimentation basins; only clarified water will be disposed into drains • Safety measures will be undertaken to avoid any risk of collapse due to water entry • Conduct surface quality inspection according to the Environmental Management Plan (EMP).
Weir & Intake Construction works in River Bina	Pollution of Bina River due to construction of weir & intake well in River bed for Rahatgarh WSS	• Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition, and able to complete the construction work prior to onset of monsoon • Schedule the construction works in river bed during summer where there is no flow / low water level period – late winter months to pre monsoon (February – June/July); ensure that works are completed during the same period to prior to onset of monsoon; confirm with dam authorities on release of water; avoid scheduling the works during water release period. • Do not disturb river bed except the actual work area; no equipment, machinery shall be operated outside the work area • Erect temporary barriers to form enclosed construction area with least disturbance • Allow adequate time settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the reservoir; any silt laden water should be pumped to a silt pond • Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage • Clean up the area after the completion & prior to the onset of monsoon flow
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	• Noisy works will be avoided in the night • Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; • Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; • Drivers will be trained to avoid usage of horns unnecessarily • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor; and • Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s. • Before undertaking work with heavy noise/vibration, surrounding area / buildings will be surveyed to identify any old / sensitive buildings at risk, and necessary precautions will be taken to avoid any risk • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity; • Noisy works will not be conducted near

		sensitive places (hospitals, schools, etc.,) and at sensitive times (festivals etc.,); works will be scheduled accordingly
Landscape and aesthetics	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items.	• Prepare and implement a Construction Waste Management Plan • All the cut and open surfaces shall be properly consolidated and protected with surface pitching /grass turfing etc. as appropriate to avoid any surface erosion • Excess soil / debris will be utilized in construction / useful purposes to avoid disposal • Excess soils/debris will be removed from site on regular basis to avoid stockpiling at site • Disposal site will be identified prior to start of work following EMP guidelines • Stockpiles, lubricants, fuels, and other materials should be located away from steep slopes and water bodies; • Avoid stockpiling any excess spoils. Excess excavated soils should be dispose to approved designated areas; • Domestic waste generated at camp sites will be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; biodegradable waste composted in impervious pit at site; recyclable waste will be sold in market • Residual and hazardous wastes such as oils, fuels, and lubricants will be disposed via licensed agencies by MPPCB • Burning of construction and domestic waste will not be allowed • Ensure that wastes are not haphazardly dumped within the project site and adjacent areas. • Sites will be managed neatly; waste collection bins will be provided, awareness will be created among workers, staff in site cleanliness • All camp/work sites will be restored to original condition after the completion of work • Get approval of PIU in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	• Obtain from PIU the list of affected utilities and operators if any; • Prepare a contingency plan to include actions to be done in case of unintentional interruption of service
Ecological Resources – Terrestrial	Loss of vegetation and tree cover	• Avoid removal of trees and vegetation along the roads best pipeline alignments and layout planning of reservoirs and facilities, however, if this cannot be avoided fully, undertake compensatory tree plantation (5 trees to 1 tree removed) • Minimize removal of vegetation and disallow cutting of trees; • If tree-removal will be required, obtain tree-cutting permit and (iii) Plant 5 native trees for every one that is removed.
Land use	Environmental Issues due	• The impact due to change in land use will be

	to land use change	negligible due to this project.
Accessibility	Traffic problems and conflicts near project locations and haul road	**Traffic management / access during pipeline works;** • Pipeline work implementation plan will be prepared for each road; works will not be conducted in all roads at once in a locality; alternative roads for traffic movement will be ensured • A simple traffic management plan will be prepared in consultation with traffic police for each road, and displayed on site; one-week prior notice will be provided • Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic aids if transportation activities cannot be avoided during peak hours • Temporary diversions will be provided as required, with prior public information • Confine work areas along the roads to the minimum possible extent; all the activities, including material & waste/surplus soil stocking should be confined to this area. Proper barricading should be provided; avoid material/surplus soil stocking in congested areas – immediately removed from site/ or brought to the as and when required • Work area will be properly defined, barricaded; minimum strip of land will be used • Material / waste / soil will not be stocked obstructing the traffic, pedestrian etc., • Trench width will be minimized as much as possible by adopting best construction methods with proper shoring/bracing • Work site will be kept free from all unnecessary obstructions • Public information boards, sign boards, caution boards will be provided along with contact numbers • Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. • Prior to start of pipeline work, information will be provided to the public through media – newspapers and local cable television (TV) services **Access to houses/business during pipeline works;** • Access to any house, business or property will not be blocked completely, at least safe pedestrian access will be maintained • Leave spaces for access between mounds of soil; • Provide walkways, wooden and metal sheets/planks on excavated trenches where required to maintain access across for people and vehicles; **Material transport using heavy trucks;** • Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; • Material haulage vehicles will main/wide roads

		as far as possible • Transportation / hauling activities will be conducted during non-peak hours (6:30 am to 8:00 am) • Locate entry and exit points in areas where there is low potential for traffic congestion; • Proper entry and exits facilities will be provided at low traffic places • Keep the site free from all unnecessary obstructions; • Drivers will be trained to drive vehicles in a considerate manner and following all traffic rules **For works in very narrow roads;** • Inform the local / affected local population / business, 1-week in advance about the work schedule and access restrictions • Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum. • Provide pedestrian access in all the locations until normalcy is restored. Provide wooden/metal planks over the open trenches at each house to maintain the access.
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	• Leave spaces for access between mounds of soil; • Provide walkways and metal sheets where required to maintain access across for people and vehicles; • Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools; • Consult businesses and institutions regarding operating hours and factoring this in work schedules; and • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints. • Notify community/ water users in advance about likely interruptions in water supply. • Provide alternate sources of clean water until water supply is restored.
Socio-Economic – Employment	Generation of temporary employment and increase in local revenue	• 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; • Comply with labor laws
Occupational Health and Safety	Occupational hazards which can arise during work	• Comply with all national, state and local core labor laws (see Appendix 13 of this IEE) • Following internationally recognized health and safety standards such as the World Bank Group's Environment, Health and Safety Guidelines (IFC's General EHS Guidelines7 and Sector Specific (Water and Sanitation) Guidelines8). • Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all

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

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

		workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; • Site will be prepared and maintained to create safe working conditions; workers will be provided with safe work areas, elevated platforms, steps, ladders, walkways /access to work areas and amenities • Deep excavations (more than 1 m) will be properly protected to avoid collapse (safety measures such as / shoring / safe slopes) • Hard barricading will be provided around deep trenches / pits of more than 1.5 m deep • All necessary precautions will be taken to avoid collapse of trench/pit, and damage to surrounding structures • Proper personnel protection equipment will be provided to all workers / staff; and its use will be ensured • Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; • Provide medical insurance coverage for workers; • All installations will be properly secured from unauthorized intrusion and accident risks; hazardous locations will be properly marked • All work sites will be properly secured, barricaded to avoid unauthorized public/traffic entry • Provide road signs and flagman to regulate traffic / pedestrians / road users, of on-going trenching activities • Site safety orientation will be provided to all visitors to the site • Drinking water, sanitation, washing and resting facilities will be provided at all sites; separate sanitation facilities for women • Provide clean eating areas where workers are not exposed to hazardous or noxious substances; • Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Proper audible back-up alarms will be ensured for all moving equipment/machinery • Provide safety sign, caution, information boards on site for workers and staff awareness, follow

		up • 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 • Emergency procedures and contact information will be provided on all sites • Accidents will be promptly registered and reported; register will be maintained at every work site • Public compliant box and compliant register will be provided at every work site • 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.
Asbestos Cement (AC) Materials	Health risks associated with AC pipes	• Location of existing/old AC pipes will be identified prior to excavation for new pipes • Underground AC pipes will left as it is in the ground without disturbing / touching • Awareness will be created among workers and supervisors on AC pipes
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	• Plan routes to avoid times of peak-pedestrian activities. • Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. • Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. • Provide road signs and flag persons to warn of on-going trenching activities.
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	• Provide prior information to the local people about the nature and duration of work • Conduct awareness program on safety during the construction work • Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day • Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches
Work Camps and worksites	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants Unsanitary and poor living conditions for workers	• Consult with PIU before locating project offices, sheds, and construction plants; • Minimize removal of vegetation and disallow cutting of trees; • Provide drinking water, water for other uses, and sanitation facilities for employees; • Ensure conditions of livability at work camps are maintained at the highest standards possible at all times; • Prohibit employees from poaching wildlife and cutting of trees for firewood; • Train employees in the storage and handling of materials which can potentially cause soil contamination; • Recover used oil and lubricants and reuse or

		remove from the site; • Manage solid waste according to the preference hierarchy: reuse, recycling and disposal to designated areas; • Ensure unauthorized persons specially children are not allowed in any worksite at any given time.
Establishing construction camps / labour camps	Guidelines to be followed for establishing construction camps / labour camps	• Camp sites shall be away from residential areas (100 m), sensitive areas (schools, hospitals, etc. 250 m,), water bodies (500 m) and forests (more than 1 km) • Use unused, vacant lands; no trees shall be cut • Provide a proper fencing/compound wall • Prepare a site layout plan & display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Living quarters and construction camps shall be provided with standard materials; no shacks or huts • Adequate lighting and ventilation • Provide drinking water, water for other uses, and sanitation facilities; drinking water should be regularly tested • Provide clear pathways for safe movement • Provide cooking fuel (cooking gas); and a separate safe place to cook; fire wood not allowed • Construct septic tanks and soak pit arrangement for wastewater disposal • Solid waste shall be properly manager – provide separate bins, compost biodegradable waste; sell recyclable waste • Camp sites shall be cleared and restored to original after completion of work, all debris, wreckage cleared
	Work site management	• Provide a proper fencing/compound wall • Prepare a site layout plan & display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Provide clear pathways (for workers/staff) and roads (for vehicles) for safe movement in the work site
	Worker amenities at all work sites	• A temporary rest area for workers (for resting in break time, protection against rain/sun, eating etc.,) • Drinking water • Wash area, toilets (separate for women); mobile toilets for linear work • Septic tank and soak pits for waste disposal • First aid
Social and Cultural Resources	Risk of archaeological chance finds	• Excavation work shall be supervised by a person with archaeological training • If any chance find is suspected during excavation/works, work will be immediately stopped, and report to PIU/PMU and PMC • Stop work immediately to allow further

		investigation if any finds are suspected; • Necessary action as suggested by concerned authorities will be undertaken
Submission of EMP implementation report	Unsatisfactory compliance to EMP	• Appointment of (I) EHS Supervisor and Archeological supervisor to ensure EMP implementation • Timely submission of monitoring reports including pictures
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	• All spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required will be removed; and • All excavated roads shall be reinstated to original condition. • All disrupted utilities will be restored • All affected structures rehabilitated / compensated • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these will be cleaned up. • All hardened surfaces within the construction camp area will be ripped, all imported materials removed, and the area will be top soiled and regrassed using the guidelines set out in the revegetation specification that forms part of this document. • The contractor must arrange the cancellation of all temporary services • Restoration to original will be documented and reported to PIU • .Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.

C. Operation and Maintenance Impacts

122. Operation and Maintenance of the water supply system will be carried out by Rahatgarh Nagar Parishad directly or through an external operator. During the system design life (15/30 years for mechanical/civil components) it shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the equipment in working order. The stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs will be small-scale involving manual, temporary, and short-term works involving regular checking and recording of performance for signs of deterioration servicing and replacement of parts.

123. Recurrence of pipe bursting and leakage problems can be manage by the leak detection and water auditing surveys. The ULB will be required to ensure that the leak detection and rectification time is minimized.

124. Since back wash water is recovered and recirculate in the WTP, no wastewater will be generated from water treatment process. The sludge generated from the wash water storage tank, and sedimentation tanks

125. Water treatment process will generate sludge from sedimentation of particulate matter in raw water, flocculated and precipitated material resulting from chemical coagulation, residuals of excess chemical dosage, plankton etc; and waste from rinsing and back washing of filter media containing debris, chemical precipitates, straining of organic debris and plankton. Following are included in the subproject design to dispose the sludge and back wash:

126. Provision for recirculation system for filter backwash – backwash water from filter beds will be sent to a storage tank, and after allowing adequate time for settlement of solids, clarified water will be pumped to WTP inlet. This arrangement will avoid pollution and also minimize wastage of water.

127. Accumulated sludge from filter backwash etc., will be disposed-off at sludge drying beds for natural drying. Dried sludge will be disposed off in a land fill or used as soil conditioner if it is suitable.

128. The following table 11, show the anticipated environmental impacts, proposed mitigation measures to be implemented and complied by DBO Contractor during operation stage by DBO Contractor.

Table 11: Operation Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures
Check for blockage and leakage problems reducing the water losses	Loss of water, increased demand and inconvenience to consumers & general public	• Effective leak detection and water auditing to reduce the water losses
Water contamination – raw water contamination at source and treated water during transmission	Impacts on public health	• Ensure protection of water source quality (River Bina), any entry of wastewater into the River in future should be prevented. • Contamination of treated water during transmission and distribution should be prevented by quickly identifying, isolating and repairing the leak section. Develop a system of leak detection and rectification. • Conduct regular monitoring of raw & treated water and ensure that water supplied at all times meets the drinking water standards (Appendix 12)
Discharge the impurities and other solids collected due to filtration and back wash	Pollution of streams /drains	• Backwash water will be recirculated so no wastewater generated from WTP • Maintain the mechanical parts as per the maintenance plan to avoid any hazards
Sludge generation	Land and water pollution, impacts on health & environment	• Collect the sludge from WTP units, dry in sludge drying beds, and reuse / dispose safely as per the design
Increased in sewage generation	Water pollution, and impacts on public health and environment	• Sanitation facilities needs to be improved at community level and at the town level to meet the increased sewage demand
Generation of waste materials	Impacts on public health and environment	• Collect solid wastes and dispose to approved disposal yards

Occupational health and safety	Health, social and economic impacts on the workers	• Provide appropriate PPE to workers & training on its proper use • Use fall protection equipment when working at heights. • Maintain work areas to minimize slipping and tripping hazards. • Implement a training program for operators who work with chlorine regarding safe handling practices and emergency response procedures. • Prepare escape plans from areas where there might be a chlorine emission. • Install safety showers and eye wash stations near the chlorine equipment and other areas where hazardous chemicals are stored or used. • Prohibit eating, smoking, and drinking except in designated areas. • Comply with all national, state and local core labor laws (**see Appendix 13 of this IEE)** • Following internationally recognized health and safety standards such as the World Bank Group's Environment, Health and Safety Guidelines (IFC's General EHS Guidelines9 and Sector Specific (Water and Sanitation) Guidelines10). • Develop and Implement site-specific occupational health and safety (OH&S) plan which will include measures, such as the following • Excluding public from the site;

D. Project benefits

129. During the construction phase there are likely to be positive impacts through employment generation, increase in local revenue from the project activities. During the operation phase also, there is potential for employment generation, though limited, as the improved and expanded water infrastructure requires additional workforce.

130. The citizens of the Rahatgarh Nagar Parishad will be the major beneficiaries of the improved water supply system, as they will be provided with a constant supply of better quality water, piped into their homes at an appropriate pressure. The project will improve the over-all health condition of the town as water borne diseases will be reduced, so people should spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health. This should also improve the environment of these areas, should deliver major improvements in individual and community health and well-being.

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

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

VII. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Overview

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

132. Most of the main stakeholders have already been identified and consulted during preparation of Draft IEE, and any others that are identified during project implementation will be brought into the process in the future. Primary stakeholders of the subproject are: residents, shopkeepers and businesspeople who live and work alongside the roads in which network improvements will be provided and near sites where facilities will be built (WTP and water tanks), and government and utility agencies responsible for provision of services in Rahatgarh, PWD, WRD and Madhya Pradesh Pollution Control Board. Secondary stakeholder is: NGOs and CBOs working in the area community representatives, beneficiary community in general, government agencies, the executing and implementing agencies (MPUDC, PMU and PIUs), Government of India and the ADB.

133. The stakeholders were involved in developing the IEE through discussions on-site and public consultation at several places in the town, after which views expressed were incorporated into the IEE and in the planning and development of the project. The IEE has been made available at public locations and disclosed to a wider audience via MPUDC and PMU websites. The consultation process has been continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

B. Public Consultation

134. The public consultation and disclosure program is a continuous process throughout the project implementation, including project planning, design and construction.

135. During implementation of the subprojects, an extensive consultation program is carried out with different type of stakeholders such as respective ULBs, other line departments, general public, vendors and land owner etc., in line with the requirements pertaining to disseminate the project information, in particular agreed resettlement framework. General public, business owners mainly shopkeepers and likely to be affected people were informed about the possibility of disruption due to subproject. The consultation is focused on about subproject and on entitlement matrix of the project and compensation receiving procedure. The tools used for consultations were stakeholder workshops and meetings, interviews and focus group discussions (FGD). These consultations provided inputs for identification of the felt needs of the communities, and the relevant stakeholders. Meaningful consultations have been continued with local inhabitants which include all section of society

1. Consultation during Project Preparation

136. Institutional consultations were conducted with the Governmental Departments such as PMU, Pollution Control Board, Public Health Engineering Department, Water Resourced Department, and ULB. The project proposal is formulated in consultation with Rahatgarh Nagar Parishad and suits the requirements of the ULBs.

137. **During Preliminary Design Stage:** Focus-group discussions with affected persons and other stakeholders were conducted to learn their views and concerns. A socio economic household survey has been conducted in the town, covering sample households, to understand the household characteristics, health status, and the infrastructure service levels, and also the demand for infrastructure services. General public and the people residing along the project activity areas were also consulted during visits to the project sites. Project planning stage consultation was conducted at Rahatgarh Nagar Parishad office with elected public representative and people of Rahatgarh town on 27th March 2016 **(Refer Appendix 2).**

138. **During Detailed Design Stage;** PMC experts and field staff conducted various consultations with the public to understand their views on existing water supply status. At the same time, the communities were informed about the MPUSIP project in detailed along with proposed water supply infrastructure in their town. During consultations, community enquired about the perceived benefits of water supply scheme. During implementation period, there has been consultations on project design, features, implementation procedures, sewerage scheme, health and sanitation, formation of GRC, land transfer, rehabilitation of affected households, Possible positive & negative impacts of the project and other social safeguard issues. There is great acceptance of the project as there is only positive impact on the life of community. The people mainly raised the issue of sanitation which will be resolved after availability of safe water.

139. Stakeholder Consultation/s was held in Rahatgarh municipal office. Several other meetings also conducted at ward level with communities and in market areas. A town level consultation meeting was conducted in Rahatgarh town in January 2019, where in which 08 community representatives, participated. Consultation meetings were also conducted in Ward 01, 06 and Ward 07 in Rahatgarh subproject town in May and December 2018. Besides, several other meetings also conducted at ward-level with communities, and at market with street vendors and hawkers. The details of consultation are provided in **(Table 12 & Appendix 1)**. In all 65 stakeholders participated in the consultations (male = 30, female = 35)

140. The people are willing to extend their cooperation as the activities are proposed to improve the water supply service levels and the living standards. Stakeholder expressed their concern regarding water charges, affordability, disturbance and loss of business due to the work in market area (dust, road closure etc.). The project team explained the proposed mitigation measures to mitigate / minimize such issues.

141. During the consultation/s the following queries were raised by the local communities and it was responded by the Concerned PIU/ PMC and DBO Contractors.

- All stakeholders were very supporting of the project, and extended full cooperation during the works as the activities are proposed to improve the water supply service levels and the living standards.
- Stakeholder expressed their concern regarding water charges, affordability, disturbance and loss of business due to the work in market areas, dust, road closure etc.).
- Water logging during rains, damage to existing utilities during excavation, disturbance to shops, traffic etc.,
- Stakeholders also indicated that a public notice on works, and awareness programs to be conducted
- The project team explained the proposed mitigation measures to mitigate / minimize such issues. Attention of stakeholders drawn to the EMP, and explained to them how the construction phase issues by avoided, minimized or mitigated and managed.

2. Consultation during Construction

142. Prior to start of construction, ULB and PIU with the assistance of PDMC will conduct information dissemination sessions at various places and solicit the help of the local community, leaders/prominent for the project work. At each ward/neighborhood level, focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts.

143. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction phases and also regarding the grievance redress mechanism. ULB / PIU and PDMC will organize public meetings and will appraise the communities about the progress on the implementation of EMP. Meeting will also be organized at the potential hotspots/sensitive locations before and during the construction.

C. Information Disclosure

144. Executive summary of the IEE will be translated in Hindi and made available at the offices of PMU, PIU, Nagar Parishad offices, and also displayed on their notice boards. Hard copies of the IEE will be accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Hindi will be placed in the official website of the MPUDC, PMU after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

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

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

147. The PMC/PIU and DBO Contractor will continue meaningful consultations and information disclosure during the construction phase. DBO Contractor will include records of consultations, issues/concerns, attendance sheets, and resolutions to the progress report to be submitted to PIU. This will be included by PMU in the environmental monitoring report to be submitted to ADB on a semi-annual basis.

Table 12: Summary of Consultation with Stakeholders at Subproject Towns Under Package 6C

Date	Location	No. of Participants	Participants	Topics Discussed	Issues raised / Remarks
10 January 2019	Office of the Nagar Parishad-Rahatgarh	Total = 08 Male = 08 Female = 0	Elected ward Councilors and Nagar Parishad officials	• Present drinking water supply source and its condition • Need of improvement of the present situation • Briefing on project objectives probable implementation procedures • Attention of stakeholders drawn to the EMP, and explained to them how construction phase issues be	• Participants welcome the water supply scheme and offered full cooperation with DBO Contractor as it will be beneficial to the community in all aspects. • Shown their displeasure with poor existing water supply in

				avoided, minimized or mitigated • Briefing about mitigation measures for local people during construction like- ▪ Construction area will be demarcated on both sides using hard barricade. ▪ Excess excavated soil storage during pipe lines work will be removed from the site immediately & disposed from the roads. ▪ Road restoration will be taken up immediately after backfilling by consolidation. ▪ Dust screens will be provided around work sites. ▪ Water will be sprinkled adequately in case of excess dust generated during pipe line work. ▪ Noisy works will be avoided in the night. • Potential positive and negative impacts due to project implementation • Land use and area to be covered under the project • Objective of Door to Door Survey etc. • Grievance Redress procedures	the town. • Nagar Parishad is operating the water supply system for the town, but capacity to be further built. • The Chairman of the ULB expressed need for the project and willingness to take it up; • The Nagar Parishad do not have capacity or resources to be party to sharing the loan repayment. • The prime concern and apprehension of the ULB Chairman regarding the project was whether it will be a financial burden on the Nagar Parishad. • Operation and maintenance of the facilities developed under the project and community participation; • Few participants also complained in the delay of progress. • People are ready to take new water connection in place of old one • People were agreeing to pay proposed water tariff. • All welcome the GRC under MPUSIP..
18 December 2018	Ward no 06	Total = 13 Male = 0 Female = 13	Community people	• Briefing on project objectives probable implementation procedures • Potential positive and negative impacts due to project implementation • Attention of stakeholders drawn to the EMP, and explained to them how construction phase issues be avoided, minimized or mitigated • Briefing about mitigation measures for local people during construction like- • Construction area will be demarcated on both sides using hard barricade.	• None of the people knew about the proposed project. On learning about the project, they expressed that they were happy that the entire community would be benefited from the upgraded water supply. • The community welcomed the project and expressed its need for it. • Slum dwellers showed willingness to

				• Excess excavated soil storage during pipe lines work will be removed from the site immediately & disposed from the roads. • Road restoration will be taken up immediately after backfilling by consolidation. • Dust screens will be provided around work sites. • Water will be sprinkled adequately in case of excess dust generated during pipe line work. • Noisy works will be avoided in the night. • Experiences sharing on-livelihood activities, Resettlement and • Rehabilitation, women empowerment, tribal development, health, education, convergence with existing government social security schemes	take water connections but demanded relaxation in user charges. • People were briefed about the complaint redress mechanism.
18 December 2018	Ward no 07	Total = 15 Male = 05 Female = 10	Community people	• Briefing on project objectives probable implementation procedures • Attention of stakeholders drawn to the EMP, and explained to them how construction phase issues be avoided, minimized or mitigated • Briefing about mitigation measures for local people during construction like- ▪ Construction area will be demarcated on both sides using hard barricade. ▪ Excess excavated soil storage during pipe lines work will be removed from the site immediately & disposed from the roads. ▪ Road restoration will be taken up immediately after backfilling by consolidation. ▪ Dust screens will be provided around work sites. ▪ Water will be sprinkled adequately in case of excess dust generated during pipe line work. ▪ Noisy works will be avoided in the night. • Potential positive and negative impacts due to project implementation • Experiences sharing on	• None of the people knew about the proposed project. On learning about the project, they expressed that they were happy that the entire community would be benefited from the upgraded water supply. • Slum dwellers showed willingness to take water connections but demanded relaxation in user charges. • People were briefed about the complaint redress mechanism.

				- livelihood activities, Resettlement and Rehabilitation, women empowerment, tribal development, health, education, convergence with existing government social security schemes etc. • Grievance redress procedures	
07th May 2018	Ward no 01	Total= 18 Male = 06 Female = 12	Local Residents	• Status of existing drinking water supply system; • Need for improvements to present system; • Relevant information of the upcoming project and benefits of the project. • Attention of stakeholders drawn to the EMP, and explained to them how construction phase issues be avoided, minimized or mitigated • Briefing about mitigation measures for local people during construction like- • Construction area will be demarcated on both sides using hard barricade. • Excess excavated soil storage during pipe lines work will be removed from the site immediately & disposed from the roads. • Road restoration will be taken up immediately after backfilling by consolidation. • Dust screens will be provided around work sites. • Water will be sprinkled adequately in case of excess dust generated during pipe line work. • Noisy works will be avoided in the night. • Potential positive and negative impacts due to project implementation • Ensuring no income loss	• The area has insufficient and inadequate drinking water supply. Water from two tube wells is presently supplied to the area/community. The area faces severe water crisis during the summer season when the ground water level drops. • The community welcomed the project and expressed need for it. However, they were apprehensive that their economic condition would prevent them from paying water user charges. • Possibility of exempting the poor and vulnerable from user charge payment.
07th May 2018	Ward no 06	Total = 11 Male = 11 Female = 0	Local Residents	• Briefing on project objectives probable implementation procedures • Briefing about mitigation measures for local people during construction like- ▪ Construction area will be demarcated on both sides using hard barricade. ▪ Excess excavated soil storage during pipe lines work will be removed from the site	• None of the people knew about the proposed project. On learning about the project, they expressed that they were happy that the entire community would be benefited from the upgraded water supply. • Slum dwellers showed willingness to take water connections

				immediately & disposed from the roads. ▪ Road restoration will be taken up immediately after backfilling by consolidation. ▪ Dust screens will be provided around work sites. ▪ Water will be sprinkled adequately in case of excess dust generated during pipe line work. ▪ Noisy works will be avoided in the night. • Potential positive and negative impacts due to project implementation • Experiences sharing on - livelihood activities,	but demanded relaxation in user charges. • People were briefed about the complaint redress mechanism.

VIII. GRIEVANCE REDRESS MECHANISM

A. Project Specific Grievance Redress Mechanism

148. A project-specific grievance redress mechanism (GRM) shall be established to receive, evaluate, and facilitate the resolution of AP"s concerns, com plaints, and grievances about the social and environmental performance at the level of the project. The following GRM provides a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project.

149. A common GRM will be in place for social, environmental, or any other grievances related to the project. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons" grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons" advice at each stage, as required. ULB-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign.

150. **Who can complain:** A complaint may be brought by persons who are, or could be, "directly indirectly, materially, and adversely" affected by the project. A complaint can be submitted on behalf of the affected person/people by a representative, provided that he or she identifies the affected person/people and includes evidence of the authority to act on their behalf.

151. **What the Grievance/Complain should contain:** Any concerns pertaining to safeguard compliance - environment, involuntary resettlement, indigenous people, design related issues, compensation, service delivery or any other issues or concerns related to the project. The complaint must contain name, date, address/contact details of the complainant, location of the problem area, along with the problem.

152. **Where to file a Complaint:** Complainants will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes to be installed by project at respective Nagar Parishad Offices, PIU offices or by e-mail or by writing in a complaints register in the PIU offices or at construction site offices.

153. **How to file a Complaint:** The application should be precise and specific. The application can be sent either by post or through electronic means or deliver personally. A sample grievance form is at **Appendix 19**.

(i) **Offline System -** The application can be made on the application form available at all accessible places (NPs / Office of PIUs / construction site offices). The application should have the name and complete postal address of the applicant.

(ii) **Online System -** Grievances pertaining to the implementation of the project can also be filed online at the website of MPUDC/PMU or by e-mails.

154. **Documentation:** Documentation of the complaints is important and must contain name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved. PMU with the support of PIU will have the overall responsibility for timely grievance redress, and for registration of grievances, related disclosure, and communication with the aggrieved party. All the documents made available to the public at the community level (at ward offices) and will include information on the contact number, address and contact person for registering grievances, and will be disseminated throughout the project area by the PIU.

155. **Grievance/Problem Redress through Participatory Process:** Efforts must be made by the PIU with the support of safeguard consultants to resolve problems amicably, conflicts through participatory process with the community and the Nagar Parishad. In case of grievances that are

immediate and urgent in the perception of the complainant, the Contractor, and supervision personnel from the PIU will provide the most easily accessible or first level of contact for the quick resolution of grievances. Contact phone numbers and names of the concerned staff and contractors, will be posted at all construction sites at visible locations.

156. Following process will be followed:

(i) **1st level grievance.** In case of grievances that are immediate and urgent in the perception of the complainant, PMC supervising staff will direct the contractor to and ensures that it is resolved. If the grievance is not under the contractor scope, but under the project, PMC (field office) will resolve this issue. All the grievances should be resolved within 3 days of receipt of a complaint/grievance.

(ii) **2nd level grievance.** All grievances that cannot be redressed at first level within 3 days will be brought to the notice of PIU and PMC Assistant Environmental Specialist. PIU will review the grievance and act appropriately to resolve it within 10 days of receipt.

(iii) **3rd level grievance.** All the grievances that are not addressed at 2nd level by PIU within in 10 days of receipt will be brought to the notice of notice of the Grievance Redressal Committee (GRC)[1]. GRC will meet twice a month and determine the merit of each grievance brought to the committee. The GRC will resolve the grievance within 1 month of receiving the complaint. The Nodal Officer will communicate all decisions taken by the GRC to complainant.

157. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. Alternatively, if the grievance is related to land acquisition, resettlement & rehabilitation2, the APs can approach the Land Acquisition, Rehabilitation and Resettlement Authority (LARRA) of Madhya Pradesh, established under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act, 2013.

158. **Record-keeping.** PIU will keep records of grievances received, corrective actions taken and the final outcome. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PIU office, ULB offices, and on the web.

B. Structure of GRM and its Functions

159. The GRM will have a three- tier decision making process. The first tier which is at the town level aims to resolve all construction related grievances which require quick and efficient action. The second tier which is at the project implementation unit (PIU) will handle complaints that could not be resolved by the first- tier level and/or grievances related to land acquisition and compensation. The third tier which is at the project management unit (PMU) or state level will handle complaints which are over and above the scope for the first and second tier and/or complaints which could not be resolved by the first and second tier levels.

160. Contact numbers of GRC Chair-person and members, CDO and contractor's focal person will be placed at appropriate locations like construction sites, ULB office etc.

161. The three-tier Grievance Redress Mechanism under MPUSIP is described below:

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[1] Grievance redress committee (GRC) will be formed at town-level with members composed of: ULB Chairperson ULB CMO, Environmental Specialist of PMC, PIU Dy.PM and PIU Community Development Officer.

[2] the Authority admits grievance only with reference to the LA and R&R issues under the new Act

C. Structure of GRM and its Functions

162. The GRM will have a three- tier decision making process. The first tier which is at the town level aims to resolve all construction related grievances which require quick and efficient action. The second tier which is at the project implementation unit (PIU) will handle complaints that could not be resolved by the first- tier level and/or grievances related to land acquisition and compensation. The third tier which is at the project management unit (PMU) or state level will handle complaints which are over and above the scope for the first and second tier and/or complaints which could not be resolved by the first and second tier levels.

163. Contact numbers of GRC Chair-person and members, CDO and contractor's focal person will be placed at appropriate locations like construction sites, ULB office etc.

164. The three-tier Grievance Redress Mechanism under MPUSIP is described below:

1st tier (At Town Level):
Composition of the Grievance Redress Committee (GRC):

- A representative of Chief Municipal Officer associated with Urban Local Body, Chairperson;
- CDO of ULB designated/nominated by ULB.
- Field Engineer of Project Management Consultants;
- Focal person (GRC Person) of DBO contractor of respective town;
- Field Engineer of concerned ULB designated by the respective PIU, Secretary;

Major Functions: The major functions of town level GRC is as follows:

- Registration of Grievances by the Local person (GRC Person) of DBO contractor of respective town Sorting of Grievances by Focal person (GRC Person) of DBO contractor of respective town and Chairperson;
- Forwarding grievances to concerned authorities i.e. Site Engineer for resolution;
- Information to the complainant on the decision taken to address registered complaint and expected time to resolve issue;
- Resolution of issues emerged due to construction;
- Feedback to the complainant on action completed against registered complaint and seeking complainant feedback on level of satisfaction;
- Closure of grievances by CDO-ULB or forwarding of complaint to PIU GRC if grievance remains unresolved.

2nd Tier {At PIU Level}:
Composition of the PIU level GRC:

- Project Manager, associated with Project Implementation Unit (PIU) of Madhya Pradesh
- Urban Development Company Limited - Chairperson
- An elected member nominated by Mayor in Council/ President in Council of associated
- Urban Local Body (ULB).
- A Social Worker nominated by Mayor in Council/ President in Council of associated Urban Local Body
- Commissioner of associated Urban Local Body/Chief Municipal Officer or Community
- Development Officer/Community Organizer of Urban Local Body.
- Community Development Officer CDO-PIU - Secretary

Major Functions: The following functions will be performed by the PIU level GRC:

- Registration of complaints by CDO-PIU from the 1st tier GRC and/or affected people;
- Eligibility assessment of grievances by the GRC Chairperson;
- Information to the complainant about eligibility of the complaint;
- Grievance Redress Committee meetings to discuss grievances and action required;
- Ensuring collection of detailed information about the eligible complaint;
- Assessment of complaint, draw conclusion from discussions and make recommendations;
- Develop action plan outlining activities required to implement the recommendations;
- Ensuring implementation of recommendations by stakeholders or concerned authorities;
- Monitoring actions of the recommendations in view of timeline;
- Feedback to the complainant on action completed against registered complaint and seeking complainant feedback on level of satisfaction;
- Closure of grievances by CDO-PIU or forwarding of complaint to PMU GRC if grievance remains unresolved.

3rd Tier {At PMU-State Level}
Composition of State Level GRC:

- Engineer in Chief, MPUDC – Chairperson
- Deputy Project Director (T)
- Deputy Project Director (A) (Secretary)
- Project Officer
- Community Development Officer CDO-PMU
- PMC TL or representative Advisor

Major Functions: The state level GRC will be responsible to perform the following functions:

- Registration of complaints received from GRC PIU and/or affected people;
- Information to the complainant about eligibility of the complaint;
- Eligibility assessment of grievances by the GRC PMU chairperson with support of the
- Secretary of state GRC- – whether grievance is eligible for consideration or not at the state level;
- Ensuring collection of required information about the eligible complaint;
- Assessment of complaint to draw conclusion from discussions and make recommendations;
- Develop action plan outlining activities required to implement the recommendations;
- Ensuring implementation of recommendations by stakeholders or concerned authorities;
- Monitoring actions of the recommendations in view of timeline;
- Closing complaint after all actions taken as per recommendations and feedback to the complainant.
- Advise to complainants about approach /appeal to the concerned department in case the complainant is not satisfied or complaint is beyond the scope of the GRC PMU.

Figure 12: Work Flow Diagram of GRM

D. Action Plan for the formation of the GRM

S. No	Action Plan	Time Line
A	Action required at PMU/PMC	
A1	Letter for formation of GRC and follow up	Pre -construction
A2	Development of GRM Manual	Pre -construction
A3	Orientation of GRC members by integrating with training/workshops/meetings	Construction
A4	Integration of GRC topic in BCC – like availability of GRC and its procedure	Construction
A5	Review of functioning of GRC by integrating with meetings and visits	Construction
B	Action at Town level	

B1	Formation of GRC at town level and inform to the PMU/PMC	Pre -construction
B2	Information to All ULB Officials/Public about existence of GRC, its committee members and their function	Construction
B3	Orientation of all GRC members during visit of PMU and PMC officials	Construction
B4	Tracking of complaint registered and its status	Construction
B5	Sharing status of grievances with PIUs with the help of GRC person	Construction
B6	Training of selected women to maintain grievances at customer service center (Educated Prerak (Motivator) may be considered)	Construction
B7	Complaint management	Operation and maintenance phase

E. Process of Grievance Redress Mechanism

165. The following process shall be adopted for receiving complaints and addressing received complaints:

Step 1: Receiving Grievances/ Complaints and its Registration at town Level

- All grievances, complaints, concerns shall be submitted verbally or in writing to CDO contractor's focal person or any GRC members – by filling the Complaint Registration Slip (Refer **Appendix 19**) and putting into the complaint box placed at construction sites or ULB office.
- Received complaints shall be recorded, compiled and Registered (Grievance Number) in a register (database) placed at the ULB by CDO with support of the contractor's focal person on a daily basis (24 hours). Each grievance shall be given a number to track status.

Step 2: Review of Grievances, Sorting, Information and Forwarding (24 hours)

- Registered grievances shall be reviewed by the CDO with support of the contractor's focal person.
- Based on type of grievances, CDO shall sort out grievances with support of the contractor's focal person.
- CDO (ULB) shall inform the GRC Chairperson about all grievances either by phone or in writing. At that time, CDO may suggest grievances can be managed by the site engineer to the GRC Chairperson;
- GRC Chairperson will determine eligibility of the complaints. Inconveniences caused by minor construction related issues shall be referred to the site engineer to resolve immediately or within 24 hours. For example -site engineer shall be instructed to resolve grievances associated with construction at the town such as restoration of road, obstruction in accessing house/shop or any place due to dumping of construction materials, dust etc. Site engineer will be responsible to respond to the complaints immediately. On the other hand, issues which cannot be resolved by the site engineer and if it is complex in nature shall be referred to GRC.
- CDO shall receive acknowledgement from concerned authorities (site engineer) on receipt of the grievances shared with them. CDO shall inform complainants regarding eligibility of their complaint and action to be taken by the concerned authority (site engineer/ GRC) within (24 hours). If the grievance is ineligible, complainants should be informed of the reasons;

Step 3: Eligibility and Preparation for GRC meeting (3 days)

- GRC Chairperson shall receive eligible complaints (copy of written complaint document or verbally recorded messages) from the CDO (ULB) and review details; GRC Chairperson may ask to collect baseline information about the grievances registered, if required.
- GRC Chairperson shall share list of documents with the GRC Secretary to collect baseline information on selected grievances to be addressed.
- The GRC Secretary shall arrange all documents with the help of CDO-ULB, CDO-PIU or the contractor's focal person in a proper way to present in front of GRC.
- GRC Chairperson shall call a meeting as per convenient date and time of the committee members.

Step 4: Assessment of the Grievance, Meeting and Plan of Action (7 days)

- If necessary, the GRC shall consult and seek relevant information about complaint from the concerned parties.
- On basis of the collected evidences, GRC shall draw conclusions and make recommendations for a solution.
- GRC Secretary shall keep record of the proceedings and decisions taken by GRC members to further track the status as per decided time line.
- The GRC shall agree on the action plan required to be implemented according to the recommendations made. The action plan shall include detailed activities along with timeline.
- GRC Secretary shall inform to the complainant about the decisions taken by the committee members and expected date of resolution of the grievance.
- If the complaint is complex, the GRC may request for additional time and resolution after proper assessment or refer the complaint to the GRC-PMU Level.
-

Step 5: Implementation of Action (30 days)

- The concerned parties shall be responsible to implement action plan according to recommendations of the GRC.
- The GRC members may arrange field trip and interact with the concerned persons, if needed before reaching the conclusion.

Step 6: Monitoring and Reporting (Monthly)

- CDO (ULB) shall be responsible to track and record status of all complaints -whether forwarded to site engineer or GRC in the database as follows – Grievance registered, Grievance in process to be resolved, Grievance addressed and closed, and Grievance forwarded to concerned authorities.
- CDO (ULB) shall be responsible to report/inform status of the complaints (received, addressed and forwarded) to the contractor for further reporting to respective PIU.
- Overall GRC chairperson shall be responsible for effective management of complaints at the town level.

Step 7: Closure of the Complaint

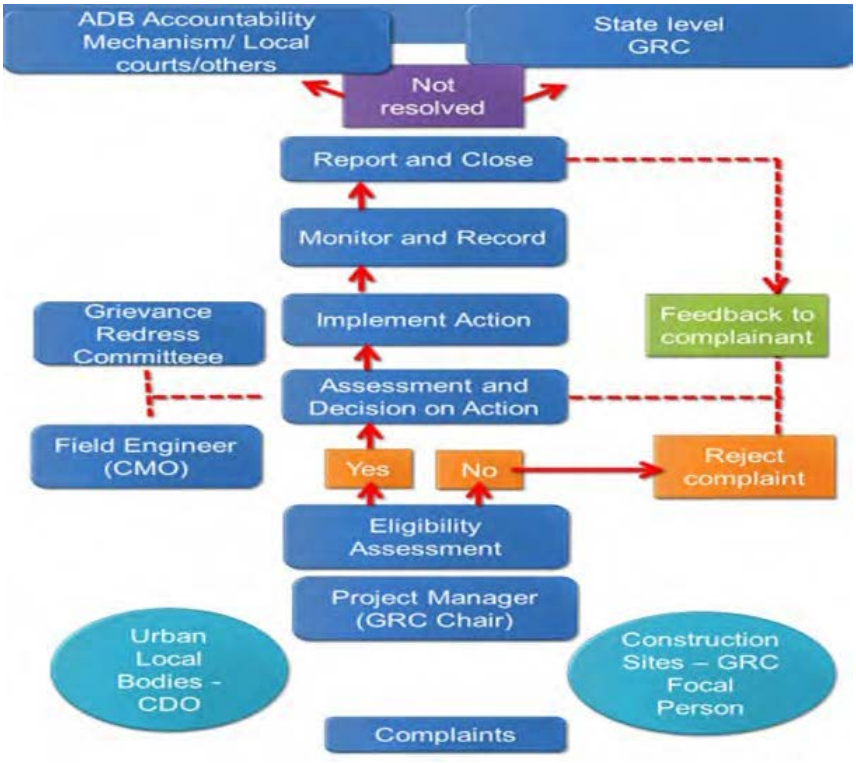
- GRC Secretary shall prepare a summary of the findings and share with GRC members.
- On agreement of all GRC members, GRC Secretary shall provide information to the complainant about decisions taken in writing/verbal on the registered complaint and seek feedback of the complainant about the decisions taken. A copy of the letter shall be kept as record with GRC Secretary and CDO (ULB).
- Complaint shall be considered closed if all actions have been taken and the complainant satisfied with the resolution.
- GRC Secretary shall prepare a closure report of the grievances handled by GRC members and the closure shall be documented by the CDO (ULB) in his register.

Step 8: Appeal to the State level GRC

- In the event that GRC PIU cannot make a decision on how to resolve the complaint, or if a complainant is not satisfied with the actions taken to resolve the complaint by the GRC (PIU), an appeal can be made to state level GRC (PMU) either by the GRC Chairperson (PIU) or complainant directly.
- GRC Chairperson (PIU) or complainant shall submit an appeal in writing to the state level GRC established at PMU.
- The state GRC Secretary shall register the case in consultation with Chairperson and provide a number of the grievances to be tracked.
- The state GRC Secretary shall acknowledge the registration of the grievance to the complainant in writing.
- The Secretary of the GRC shall review the registered grievances and collect required evidences from relevant parties to present case to the GRC.
- The state GRC Chairperson shall call a GRC meeting to review the complaint. GRC members shall get information about the meeting in advance to ensure their availability in the meeting.
- The state GRC shall draw conclusions and recommendations based on the evidence in the meeting. At the same time an action plan shall be developed for implementation with a timeline.
- The state GRC Secretary shall communicate decisions of the State GRC to the complainant in writing. The copy of the communication shall be kept with the state GRC Secretary as record.
- The recommendations shall be implemented immediately
- Upon completion of the recommended actions, the state GRC Secretary shall prepare a report on the closure of the complaint which will be signed by the complainant and state GRC Chairperson. A copy of the same shall be kept for record.

166. The structure and process of GRM is presented below for detailed understanding

Figure 13: Structure and Process of GRC



F. Monitoring and Evaluation systems of GRM

167. All grievances, concerns and complaints received shall be recorded by concerned authorities to be tracked. The status of the grievances shall be discussed in the review meetings organized at PIU and PMU level. The following indicators shall be monitored and recorded

- Number and type of complaints received;
- Number and % of complaints that have been resolved;
- Number and % of complaints that are unresolved;

168. The State GRC shall review grievance related data on monthly basis to evaluate the functionality of the system, as well as to note the followings:

- Failures to follow GRM procedures;
- Delays in complaint resolution, particularly those that can affect project construction;
- Most frequent types of grievances and complaints;
- Location(s) producing the most grievances and complaints;

169. The GRM is envisaged to provide a time bound and transparent mechanism to voice and resolve social and environmental concerns linked with the project. In this regard, MPUSIP had issued an official order along with the guideline to all PIUs and ULBs to establish grievance redress committee (GRC) at all awarded subproject towns. Copy of government order to form GRC at each subproject towns are enclosed as **Appendix 5 to Appendix 7**. Copy of GRC established in the subproject town Rahatgarh under package 6C is enclosed as **Appendix 8**. Status of the formation of GRC & List of GRC members at town level (subproject town Rahatgarh) is as follows in the Table 13 and Table 14.

Table 13: Status of GRC Formation Under Package 6C Subproject Town Rahatgarh

Sl. No.	Package No.	Name of the Town	Status of GRC Formation
1	6C	Rahatgarh	GRC formed on 22.09.2017

Table 14: List of GRC Members

S. No	Package	Town	Project Manager MPUDC	Elected Member Nominated by Mayor in Council/President in Council	Social Worker nominated by Mayor in Council/President in Council	Commissioner / CMO/Community Organizer of ULB	Community Deployment Officer of related PIU	Gender -Male (Nos)	Gender - Female (Nos)	Date
1	6C	Rahatgarh	BK Shrivastava	Mrs. Kalpana / Surendra Chourasiya	Mr. Narendra Rai	Miss Vidya Mishra, CMO	Shri Kashi Ram Khoiya	3	2	September 22, 2017

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

170. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

171. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between MPUDC, project management unit (PMU), project implementing unit (PIU), consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

172. The DBO contractor has prepared and submitted a site environmental plan (SEP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMP; and (iv) budget for EMP implementation to PMU/ADB for review and approval. No works are allowed to commence prior to approval of SEP.

173. A copy of the updated EMP/approved SEP has been kept on site during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

174. For civil works, the contractor will be required to (i) carry out all of the mitigation and monitoring measures set forth in the updated EMP/approved SEP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this final IEE including updated EMP. The contractor shall allocate budget for compliance with these EMP measures, requirements and actions.

175. The following table 15 to table 20, shows the potential environmental impacts, proposed mitigation measures and responsible agencies for implementation and monitoring during design stage, pre-construction stage, construction stage and operation stage.

Table 15: Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation / Monitoring	Cost and Source of Funds
Design of water supply system	Unsustainable source; resource & energy use	• Discontinuation of current unsustainable groundwater source and creating a new comprehensive water supply system based on a nearest surface water source i.e. Bina River for Rahatgarh town. • Limiting the height of water impounding structure (weir) in Rahatgarh to the height of the river banks so that the storage is limited to the river course • Provision of sluice gate to allows heavy monsoon flow freely without any obstruction, and also avoids dam silting • Design of apron to arrest erosion of the river bank of the downstream of dam • Appropriate location of weir & river intake to ensure water availability throughout the year • Recovering wash water from treatment process • Treatment and reuse of sludge from treatment process • Minimizing water losses from pipelines by perfect jointing and alignments using appropriate techniques (HDPE pipes up to 150 mm dia joined by electro fusion couplers using on-site electro fusion welding, and all higher dia pipes by on site butt welding) • Designing the entire system to maintain optimal flow and terminal pressure, and optimizing the overall energy usage • Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies • Improve water use efficiency and reduce water wastage at household level by recording and monitoring the water usage, and charging the consumers as per usage; due consideration to urban poor • Minimize unaccounted for water (UFW) losses using district metered area approach with flow meter and pressure logging arrangements to identify and rectify the leaks, and unauthorized connections • Using low-noise and energy efficient pumping	DBO Contractor / PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation / Monitoring	Cost and Source of Funds
		systems • During the design, construction, and operation of the project, apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines (IFC's General EHS Guidelines11 and Sector Specific (Water and Sanitation) Guidelines12).		
Water abstraction from Bina River	Project sustainability & water use conflicts	• Obtain permission from Water resources department, GoMP, - this already obtained	PMU & Rahatgarh Nagar Parishad	Project Costs
Waste generation from WTP operations	Environmental pollution	• Obtain consent from MPPCB for WTP at Rahatgarh prior to start of construction – It is already obtained	PMU / Nagar Parishad; DBOC to prepare application, and assist as required	No costs; scope of IA & DBO
Chlorine usage as disinfectant at WTP	Chlorine handling & application risk – health & safety risk to workers and general public	• **Provide the following measure at the chlorine application unit:** o Chlorine neutralization pit with a lime slurry feeder o Proper ventilation, lighting, entry and exit facilities o Facility for isolation in the event of major chlorine leakage o Personal protection and safety equipment for the operators in the chlorine plant o Provide training to the staff in safe handling and application of chlorine; this shall be included in the contract of Chlorinator supplier o Supplier of Chlorinator equipment shall provide standard operating manual for safe operation and as well as maintenance and repairs; preferably these shall be provided both in English and Hindi Languages	DBO Contractor / PMU	Project Costs

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

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation / Monitoring	Cost and Source of Funds
Socio Cultural Resource	Encroachment / damage to protected monuments and chance finds	• Obtain ASI permission for construction of WTP and intake well within 300 m of protected monuments prior to start of bidding – this already obtained • Include ASI as project stakeholder, Rahatgarh local representative of ASI should be included in the town level committee • Proper procedures (protocol) shall be used by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve: • Having excavation observed by a person with archaeological field training; contractor should employee a person with a formal certification course in archaeology from recognized (such as Institute of Archaeology, ASI, Delhi) during the ground excavation activities • Conduct awareness training to contractor & supervision staff prior to start of excavation • Stopping work immediately to allow further investigation if any finds are suspected; • Calling in the ASI if a find is suspected, and taking any action they require to ensure its removal or protection in situ	DBOC to follow, enhance where possible. PMU to ensure compliance.	Project Costs

Table 16: Pre-Construction State Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
EMP Implementation & reporting	Unsatisfactory compliance to EMP	• Appoint EHS supervisor and designate 1 EHS coordinator (among the technical staff) in each town • Ensure that all pre-construction activities are complete prior to start of construction work • Updated IEE / site specific EMP will be submitted • Ensure timely submission of	DBO contractor	• Ensure that all pre-construction activities are complete prior to start of construction work • Ensure timely submission of monitoring reports	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		monitoring reports			
Utilities	Telephone lines, electric poles and wires, water lines within proposed project area	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and • Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. • Require contractors to prepare spoils (waste) management plan (Appendix 14) and traffic management plan (Appendix 16)	DBO Contractor in collaboration with PIU and with approval of PMU	• List of affected utilities and operators; • Bid document to include requirement for a contingency plan for service interruptions (example provision of water if disruption is more than 24 hours), waste management plan and traffic management plan	Project costs – general construction practice
Construction work camps, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; disruption to traffic flow and sensitive receptors	• Prioritize barren, waste, infertile, vacant lands within the area, • Shall not be located in productive agricultural lands, water bodies, natural drainage channels, flood plains & groundwater recharge areas, forests, vegetative lands, etc. • Prioritize areas within or nearest possible vacant space in the project location; • If it is deemed necessary to locate elsewhere, consider sites that will not promote instability flooding and result in destruction of property, natural drainage, vegetation, irrigation, and drinking water supply systems; • For private lands, obtain land owner's (not lessees) written consent; indicate the requirement for reinstatement to original • Do not consider residential areas;	DBO Contractor to finalize locations in consultation and approval of PIU	• List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas. • Written consent of landowner/s (not lessee/s)	Project costs – general construction practice

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		• Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. • For excess spoil disposal, ensure (a) site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (c) no residential areas shall be located within 50 m downwind side of the site; and (d) site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies. • Document site's pre-project conditions			
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.	• Prioritize sites already permitted by the Department of Mines and Geology • No new borrow areas / quarries will be created for the work • If new new quarries sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and contractor shall be obtain all necessary permissions as per the law in force • If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU. • Maintain a construction material	DBO Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIU	• List of approved quarry sites and sources of materials;	Part of project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		register at the site • A monthly report will be submitted to PIU on construction material quantity (sources-wise) • All clearance/license copies of quarries / borrow areas are provided to PIU for prior approval			
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to award of civil works. • Ensure that all necessary approvals for construction to be obtained by contractor are in place including in compliance with labour laws, before start of construction • Contractor to acknowledge in writing to PIU and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. • Copies of all permission / approvals are submitted to PIU prior to start of work • Include in detailed design drawings and documents all conditions and provisions if necessary	PIU and PMU	• Incorporated in final design and communicated to contractors.	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU.
Asbestos Cement Pipes	Health risk due to exposure to asbestos materials	• Obtain details from PHED/NPs on location of underground AC pipes • Locate the new pipe/sewer carefully to avoid encountering AC pipes • Leave the AC pipes undisturbed in the ground.	DBO Contractor in coordination with PIU and PMC	• Detailed construction drawings showing alignment of AC pipes	No cost required. Mitigation measures are part of TOR of PIU and PMDSC
Guidelines to be followed for establishing construction camps / labour camps	Establishing construction camps / labour camps	• Camp sites shall be away from residential areas (100 m), sensitive areas (schools, hospitals, etc. 250 m,), water bodies (500 m) and forests (more	DBO Contractor to finalize locations in consultation and	• List of selected sites for construction work camps/labour camps	Project costs – general construction practice

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		than 1 km) • Use unused, vacant lands; no trees shall be cut • Provide a proper fencing/compound wall • Prepare a site layout plan & display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Living quarters and construction camps shall be provided with standard materials; no shacks or huts • Adequate lighting and ventilation • Provide drinking water, water for other uses, and sanitation facilities; drinking water should be regularly tested • Provide clear pathways for safe movement • Provide cooking fuel (cooking gas); and a separate safe place to cook; fire wood not allowed • Construct septic tanks and soak pit arrangement for wastewater disposal • Solid waste shall be properly manager – provide separate bins, compost biodegradable waste; sell recyclable waste • Camp sites shall be cleared and restored to original after completion of work, all debris, wreckage cleared	approval of PIU		
	Work site management	• Provide a proper fencing/compound wall • Prepare a site layout plan &	DBO Contractor	• Provide a proper fencing/compound wall	Project costs – general construction

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Provide clear pathways (for workers/staff) and roads (for vehicles) for safe movement in the work site			practice
	Worker amenities at all work sites	• A temporary rest area for workers (for resting in break time, protection against rain/sun, eating etc.) • Drinking water • Wash area, toilets (separate for women); mobile toilets for linear work • Septic tank and soak pits for waste disposal • First aid	DBO Contractor	• Provide basic facilities for site worker	Project costs – general construction practice

Table 17: Construction Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
EMP Implementation Training	Irreversible impact to the environment, workers, and community	• Project manager, staff and all key workers will be required to undergo training on EMP implementation including spoils/waste management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc. prior to start of work	DBO Contractor	Certificate of Completion (Safeguards Compliance Orientation) Posting of EMP at worksites	Cost of EMP Implementation Orientation Training to contractor is responsibility of PMU. Other costs responsibility of contractor.
Air Quality	Emissions from construction	**Vehicle emissions;** • Fit all heavy equipment, and	DBO	• Location of stockpiles; • Complaints from	Cost for implementation of

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	vehicles, equipment, and machinery used for installation of pipelines resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons.	machinery with air pollution control devices which are operating correctly; all the vehicle shall meet the emission norms and shall have valid pollution under control (PUC) certificate (Appendix 11) • Pollution under control (PUC) certificate will be obtained for all vehicles, equipment, and records maintained **Dust Control;** • Dust screen will be provided around work sites (OHT, GLSR, WTP, intake etc.) • Loose soil on work sites, vehicle and worker movement areas will be properly rammed and stabilized to minimize dust generation; it will be ensured that no loose soil surface at working places • Access to work area will be controlled; unnecessary movement of vehicles, workers and public in work areas will be controlled to minimize soil disturbance • Prior to any leveling or earth moving activity, water will be sprinkled to avoid dust • Damp down exposed soil and any stockpiled material on site by water sprinkling; • Water will be sprinkled adequately (at least daily 3 times in dry weather) to maintain surface in stabilized and damp condition • Material stocks will be covered with tarpaulins/covers at the sites • Use tarpaulins to cover sand and other loose material when transported by trucks; • Loose material from trucks will be unloaded in a barricaded area and	Contractor	sensitive receptors; • Heavy equipment and machinery with air pollution control devices; • Pollution under control certificate	mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		with water sprinkling • Clean wheels and undercarriage of haul trucks prior to leaving construction site • Disallow access in the work area except workers to limit soil disturbance and prevent access by barricading and security personnel **Dust control from pipeline works;** • Construction area will be barricaded on both sides using hard barricades of 2m height • Site clearance and excavation work will be commenced only after barricading the site • Works and all associated activities (material, soil, debris, equipment, machinery) will be confined to barricaded area • Excavated soil storage will be removed from the site immediately & stored/disposed at identified site • Work will be undertaken section wise (100-500 m) at various places; these sections will be demarcated and barricaded and trench filled • Work will be conducted work sequentially - excavation, pipe laying, backfilling; testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done • Excavated soil will be removed section-wise, and used for filling the previous section, this is to avoid stocking of excavated soil • Road restoration will be taken up immediately after backfilling by proper consolidation			
Surface water quality	Water pollution / works in rainy season,	• No earthwork will be conducted during rainy season • All earthworks be conducted during	DBO Contractor	• Areas for stockpiles, storage of fuels and lubricants and waste	Cost for implementation of mitigation

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	the dry season to prevent the problem of soil run-off during monsoon season; • Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; • Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used; • Disposal sites will be selected prior to start of construction following the EMP guidelines • Dispose any wastes generated by construction activities in designated sites; and • Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies to control water pollution; • Place storage areas for fuels and lubricants away from any drainage leading to water bodies; • Temporary drains or bunds will be created around the periphery of work area to avoid flooding, and entry of runoff • Accumulated water in work areas / excavated pits will be pumped to a temporary ponds / sedimentation basin; only clarified water will be disposed into drains • Safety measures will be undertaken to avoid any risk of collapse due to water entry • Conduct surface quality inspection according to the Environmental Management Plan (EMP).		materials; • Records of surface water quality inspection; • Effectiveness of water management measures; • No visible degradation to nearby drainages, nallahs or water bodies due to civil works	measures responsibility of contractor.
Weir & Intake Construction	Pollution of Bina River due to weir	• Select a construction methodology that is least disturbing, and	DBO contractor	• No visible degradation to nearby drainages,	Cost for implementation of

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
works in Bina River	& intake well construction	appropriate for the in-situ soil condition, and able to complete the construction work prior to onset of monsoon • Schedule the construction works in river bed during summer where there is no flow / low water level period – late winter months to pre monsoon (February – June/July); ensure that works are completed during the same period to prior to onset of monsoon; confirm with dam authorities on release of water; avoid scheduling the works during water release period. • Do not disturb river bed except the actual work area; no equipment, machinery shall be operated outside the work area • Erect temporary barriers to form enclosed construction area with least disturbance • Allow adequate time settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the reservoir; any silt laden water should be pumped to a silt pond • Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage • Clean up the area after the completion & prior to the onset of monsoon flow		nallahs or water bodies due to civil works • water quality monitoring results	mitigation measures responsibility of contractor.
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and	• Noisy works will be avoided in the night • Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;	DBO Contractor	• Complaints from sensitive receptors; • Use of silencers in noise-producing equipment and sound barriers; • Equivalent day and night time noise levels	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	people	• Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; • Drivers will be trained to avoid usage of horns unnecessarily • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor; and • Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s. • Before undertaking work with heavy noise/vibration, surrounding area / buildings will be surveyed to identify any old / sensitive buildings at risk, and necessary precautions will be taken to avoid any risk • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity; • Noisy works will not be conducted near sensitive places (hospitals, schools, etc.,) and at sensitive times (festivals etc.,); works will be scheduled accordingly			
Landscape and aesthetics	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils,	• Prepare and implement a Construction Waste Management Plan • All the cut and open surfaces shall be properly consolidated and protected with surface pitching /grass turfing etc. as appropriate to avoid any surface erosion • Excess soil / debris will be utilized in construction / useful purposes to avoid disposal	DBO Contractor	• Complaints from sensitive receptors; • Worksite clear of hazardous wastes such as oil/fuel • Worksite clear of any excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	oils, lubricants, and other similar items.	• Excess soils/debris will be removed from site on regular basis to avoid stockpiling at site • Disposal site will be identified prior to start of work following EMP guidelines • Stockpiles, lubricants, fuels, and other materials should be located away from steep slopes and water bodies; • Avoid stockpiling any excess spoils. Excess excavated soils should be dispose to approved designated areas; • Domestic waste generated at camp sites will be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; biodegradable waste composted in impervious pit at site; recyclable waste will be sold in market • Residual and hazardous wastes such as oils, fuels, and lubricants will be disposed via licensed agencies by MPPCB • Burning of construction and domestic waste will not be allowed • Ensure that wastes are not haphazardly dumped within the project site and adjacent areas. • Sites will be managed neatly; waste collection bins will be provided, awareness will be created among workers, staff in site cleanliness • All camp/work sites will be restored to original condition after the completion of work • Get approval of PIU in writing that the necessary environmental restoration work has been		materials, empty containers	

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		adequately performed before acceptance of work.			
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	• Obtain from PIU the list of affected utilities and operators if any; • Prepare a contingency plan to include actions to be done in case of unintentional interruption of service	DBO Contractor	• Existing Utilities Contingency Plan	Cost for implementation of mitigation measures responsibility of contractor.
Ecological Resources – Terrestrial	Loss of vegetation and tree cover	• Avoid removal of trees and vegetation along the roads best pipeline alignments and layout planning of reservoirs and facilities, however, if this cannot be avoided fully, undertake compensatory tree plantation (5 trees to 1 tree removed) • Minimize removal of vegetation and disallow cutting of trees; • If tree-removal will be required, obtain tree-cutting permit and (iii) Plant 5 native trees for every one that is removed.	DBO Contractor	• PIU to report in writing the no of trees cut and planted.	Cost for implementation of mitigation measures responsibility of contractor.
Land use	Environmental Issues due to land use change	• The impact due to change in land use will be negligible due to this project.	Not applicable	• Not applicable	Not applicable
Accessibility	Traffic problems and conflicts near project locations and haul road	**Traffic management / access during pipeline works;** • Pipeline work implementation plan will be prepared for each road; works will not be conducted in all roads at once in a locality; alternative roads for traffic movement will be ensured • A simple traffic management plan will be prepared in consultation with traffic police for each road, and displayed on site; one-week prior notice will be provided • Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic	Construction Contractor	• Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite (Appendix 16); • Complaints from sensitive receptors; • Number of signages placed at project location.	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		aids if transportation activities cannot be avoided during peak hours • Temporary diversions will be provided as required, with prior public information • Confine work areas along the roads to the minimum possible extent; all the activities, including material & waste/surplus soil stocking should be confined to this area. Proper barricading should be provided; avoid material/surplus soil stocking in congested areas – immediately removed from site/ or brought to the as and when required • Work area will be properly defined, barricaded; minimum strip of land will be used • Material / waste / soil will not be stocked obstructing the traffic, pedestrian etc., • Trench width will be minimized as much as possible by adopting best construction methods with proper shoring/bracing • Work site will be kept free from all unnecessary obstructions • Public information boards, sign boards, caution boards will be provided along with contact numbers • Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. • Prior to start of pipeline work, information will be provide to the public through media – newspapers and local cable television (TV) services			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		Access to houses/business during pipeline works; • Access to any house, business or property will not be blocked completely, at least safe pedestrian access will be maintained • Leave spaces for access between mounds of soil; • Provide walkways, wooden and metal sheets/planks on excavated trenches where required to maintain access across for people and vehicles; **Material transport using heavy trucks;** • Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; • Material haulage vehicles will main/wide roads as far as possible • Transportation / hauling activities will be conducted during non-peak hours (6:30 am to 8:00 am) • Locate entry and exit points in areas where there is low potential for traffic congestion; • Proper entry and exits facilities will be provided at low traffic places • Keep the site free from all unnecessary obstructions; • Drivers will be trained to drive vehicles in a considerate manner and following all traffic rules **For works in very narrow roads;** • Inform the local / affected local population / business, 1-week in advance about the work schedule and access restrictions • Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum.			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		• Provide pedestrian access in all the locations until normalcy is restored. Provide wooden/metal planks over the open trenches at each house to maintain the access.			
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	• Leave spaces for access between mounds of soil; • Provide walkways and metal sheets where required to maintain access across for people and vehicles; • Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools; • Consult businesses and institutions regarding operating hours and factoring this in work schedules; and • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints. • Notify community/ water users in advance about likely interruptions in water supply. • Provide alternate sources of clean water until water supply is restored.	DBO Contractor	• Complaints from sensitive receptors; • Spoils management plan • Number of walkways, signages, and metal sheets placed at project location.	Cost for implementation of mitigation measures responsibility of contractor.
Socio-Economic – Employment	Generation of temporary employment and increase in local revenue	• 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; • Comply with labor laws	DBO Contractor	• Employment records; • Compliance to labor laws (see Appendix 13 of this IEE)	Cost for implementation of mitigation measures responsibility of contractor.
Occupational Health and Safety	Occupational hazards which can arise during work	• Comply with all national, state and local core labor laws (see Appendix 13 of this IEE) • Following internationally recognized health and safety standards such as the World Bank Group's Environment, Health and Safety	DBO Contractor	• Site-specific OH&S Plan; • Equipped first-aid stations; • Medical insurance coverage for workers; • Number of accidents; • Supplies of potable	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		Guidelines (IFC's General EHS Guidelines[13] and Sector Specific (Water and Sanitation) Guidelines[14]). • Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; • Site will be prepared and maintained to create safe working conditions; workers will be provided with safe work areas, elevated platforms, steps, ladders, walkways /access to work areas and amenities • Deep excavations (more than 1 m) will be properly protected to avoid collapse (safety measures such as / shoring / safe slopes) • Hard barricading will be provided around deep trenches / pits of more than 1.5 m deep • All necessary precautions will be taken to avoid collapse of trench/pit, and damage to surrounding structures • Proper personnel protection equipment will be provided to all workers / staff; and its use will be ensured		drinking water; • Clean eating areas where workers are not exposed to hazardous or noxious substances; • record of H&S orientation trainings • personal protective equipment; • % of moving equipment outfitted with audible back-up alarms; • permanent sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. • Compliance to core labor laws (see Appendix 13 of this IEE)	

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

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		• Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; • Provide medical insurance coverage for workers; • All installations will be properly secured from unauthorized intrusion and accident risks; hazardous locations will be properly marked • All work sites will be properly secured, barricaded to avoid unauthorized public/traffic entry • Provide road signs and flagman to regulate traffic / pedestrians / road users, of on-going trenching activities • Site safety orientation will be provided to all visitors to the site • Drinking water, sanitation, washing and resting facilities will be provided at all sites; separate sanitation facilities for women • Provide clean eating areas where workers are not exposed to hazardous or noxious substances; • Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		areas; • Proper audible back-up alarms will be ensured for all moving equipment/machinery • Provide safety sign, caution, information boards on site for workers and staff awareness, follow up • 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 • Emergency procedures and contact information will be provided on all sites • Accidents will be promptly registered and reported; register will be maintained at every work site • Public compliant box and compliant register will be provided at every work site • 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.			
Asbestos Cement (AC) Materials	Health risks associated with AC pipes	• Location of existing/old AC pipes will be identified prior to excavation for new pipes • Underground AC pipes will left as it is in the ground without disturbing / touching • Awareness will be created among workers and supervisors on AC	DBO Contractor	• on site observations & records	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		pipes			
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	• Plan routes to avoid times of peak-pedestrian activities. • Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. • Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. • Provide road signs and flag persons to warn of on-going trenching activities.	DBO Contractor	• Traffic Management Plan; • Complaints from sensitive receptors	Cost for implementation of mitigation measures responsibility of contractor.
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	• Provide prior information to the local people about the nature and duration of work • Conduct awareness program on safety during the construction work • Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day • Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	DBO Contractor	• Complaints from neighborhood and monitoring of accidents	Cost for implementation of mitigation measures responsibility of contractor.
Work Camps and worksites	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants Unsanitary and poor living conditions for	• Consult with PIU before locating project offices, sheds, and construction plants; • Minimize removal of vegetation and disallow cutting of trees; • Provide drinking water, water for other uses, and sanitation facilities for employees; • Ensure conditions of livability at work camps are maintained at the highest standards possible at all times; • Prohibit employees from poaching wildlife and cutting of trees for firewood;	DBO Contractor	• Complaints from sensitive receptors; • Drinking water and sanitation facilities for employees	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	workers	• Train employees in the storage and handling of materials which can potentially cause soil contamination; • Recover used oil and lubricants and reuse or remove from the site; • Manage solid waste according to the preference hierarchy: reuse, recycling and disposal to designated areas; • Ensure unauthorized persons specially children are not allowed in any worksite at any given time.			
Establishing construction camps / labour camps	Guidelines to be followed for establishing construction camps / labour camps	• Camp sites shall be away from residential areas (100 m), sensitive areas (schools, hospitals, etc. 250 m,), water bodies (500 m) and forests (more than 1 km) • Use unused, vacant lands; no trees shall be cut • Provide a proper fencing/compound wall • Prepare a site layout plan & display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Living quarters and construction camps shall be provided with standard materials; no shacks or huts • Adequate lighting and ventilation • Provide drinking water, water for other uses, and sanitation facilities drinking water should be regularly tested • Provide clear pathways for safe movement • Provide cooking fuel (cooking gas); and a separate safe place to cook; fire wood not allowed	DBO Contractor	• Complaints from sensitive receptors; • Drinking water and sanitation facilities for employees	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		• Construct septic tanks and soak pit arrangement for wastewater disposal • Solid waste shall be properly manager – provide separate bins, compost biodegradable waste; sell recyclable waste • Camp sites shall be cleared and restored to original after completion of work, all debris, wreckage cleared			
	Work site management	• Provide a proper fencing/compound wall • Prepare a site layout plan & display at the site; uniformly label (name boards) all the places in the facility • Entire site/facility area shall be provided with hard leveled surface as appropriate; no loose soil, slush, water logging etc., • Provide clear pathways (for workers/staff) and roads (for vehicles) for safe movement in the work site	DBO Contractor	• Complaints from sensitive receptors; • Provide a proper fencing/compound wall • Provide clear pathways (for workers/staff) and roads (for vehicles) for safe movement in the work site	Cost for implementation of mitigation measures responsibility of contractor.
	Worker amenities at all work sites	• A temporary rest area for workers (for resting in break time, protection against rain/sun, eating etc.,) • Drinking water • Wash area, toilets (separate for women); mobile toilets for linear work • Septic tank and soak pits for waste disposal • First aid	DBO Contractor	• Drinking water and sanitation facilities for employees • First aid	Cost for implementation of mitigation measures responsibility of contractor.
Social and Cultural Resources	Risk of archaeological chance finds	• Excavation work shall be supervised by a person with archaeological training • If any chance find is suspected during excavation/works, work will be immediately stopped, and report to PIU/PMU and PMC • Stop work immediately to allow further investigation if any finds are suspected;	DBO Contractor	• mobilization of archeologist • Records of chance finds	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		• Necessary action as suggested by concerned authorities will be undertaken			
Submission of EMP implementation report	Unsatisfactory compliance to EMP	• Appointment of (I) EHS Supervisor and Archeological supervisor to ensure EMP implementation • Timely submission of monitoring reports including pictures	DBO contractor	• Availability and competency of appointed supervisor • Monthly report	Cost for implementation of mitigation measures responsibility of contractor.
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	• All spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required will be removed; and • All excavated roads shall be reinstated to original condition. • All disrupted utilities will be restored • All affected structures rehabilitated / compensated • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these will be cleaned up. • All hardened surfaces within the construction camp area will be ripped, all imported materials removed, and the area will be top soiled and regrassed using the guidelines set out in the revegetation specification that forms part of this document. • The contractor must arrange the cancellation of all temporary services • Restoration to original will be documented and reported to PIU • .Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	DBO Contractor	• PIU/PDMC report in writing that (i) worksite is restored to original conditions; (ii) camp has been vacated and restored to pre-project conditions; (iii) all construction related structures not relevant to O&M are removed; and (iv) worksite clean-up is satisfactory.	Cost for implementation of mitigation measures responsibility of contractor.

Table 18: Operation Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Check for blockage and leakage problems reducing the water losses	Loss of water, increased demand and inconvenience to consumers & general public	• Effective leak detection and water auditing to reduce the water losses	DBO Contractor	• PIU and respective Nagar Parishad Rahatgarh	Operating costs
Water contamination – raw water contamination at source and treated water during transmission	Impacts on public health	• Ensure protection of water source quality (Bina River), any entry of wastewater into the river upstream of sites should be prevented. • Contamination of treated water during transmission and distribution should be prevented by quickly identifying, isolating and repairing the leak section. Develop a system of leak detection and rectification. • Conduct regular monitoring of raw & treated water and ensure that water supplied at all times meets the drinking water standards (Appendix 12)	Rahatgarh Nagar Parishad DBO Contractor	• PMU in coordination with WRD • PIU and respective Nagar Parishad Rahatgarh	Operating costs
Discharge the impurities and other solids collected due to filtration and back wash	Pollution of streams /drains	• Backwash water will be recirculated so no wastewater generated from WTP • Maintain the mechanical parts as per the maintenance plan to avoid any hazards	DBO Contractor	• PIU and Rahatgarh Nagar Parishad	Operating costs
Sludge generation	Land and water pollution, impacts on health & environment	• Collect the sludge from WTP units, dry in sludge drying beds, and reuse / dispose safely as per the design	DBO Contractor	• PIU and Rahatgarh Nagar Parishad	Operating costs
Increased in sewage generation	Water pollution, and impacts on	• Sanitation facilities needs to be improved at community level and at the town level to meet	Rahatgarh Nagar Parishad	• PMU	To be identified - respective NPs

	public health and environment	the increased sewage demand			
Generation of waste materials	Impacts on public health and environment	• Collect solid wastes and dispose to approved disposal yards	DBO Contractor	• PIU and Rahatgarh Nagar Parishad	Operating costs
Occupational health and safety	Health, social and economic impacts on the workers	• Provide appropriate PPE to workers & training on its proper use • Use fall protection equipment when working at heights. • Maintain work areas to minimize slipping and tripping hazards. • Implement a training program for operators who work with chlorine regarding safe handling practices and emergency response procedures. • Prepare escape plans from areas where there might be a chlorine emission. • Install safety showers and eye wash stations near the chlorine equipment and other areas where hazardous chemicals are stored or used. • Prohibit eating, smoking, and drinking except in designated areas. • Comply with all national, state and local core labor laws (see Appendix 13 of this IEE) • Following internationally recognized health and safety standards such as the World Bank Group's Environment, Health and Safety Guidelines (IFC's General EHS Guidelines[15] and Sector	DBO Contractor	• PIU and Rahatgarh Nagar Parishad	Operating costs

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

		Specific (Water and Sanitation) Guidelines16). • Develop and Implement site-specific occupational health and safety (OH&S) plan which will include measures, such as the following • Excluding public from the site;			

Table 19: Construction Stage Environmental Monitoring Plan

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Construction disturbances, nuisances, public & worker safety,	All work sites	Implementation of dust control, noise control, traffic management, & safety measures. Site inspection checklist to review implementation is appended at Appendix 17	Regularly as required during construction; checklist to be filled monthly once	Supervising staff and safeguards specialists	Part of TOR of PIU, PMC and PMU
Ambient air quality	**Total three (3) locations at Rahatgarh town** 1. WTP 2. OHT 3. Pipeline work sites	PM10, PM2.5 NO2, SO2, CO	Once before start of construction Quarterly (yearly 4-times) during construction (2 year period considered)	DBO Contractor	Cost for implementation of monitoring measures responsibility of contractor (27 samples x 5000 per sample = 1,35,000)
Ambient noise	**Total three (3) locations at Rahatgarh town** 1. WTP 2. OHT 3. Pipeline work sites	Day time and night time noise levels (24 hours)	Once before start of construction Quarterly (yearly 4-times) during construction (2 year period considered)	DBO Contractor	Cost for implementation of monitoring measures responsibility of contractor (27 samples x 1500 per sample = 40,500)
Surface water quality	02 Locations Intake/Weir, Bina river (Upstream, downstream)	• pH, Oil & grease, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity	Once before start of construction and monthly during construction (12 months period considered)	DBO Contractor	Cost for implementation of monitoring measures responsibility of contractor (26 samples x 4000 per sample = 1,04,000)

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

Table 20: Operation Stage Environmental Monitoring Plan

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Source water quality	Near intake point in Bina River (for Rahatgarh)	pH, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity heavy metals & pesticides	Yearly twice (pre & post monsoon)	DBO Contractor	O&M costs
Monitoring of quality of water supplied to consumers	Consumer end-random sampling in all zones	pH, Nitrite, Nitrate, Turbidity, Total Alkalinity, Total coliform and Fecal coliform	Monthly once	DBO Contractor	O&M costs
Sludge quality and suitability as manure	WTP	Analysis for concentration of heavy metals and confirm that value are within the following limits (all units are in mg/kg dry, except pH) • Arsenic - 10.00, • Cadmium - 5.00 • Chromium - 50.00 • Copper - 300.00 • Lead - 100.00 • Mercury - 0.15 • Nickel - 50.00 • Zinc - 1000.00 • PH - 5.5-8.5	Yearly once	DBO Contractor	O&M costs

B. Implementation Arrangements

176. Urban Development and Housing Department (UDHD) of Government of Madhya Pradesh is the Executing Agency for the Project, responsible for management, coordination and execution of all activities funded under the loan. Implementing Agency is Madhya Pradesh Urban Development Company (MPUDC), a wholly owned subsidiary of GoMP. A central Project Management Unit (PMU) attached to MPUDC is responsible for implementing the MPUSIP. The PMU is being supported by Project Implementation Units (PIUs) with a flexibility to redeployment depending upon the implementation requirements.

177. The PMU and PIUs are supported by several teams of Design Consultants in preparation of preliminary engineering designs.

178. Water Resource Review Committee (WRRC) is constituted to undertake a thorough review of the source when recommended by the Design Consultant in regard to techno- economic feasibility and sustainability especially ensuring climate change resilience, and Technical Review Committee (TRC) to review and approve the preliminary designs developed by the Design Consultants.

179. Project Management Consultant (PMC) centrally located in PMU and with field teams located in PIUs is responsible for implementation of the Project. All infrastructure contracts will be procured through performance-based contracts (PBCs) and include build- operate (BO) framework. Based on the preliminary designs prepared by Design Consultants, the DBO (design-build-operate) Contractor will design, construct, commission and operate for 10 years, after which it will be transferred to the respective ULB.

180. Two Committees - an Empowered Committee cum Executive Committee and a Technical Clearance and Tender Committee have been constituted by the Government to be responsible for effective and timely implementation of the Project.

181. **Safeguards Compliance Responsibilities.** At PMU, there is two safeguard specialists: (i) Project Officer (Environment) and (ii) Social & Gender Officer, who will responsible for compliance with the environmental and social safeguards in project implementation. PO (Environment) will have overall responsibility in implementation of the investment project as per the Environmental Assessment & Review Framework (EARF) agreed between ADB and the government. At individual subproject level, PO will ensure that environmental assessment is conducted, and a project-specific is prepared and implemented, and the compliance, and corrective actions, if any are reported as required.

182. **PMU Responsibilities.** PO (Environment) is supported by PMC, which is staffed with an Environmental Specialist, and Environmental Coordinators. Key tasks and responsibilities of the PO (Environment) for this sub project include the following:

Bidding Stage

(i) Prior to invitation of bids for civil works contract, ensure that
   - ✓ Water Resources Department (WRD) permission is obtained for sourcing water from Reservoirs
   - ✓ Consent for establishment (CFE) is obtained from MPPCB for WTP construction

(ii) Ensure that EMPs are included in bidding documents and civil works contracts

(iii) Ensure that the bid/ contract documents include specific provisions requiring contractors

to comply with all applicable labor laws and core labor standards including:

- ✓ Labour welfare measures and provision of amenities
- ✓ Prohibition of child labor as defined in national legislation for construction and maintenance activities
- ✓ equal pay for equal work of equal value regardless of gender, ethnicity, or caste
- ✓ elimination of forced labor
- ✓ The requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

(iv) Ensure that staff required for implementation of EMP (EHS officer for Town is included in the bid requirements

(v) Ensure that EMP cost is included in the project cost

(vi) In the pre-bid meeting, provide insight into the EMP measures, and overall compliance requirements to the bidders

Construction Stage

(i) Facilitate and ensure that all necessary environmental clearances/ permissions, including that of contractors are in place prior to start of construction

(ii) Organize an induction course for the training of contractors, preparing the men EMP implementation, environmental monitoring, and on taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.

(iii) Provide over sight on environmental management aspects of subprojects and ensure

(iv) EMPs are implemented by PIU and contractors

(v) Supervise and provide guidance to the PIUs to properly carryout the environmental monitoring as per the EMP

(vi) Oversee grievance redress mechanism to address any grievances brought about in a timely manner; ensure that records are properly maintained

(vii) Consolidate monthly environmental monitoring reports from PIU and submit semi-annual monitoring reports to ADB

(viii) Oversee site closures to ensure that all work / facility sites are restored properly prior to issuing work completion certificate to the contractor

Operation Stage

(i) Ensure and consent for operation (CFO) is obtained from MPPCB for WTP prior to start of operation

183. **PIU Responsibilities:** PIU is headed by a Project Manager and supported by PMC. An Assistant Project Manager of PIU will be given additional responsibilities of safeguard tasks and has been designated as Assistant Environmental Officer (ASO). ASO is be supported by PMC Environmental Specialist and Environmental Coordinator. Key tasks and responsibilities of the ASO for this subproject include the following:

(i) Provide necessary support to PIU and Nagar Parishad in obtaining permission from WRD and MPPCB; liaison with PMU and regulatory agencies

(ii) Oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations, take necessary action for obtaining rights of way

(iii) Oversee environmental monitoring by contractors

(iv) Take corrective actions when necessary to ensure no environmental impacts
(v) Submit monthly environmental monitoring reports to PMU
(vi) Conduct continuous public consultation and awareness
(vii) Address any grievances brought about through the grievance redress mechanism in a timely manner as per the EMP

184. **Contractor's Responsibilities**

Bidding Stage

(i) Understand the EMP requirements and allocate necessary resources (budget, staff, etc.
(ii) Understand the regulatory compliance requirements related to labour welfare, safety, environment etc.,

Bidding Stage

(i) Review the IEE Report including the REA checklist, category and the EMP, and conduct site visits to understand the environmental sensitivity of the project sites.
(ii) Update the REA checklist, confirm the category, and update/revise the IEE Report of the project reflecting the changes /amendments /additions that are effected in the project during the detailed design
(iii) Update / revise and finalize the EMP
(iv) Provide all necessary technical assistance to PIU / ULB in obtaining regulatory clearances/approvals.
(v) Ensure that all design-related measures of the EMP, and conditions, if any, of government regulatory agencies (like MPPCB consent conditions) are duly included in the final designs.

Construction Stage:

(i) Ensure that all regulatory clearances (both project related and contractor related) are in place before start of the construction work.
(ii) Mobilize EHS officer prior to start of work
(iii) . Confirm with PIU availability of rights of way at all project sites prior to start of work.
(iv) Prepare and Submit:
  - ✓ Construction waste management (CWM).
  - ✓ Traffic management (TM)plan

(v) Implement the mitigation measures as per the EMP including CWM & TM Plans
(vi) Follow the EMP measures/guidelines for establishment of temporary construction camps, construction waste disposal sites, and material borrow areas, etc.,
(vii) Implement EMP and ensure compliance with all the mitigation and enhancement measures
(viii) Conduct environmental monitoring as per the EMP
(ix) Undertake immediate action as suggested by PIU/ PMU/ PMC to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation
(x) Submit monthly compliance reports on EMP implementation
(xi) Act promptly on public complaints and grievances related to construction work and redress in a timely manner in coordination with PIU
(xii) Comply with applicable government rules and regulations

Operation Stage:

(i) Obtain CFO from MPPCB in coordination with the ULB, and comply with MPPCB conditions, if any, during the operation phase
(ii) Implement the operation phase EMP including the monitoring plan
(iii) Submit quarterly EMP implementation report

C. Training Needs

185. The following table 21 presents the outline of capacity building program to ensure EMP implementation. The detailed and specific modules will be customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project by the ES of PMC.

Table 21: Outline Capacity Building Program on EMP Implementation

Description	Target Participants & Venue	Estimate (INR)	Cost and Source of Funds
1. Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement - Government of India and Madhya Pradesh applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH&S, etc. - Incorporation of EMP into the project design and contracts - Monitoring, reporting and corrective action planning	All staff and consultants involved in the project At PMU, Bhopal (combined program for all subprojects)	-	Included in the overall project cost
2. EMP implementation (1/2 day) - EMP mitigation & monitoring measures -Roles and responsibilities - Public relations, - Consultations - Grievance redress - Monitoring and corrective action planning - Reporting and disclosure - Construction site standard operating procedures (SOP) - AC pipe protocol - Traffic management plan - Waste management plan - Site clean-up & restoration	All PIU staff, contractor staff and consultants involved in the Package 6C subproject town Rahatgarh At PIU	-	Part of overall project costs – PMC will conduct at PIU office Part of scope of work of PMU, PIU, PMC & DBOC
3. Contractors Orientation to Workers (1/2 day) - Environment, health and safety in project construction	Once before start of work, and thereafter regular briefing every month once. Daily briefing on safety prior to start of work All workers (including unskilled laborers)	-	Contractors cost

D. Monitoring and Reporting

186. During the detailed design stage, DBO Contractor should confirm PMU the mobilization of Environmental Expert for IEE update and integrating design stage EMP into designs.

187. Prior to commencement of the works, the contractor will submit a compliance report to PIU that all identified pre-construction mitigation measures as detailed in the EMP are undertaken. Contractor should confirm EHS supervisor is mobilized and EHS coordinators are designated for each town for effective implementation of the EMU. PMU with the assistance of the P MC will review the report and permit commencement of works.

188. During construction, results from internal monitoring by the contractor will be reflected in their monthly EMP implementation reports to the PIU. PMU will review and advise contractors for corrective actions if necessary. Quarterly report summarizing compliance and corrective measures taken will be prepared by PMC field team at PIU and submitted to PMU **(Refer Appendix 18)**. During operation, the contractor will conduct management and monitoring actions as per the operation stage EMP, and submit to PMU and ULB a quarterly report on EMP implementation and compliance.

189. Based on monthly & quarterly reports and measurements, PMU will submit to ADB, semi-annual (6-monthly) Environmental Monitoring Reports (EMR). Once concurrence from the ADB is received the report will be disclosed on the MPUDC and PMU websites.

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

E. EMP Implementation Cost

191. Most of the mitigation measures require the 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. The costs which are specific to EMP implementation and are not covered elsewhere in the projects are given below in table 22. The total costs are estimated at INR 2.65 million, which are to be covered by contractor costs.

Table 22: Cost Estimates to Implement the EMP

	Particulars	**Stages**	**Unit**	**Total Number**	**Rate (INR)**	**Cost (INR)**	**Costs Covered By**
A.	**Implementation staff**						
1	Environmental Specialist	Design & pre construction	Per month	0.5	150,000	75,000	DBO Contract
2	EHS Supervisor	Construction	per month	24	50,000	1,200,000	DBO contract
3	Archeological supervisor	Construction	Per month	12	75,000	900,000	
	Subtotal (A)					**2,175,000**	
B.	**Mitigation Measures**						
1	Consent for establishments & consent for operation from MPPCB	Pre construction	Lump sum			50,000	Project costs

2	Provision for tree cutting & compensatory plantation measures	Construction	Per tree	100	1,000	50,000	DBO contract
3	Traffic management at work sites (Pavement Markings, Channelizing Devices, Arrow Panels and Warning Lights)	Construction	Lump sum	-	-	100,000	DBO contract
	Subtotal (B)					**200,000**	
C.	**Monitoring Measures**						
1	Air quality monitoring	Construction	/	27	5,000	1,35,000	DBOC
2	Noise levels monitoring	Construction	/ sample	27	1,500	40,500	DBOC
3	Surface water monitoring	Construction	/ sample	26	4,000	1,04,000	DBOC
	Subtotal (C)					**2,79,500**	
	Subtotal (D)					**-**	
	Total (A+B+C)				**INR**	**2,654,000**	

X. FIELD BASED ENVIRONMENTAL DUE DILIGENCE

192. This chapter ascertains presence of any residual environmental impacts due to implementation of works on account of changes in sub-projects locations and other additional scope, and suggests appropriate, time-bound corrective measures to address those residual environmental impacts.

193. The various aspects that would be considered for such field-based environmental due diligence are elaborated below:

(a) Confirmation of EMP in contractor's contract agreement;

194. Yes, it is confirmed that EMP is in contractor's contract agreement.

(b) Compliance status during pre-construction, construction and operation stage of the sub-project(s);

195. **Pre-construction stage measures**. In package 6C, water supply subprojects, most of the pre-construction stage measures are implemented.

196. **Construction stage measures.** The compliance status of package 6C with construction stage EMP measures are implemented and being complied.

197. **Operation stage measures.** In package 6C, water supply subprojects, operation stage EMP measures will be implemented

198. Safeguard team at PMU/PIU and the expert from PMC along with support staff at PIU have been mobilized for the implementation of EMP and monitoring of environmental safeguard activities. Application of EMP being commenced as per final IEE report. Site specific EMP has been prepared and submitted by concerned contractor of the package 6C.

199. Construction works are being conducted in package 6C. EHS supervisor have been appointed by the Contractor. PIU and PMC supervises and monitors the EMP implementation, and PMU oversees the overall implementation and monitoring of safeguard tasks in the project ensuring compliance. Site verification is conducted by visual observations, using work/site specific checklists (developed from respective subproject EMPs) and ambient environmental monitoring for parameters like air and noise. Safeguard staff of PMC and PIU/PMU conducted site verification in both the towns of package 6C under construction.

(c) Status of statutory permission applicable for the sub-project(s), if any;

200. **Water abstraction permit/clearance;** Clearance required from the Water Resources Department, Government of Madhya Pradesh for water abstraction of 1.825 mcm from Bina River for Rahatgarh Town has been obtained on dated 02.07.2016.

201. **Consent to establish;** Consent to establish (CTE) from Madhya Pradesh Pollution Control Board (MPPCB), which is mandatory for the WTP, has been obtained from MPPCB for Rahatgarh WTP, on dated 01.01.2019.

202. **ASI Clearance.** Archeological Survey of India (ASI) clearance is required for construction of WTP as WTP site is located within 300m from ASI monument within the premises of existing WTP

campus. The ASI clearance for Rahatgarh town WTP has been issued on February 23, 2018.

(d) Status on implementation of environmental mitigation measures, if any, and testing of environmental parameters of ambient air quality and ambient noise levels along the sub-projects as per agreed monitoring plan, if any;

203. The compliance status of environmental mitigation measures are implemented and being complied. The compliance status of package 6C with construction stage EMP measures is Fair (some mitigation measures implemented satisfactorily)

204. Ambient environment monitoring not conducted during detailed design staged that are in construction phase. During construction" monitoring has been carried out as per Environment Management and Monitoring Plan. All the tested parameters of ambient air quality are within the limits of National Ambient Air Quality Standards (NAAQS).

(e) Residual environmental impacts, if any with appropriate, time-bound corrective measures;

205. There are no residual environmental impacts, so no time bound action is required

(f) Public consultations during project implementation and operation stages;

206. Public consultation conducted during draft IEE preparation and continued during implementation phase also. Local community, residents, business, elected representatives, ULB officials, government departments etc., consulted. Stakeholder Consultation/s was held in respective municipal offices and at various locations in the sub-project towns during the implementation phase **(For details Refer Table 12 and Appendix 1 & 2).**

(g) Status of grievances, if any, received due to implementation of the sub-projects; and

207. All the construction related grievances are resolved successfully at field level by DBO Contractor and PIU, and none of the grievance were escalated or required intervention of GRC.

(h) Conclusions (clearly stating presence or absence of residual environmental impacts, and the corrective actions proposed thereof)

208. No residual environmental impact is resulted by the construction activities under the project

XI. CONCLUSIONS AND RECOMMENDATIONS

209. The ADB-approved initial environmental examination (IEE) report, April 2016 for the construction package 6C has been updated considering the detailed design completed for the sub-project.

210. The process described in this document has assessed the environmental impacts of all elements of the Rahatgarh water supply improvement subproject. All potential impacts were identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant.

211. There are two important location and design aspects. First, the proposed water supply schemes include design of new water sources, that include construction of weir on Bina river. Secondly proposed WTP site is comes under regulated area of ASI monument.

212. No flow data available for Bina river as they are not gauged by WRD. Considering the low water requirement of town with very high flows during monsoon, (as gathered from local information), it is assessed to be unlikely to have any issue of source sustainability. To cater to the low and no - flow period (~7 months), One small weir is proposed, across Bina river. It is small weir, with a height of just 3 m above the river bed level (same as depth of river banks), thus confining the submergence to river course itself. Storage is small and therefor the weir will be filled at the first monsoon flow itself, and the water coming from the upstream will overflow freely. Therefore, the change in flow regime due to the weir will be negligible on downstream users and on river ecosystem. The proposed impoundment in fact is likely to benefit the environment through groundwater recharge and propagation of aquatic life. Water quality is suitable for drinking water after conventional treatment and disinfection, and there are no notable pollution sources. No negative impacts thus envisaged.

213. Proposed WTP site is located within the regulated area around the monuments (300 m). Given the minimal excavation, there is no risk to any structure. Nevertheless, the works has been implemented only after due permission of ASI and also the construction methodology has been discussed with the ASI. For chance finds, works will be observed by a person with archeological background.

214. During the construction phase, impacts mainly arise from the construction dust and noise, the need to dispose of large quantities of waste soil and import of construction material, and from the disturbance of residents, businesses, traffic and important buildings by the construction work. The social impacts (access disruptions) due to construction activities are unavoidable, as the residential and commercial establishments exist along the roads where pipes will be laid. As some of the works are conducted in river, there is a risk of water contamination, river bed damage, etc. Appropriate measures are suggested.

215. Anticipated impacts of water supply during operation and maintenance will be related to detection and repair of leaks, pipe bursts. These are, however, likely to be minimal, as proper design and selection of good quality pipe material shall mean that leaks are minimal. Leak repair work will be similar to the pipe-laying work. Appropriate measures to deal with backwash water and sludge from WTP is included in the project design. Application and handling of chlorine gas will involve certain risks, and appropriate measures are suggested for safe application. The DBO Contractor will implement the operation stage EMP during contract period.

216. The public participation processes undertaken during project design ensured stakeholders are engaged during the preparation of the final IEE report. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation.

217. The project's grievance redress mechanism provides the citizens with a platform to redress of their grievances, and describes the informal and formal channels, time frame, and mechanisms for resolving complaints about environmental performance.

218. A copy of the updated EMP/approved SEP has been kept on-site during the construction period at all times. The EMP has been made binding on all contractors operating on the site, and included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

219. The project will benefit the general public by contributing to the long-term improvement of water supply systems and community livability in Rahatgarh.

220. The subproject is therefore unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the project continues to be Category "B" is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006). Project require permission of (i). Water Resources Department (WRD) for water abstraction, weir/intake construction, which is already obtained (ii) permission of ASI for works within 300 m of protected Monuments; already obtained and (iii). Consent of Madhya Pradesh Pollution Control Board (MPPCB) for WTP. It is also already obtained.

221. This final IEE report has been updated during the detailed design stage by the DBO contractor reflecting changes, amendments and has been reviewed and approved by PMU.

Appendix 1: Stakeholder Consultation Photographs & List of Participants during Detailed design stage in 2018

Stakeholder Consultation photographs With Ward Parshads and Nagar Parishad officials and list of participants

Type of Stakeholders:

Attendance Sheet of Participants during Consulatation

Sr. No.	Name of the Participant	Designation	Mobile Number	Signature
01.	Ajay kumar Ahirwar	Sub Engineer (PIO)	9926271388	[illegible]
02	Hemraj kori Account- N.P. Rahatgarh	Accountant-	[illegible]	[illegible]
3.	S. K. Khemariya (N.P. Rahatgarh)	S/E	7697343434	[illegible] 10/1/19
4.	[illegible] पार्षद वार्ड 09	पार्षद 09	969143775[illegible]	[illegible]
5	[illegible]	पार्षद वार्ड 12	9826658323	A. Kaleem
6	[illegible]	पार्षद वार्ड 11	9301037550	[illegible]
7	प्रमोद [illegible]	पार्षद 9[illegible]	7697372975	[illegible]
8	[illegible]	[illegible]	966945222[illegible]	[illegible]

Stakeholder Consultation photographs and list of participants with Local Community in Ward No. 6 on 18.12.2018

Recording format for Consultation Meeting/Awareness Raising Programme

1. Package Number: 6C
2. Name of the Town: राहतगढ़
3. Date of Consultation: 18/12/2018
4. Place of Consultation: 1200 K.L. OHT नगर परिषद राहतगढ़ वार्ड न.-06
5. Name of the officer organized consultation: PMC/PIU सागर
6. Topics covered during consultation: जल प्रदाय योजना के अन्तर्गत "स्वच्छता अभियान", SHG गठन पर विचार-चर्चा
7. Issues concerned raised by public during consultations:
8. Responses/Issues provided against the concerns raised by the public:

List of Participants

S.No.	Name of Participants	Sex (M/F)	Categories Participated– Community/ ULB officials/ Front line workers/ Local leaders/ others -Specify	Signature of Participants
1	राधारानी	F	SC/. Front line workers	राधारानी
2	आरती	F	"	आरती
3	गीताबाई	F	"	गीताबाई
4	मोनिका	F	"	मोनिका
5	अमीता	F	"	अमीता
6	रेखा	F	"	रेखा
7	आरती नवीन	F	"	आरती
8	गीता राजाराम	F	"	गीता
9	क्रांति विनोद	F	"	क्रांति
10	माया भागीरथ	F	"	माया
11	लक्ष्मण मीना	F	"	मीना
12	शम्भू उमा	F	"	उमा
[illegible]	अनिल राजकुमारी	F	"	राजकुमारी

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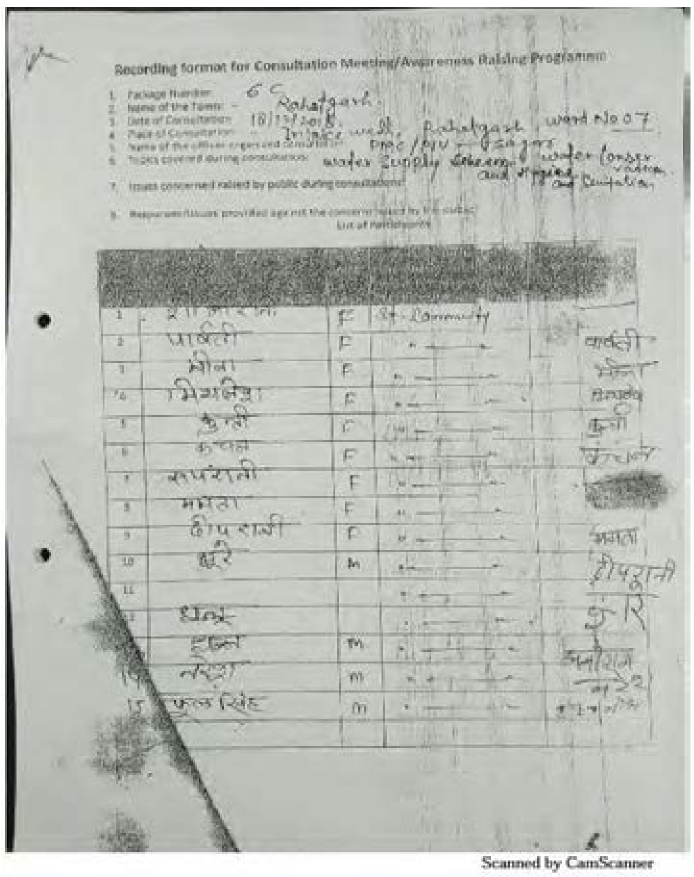
Stakeholder Consultation photographs and list of participants with Local Community in Ward No. 7 on 18.12.2018



Recording format for Consultation Meeting/Awareness Raising Programme

1. Package Number: 6 C
2. Name of the Town: – Rahatgarh
3. Date of Consultation: 18/12/2018
4. Place of Consultation: – Inpace well, Rahatgarh, ward No 07
5. Name of the officer organized consultation: PMC/PIU – Sagar
6. Topics covered during consultation: water supply scheme & water conservation and hygiene and sanitation
7. Issues concerned raised by public during consultation:
8. Response/Issues provided against the concern raised by the public:

List of Participants

[redacted]					
1	[illegible]	F	St. Community		
2	पार्वती	F	"		पार्वती
3	मीना	F	"		मीना
4	मिथलेश	F	"		[illegible]
5	कुन्ती	F	"		कुन्ती
6	कमला	F	"		कमला
7	रूपरानी	F	"		[redacted]
8	ममता	F	"		ममता
9	दीपरानी	F	"		दीपरानी
10	हरि	M	"		हरि
11			"		
12	[illegible]		"		
13	[illegible]	m	"		[illegible]
14	नरेश	m	"		[illegible]
15	फूल सिंह	m	"		[illegible]

Scanned by CamScanner

Stakeholder Consultation photographs and list of participants with Local Residents in Ward No. 01 on 07.05.2018

MPUDC जल प्रदाय योजना के अंतर्गत जनसंपर्क अभियान

वार्ड क्र. 1. पैकेज - 8C · मदनीर वार्ड - राहतगढ़ (म.प्र.)

क्र.	नाम	हस्ता.	जाति
1.	ममता रैकवार	ममता	OBC
2.	कुमा रैकवार	—	OBC
3.	हरी बाई रैकवार	सुम्बा	OBC
4.	शोभा सेन	हरीबाई	OBC
5.	मीरा लोधी	शोभा सेन	OBC
6.	प्यारी बाई लोधी	मीरा	OBC
7.	राम श्री सेन	प्यारीबाई	OBC
8.	ललता बाई रैकवार	रामश्री	OBC
9.	श्याम लाल सेन	ललिताबाई	OBC
10.	प्रमोद कुमार	श्याम लाल	OBC
11.	देवेन्द्र सेन	प्रमोद कुमार	OBC
12.	रनधीर लोधी	देवेन्द्र सेन	OBC
13.	कमोद सेन	रनधीर	OBC
14	कल्ला देवी तिवारी	कमोद सेन	GN
15	रजनी तिपाठी	कल्लादेवी	GN
16.	रागनी तिपाठी	रजनी	GN
17.	आशा तिपाठी	Ragani	GN
18.	नेहा तिपाठी	आशा	GN
		नेहा	GN

Stakeholder Consultation photographs and list of participants with Local Residents in Ward No. 0(
07.05.2018

MPUDC जल प्रदाय योजना के अंतर्गत जनसंपर्क अभियान
वार्ड क्र. - 6 पैकेज - 6C - राहतगढ़ (म.प्र.)

क्र.	नाम	हस्ता०	जाति
①	रूपकिशोर	रूपकिशोर	SC
②	रमाशंकर	रमाशंकर	S.C
③	हरप्रसाद	हरप्रसाद	ST
④	गौरीलाल	गौरीलाल	OBC
⑤	विनोद	विनोद	ST
⑥	नाथूराम	नाथूराम	ST
⑦	राजेश	राजेश	SC
⑧	सोमाराम	सोमाराम	SC
⑨	धर्मेन्द्र	[illegible]	SC
⑩	रजनी	रजनी	SC
⑪	अरविन्द	अरविन्द	ST

Appendix 2:: Stakeholder Consultation photographs and list of participants during preliminary design stage by DPR Consultant in 2016

Stakeholder Consultation at Rahatgarh Nagar Parishad

Community Consultation during Transect Walk

List of Participants

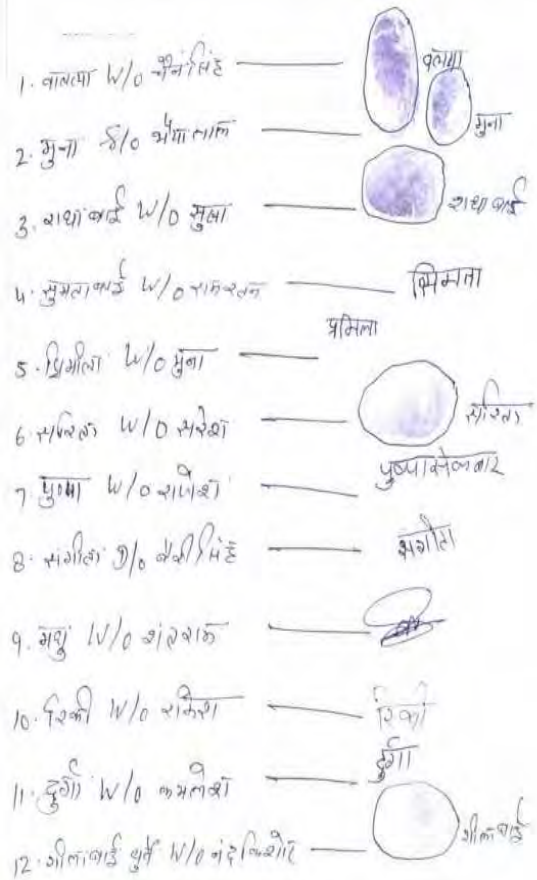
कार्यालय नगर परिषद [illegible] (म.प्र.)

-: सूचना पत्र :-

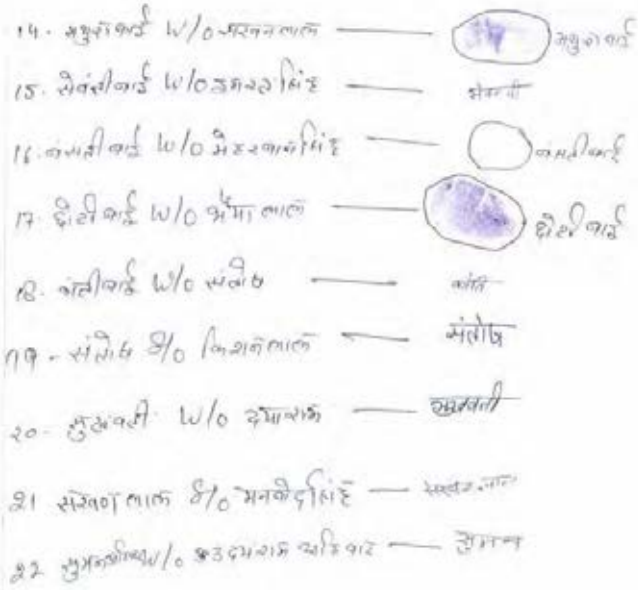
समय - प्रातः 11-00 बजे

स्थान - वन विभाग विश्राम गृह (फॉरेस्ट रेस्ट हाऊस) वार्ड क्र. 15 [illegible]

Attendance List of person's Participated and Proceedings



Attendance List of person's Participated and Proceedings



Appendix 3: Updated Rapid Environment Assessment Checklist

Country/ Project: India/ Madhya Pradesh Urban Service Improvement Project – Rahatgarh Water Supply Subproject
Sector/ Division: Urban Development and Housing Department/ UDHD/MPUDC

SCREEINING QUESTION	YES	NO	REMARKS
A. Project Siting Is the project area			
• Densely populated?	√		Subproject activities extend to the entire town including the densely populated areas. There are no major negative impacts envisaged, because pipeline will be located in unused government lands alongside the existing roads and can be constructed without causing disturbance to, houses, and commercial establishments. In narrow streets, disruption to road users is likely, and measure like best activity scheduling, alternative routes, prior information to road users, houses and shops will minimize the impact to acceptable levels.
• Heavy with development activities?		√	No
• Adjacent to or within any environmentally sensitive areas?		√	No
• Cultural heritage site	√		Rahatgarh fort is listed as archeological Monument of Madhya Pradesh.
• Protected Area		√	No
• Wetland		√	No
• Mangrove		√	No
• Estuarine		√	No
• Buffer zone of protected area		√	No
• Special area for protecting biodiversity		√	No
• Bay		√	No
B. Potential Environmental Impacts Will the Project cause**…**			
• Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		√	There are no significant water pollution sources in the catchment. Raw water quality is tested and found that it is suitable for domestic use
• Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	Not applicable
• Hazard of land subsidence caused by excessive ground water pumping?		√	Not applicable; subproject does not involve groundwater abstraction
• Social conflicts arising from displacement of communities?		√	Subproject does not involve land acquisition /displacement. No social conflicts envisaged
• Conflicts in abstraction of raw water for water supply with other beneficial		√	No; the water will be abstracted only with due permission of government and

water uses for surface and ground waters?			allocation of water from Bina River for water supply of Rahatgarh. Drinking water is priority as per the MP water policy.
• Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?		√	Raw water quality is tested and found that it is suitable for domestic use. Bacteriological contamination is noticed, and water will be subjected for treatment prior to supply
• Delivery of unsafe water to distribution system?		√	Water will be treated and disinfected prior to supply
• Inadequate protection of intake works or wells, leading to pollution of water supply?		√	Not applicable
• Over pumping of ground water, leading to salinization and ground subsidence?		√	No
• Excessive algal growth in storage reservoir?		√	Regular cleaning of storage tanks will be conducted during operation
• Increase in production of sewage beyond capabilities of community facilities?	√		As per CPHEEO manual the rate of water supply is 70lpcd for the town where sewerage scheme is not anticipated
• Inadequate disposal of sludge from water treatment plants?		√	Not applicable
• Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	No
• Impairments associated with transmission lines and access roads?		√	No
• Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		√	Measures for safe handling of chlorine are included
• Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?		√	Measures for safe handling of chlorine are included
• Dislocation or involuntary resettlement of people		√	There is no resettlement of people for project implementation.
• Social conflicts between construction workers from other areas and community workers?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
• Noise and dust from construction	√		All the construction machineries

activities?			employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
• Increased road traffic due to interference of construction activities?	√		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic within city. Proper traffic management and construction planning will be ensured to minimize the interference
• Continuing soil erosion/silt runoff from construction operations?	√		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
• Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?		√	No; appropriate O&M will conducted
• Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		√	Not envisaged
• Accidental leakage of chlorine gas?		√	Measures for safe handling of chlorine are included
• Excessive abstraction of water affecting downstream water users?		√	Water abstraction will be limited to the allocated quantity for Rahatgarh
• Competing uses of water?		√	Water abstraction will be limited to the allocated quantity for Rahatgarh
• Increased sewage flow due to increased water supply	√		As per CPHEEO manual the rate of water supply is 70 lpcd for the town where sewerage scheme is not anticipated
• Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	√		As per CPHEEO manual the rate of water supply is 70 lpcd for the town where sewerage scheme is not anticipated
• Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Minimum influx of population during the construction and operation period.
• Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel, and other chemicals		√	No such materials are used in project so no risk to community health & safety

during operation and construction?			
• Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation, and decommissioning?	√		Proper safety measures would be ensured during the construction & operation and decommissioning.
Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	**Yes**	**No**	**Remarks**
Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes?	√		Semi-arid zone, unreliable rainfall, less vegetation cover. Promote more efficient use of water by reducing losses and wastage to counter increased demands due to higher temperatures.
Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)?	√		Reduction in rainfall may affect the water availability from dam. Given the priority for drinking water supply, dead storage will be utilized in case of low rain fall years .
Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		√	No
Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?		√	No

Appendix 4: Weir Capacity Calculation for Rahatgarh

RAHATGHAD DAM CAPACITY TABLE FROM GIS MAPPING TECHNIQUE

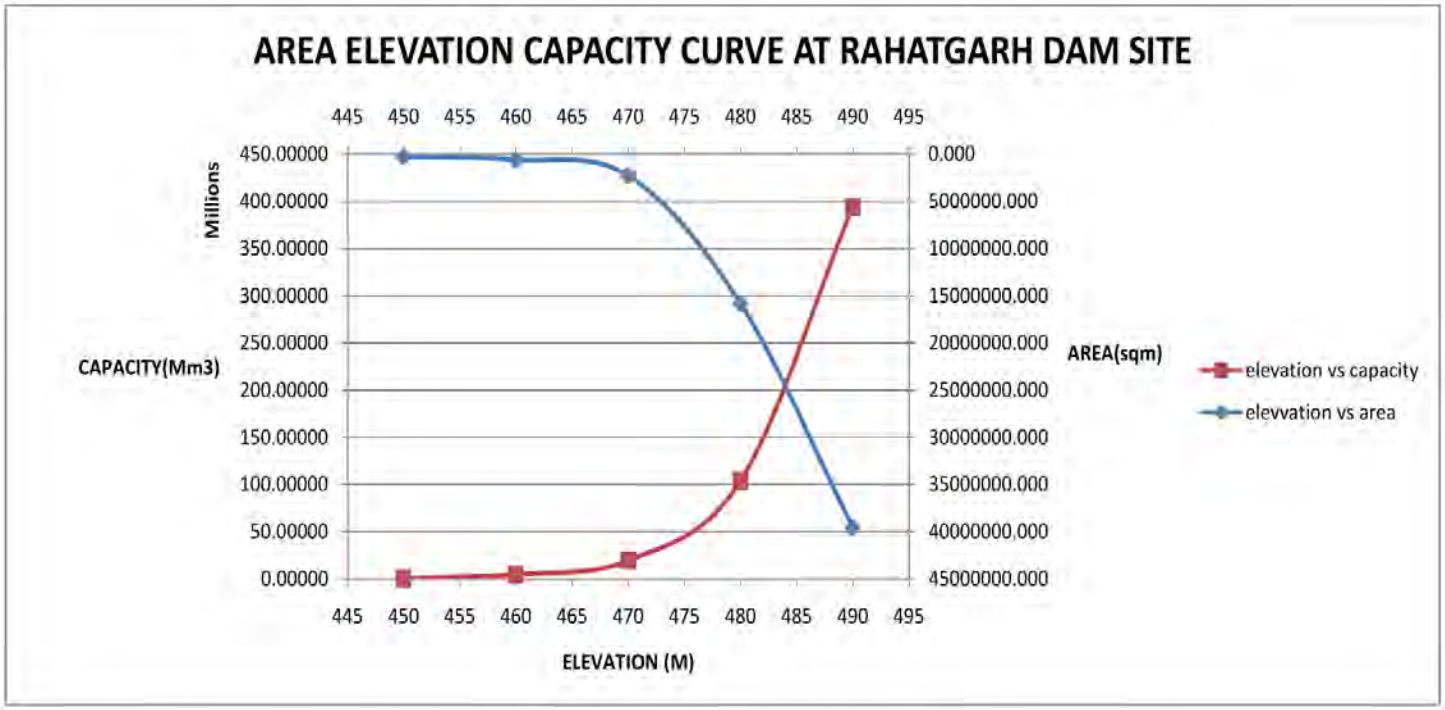
S. No.	Elevation in Meter	Area (Sq M)	Sum Area =(a1+a2)	Root Area= sqrt(sum a1)*sqrt(sum a2)	h/3(sum+Root area)	Cummulative capacity (m3)	Mm3	Remark
1	450	266280.920	266280.920	266280.920	266280.920	266280.920	0.266	
2	460	594907.484	861188.404	478871.633	4466866.788	4733147.708	4.733	
3	470	2289639.140	2884546.624	1576114.876	14868871.665	19602019.373	19.602	
4	480	15822444.171	18112083.311	7228080.572	84467212.944	104069232.317	104.069	
5	490	39536230.000	55358674.171	31664821.467	290078318.795	394147551.112	394.148	

prismoidal rule=	**366837319.40**	**366.84**	MM3
trapezoidal rule=	**386082462.55**	**386.08**	MM3

S. No.	Elevation in Meter	Area (Sq M)	Sum Area =(a1+a2)	Root Area= sqrt(sum a1)*sqrt(sum a2)	h/3(sum+Root area)	Cummulative capacity (m3)	Mm3	Remark
1	450	266280.920	266280.920	266280.920	266280.920	266280.920	0.266	
2	451	299143.576	565424.497	388022.880	317815.792	584096.712	0.584	
3	452	332006.233	631149.809	597383.933	409511.247	993607.959	0.994	
4	453	364868.889	696875.122	663198.764	453357.962	1446965.921	1.447	
5	454	397731.546	762600.435	728997.442	497199.292	1944165.214	1.944	
6	455	430594.202	828325.747	794783.980	541036.576	2485201.790	2.485	
7	456	463456.858	894051.060	860561.161	584870.741	3070072.530	3.070	
8	457	496319.515	959776.373	926330.980	628702.451	3698774.981	3.699	
9	458	529182.171	1025501.686	992094.899	672532.195	4371307.176	4.371	
10	459	562044.827	1091226.998	1057854.019	716360.339	5087667.515	5.088	
11	460	594907.484	1156952.311	1123609.184	760187.165	5847854.680	5.848	

prismoidal rule=	**4305942.019**	**4.306**	MM3
trapezoidal rule=	**4305942.019**	**4.306**	MM3

APPENDIX-4 Capacity calculation



RAHATGHAD DAM CAPACITY TABLE

S. No.	Elevation in Meter	Area (Sq M)	Sum Area =(a1+a2)	Root Area= sqrt(sum a1)*sqrt(sum a2)	h/3(sum+Root area)	Cummulative capacity (m3)	Mm3	Remark
1	449	22626.240	22626.240	22626.240	22626.240	22626.240	0.023	
2	450	266280.920	288907.160	80850.991	123252.717	145878.957	0.146	
3	451	299143.576	565424.497	404172.223	323198.906	469077.863	0.469	
4	452	332006.233	631149.809	597383.933	409511.247	878589.111	0.879	
5	453	364868.889	696875.122	663198.764	453357.962	1331947.073	1.332	

Slope of profile	**S =**	150
	or	0.006666667

Calculation for Design Flood HFL Calculations by Manning's Formulla

	Levels	n	Area (A)	Perimeter(P)	R=A/P	Velocity (V)	Discharge (Q)	Remark
TBL	452	0.03	212.861	234	0.91	2.56	543.90	
						Q passing: Q= c*Le*He^(3/2)	8334.66	Hence Safe

Demand for Rahatghad dam

Demamd	8.7	MLd
	8700000	Liter/day
	8700	M3/d
	362.5	M3/hr
	0.1007	M3/sec

Month	7			
running days	210	8700 M3/d		
hr	5040	362.5 M3/hr	1827000	M3
sec	18144000	0.100694444 M3/sec		
			1.827	**MCM**

Appendix 5: Office Order of EA to Establish GRC at subproject town level

मध्यप्रदेश अर्बन डेवलपमेंट कंपनी लिमिटेड
(म.प्र. शासन, नगरीय विकास एवं आवास विभाग)

क्र./पी.एम.यू./2017/1108 भोपाल दिनांक 23/6/17

प्रति,
परियोजना प्रबंधक,
परियोजना क्रियान्वयन इकाई
सतना

विषय :-शिकायत निवारण समिति के गठन के संबंध में।

संदर्भ:- संचालनालय, नगरीय प्रशासन एवं विकास, भोपाल के आदेश क्रमांक/यू.प्र./7/2017/3934 दिनांक 06.03.2017

विषयांतर्गत संदर्भित आदेश (प्रावधानों सहित) के अनुसार समस्त बाह्य वित्त पोषित योजनाओं के क्रियान्वयन तथा संचालन एवं संधारण अवधि के दौरान शिकायत निवारण समिति का गठन किया जाना है।

आदेश के परिपालन में जिन परियोजनाओं में ठेकेदार नियुक्त किये जा चुके हैं, उन सभी उप परियोजनाओं में शिकायत निवारण समिति का गठन आदेश अनुसार तत्काल कर अवगत कराये। इसके साथ ही भविष्य में क्रियान्वित की जाने वाली योजनाओं में भी आदेश का पालन सुनिश्चित किया जावे।

संलग्न- उपरोक्तानुसार।

(आर.के. पांडे)
प्रमुख अभियंता
म.प्र.शा. अर्बन डेवलपमेंट कंपनी
भोपाल

पृ.क्र./पी.एम.यू./2017/1109 भोपाल, दिनांक 23/6/17

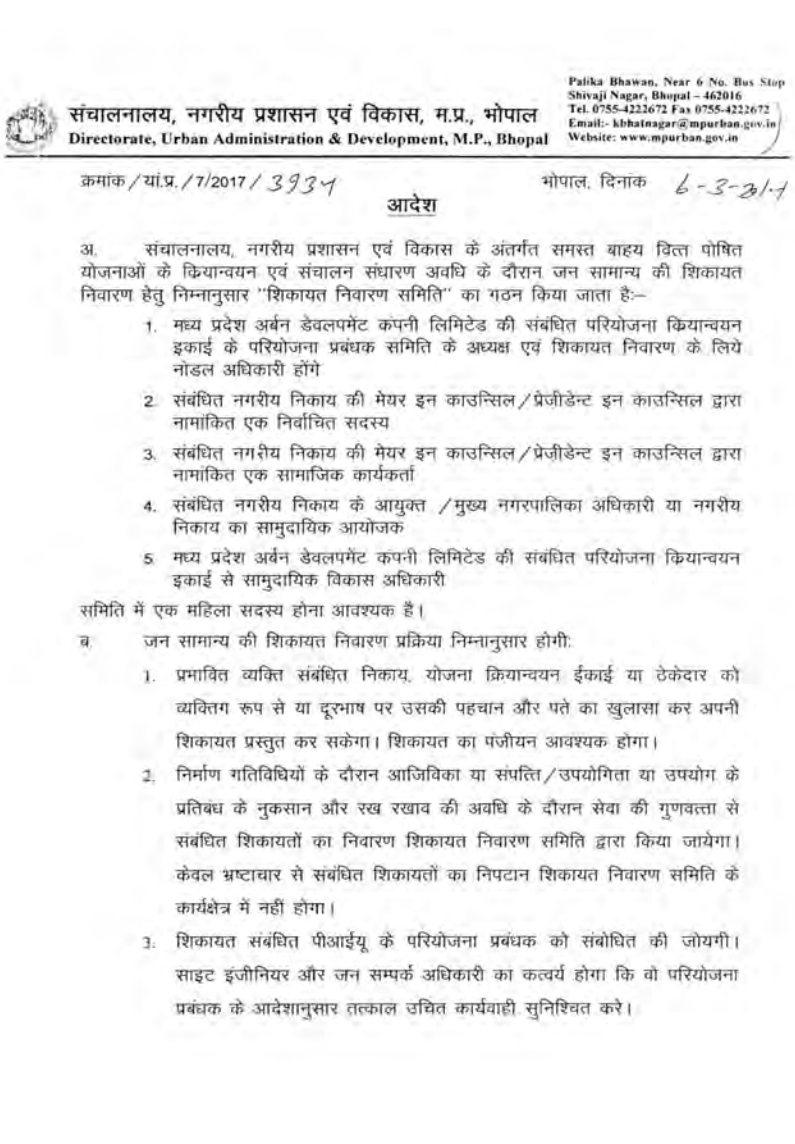
प्रतिलिपि :-

1. निज सचिव, प्रबंध संचालक, म.प्र.शा. अर्बन डेवलपमेंट कंपनी, बीज भवन भोपाल।
2. अतिरिक्त प्रबंध संचालक, म.प्र.शा. अर्बन डेवलपमेंट कंपनी, बीज भवन भोपाल।
3. संचालक (तकनीकी), म.प्र.शा. अर्बन डेवलपमेंट कंपनी, बीज भवन भोपाल।
4. उप परियोजना संचालक (तकनीकी) म.प्र.शा. अर्बन डेवलपमेंट कंपनी, बीज भवन भोपाल।
की ओर सूचनार्थ।
5. श्री हैलेन्द्र पुरी, परियोजना अधिकारी, म.प्र.शा. अर्बन डेवलपमेंट कंपनी, बीज भवन भोपाल।
6. श्री कमलेश भटनागर, तकनीकी अधिकारी, म.प्र.शा. अर्बन डेवलपमेंट कंपनी, बीज भवन भोपाल।
7. टीम लीडर, पी.एम.सी., एम.पी.यू.डी.ए.
8. टीम लीडर, पी.एम.सी., एम.पी.यू.सा.आई.पी.

की ओर उपरोक्त संदर्भित आदेश का पालन सुनिश्चित करने हेतु।

प्रमुख अभियंता
म.प्र.शा. अर्बन डेवलपमेंट कंपनी
भोपाल

"बीज भवन", सेक्टर नं.ए, अरेरा हिल्स, भोपाल-462011
फोन : +91-755-2763060,61,62 फैक्स : +91-755-2763065 ई-मेल. mpusipbpl@gmail.com



संचालनालय, नगरीय प्रशासन एवं विकास, म.प्र., भोपाल
Directorate, Urban Administration & Development, M.P., Bhopal

Palika Bhawan, Near 6 No. Bus Stop
Shivaji Nagar, Bhopal – 462016
Tel. 0755-4222672 Fax 0755-4222672
Email:- kbhatnagar@mpurban.gov.in
Website: www.mpurban.gov.in

क्रमांक/यां.प्र./7/2017/3934 भोपाल, दिनांक 6-3-31-7

आदेश

अ. संचालनालय, नगरीय प्रशासन एवं विकास के अंतर्गत समस्त बाह्य वित्त पोषित योजनाओं के क्रियान्वयन एवं संचालन संधारण अवधि के दौरान जन सामान्य की शिकायत निवारण हेतु निम्नानुसार "शिकायत निवारण समिति" का गठन किया जाता है:–

1. मध्य प्रदेश अर्बन डेवलपमेंट कंपनी लिमिटेड की संबंधित परियोजना क्रियान्वयन इकाई के परियोजना प्रबंधक समिति के अध्यक्ष एवं शिकायत निवारण के लिये नोडल अधिकारी होंगे
2. संबंधित नगरीय निकाय की मेयर इन काउन्सिल/प्रेजीडेन्ट इन काउन्सिल द्वारा नामांकित एक निर्वाचित सदस्य
3. संबंधित नगरीय निकाय की मेयर इन काउन्सिल/प्रेजीडेन्ट इन काउन्सिल द्वारा नामांकित एक सामाजिक कार्यकर्ता
4. संबंधित नगरीय निकाय के आयुक्त /मुख्य नगरपालिका अधिकारी या नगरीय निकाय का सामुदायिक आयोजक
5. मध्य प्रदेश अर्बन डेवलपमेंट कंपनी लिमिटेड की संबंधित परियोजना क्रियान्वयन इकाई से सामुदायिक विकास अधिकारी

समिति में एक महिला सदस्य होना आवश्यक है।

ब. जन सामान्य की शिकायत निवारण प्रक्रिया निम्नानुसार होगी:

1. प्रभावित व्यक्ति संबंधित निकाय, योजना क्रियान्वयन ईकाई या ठेकेदार को व्यक्तिगत रूप से या दूरभाष पर उसकी पहचान और पते का खुलासा कर अपनी शिकायत प्रस्तुत कर सकेगा। शिकायत का पंजीयन आवश्यक होगा।
2. निर्माण गतिविधियों के दौरान आजिविका या संपत्ति/उपयोगिता या उपयोग के प्रतिबंध के नुकसान और रख रखाव की अवधि के दौरान सेवा की गुणवत्ता से संबंधित शिकायतों का निवारण शिकायत निवारण समिति द्वारा किया जायेगा। केवल भ्रष्टाचार से संबंधित शिकायतों का निपटान शिकायत निवारण समिति के कार्यक्षेत्र में नहीं होगा।
3. शिकायत संबंधित पीआईयू के परियोजना प्रबंधक को संबोधित की जायगी। साइट इंजीनियर और जन सम्पर्क अधिकारी का कत्वर्य होगा कि वो परियोजना प्रबंधक के आदेशानुसार तत्काल उचित कार्यवाही सुनिश्चित करे।

4. शिकायत करने के 2 कार्य दिवस में शिकायत का निवारण सुनिश्चित किया जाये। अगर किसी तकनीकी समस्या के कारण निवारण में विलम्ब हो सकता है तो प्रभावित को तद्नुसार सूचित किया जाये।

5. यदि शिकायत प्राप्त होने के 2 कार्य दिवस में शिकायत का निवारण नहीं किया जाता है, न ही विलम्ब के संबंध में व कारण से शिकायतकर्ता को अवगत कराया जाता है तो ऐसी शिकायत अथवा शिकायत के निवारण से असंतुष्ट प्रभावित व्यक्ति/परिवार औपचारिक रूप से उसके समर्थन दस्तावेज/जानकारी के साथ अपनी अपील शिकायत निवारण समिति के समक्ष प्रस्तुत कर सकता है।

6. नोडल अधिकारी शिकायत निवारण समिति की बैठक एक अथवा एक से अधिक शिकायतों के लिये आयोजित कर सकेंगे परन्तु यह सुनिश्चित किया जाना आवश्यक है कि किसी भी शिकायत के निवारण में अनुचित विलम्ब न हो। समिति परियोजना अधिकारी द्वारा प्रस्तुत शिकायतों और संबंधित जानकारियों का अध्ययन कर शिकायत को हल करने हेतु निर्णय लेगी। शिकायत निवारण समिति की कार्यवाही को अभिलिखित किया जायेगा तथा निर्णय से शिकायतकर्ता को लिखित में अवगत कराया जायेगा। निर्णय का क्रियान्वयन नगरीय निकाय/परियोजना क्रियान्वयन ईकाई, ठेकेदार के माध्यम से अथवा स्वयं सुनिश्चित करेगी।

(विवेक अग्रवाल)
आयुक्त
नगरीय प्रशासन एवं विकास
म0प्र0 भोपाल

पृष्ठाकंन क्र./यां.प्र./7/2017/3938 भोपाल, दिनांक 6-3-17

प्रतिलिपि:–

1. निज सचिव, माननीय मंत्रीजी, मध्यप्रदेश शासन, नगरीय विकास एवं आवास विभाग, भोपाल।
2. प्रमुख सचिव, म0प्र0 शासन, नगरीय विकास एवं आवास विभाग मंत्रालय, भोपाल।
3. आयुक्त, नगरीय प्रशासन एवं विकास, भोपाल, मध्यप्रदेश।
4. आयुक्त, राजस्व समस्त संभाग, मध्यप्रदेश।
5. आयुक्त, नगर तथा ग्राम निवेश, भोपाल मध्यप्रदेश।
6. प्रबंध संचालक, म0प्र0 अर्बन डेवलपमेंट कंपनी लिमिटेड, मध्यप्रदेश।
7. समस्त कलेक्टर, मध्यप्रदेश।
8. अधीक्षण यंत्री/कार्यपालन यंत्री, समस्त संभागीय कार्यालय, नगरीय प्रशासन एवं विकास मध्यप्रदेश।
9. उपसंचालक, समस्त संभागीय कार्यालय, नगरीय प्रशासन एवं विकास मध्यप्रदेश।
10. समस्त आयुक्त, नगरपालिक निगम, मध्यप्रदेश।
11. मुख्य नगरपालिका अधिकारी, नगरपालिका परिषद/नगर परिषद, मध्यप्रदेश।
12. प्रोजेक्ट मैनेजर, समस्त परियोजना क्रियान्वयन इकाई, म0प्र0 अर्बन डेवलपमेंट कंपनी लिमिटेड, म0प्र0।

आयुक्त
नगरीय प्रशासन एवं विकास
म0प्र0 भोपाल

Summary Translation in English - Office Order of EA to Establish GRC at subproject town level

(i) Letter No 1108 dated 23.06.2017 signed by EnC, MPUDC To Commissioner/Chief Municipal Officer, All ULBs regarding formation of Grievance Redressal Committees

Ref.: Order No 3934 dated 06.03.2017 of Directorate of Urban Development

In compliance of the above office order, the Grievance Redressal Committees to be formed in all the externally funded projects during operation, implementation and maintenance phase in the chairmanship of Project Officer, Project Implementation Unit (PM, PIU), MPUDC. In the above committee, following members from the ULBs will be nominated:

- An elected member nominated by Mayor in Council/ President in Council of associated Urban Local Body (ULB).
- A Social Worker nominated by Mayor in Council/ President in Council of associated Urban Local Body
- Commissioner of associated Urban Local Body/Chief Municipal Officer or Community Development Officer/Community Organizer of Urban Local Body.

It is therefore requested to nominate above members with immediate effect for form GRC.

(i) Office Order No 3934 dated 06.03.2017 signed by Commissioner, Urban Administration and Development, Madhya Pradesh

a. The Grievance Redressal Committees to be formed in all the externally funded projects to resolve the public grievances during operation, implementation and maintenance phase. In the above committee, following members will be nominated:

- Project Officer, Project Implementation Unit (PM, PIU), MPUDC will be chairman and Nodal Officer of the committee
- An elected member nominated by Mayor in Council/ President in Council of associated Urban Local Body (ULB).
- A Social Worker nominated by Mayor in Council/ President in Council of associated Urban Local Body
- Commissioner of associated Urban Local Body/Chief Municipal Officer or Community Development Officer/Community Organizer of Urban Local Body.
- Community Development Officer (CDO), Project Implementation Unit (PM, PIU), MPUDC will be chairman and Nodal Officer of the committee

Committee should have at least one-woman member.

b. The process of grievance redressal should be as follows:
    1. Complain shall be registered by affected person at – office of urban local body/or PIU/or Contractor through personal visit /or telephonically by disclosing his/her identity or address.
    2. Damage/or loss of livelihood/property/quality of services affected during construction/or operations and maintenance period of the project shall be resolved by the Grievance Redressal Committee. Only Corruption related issues will not fall under the preview of Grievance Redressal Committee to be resolved.

3. Compliance shall be addressed to the Project Manager of Project Implementation Unit. Site Engineer and Public Relation Officer will be responsible to ensure compliance as per instructions of the Project Manager.
4. Grievance shall be resolved within two days of registration of complain by affected person. Complainant should be informed if Grievance Redressal is taking time due to any technical reason.
5. Complainant can appeal to Grievance Redressal Committee with relevant documents in case grievance is neither resolved within two working days nor affected person is informed about the delay in process.
6. Nodal officer can organize grievance redressal meeting to solve one or more problems but they have to avoid unnecessary delay in resolving the problem. Complain will be presented by the project manager to review by the committee members and their decision shall be discussed against each complain. Proceedings of grievance redressal meeting shall be documented. Decision to the complainant will be informed in writing. Execution of decision should be performed either directly by PIU or with the support of contractors.

Appendix 6: Letter to PIU From MPUDC (IA) to Establish GRC at subproject town level

Madhya Pradesh Urban Development Company Limited
(CIN No. U75110MP2015SGC034139)
(Department of Urban Development and Housing, Government of Madhya Pradesh)
Project Management Unit

कमांक 1881 / पीएमयू/यांत्रिकी/2018 भोपाल, दिनांक 31/05/2018

प्रति,
परियोजना प्रबंधक,
परियोजना कियान्वयन इकाई
समस्त

विषय :– शिकायत निवारण समिति के गठन के संबंध में।

संदर्भ:– संचालनालय नगरीय प्रशासन एवं विकास भोपाल के आदेश कमांक/या.प्रा./7/2017/3934, दिनांक 06.03.2017

विषयान्तर्गत संदर्भित आदेश (छायाप्रति संलग्न) के अनुसार समस्त वित्त पोषित योजनाओं के कियान्वयन तथा संचालन एवं संधारण अवधि के दौरान शिकायत निवारण समिति का गठन किया जाना है।

आदेश के परिपालन में जिन परियोजनाओं में ठेकेदार नियुक्त किये जा चुके है, उन सभी उप परियोजनाओं में शिकायत निवारण समिति का गठन आदेश अनुसार तत्काल कर अवगत करायें। इसके साथ ही भविष्य में कियान्वित की जाने वाली योजनाओं में भी आदेश का पालन सुनिश्चित किया जायें ।

संलग्न– उपरोक्त अनुसार।

RK Vyas
ह/ (आर.के.व्यास)
प्रमुख अभियंता
म. प्र. अर्बन डेवलपमेंट कंपनी
भोपाल

कमांक 1882/ पीएमयू/यांत्रिकी/2018 भोपाल, दिनांक 03/05/18

प्रतिलिपि:–

1. निज सचिव, प्रबंध संचालक, म.प्र. अर्बन डेवलपमेंट कं. लि. भोपाल।
2. अतिरिक्त प्रबंध संचालक, म.प्र. अर्बन डेवलपमेंट कं. लि. भोपाल।
3. संचालक (तकनीकी), म.प्र. अर्बन डेवलपमेंट कं. लि. भोपाल।
4. उप परियोजना संचालक (तकनीकी), म.प्र. अर्बन डेवलपमेंट कं. लि. भोपाल।
5. श्री शैलेन्द्र गुप्ता, परियोजना अधिकारी, म.प्र. अर्बन डेवलपमेंट कं. लि. भोपाल।
6. श्री कमलेश भटनागर, तकनीकी अधिकारी, म.प्र. अर्बन डेवलपमेंट कं. लि. भोपाल।
7. टीम लीडर, पीएमसी, एमपीयूडीपी
8. टीम लीडर, पीएमसी, एमपीयूएसआईपी की ओर उपरोक्त संदर्भित आदेश का पालन सुनिश्चित करने हेतु।

RK Vyas
ह/ प्रमुख अभियंता
म.प्र. अर्बन डेवलपमेंट कं. लि.
भोपाल

1st Floor M.P. Rajya Sahkari Krishi Evam Gramin Bank A, Arera Hills, Bhopal 462011 ☎ : 91+755-2763060, 61, 62

Summary Translation in English - Letter to PIU from MPUDC (IA) to Establish GRC at subproject town level

Letter No 1881 dated 31.05.2018 signed by EnC, MPUDC to Project Managers, PIUs(all), MPDUC Regarding formation of Grievance Redressal Committees

Ref.: Order No 3934 dated 06.03.2017 of Directorate of Urban Development

In compliance of the above office order, the Grievance Redressal Committees to be formed in all the externally funded projects to resolve the public grievance during operation, implementation and maintenance phase.

In compliance of above, please ensure formation of Grievance Redressal Committees in the sub projects where contract have been awarded. This should be followed for all the future sub projects awarded.

Appendix 7: Letter to CMO From MPUDC (IA) to Establish GRC at subproject town level

मध्यप्रदेश अर्बन डेवलपमेंट कम्पनी लिमिटेड

(म.प्र शासन, नगरीय विकास एवं आवास विभाग)
परियोजना प्रबंधन इकाई

क्र. /पी.एम.यू./यां./2017/2349 भोपाल, दिनांक 15/11/17

प्रति,

स्मरण–पत्र

1.आयुक्त
नगर पालिक निगम
.....

2.मुख्य नगरपालिका अधिकारी,
नगर पालिका/नगर परिषद्
.....

विषयः– शिकायत निवारण समिति के गठन के संबंध में।

संदर्भः– (1)संचालनालय, नगरीय प्रशासन एवं विकास, भोपाल के आदेश कमांक/या.प्र./7/2017/3934 दिनांक 06.03.2017।
(2) एमपीयूडीसी के पत्र क. 1108 दि. 23.06.2017.

विषयांतर्गत संदर्भित आदेश के अनुसार समस्त बाह्य वित्त पोषित योजनाओं के कियान्वयन तथा संचालन एवं संधारण अवधि के दौरान शिकायत निवारण समिति का गठन परियोजना प्रबंधक, परियोजना कियान्वयन इकाई, मध्य प्रदेश अर्बन डवलपमेंट कंपनी लिमिटेड की अध्यक्षता में किया जाना है।

उक्त समिति में निम्नानुसार सदस्यों का नामांकन नगरीय निकाय स्तर से किया जाना है :–

1	संबंधित नगरीय निकाय की मेयर इन काउन्सिल/प्रेसीडेन्ट इन काउन्सिल द्वारा नामांकित एवं निर्वाचित सदस्य
2	संबंधित नगरीय निकाय की मेयर इन काउन्सिल/प्रेसीडेन्ट इन काउन्सिल द्वारा नामांकित सामाजिक कार्यकर्ता
3	संबंधित नगरीय निकाय के आयुक्त/मुख्य नगर पालिका अधिकारी या नगरीय निकाय का सामुदायिक आयोजक

अतः उपरोक्तानुसार सदस्यों को नामांकित कर अवगत कराने का कष्ट करें, जिससे तत्काल समिति का गठन किया जा सके।

संलग्न :– शिकायत पंजीयन प्रपत्र

(आर. के. व्यास)
प्रमुख अभियंता
एमपीयूडीसी, भोपाल

"बीज भवन" सैकण्ड फ्लोर, अरेरा हिल्स, भोपाल-462011
फोन : +91-755-2763060, 61, 62 फेक्स +91-755-2761868 ई-मेल: mpudcbhl@gmail.com

Summary Translation in English - Letter to CMO from MPUDC (IA) to Establish GRC at subproject town level

Letter No 2349 dated 15.11.2017 signed by EnC, MPUDC to Commissioner/Chief Municipal Officer, All ULBs Regarding formation of GRC(Reminder)

Ref.: Order No 3934 dated 06.03.2017 of Directorate of Urban Development

In compliance of the above office order, the Grievance Redressal Committees to be formed in all the externally funded projects during operation, implementation and maintenance phase in the chairmanship of Project Officer, Project Implementation Unit (PM, PIU), MPUDC. In the above committee, following members from the ULBs will be nominated:

- An elected member nominated by Mayor in Council/ President in Council of associated Urban Local Body (ULB).
- A Social Worker nominated by Mayor in Council/ President in Council of associated Urban Local Body
- Commissioner of associated Urban Local Body/Chief Municipal Officer or Community Development Officer/Community Organizer of Urban Local Body.

It is therefore requested to nominate above members with immediate effect for form GRC.

Appendix 8: GRC Established at Rahatgarh Nagar Parishad

म.प्र. अर्बन डेवलपमेंट कम्पनी लि.

परियोजना क्रियान्वयन इकाई सागर (म.प्र.)

(PIU SAGAR)
(नगरीय विकास एवं पर्यावरण विभाग)

Email : udcsagarpiu@gmail.com Ph.No. : 07582-223280

आदेश

क्रमांक / पी.आई.यू. / 2017 / 177 सागर, दिनांक : 22.9.17

संचालनालय नगरीय प्रशासन एवं विकास के पत्र क्र. / यां.प्र. / 7 / 2017 / 3937 भोपाल दिनांक 06.03.2017 एवं म.प्र. अर्बन डेवलपमेंट कम्पनी लि. के पत्र क्र. / पी.एम.यू. / 2017 / 1108 भोपाल दिनांक 23.06.2017 के परिपालन में बाह्य वित्त पोषित योजनाओं के क्रियान्वयन एवं संचालन संधारण अवधि के दौरान जन सामान्य की शिकायत निवारण हेतु निम्नानुसार शिकायत निवारण समिती का गठन किया जाता है।

क्रमांक	अधिकारी / कर्मचारी	समिती सदस्य
1.	परियोजना प्रबंधक, पी.आई.यू. सागर	अध्यक्ष / नोडल अधिकारी
2.	श्रीमति कल्पना / सुरेन्द्र चौरसिया (संबंधित नगरीय निकाय की प्रेसीडेंट–इन–काउंसिल द्वारा नामांकित) पार्षद वार्ड क्र. 07 नगर परिषद राहतगढ़	सदस्य
3.	श्री नरेन्द्र (गोलू) राय (संबंधित नगरीय निकाय की प्रेसीडेंट–इन–काउंसिल द्वारा नामांकित) वार्ड क्र. 02 समाजिक कार्यकर्ता	सदस्य
4.	मुख्य नगर पालिका अधिकारी नगर परिषद– राहतगढ़	सदस्य
5.	सामुदायिक विकास अधिकारी, पी.आई.यू. सागर	सदस्य

उक्त समिती नगर परिषद राहतगढ़ की पेयजल सुधार योजना (MPUSIP) अन्तर्गत में मे0 जय वरूडी कंस्ट्रक्शन कम्पनी एण्ड रंजीत बिल्डकॉन जे.वी. को आवंटित कार्य पैकेज क्रमांक 6C अन्तर्गत निर्माण गतिविधियों के दौरान आजीविका संपत्ति / उपयोगिता या उपयोग प्रतिबंध के नुकसान और रख रखाव की अवधि के दौरान सेवा की गुणवत्ता से संबंधित शिकायतों का निराकरण संदर्भित पत्रों में उल्लेखित निर्देशानुसार समिती द्वारा निपटान किया जावेगा।

परियोजना प्रबंधक
परियोजना क्रियान्वयन इकाई सागर
म.प्र. अर्बन डेवलपमेंट कम्पनी

पृ.क्र. / पी.आई.यू. / 2017 / 178 सागर, दिनांक : 22.9.17

प्रतिलिपि :

1. आयुक्त, नगरीय प्रशासन एवं विकास म.प्र. भोपाल की ओर सूचनार्थ।
2. प्रबंध संचालक, म.प्र. अर्बन डेवलपमेंट कम्पनी लि., भोपाल।
3. संचालक (तक.), म.प्र. अर्बन डेवलपमेंट कम्पनी, बीज भवन भोपाल।
4. उप परियोजना संचालक (तक.), म.प्र. अर्बन डेवलपमेंट कम्पनी, बीज भवन भोपाल।
5. टीम लीडर, पी.एम.सी., एम.पी.यू.डी.सी. भोपाल।
6. टीम लीडर, पी.एम.सी., एम.पी.यू.एस.आई.पी. भोपाल।
7. संयुक्त संचालक / अधीक्षण यंत्री / कार्यपालन यंत्री, नगरीय प्रशासन एवं विकास सागर संभाग सागर।
8. मुख्य नगर पालिका अधिकारी, नगर परिषद राहतगढ़, की ओर आवश्यक कार्यवाही एवं संबंधित सदस्यों को सूचित करने हेतु सूचनार्थ।
9. मे0 जय वरूडी कंस्ट्रक्शन कम्पनी एण्ड रंजीत बिल्डकॉन जे.वी. की ओर भेजकर निर्देशित किया जाता है कि संदर्भित पत्रों में दिये गये निर्देशानुसार शिकायतों की पंजी संधारित कर निराकरण कराये जाने हेतु व्यवस्था सुनिश्चित करें।
10. श्री ..... यंत्री निर्देशानुसार शिकायतों के निपटान हेतु आवश्यक कार्यवाही सुनिश्चित करें।

परियोजना प्रबंधक
परियोजना क्रियान्वयन इकाई सागर
म.प्र. अर्बन डेवलपमेंट कम्पनी

Summary Translation in English - Letter to GRC Established at Rahatgarh Nagar Parishad

Letter No 177 dated 22.09.2017 Regarding formation of GRC in Rahatgarh

In compliance of order no 3934, dated 06.03.2017 the Grievance Redressal Committees has been formed for externally funded project MPUSIP during operation, implementation and maintenance phase. The members of the committee are as follows:

S. N.	Name	Designation	Post in GRC
1	Shri B. K. Srivastava	PM, PIU Sagar	Chairperson
2	Smt Kalapna/ Surendra Chourasiya	Parshad, Ward No. 7, Rahatgarh	Member
3	Shri Narendra Rai	Social Worker	Member
4	Miss Vidya Mishra	CMO, ULB Rahatgarh	Member
5	Shri Kashi Ram Khoiyai	CDO, PIU, Sagar	Member

Appendix 9: National Ambient Air Quality Standards

SL NO:	Pollutants	Time weighted average	Concentration in ambient air		Method of measurement
			Industrial, Residential, Rural & Other Areas	Ecologically Sensitive Areas	
1	Sulphur Dioxide (SO_2) $\mu g/m^3$	Annual 24 hours	50 80	20 80	Improved West and Geake-Ultraviolet fluorescence
2	Nitrogen Dioxide (NO_2) $\mu g/m^3$	Annual 24 hours	40 80	30 80	Modified Jacob &Hochheiser (Na-Arsenite) Chemiluminescence
3	Particulate Matter (Size less than 10 µm) or PM10 $\mu g/m^3$	Annual 24 hours	60 100	60 100	Gravimetric -TOEM -Beta attenuation
4	Particulate Matter (Size less than 2.5 µm) or PM2.5 $\mu g/m^3$	Annual 24 hours	40 60	40 60	Gravimetric -TOEM -Beta attenuation
5	Carbon Monoxide (CO) mg/m^3	8 hours 1 hours	02 04	02 04	Non Dispersive Infra Red (NDIR) Spectroscopy

Appendix 10: National Ambient Air Quality Standards in Respect of Noise

Area code	Category of area/zone	Limit in dB (A)	
		Day time	Night time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence zone	50	40

Appendix 11: Vehicle Exhaust Emission Norms

1. Passenger Cars

Norms	CO(g/km)	HC+ NOx(g/km)
1991Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35 (combined)
Bharat Stage-IV	1.0	0.18 (combined)

2. Heavy Diesel Vehicles

Norms	CO(g/kmhr)	HC (g/kmhr)	NOx (g/kmhr)	PM(g/kmhr)
1991Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Source: Central Pollution Control Board

CO = Carbon Monixide; g/kmhr = grams per kilometer-hour; HC = Hydrocarbons; NOx = oxides of nitrogen; PM = Particulates Matter

Appendix 12: Drinking Water Standards

No.	Substance or characteristic	Requirement Desirable limit	Undesirable effect outside the desirable	Permissible limit in the absence of alternate Source	Remarks
Essential Characteristic					
1.	Colour Hazen Units, Max	5	Above 5, consumer acceptance decreases	25	Extended to 25 only if toxic Substance are not suspect in absence of alternate sources
2.	Odour	Unobjectionable	-	-	a) test cold and when heated b) test are several dilutions
3.	Taste	Agreeable	-	-	Test to be conducted only after safely has been established
4.	Turbidity (NTU) Max	5	Above 5, consumer acceptance decreases	10	-
5.	pH value	6.5 to 8.5	Beyond this range the water will after the mucous membrane and/or water supply system	No relaxation	-
6.	Total Hardness (mg/L) CaCO3	300	Encrustation in water supply structure and adverse effects on domestic use	600	-
7.	Iron (mg/L, Fe) Max	0.3	Beyond this limit taste/appearance are affected; has adverse effects on domestic uses and water supply structure and promotes iron bacteria	1.0	-
8.	Chlorides 250 (mg/L, Cl) Max	250	Beyond effects outside the desirable limit	1000	-
9.	Residual free Chlorine (mg/L), Max	0.2	-	-	To be applicable only when water is chlorinated. Tested at customer end. When protection against viral infection is required, it should be min. 0.5 mg/L.
Desirable Characteristics					
10.	Dissolved solids mg/L. Max	500	Beyond this, palatability decreases and may cause gastrointestinal irritation.	2000	-
11.	Calcium (mg/L, Ca) Max.	75	Encrustation in water supply structure and adverse effects on domestic use.	200	-
12.	Magnesium (mg/L, Mg) Max	30	Encrustation in water supply structure and adverse effects on domestic use.	100	-
13.	Copper (mg/L, Cu) Max	0.05	Astringent taste dis coloration and corrosion of pipes fittings and utensils	1.5	-

			will be caused beyond this.		
14.	Manganese (mg/L, Mn) Max	0.1	Beyond this limit taste/appearance are affected, has advers effect on domestic use and water supply structure	0.3	-
15.	Sulphate (mg/L, SO4) Max.	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	400	May be extended upto 400 provided magnesium (as Mg) does not exceed 30
16.	Nitrate (mg/L, NO3) Max.	45	Beyond this methaemoglobinemia takes place.	100	-
17.	Fluoride (mg/L, F) Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis.	1.5	-
18.	Phenolic Compounds (mg/L C6H5OH) Max.	0.001	Beyond this, it may cause objectionable taste and odour	0.002	-
19.	Mercury (mg/L Hg) Max	0.001	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected
20	Cadmium (mg/L, Cd) Max	0.01	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected
21.	Selenium (mg/L, Se) Max	0.01	Beyond this the water becomes toxic.	No Relaxation.	To be tested when pollution is suspected
22.	Arsenic (mg/L, As) Max.	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
23.	Cyanide	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
24.	Lead (mg/L Pb) Max.	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
25.	Zinc (mg/L, Zn) Max.	5	Beyond this limit it can cause astringent taste and an opalescence in water	15	To be tested when pollution is suspected
26.	Anionic detergents (mg/L, MBAS) Max	0.2	Beyond this limit it can cause a light froth in water	1.0	To be tested when pollution is suspected
27.	Chromium (mg/L, Cr6+	0.05	May be carcinogenic above this limit	-	-
28.	Polynuclear Aromatic Hydrocarbons (mg/l, PAH) Max	-	May be carcinogenic	-	-
29.	Mineral oil (mg/L)	0.01	Beyond this limit, undesirable taste and odour after chlorination takes place	0.03	To be tested when pollution is suspected
30.	Pesticides (mg/L) max	Absent	Toxic	0.001	-
Radioactive materials					
31.	Alpha emitters Bq/L Max	-	-	0.1	-
32.	Beta emitters Pci/L Max	-	-	1.0	-
33.	Alkalinity (mg/L,) Max	200	Beyond this limit, taste becomes unpleasant	600	-
34.	Aluminum (mg/L, Al) Max	0.03	Cumulative effect is reported to cause dementia	0.2	
35.	Boron (mg/L) Max	1.0	-	5.0	-

Appendix 13: Salient Features of Major Labor Laws Applicable to Establishments Engaged in Construction of Civil Works

(i) Workmen Compensation Act, 1923 - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

(ii) Payment of Gratuity Act, 1972 - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

(iii) Employees' PF and Miscellaneous Provisions Act, 1952 - The Act provides for monthly contributions by the employer plus workers @10 % or 8.33 %. The benefits payable under the Act are: (a) Pension or family pension on retirement or death as the case may be; (b) deposit linked insurance on the death in harness of the worker; (c) payment of PF accumulation on retirement/death etc.

(iv) Maternity Benefit Act, 1951 - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(v) Contract Labour (Regulation and Abolition) Act, 1970 - The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.

(vi) Minimum Wages Act, 1948 - The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employment.

(vii) Payment of Wages Act, 1936 - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

(viii) Equal Remuneration Act, 1979 - The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.

(ix) Payment of Bonus Act, 1965 - The Act is applicable to all establishments employing 20 or more workmen. The Act provides for payments of annual bonus subject to a minimum of 8.33 % of wages and maximum of 20 % of wages to employees drawing Rs. 3,500/- per month or less. The bonus to be paid to employees getting Rs. 2,500/- per month or above up to Rs.3,500/- per month shall be worked out by taking wages as Rs.2,500/- per month only. The Act does not apply to certain establishments. The newly set up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of the Act.

(x) Industrial Disputes Act, 1947 - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(xi) Industrial Employment (Standing Orders) Act, 1946 - It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the employer on matters provided in the Act and get the same certified by the designated Authority.

(xii) Trade Unions Act, 1926 - The Act lays down the procedure for registration of trade unions of workmen and employees. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(xiii) Child Labor (Prohibition and Regulation) Act, 1986 - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry.

(xiv) Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979 - The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc

(xv) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996 - All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

Appendix 14: Sample Outline Spoils (construction waste) Management Plan

- The Spoil Management Plan should be site specific and be part of the monthly Construction Management Plan.
- The contractor, in consultation with the PIU, has to find out appropriate location/s for the disposal of the excess soil generated. The spoils should be deposited only at these sites.
- Further precautions need to be taken in case of the contaminated spoils
- The vehicle carrying the spoil should be covered properly.
- The spoils generating from each site should be removed on the same day or immediately after the work is complete. The site / road should be restored to the original condition.

I. Spoils information

The spoil information contains the details like a) The type / material, b) Potential contamination by that type, c) Expected volume (site / component specific), d) Spoil Classification etc.

II. Spoils management

The Spoil Management section gives the details of a) Transportation of spoil b) disposal site details c) Precautions taken d) Volume of contaminated spoil, if present, d) Suggested reuse of disposal of the spoil

III. Documentation

The volume of spoil generated (site specific, date wise), site disposed, reuse / disposal details should be documented properly.

Appendix 15: Extract from Construction & Demolition Management Rules, 2016

[Published In the Gazette of India, Part-II, Section-3, Sub-section (ii)]
Ministry of Environment, Forest and Climate Change

NOTIFICATION

New Delhi, the 29th March, 2016

G.S.R. 317(E).-Whereas the Municipal Solid Wastes (Management and Handling) Rules, 2000 published vide notification number S.O. 908(E), dated the 25th September, 2000 by the Government of India in the erstwhile Ministry of Environment and Forests, provided a regulatory frame work for management of Municipal Solid Waste generated in the urban area of the country;

And whereas, to make these rules more effective and to improve the collection, segregation, recycling, treatment and disposal of solid waste in an environmentally sound manner, the Central Government reviewed the existing rules and it was considered necessary to revise the existing rules with a emphasis on the roles and accountability of waste generators and various stakeholders, give thrust to segregation, recovery, reuse, recycle at source, address in detail the management of construction and demolition waste.

And whereas, the draft rules, namely, the Solid Waste Management Rules, 2015 with a separate chapter on construction and demolition waste were published by the Central Government in the Ministry of Environment, Forest and Climate Change vide G.S.R. 451 (E), datedthe 3rd June, 2015 inviting objections or suggestions from the public within sixty days from the date of publication of the said notification;

And Whereas, the objections or suggestions received within the stipulated period were duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sections 6, 25 of the Environment (Protection) Act, 1986 (29 of 1986), and in supersession of the Municipal Solid Wastes (Management and Handling) Rules, 2000, except as respect things done or omitted to be done before such supersession, the Central Government hereby notifies the following rules for Management of Construction and Demolition Waste –

1. Short title and commencement.-(1) These rules shall be called the Construction and Demolition Waste Management Rules, 2016.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Application.-The rules shall apply to every waste resulting from construction, re-modeling, repair and demolition of any civil structure of individual or organisation or authority who generates construction and demolition waste such as building materials, debris, rubble.

3. Definitions –(1) In these rules, unless the context otherwise requires,-

(a) " ACT' means the Environment (Protection) Act, 1986 (29 of 1986);

(b) **"construction"** means the process of erecting of building or built facility or other structure, or

1

building of infrastructure including alteration in these entities,;

(c) **"construction and demolition waste"** means the waste comprising of building materials, debris and rubble resulting from construction, re-modeling, repair and demolition of any civil structure;

(d) **"de-construction"** means a planned selective demolition in which salvage, re-use and recycling of the demolished structure is maximized;

(e) **"demolition"** means breaking down or tearing down buildings and other structures either manually or using mechanical force (by various equipment) or by implosion using explosives.

(f) **"form" means a Form annexed to these rules;**

(g) **"local authority"** means an urban local authority with different nomenclature such as municipal corporation, municipality, nagarpalika, nagarnigam, nagarpanchayat, municipal council including notified area committee and not limited to or any other local authority constituted under the relevant statutes such as gram panchayat, where the management of construction and demolition waste is entrusted to such agency;

(h) **" schedule"** means a schedule annexed to these rules;

(i) **"service provider'** means authorities who provide services like water, sewerage, electricity, telephone, roads, drainage etc. often generate construction and demolition waste during their activities, which includes excavation, demolition and civil work;

(j) **"waste generator" means any person or association of persons** or institution, residential and commercial establishments including Indian Railways, Airport, Port and Harbour and Defence establishments who undertakes construction of or demolition of any civil structure which generate construction and demolition waste.

(2) Words and expressions used but not defined herein shall have the same meaning defined in the ACT.

(4) Duties of the waste generator -

(1) Every waste generator shall prima-facie be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated, as directed or notified by the concerned local authority in consonance with these rules.

(2) The generator shall ensure that other waste (such as solid waste) does not get mixed with this waste and is stored and disposed separately.

(3) Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar and shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work and keep the concerned

authorities informed regarding the relevant activities from the planning stage to the implementation stage and this should be on project to project basis.

(4) Every waste generator shall keep the construction and demolition waste within the premise or get the waste deposited at collection centre so made by the local body or handover it to the authorised processing facilities of construction and demolition waste; and ensure that there is no littering or deposition of construction and demolition waste so as to prevent obstruction to the traffic or the public or drains.

(5) Every waste generator shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities; Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month shall have to pay for the processing and disposal of construction and demolition waste generated by them, apart from the payment for storage, collection and transportation. The rate shall be fixed by the concerned local authority or any other authority designated by the State Government.

(5) Duties of service provider and their contractors -

(1) The service providers shall prepare within six months from the date of notification of these rules, a comprehensive waste management plan covering segregation, storage, collection, reuse, recycling, transportation and disposal of construction and demolition waste generated within their jurisdiction.

(2) The service providers shall remove all construction and demolition waste and clean the area every day, if possible, or depending upon the duration of the work, the quantity and type of waste generated, appropriate storage and collection, a reasonable timeframe shall be worked out in consultation with the concerned local authority.

(3) In case of the service providers have no logistics support to carry out the work specified in sub-rules (1) and (2) , they shall tie up with the authorised agencies for removal of construction and demolition waste and pay the relevant charges as notified by the local authority.

(6) Duties of local authority-The local authority shall,-

(1) issue detailed directions with regard to proper management of construction and demolition waste within its jurisdiction in accordance with the provisions of these rules and the local authority shall seek detailed plan or undertaking as applicable, from generator of construction and demolition waste;

(2) chalk out stages, methodology and equipment, material involved in the overall activity and final clean up after completion of the construction and demolition ;

(3c) seek assistance from concerned authorities for safe disposal of construction and demolition waste contaminated with industrial hazardous or toxic material or nuclear waste if any;

(4) shall make arrangements and place appropriate containers for collection of waste and shall remove at regular intervals or when they are filled, either through own resources or by appointing private operators;

(5) shall get the collected waste transported to appropriate sites for processing and disposal either through own resources or by appointing private operators;

(6) shall give appropriate incentives to generator for salvaging, processing and or recycling preferably in-situ;

(7) shall examine and sanction the waste management plan of the generators within a period of one month or from the date of approval of building plan, whichever is earlier from the date of its submission;

(8) shall keep track of the generation of construction and demolition waste within its jurisdiction and establish a data base and update once in a year;

(9) shall device appropriate measures in consultation with expert institutions for management of construction and demolition waste generated including processing facility and for using the recycled products in the best possible manner;

(10) shall create a sustained system of information, education and communication for construction and demolition waste through collaboration with expert institutions and civil societies and also disseminate through their own website;

(11) shall make provision for giving incentives for use of material made out of construction and demolition waste in the construction activity including in non-structural concrete, paving blocks, lower layers of road pavements, colony and rural roads.

(7) Criteria for storage, processing or recycling facilities for construction and demolition waste and application of construction and demolition waste and its products-

(1) The site for storage and processing or recycling facilities for construction and demolition waste shall be selected as per the criteria given in **Schedule I**;

(2) The operator of the facility as specified in sub- rules (1) shall apply in **Form I** for authorization from State Pollution Control Board or Pollution Control Committee.

(3) The operator of the facility shall submit the annual report to the State Pollution Control Board in **Form II.**

(3) Application of materials made from construction and demolition waste in operation of sanitary landfill shall be as per the criteria given in **Schedule II.**

(8) Duties of State Pollution Control Board or Pollution Control Committee-

(1) State Pollution Control Board or Pollution Control Committee shall monitor the implementation of these rules by the concerned local bodies and the competent authorities and the annual report shall be sent to the Central Pollution Control Board and the State Government or Union Territory or any other State level nodal agency identified by the State Government or Union Territory administration for generating State level comprehensive data. Such reports shall also contain the comments and suggestions of the State Pollution Control Board or Pollution Control Committee with respect to any comments or changes required;

(2) State Pollution Control Board or Pollution Control Committee shall grant authorization to construction and demolition waste processing facility in **Form-III** as specified under these rules after examining the application received in **Form I**;

(3) State Pollution Control Board or Pollution Control Committee shall prepare annual report in **Form IV** with special emphasis on the implementation status of compliance of these rules and forward report to Central Pollution Control Board before the 31st July for each financial year.

(9) Duties of State Government or Union Territory Administration-

(1) The Secretary in-charge of development in the State Government or Union territory administration shall prepare their policy document with respect to management of construction and demolition of waste in accordance with the provisions of these rules within one year from date of final notification of these rules.

(2) The concerned department in the State Government dealing with land shall be responsible for providing suitable sites for setting up of the storage, processing and recycling facilities for construction and demolition waste.

(3) The Town and Country planning Department shall incorporate the site in the approved land use plan so that there is no disturbance to the processing facility on a long term basis.

(4) Procurement of materials made from construction and demolition waste shall be made mandatory to a certain percentage (say 10-20%) in municipal and Government contracts subject to strict quality control.

(10) Duties of the Central Pollution Control Board - (1) The Central Pollution Control Board shall,-

(a) prepare operational guidelines related to environmental management of construction and demolition waste management;

(b) analyze and collate the data received from the State Pollution Control Boards or Pollution Control Committee to review these rules from time to time;

(c) coordinate with all the State Pollution Control Board and Pollution Control Committees for any matter related to development of environmental standards;

(d) forward annual compliance report to Central Government before the 30th August for each financial year based on reports given by State Pollution Control Boards of Pollution Control Committees.

(11) Duties of Bureau of Indian Standards and Indian Roads Congress -The Bureau of Indian Standards and Indian Roads Congress shall be responsible for preparation of code of practices and standards for use of recycled materials and products of construction and demolition waste in respect of construction activities and the role of Indian Road Congress shall be specific to the standards and practices pertaining to construction of roads.

Schedule III
Timeframe for Planning and Implementation
[See Rule 13]

Sl. No.	Compliance Criteria	Cities with population of 01 million and above	Cities with population of 0.5-01 million	Cities with population of less than 0.5 million
1	Formulation of policy by State Government	12 months	12 months	12 months
2	Identification of sites for collection and processing facility	18 months	18 months	18 months
3	Commissioning and implementation of the facility	18 months	24 months	36 months
4	Monitoring by SPCBs	3 times a year – once in 4 months	2 times a year – once in 6 months	2 times a year – once in 6 months

The time Schedule is effective from the date of notification of these rules.

FORM – I
See [Rule 7 (2)]
Application for obtaining authorisation

To,
The Member Secretary

_____Name of the local authority or Name of the agency : appointed by the municipal authority

Correspondence address Telephone No. Fax No.	
Nodal Officer and designation (Officer authorized by the competent authority or agency responsible for operation of processing or recycling or disposal facility)	
Authorisation applied for (Please tick mark)	Setting up of processing or recycling facility of construction and demolition waste
Detailed proposal of construction and demolition waste processing or recycling facility to include the following Location of site approved and allotted by the Competent Authority. Average quantity (in tons per day) and composition of construction and demolition waste to be handled	

Appendix 16: Sample Outline Traffic Management Plan

A. Principles for TMP around the Water Pipes Construction Sites

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

(i) the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
(ii) protection of work crews from hazards associated with moving traffic;
(iii) mitigation of the adverse impact on road capacity and delays to the road users;
(iv) maintenance of access to adjoining properties; and
(v) addressing issues that may delay the project.

B. Operating Policies for TMP

2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

(i) Make traffic safety and temporary traffic control an integral and high-priority element of project from planning through design, construction, and maintenance.
(ii) Inhibit traffic movement as little as possible.
(iii) Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
(iv) Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
(v) Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
(vi) Train all persons that select, place, and maintain temporary traffic control devices.
(vii) Keep the public well informed.
(viii) Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

3. **Figure A2 to Figure A12** illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyze the impact due to street closure

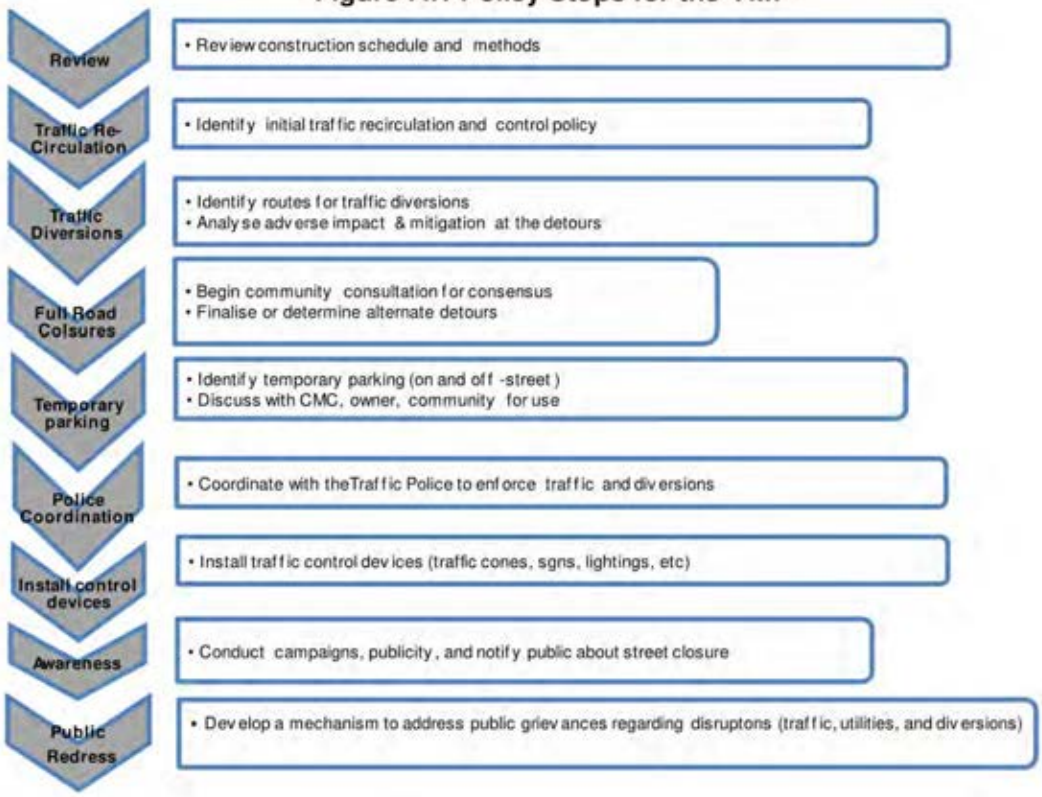
4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

(i) approval from the ULB/Public Works Department (PWD) to use the local streets as detours;
(ii) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
(iii) determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;

(iv) determining if additional traffic control or temporary improvements are needed along the detour route;
(v) considering how access will be provided to the worksite;
(vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
(vii) developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

5. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure A1: Policy Steps for the TMP



D. Public awareness and notifications

6. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

6. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

7. The PIU will also conduct an awareness campaign to educate the public about the following issues:

(i) traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
(ii) defensive driving behaviour along the work zones; and
(iii) reduced speeds enforced at the work zones and traffic diversions.

8. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

9. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

(i) explain why the brochure was prepared, along with a brief description of the project;
(ii) advise the public to expect the unexpected;
(iii) educate the public about the various traffic control devices and safety measures adopted at the work zones;
(iv) educate the public about the safe road user behaviour to emulate at the work zones;
(v) tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
(vi) indicate the office hours of relevant offices.

E. Install traffic control devices at the work zones and traffic diversion routes

10. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

11. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary "STOP" and "GO").

12. **Figure A2 to Figure A6** illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Street closure with detour

13. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

14. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flagggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

16. In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

Figure A2 & A3: Work on shoulder or parking lane & Shoulder or parking lane closed on divided road

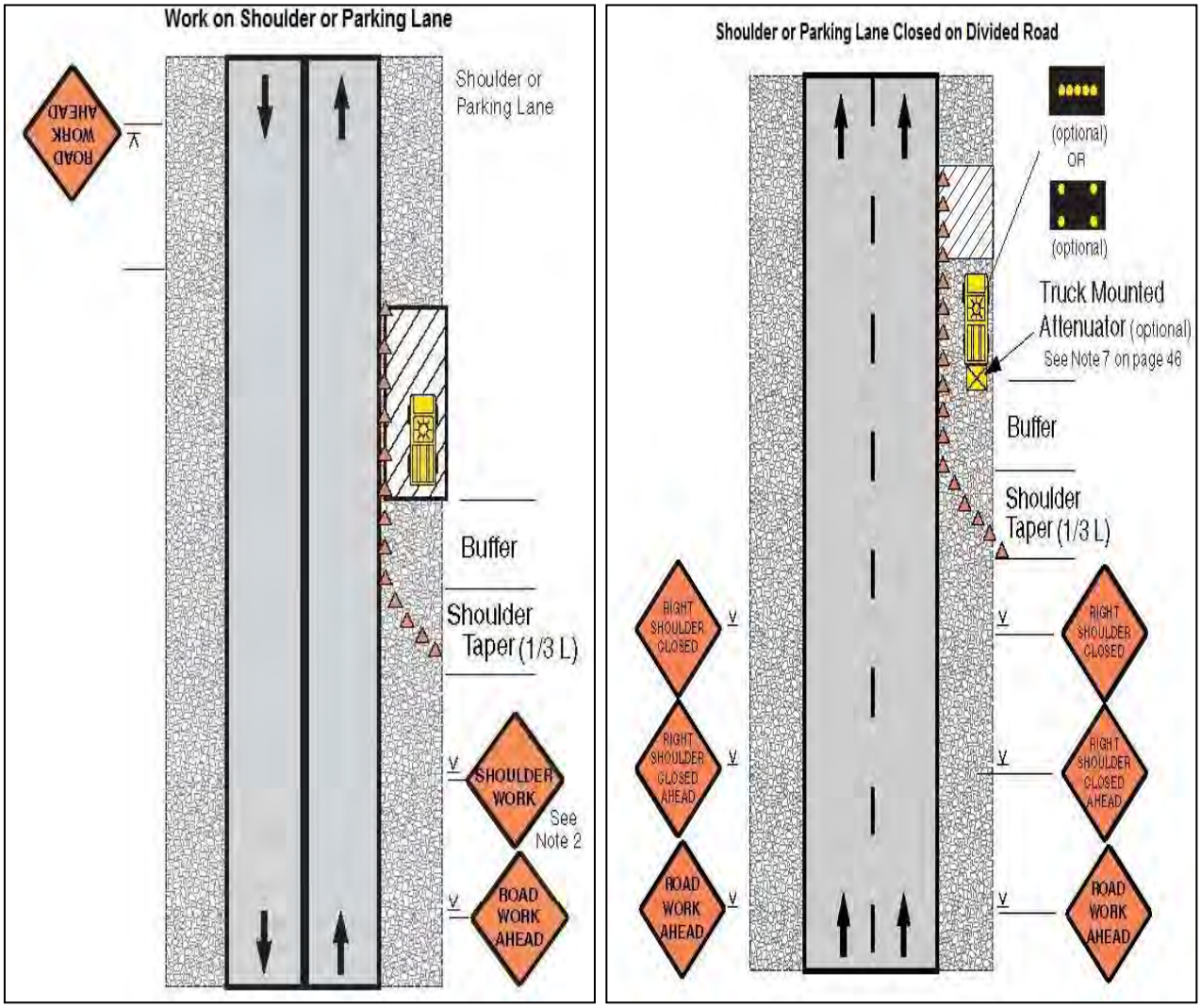


Figure A4 & A5: Work in Travel lane & Lane closure on road with low volume

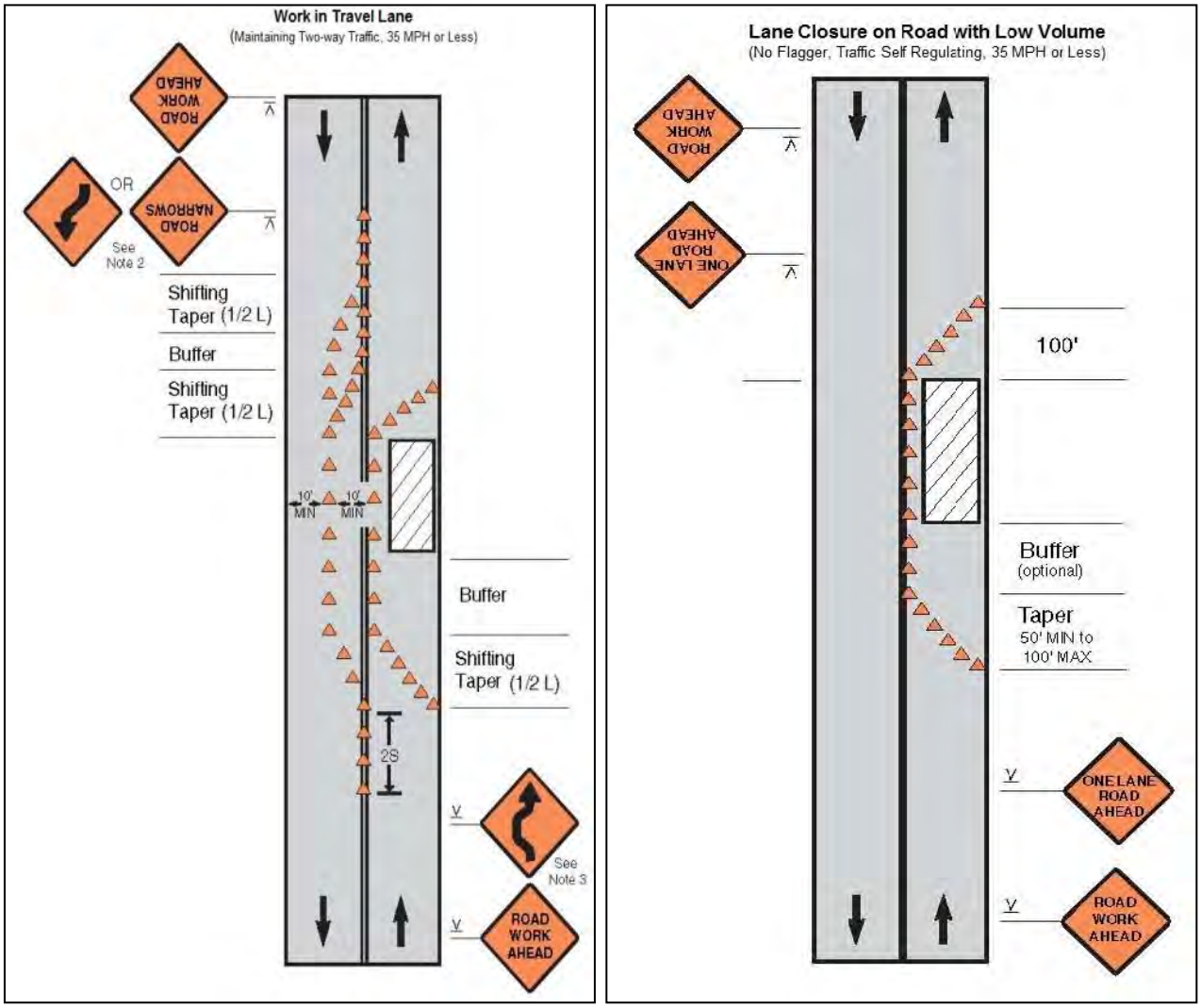
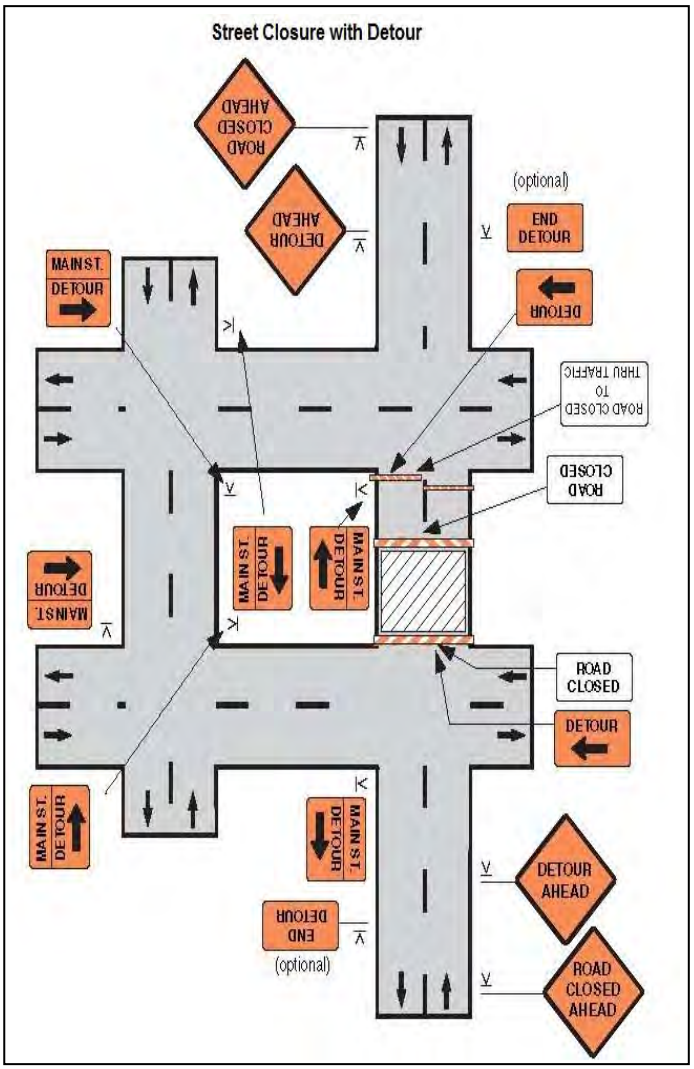


Figure A6: Street closure with detour



Appendix 17: Monitoring Checklist Format (1 to 11) Being Used at Work Sites

Package No / Name_____

Checklist 1: For overall package

Monitoring Month, Year: _____

	Mitigation Measures	Week-1			Week-2			Week-3			Week-4			Week-5			PMC
	Date																
I	**Pre-construction phase**	C	C	P	C	C	P	C	C	P	C	C	P	C	C	P	ES
1	Utilities to be shifted/disrupted identified																
2	Contingency plan prepared for utility disruptions																
3	Clearance/license copies of borrow/quarries submitted to PIU																
4	All material sources are approved by PIU / PMC																
5	Monthly material report submitted to PIU / PMC																
6	No new borrow areas / quarries created by contractor																
7	All necessary permissions obtained for works																
8	Copies of all permission/approvals available on site																
9	EMP available in all sites																
10	Contractor site staff & key workers are trained in EMP																
	Construction phase																
11	Material transport conducted during non-peak hours																
12	Contractor employed local labourers																
13	No chance finds encountered																
14	When chance find noticed, work stopped & reported to PMU/PMC																
15	Construction vehicles, P&M fitted with pollution control devises																
16	PUC certificate obtained for all vehicles/equipment																
17	Air, noise, water monitoring conducted as per the EMP																
	Post construction clean up																
18	All spoils, wreckage, temporary structures removed																
19	All disrupted utilities restored																
20	Spillage of substances like oils, paints etc., cleaned up																
21	Hardened surfaces ripped-off materials removed & top soiled																
22	Site restoration documented with photographs																

Notes:

1. C = Contractor; P = PMC; Use following signs to fill checklist: √ (if complied), × (if not complied), - (if not applicable)
2. Contractor's EHS supervisor to fill checklist twice a week
3. PMC Environmental Engineer to check weekly once; PMC Environmental specialist (ES) to check periodically the onsite compliance & mark on the checklist in given column when he/she visits; if there is no visit of ES during the month, it may be left blank
4. Contractor to submit this checklist on 5th of every month for the preceding month along with site photographs
5. Remarks on EMP implementation: Satisfactory / Unsatisfactory / Requires improvement

Contractor's Remarks:_____ **PIU Remarks:**_____ **PMC Remarks:**_____

If unsatisfactory as per PMC, describe main concern:_____

Name, Designation, Signature & Date (Contractor)_____(PIU)_____ ____(PMC)_____

Package No / Name_____

Site Photographs (showing on site compliance / non-compliance to support checklist observations):

Package No / Name_____

Checklist 2: For Labour Camps (One Checklist to be filled for each camp site)

Name/Location of Labour Camp:_____ Monitoring Month, Year: _____

	Mitigation Measures	Week-1			Week-2			Week-3			Week-4			Week-5			PMC
	Date																
		C	C	P	C	C	P	C	C	P	C	C	P	C	C	P	ES
1	Camps are located away from residential, sensitive areas, water bodies, forests																
2	No tree cut for camps set up																
3	Proper compound wall/fencing provided																
4	Site layout plan prepared & displayed on site																
5	All facilities are labeled properly																
6	Camp is provided with hard leveled surface; no loose soil, water logging																
7	Living quarters provided with standard materials; no huts/shacks																
8	Rooms have adequate lighting and ventilation																
9	Proper raised flooring provided																
10	Safe drinking water provided																
11	Washing / bath area provided with adequate water																
12	Adequate number of toilets provided with water, maintained cleanly																
13	Septic tanks & soak pit provided for wastewater																
14	Clear pathways/walk ways provided for safe movement																
15	Separate place for cooking with gas provided																
16	Solid waste is properly managed –collection bin, composting pit provided																
17	Regular maintenance /cleaning of all facilities carried out																
18	Camp facility is maintained neatly																
19	Proper separate accommodation provided for families (in case families)																
20	Crèche provide for children (in case of families with children)																
19	Camp site cleared & restored after completion of work																

Notes:

1. C = Contractor; P = PMC; Use following signs to fill checklist: √ (if complied), × (if not complied), – (if not applicable)
2. Contractor's EHS supervisor to fill checklist twice a week
3. PMC Environmental Engineer to check weekly once; PMC Environmental specialist (ES) to check periodically the onsite compliance & mark on the checklist in given column when he/she visits; if there is no visit of ES during the month, it may be left blank
4. Contractor to submit this checklist on 5th of every month for the preceding month along with site photographs
5. Remarks on EMP implementation: Satisfactory / Unsatisfactory / Requires Improvement

Contractor's Remarks:_____ **PIU Remarks:**_____ **PMC Remarks:**_____

If not satisfactory, PMC to describe main concerns:_____

Name, Designation, Signature & Date (Contractor)_____(PIU)_____ ____(PMC)_____

Package No / Name_____

Site Photographs (showing on site compliance / non-compliance to support checklist observations):

Package No / Name_____

Checklist 3: For all Work sites (OHT, WTP etc., except pipeline works) - One Checklist to be filled for each work site

Name/Location of Work site:_____ Monitoring Month, Year: _____

	Mitigation Measures	Week-1			Week-2			Week-3			Week-4			Week-5			PMC
	Date																
		C	C	P	C	C	P	C	C	P	C	C	P	C	C	P	ES
1	Proper fencing/compound wall provided																
2	Work site layout plan prepared & displayed on site																
3	All facilities, work/store area uniformly labeled & displayed																
4	Work area provided with hard leveled surface; no loose soil, water logging																
5	Clear walkways demarcated for safe movement of workers, staff, visitors																
6	Proper internal roads provided for safe movement of construction vehicles																
7	Temporary rest area provided for workers																
8	Drinking water provided																
9	Wash area provided																
10	Toilet provided																
11	Separate toilets provided for women																
12	First aid available																
	Dust control																
13	Work site and surroundings are not dusty																
14	Dust screen provided around work site																
15	There is no loose soil on work site; circulation areas properly stabilized																
16	Water sprinkled adequately (2- 3 times daily)																
17	Material stocks covered with tarpaulins																
18	Open trucks transporting material (sand, gravel, aggregate etc) are covered with tarpaulins																
19	Material from trucks unloaded in a barricaded area																
20	Wheels & undercarriage of haul trucks cleaned after unloading																
	Noise																
21	Noisy works not conducted in the nights																
22	Proper noise control (silencers, mufflers etc.,) available for all equipment																
23	Surrounding people informed of noisy work schedule																
24	There are no structures nearby that will be under risk of damage/collapse due to high construction noise, vibration																
	Water pollution / polluted runoff																
25	Earthwork not scheduled in rainy season																
26	Material, soil stockpiled covered with tarpaulins/sheets																
27	Temporary bunds, drains, silt traps / sedimentation basins provided																
28	Fuels/chemical stored on impervious floor; spill collection kit provided																
29	Debris/waste soil disposed in designated location only																
30	Accumulated water in pits is pumped to temporary basins/pits																
31	Safety measure undertaken to avoid pit collapse due to water																
	Safety at work place																
32	There are potentially unsafe areas in the work site																

Package No / Name_____

33	Site is properly maintained and safety ensured																
34	Elevated platforms, steps, access, ladders, walkways provided are safe																
35	Deep excavation (>1m) properly protected																
36	Standard, safe construction methods followed																
37	Hard barricading provided for deep excavations (>1.5 m)																
38	All workers / staff using proper PPEs																
39	All vehicles/moving equipment have back up alarms																
40	All installations (eg., electricity) properly secured; no hazard areas																
41	Work sites properly secured; no unauthorized traffic/public entry																
42	Safety, information, caution sign board provided in site for awareness																
43	Health & safety training provided to workers																
44	Accidents registered and reported																
45	Compliant info, box/register available																
	Waste management																
46	Excess soil / debris reused in in project/other construction works																
47	Soil / material / debris not stocked haphazardly on site																
48	Disposal site identified prior to start of work																
49	Hazardous wastes/residuals (oils, chemicals, lubricants etc.,) disposed via licensed agencies																
50	Separate waste collection bins provided																
51	Recyclable waste sold in market																
52	Waste is not burnt																
53	Work site is maintained neatly																
54	Site restored to original condition after work completion																

Notes:

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2. Contractor's EHS supervisor to fill checklist twice a week
3. PMC Environmental Engineer to check weekly once. PMC Environmental specialist (ES) to check periodically the onsite compliance & mark on the checklist in given column when he/she visits; if there is no visit of ES during the month, it may be left blank
4. Contractor to submit this checklist on 5th of every month for the preceding month along with site photographs
5. Remarks on EMP implementation: Satisfactory / Unsatisfactory / Requires improvement

Contractor's Remarks:_____ **PIU Remarks:**_____ **PMC Remarks:**_____

If unsatisfactory as per PMC, describe main concern:_____

Name, Designation, Signature & Date (Contractor)_____(PIU)_____ ___(PMC)_____

Package No / Name_____

Site Photographs (showing on site compliance / non-compliance to support checklist observations):

Package No / Name_____

Checklist 4: For pipeline works – (Checklist to be filled each work site-wise or at least one for each town. If one checklist is filled for one town, then checklist should present overall work in a town)

Name/Location of Pipeline Work:_____ **Monitoring Month, Year:** _____

	Mitigation Measures	Week-1			Week-2			Week-3			Week-4			Week-5			PMC
	Date	C	C	P	C	C	P	C	C	P	C	C	P	C	C	P	ES
	Dust control																
1	Construction area barricaded on both sides																
2	All work activities are confined to barricaded area																
3	Excess soil moved to disposal site																
4	Work is undertaken section-wise																
5	New section is taken up only after trench filled & properly consolidated																
6	Road restoration taken up immediately																
	Construction noise																
7	Noisy works not conducted in night																
8	Fuels/chemical stored on impervious floor; spill collection kit provided																
9	Proper noise control (silencers, mufflers etc..) available for equipment																
10	There are no old/risky buildings near noise work																
11	No noisy works conducted near hospitals/schools etc..																
	Water pollution / silt runoff																
12	Pipeline excavation work not scheduled in rainy season																
13	Material, soil stockpiled covered with tarpaulins/sheets																
14	Debris/waste soil disposed in designated location only																
15	Accumulated water in pits is pumped to temporary basins																
16	Safety measure undertaken to avoid pit collapse due to water																
	Traffic / Access management																
17	Pipeline work taken up as per implementation plan																
18	Prior to start, public is informed of pipeline work via newspapers, pamphlets, TV etc.,																
19	Alternative roads available for traffic movement																
20	Temporary diversions provided as required																
21	Local public informed about the work, diversions, traffic controls																
22	Work area demarcated, barricaded; minimum strip of land used																
23	Material/waste/construction equipment not obstructing traffic/pedestrians																
24	Trench width minimized with proper construction methods																
25	Public information / contact / sign / caution boards provided																
26	Gaps in trenches or wooden/metal planks provided																
27	Access not blocked to any house /business																
28	Local/affected people/business informed about access restriction1-week in advance																
	Safety																
29	Site is properly maintained and there are no visible unsafe areas																
30	Deep excavation (>1.5m) properly protected with bracing																

Package No / Name_____

31	Standard, safe construction methods followed																		
32	No adhoc / sub-standards methods used																		
33	Barricading provided on both sides of work area																		
34	Precautions taken to avoid trench collapse & damage to surrounding buildings																		
35	All workers / staff using proper PPEs																		
36	All vehicles/moving equipment have back up alarms																		
37	Work sites properly secured; no unauthorized traffic/public entry																		
38	Road signage, flagman provided to regulated traffic																		
39	Safety, information, caution sign board provided in site for awareness																		
40	Health & safety training provided to workers																		
41	First aid available on site																		
42	Drinking water, sanitation (mobile) provided																		
43	Compliant info, box/register available																		
	Surplus soil management																		
43	Soil / material / debris properly stocked on site																		
44	Reuse / disposal site identified prior to start of work																		
45	Work site is maintained neatly																		
	AC pipes																		
46	Workers & supervisors informed not to excavate, touch AC pipes																		
47	AC pipes left as it is in the ground without disturbing / touching																		
48	All spoils wreckage, rubbish, or temporary structures removed																		
	Post construction																		
49	Excavated roads reinstated to original condition																		
50	All disrupted utilities restored																		
51	Spillage of substances like oils, paints etc., cleaned up																		
52	Site restoration documented with photographs																		

Notes:

1. C = Contractor; P = PMC; Use following signs to fill checklist: √ (if complied), × (if not complied), – (if not applicable)
2. Contractor's EHS supervisor to fill checklist twice a week
3. PMC Environmental Engineer to check weekly once; PMC Environmental specialist (ES) to check periodically the onsite compliance & mark on the checklist in given column when he/she visits; if there is no visit of ES during the month, it may be left blank
4. Contractor to submit this checklist on 5th of every month for the preceding month along with site photographs
5. Remarks on EMP implementation: Satisfactory / Unsatisfactory / Requires improvement

Contractor's Remarks:_____ **PIU Remarks:**_____ **PMC Remarks:**_____

If unsatisfactory as per PMC, describe main concern:_____

Name, Designation, Signature & Date (Contractor) (PIU) (PMC)

Package No / Name_____

Site Photographs (showing on site compliance / non-compliance to support checklist observations):

Package No / Name_____

Checklist 5: Bore well drilling sites

Name/Location of Work site:_____ Monitoring Month, Year: _____

	Mitigation Measures	Week-1			Week-2			Week-3			Week-4			Week-5			PMC
	Date																
		C	C	P	C	C	P	C	C	P	C	C	P	C	C	P	ES
1	Temporary ditch provided for slurry generated from drilling																
2	Dust screen/barricades provided around the work area																
3	Local people informed of noisy drilling work & schedule																

Notes:

1. C = Contractor; P = PMC; Use following signs to fill checklist: √ (if complied), × (if not complied), – (if not applicable)
2. Contractor's EHS supervisor to fill checklist twice a week
3. PMC Environmental Engineer to check weekly once: PMC Environmental specialist (ES) to check periodically the onsite compliance & mark on the checklist in given column when he/she visits; if there is no visit of ES during the month, it may be left blank
4. Contractor to submit this checklist on 5th of every month for the preceding month along with site photographs
5. Remarks on EMP implementation: Satisfactory / Unsatisfactory / Requires improvement

Contractor's Remarks:_____ **PIU Remarks:**_____ **PMC Remarks:**_____

If unsatisfactory as per PMC, describe main concern:_____

Name, Designation, Signature & Date (Contractor)_____(PIU)_____ ____(PMC)_____

Package No / Name_____

Site Photographs (showing on site compliance / non-compliance to support checklist observations):

Package No / Name_____

Checklist 6: Construction Works in Water bodies (intakes/weirs)

Name/Location of Work site:_____ Monitoring Month, Year: _____

	Mitigation Measures	Week-1			Week-2			Week-3			Week-4			Week-5			PMC
	Date																
		C	C	P	C	C	P	C	C	P	C	C	P	C	C	P	ES
1	Works scheduled during no/low flow /water level period																
2	Work are properly confined to avoid entry of water into work area																
3	Best construction method adopted to minimize disturbance to water body																
4	Water flow is not blocked fully																
5	No spillage oils / fuels / chemicals observed																
6	Water collected in work area pumped out only after settling & clarified																
7	Work are cleaned up of all materials/soil/ debris & restored to original prior to onset of monsoon / after completion of work																
8	Works completed prior to monsoon /rains																
9	Water quality monitoring conducted as per the EMP																

Notes:

1. C = Contractor; P = PMC; Use following signs to fill checklist: √ (if complied), × (if not complied), - (if not applicable)
2. Contractor's EHS supervisor to fill checklist twice a week
3. PMC Environmental Engineer to check weekly once; PMC Environmental specialist (ES) to check periodically the onsite compliance & mark on the checklist in given column when he/she visits; if there is no visit of ES during the month, it may be left blank
4. Contractor to submit this checklist on 5th of every month for the preceding month along with site photographs
5. Remarks on EMP implementation: Satisfactory / Unsatisfactory / Requires improvement

Contractor's Remarks:_____ **PIU Remarks:**_____ **PMC Remarks:**_____

If unsatisfactory as per PMC, describe main concern:_____

Name, Designation, Signature & Date (Contractor)_____(PIU)_____ ____(PMC)_____

Package No / Name_____

Site Photographs (showing on site compliance / non-compliance to support checklist observations):

Checklist 7: Accident Reporting Cum First Aid Form

Sr. No.	Name of Town	Date of the Accident and Time	Nature and Extent of Injury	Number of Persons injured/Died	Action Taken	Date reporting to PIU/PMU/PMC and time	Remarks

Checklist 8: Grievances Reporting Format

		Stage - 1 Contractor Level						Stage-2 PIU level				Stage-3 PMU level			Remarks
Sr. No.	Name of Town	Date of Grievance reported	Name of Person/Address/Mob. No.	Type of Grievance	Action Taken (Yes/No)	Whether resolved or not	If not resolved (Date of Forwarding to PIU)	Date of Grievance received	Type of Action taken	Result of Action (Resolve or not resolve)	If not resolved (Date of Forwarding to PMU)	Date of Grievance received	Recommendation of Committee	Date of Action Taken	

Checklist 9: Change of Location of Subproject Components and its Impact

Sr. No.	Name of Town	Particulars	Details of Proposed component as per DPR	Details of sub-component as per DBO Contractor	Any change recommended by DBO Contractor (If yes detail of that sub component with approval)	Design Submit/Approved	Land Details with Khasra No. and Map (P-II form)	Photograph	Whether any Negative Impact on community/person reported (Impact Assessment/Transect walk required)
		Source							
		Weir/Anicut/Reservoir							
		Intake Well cum pump house							
		Raw water pipe line							
		Water Treatment Plant							
		Clear water sump well							
		Clear water pipe line							
		Storage Structure (OHT/GSR/Sump Well)							
		1-							
		2-							
		3-							
		Distribution Network							
		House Hold Connections							

Checklist10: Details about Unanticipated Environment & Social Impact on Property, Livelihood, Environment etc. reported during Construction

Sl. No.	Name of the Town	Subproject component	Any Impact Reported: Yes/No	Type of Impact: Permanent or Temporary	In case of Temporary Impact: (i)on property or structure, (ii)on livelihood, (iii) any other, specify……	Whether such type of Social Impacts are reported to PIU/PMU/PMC (Yes/No)	What type of Assistance or Compensation given to affected assets	Details about affected assets or Affected Persons

Checklist 11: Capacity Building				
Sr. No.	Orientation of subproject with regard to ADB Safeguard policy	Status (Yes/No)	Provide Details with evidence (Date, Venue, Photographs and signature of participants)	Number of Participants (Male/ Female)
1	ULB staffs and elected body			
2	Other Stakeholders (town level NGO/Govt. Department etc.)			
3	Public Consultation During Execution by DBO Contractor			
4	Community Consultation 1			
	Community Consultation 2			
	Community Consultation 3			
	Community Consultation 4			
	Community Consultation 5			

Appendix 18: Quarterly Reporting Format for Assistant Safeguards Officer

1. Introduction

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational Phase		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

2. Compliance status with National/ State/ Local statutory environmental requirements

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

3. Compliance status with environmental loan covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

4. Compliance status with the environmental management and monitoring plan

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
    - What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
    - If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;

- adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Are their designated areas for concrete works, and refueling;
- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

5. Approach and methodology for environmental monitoring of the project

- Brief description on the approach and methodology used for environmental monitoring of each sub-project

6. Monitoring of environmental impacts on project surroundings (ambient air, water quality and noise levels)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 $\mu g/m^3$	SO_2 $\mu g/m^3$	NO_2 $\mu g/m^3$

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 $\mu g/m^3$	SO_2 $\mu g/m^3$	NO_2 $\mu g/m^3$

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

7. Summary of key issues and remedial actions

- Summary of follow up time-bound actions to be taken within a set timeframe.

8. Appendixes

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

Appendix 19: Sample Grievance Registration Form

(To be available in Hindi and English)

The _____Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.
Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	**Place of registration**	**Project Town** **Project:**			
Contact information/personal details					
Name		**Gender**	* Male * Female	**Age**	
Home address					
Place					
Phone no.					
E-mail					
Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below: If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

Appendix 20: Detailed Drawings / Maps of Proposed Weir for Rahatgarh Town WSS

Figure A: Drawing of Proposed Weir Across Bina River Showing 02 Nos. Under Sluice Gates for Rahatgarh WSS

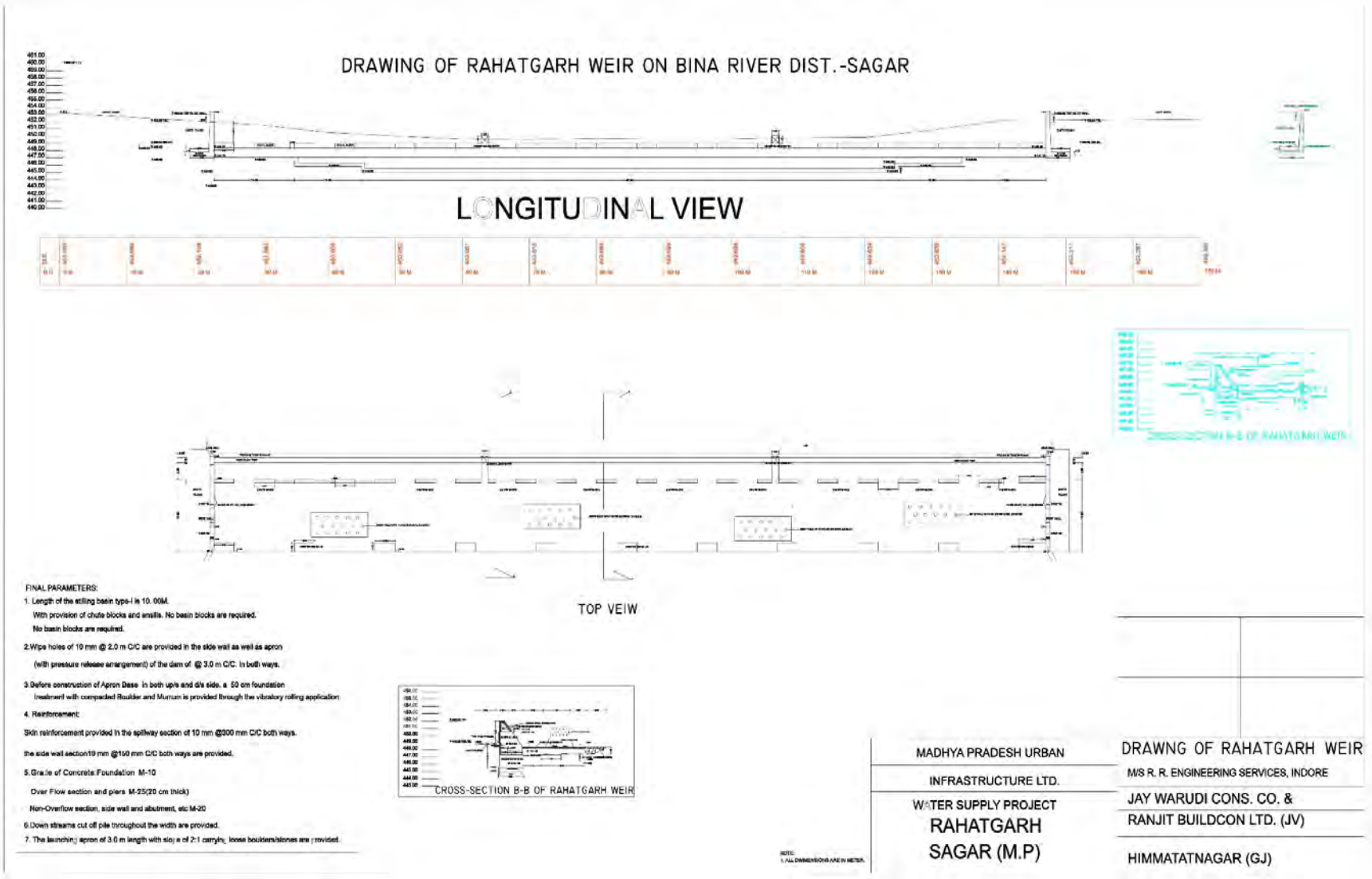


Figure B: Cross-Section of Proposed Weir for Rahatgarh WSS

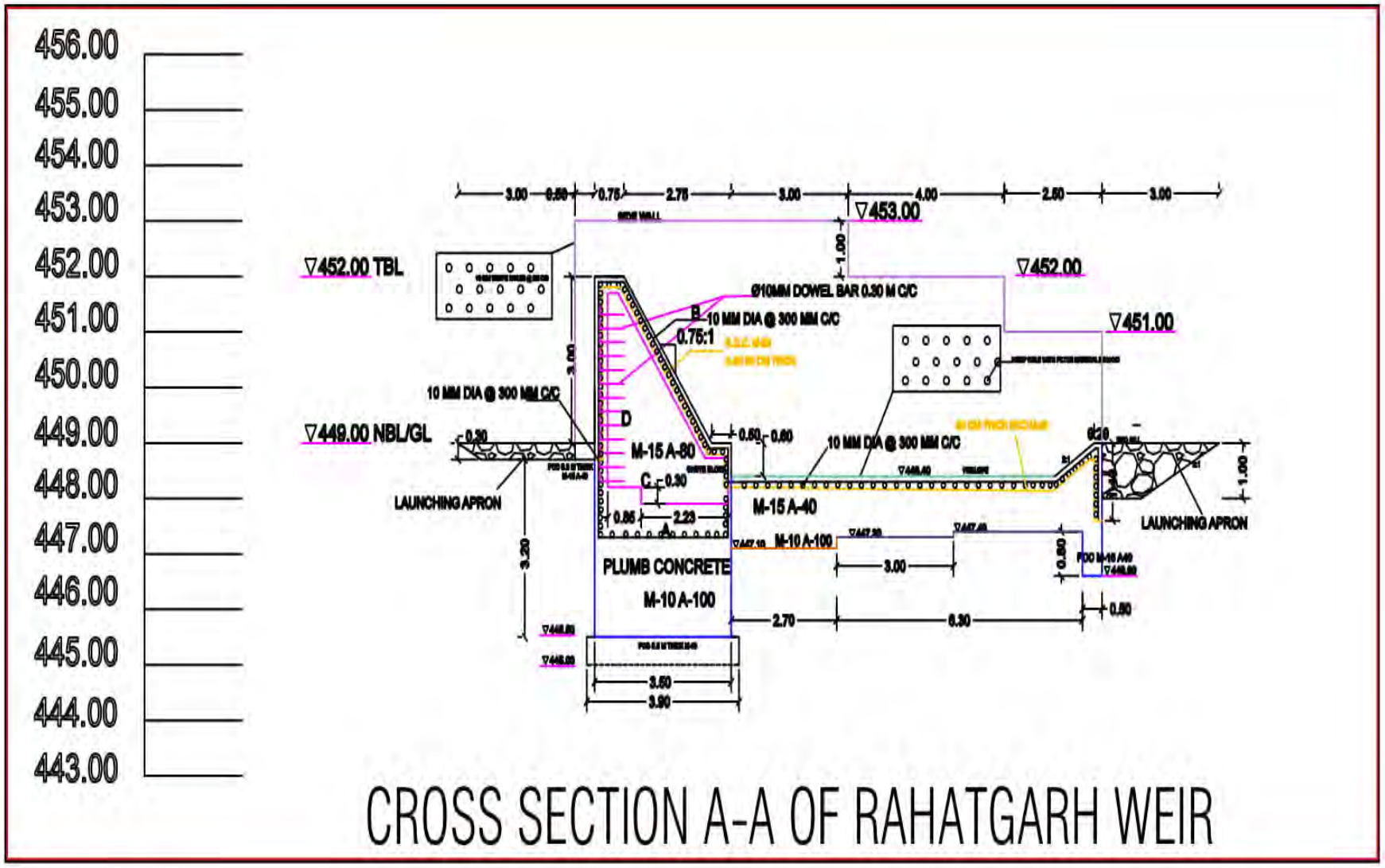


Figure C: Drawing of Under Sluice Gate of Proposed Weir Rahtgarh WSS

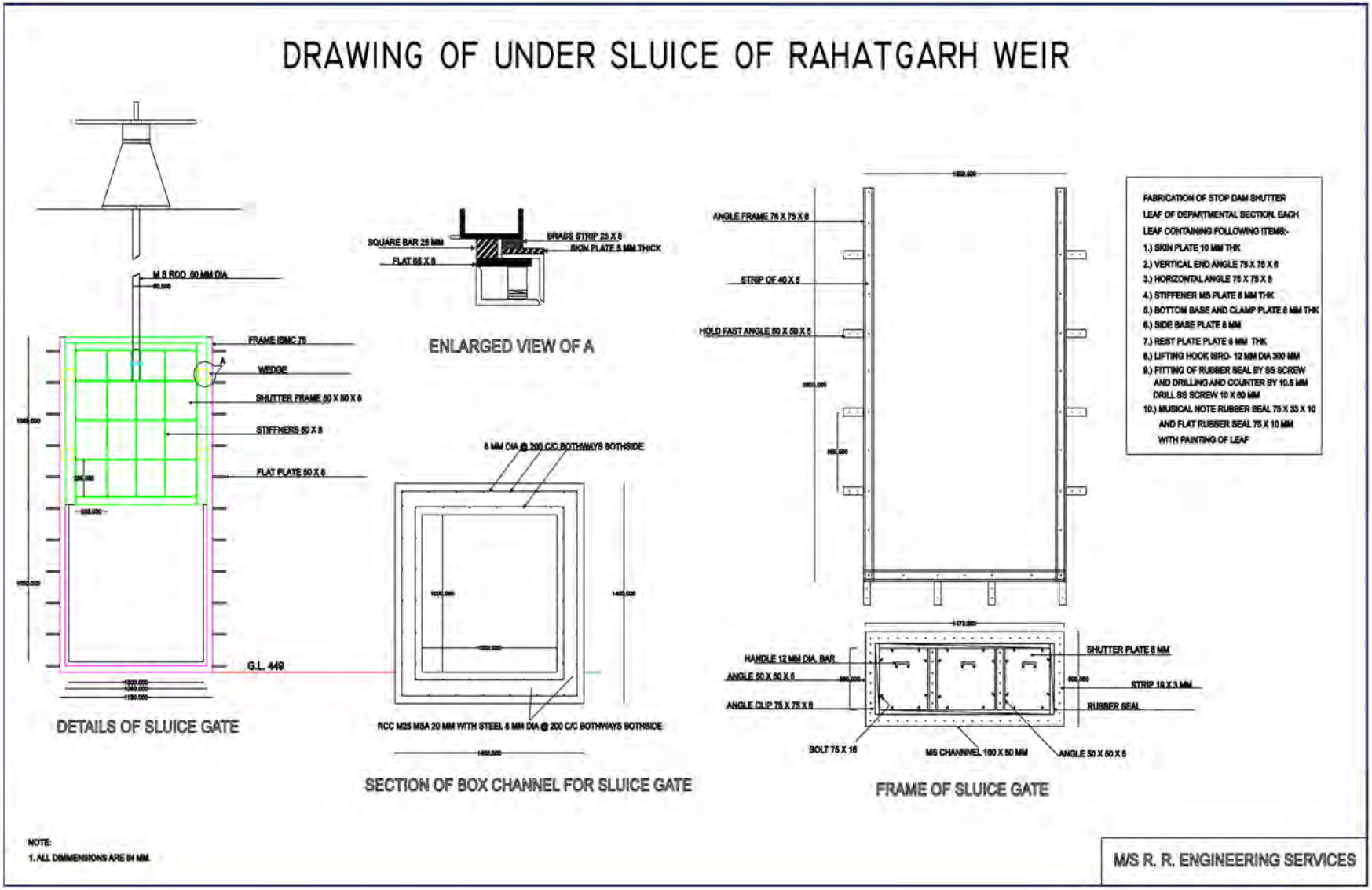


Figure D: Submergence Contour Map Showing Contour Level of Proposed Weir Site for Rahatgarh Town WSS

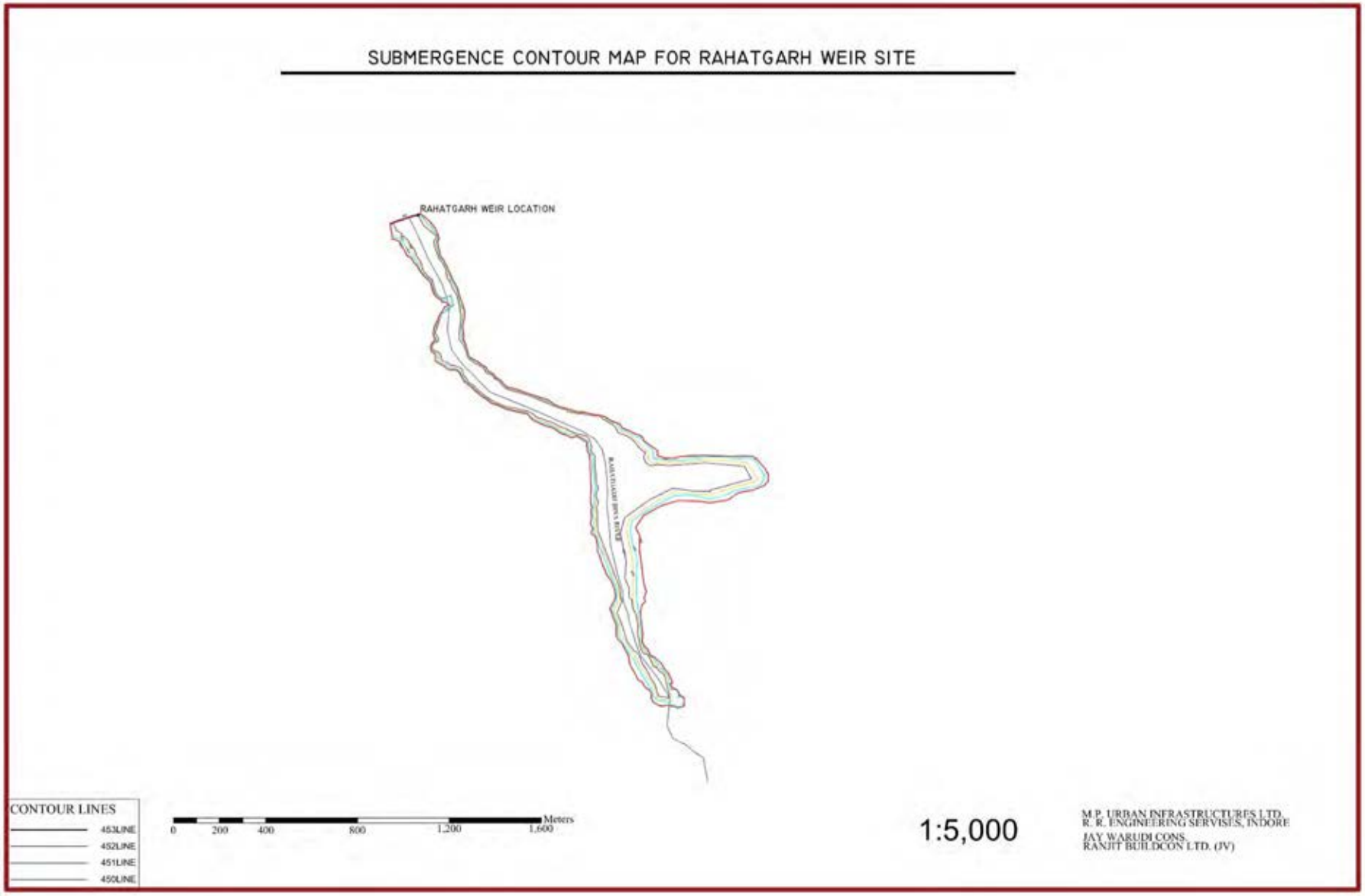
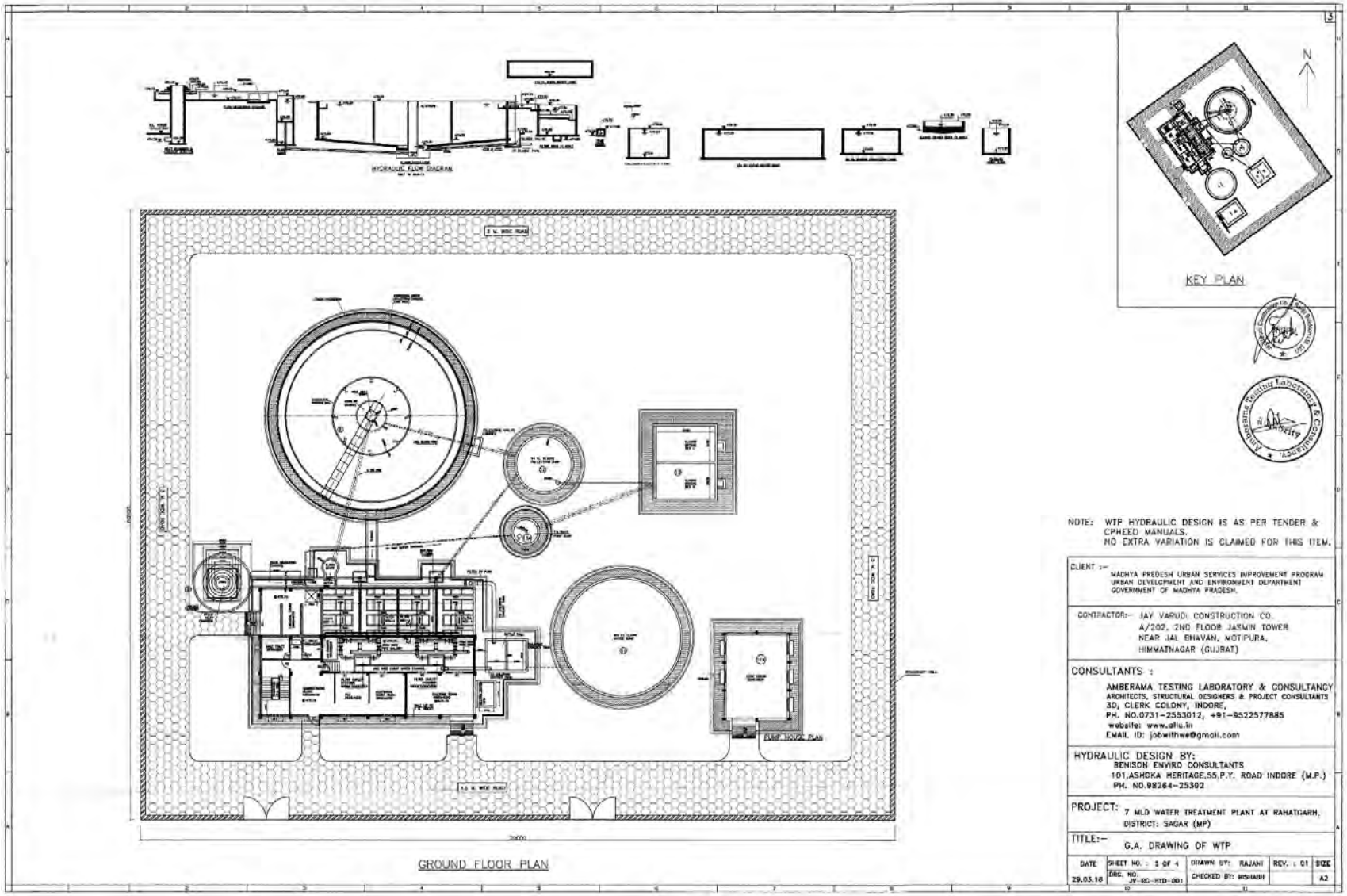
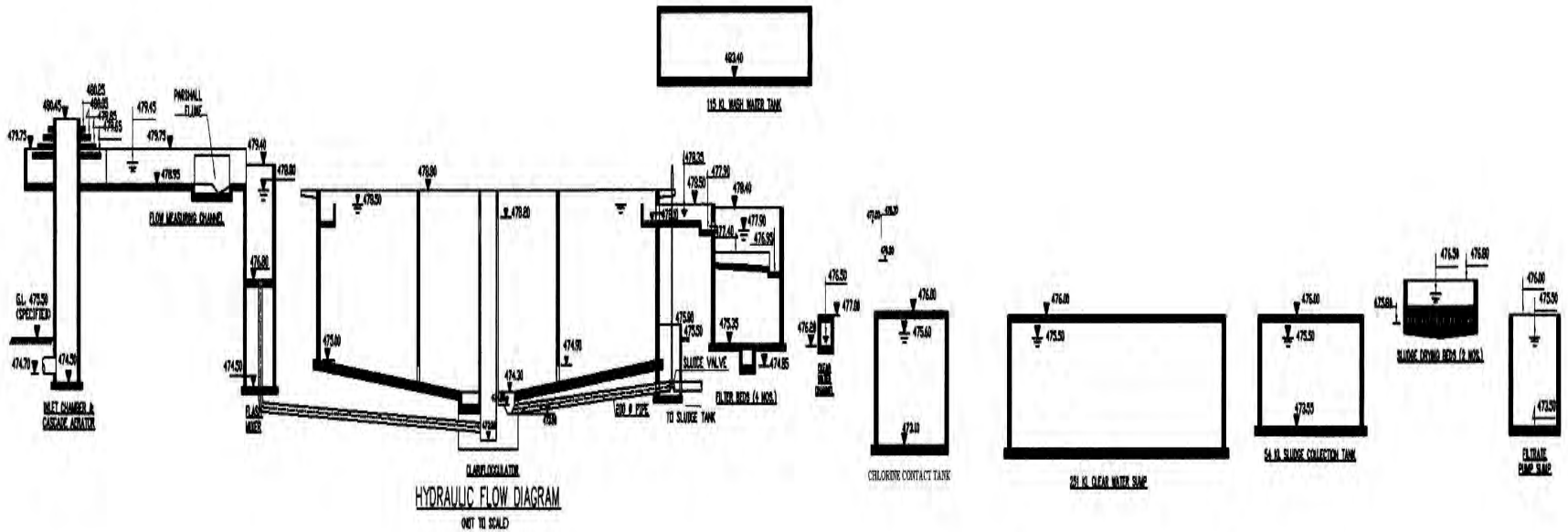


Figure E: Hydraulic Flow Diagram of Proposed WTP for Rahatgarh Town WSS





HYDRAULIC FLOW DIAGRAM

(NOT TO SCALE)

Figure F: Layout Plan of WTP for Rahatgarh Town WSS

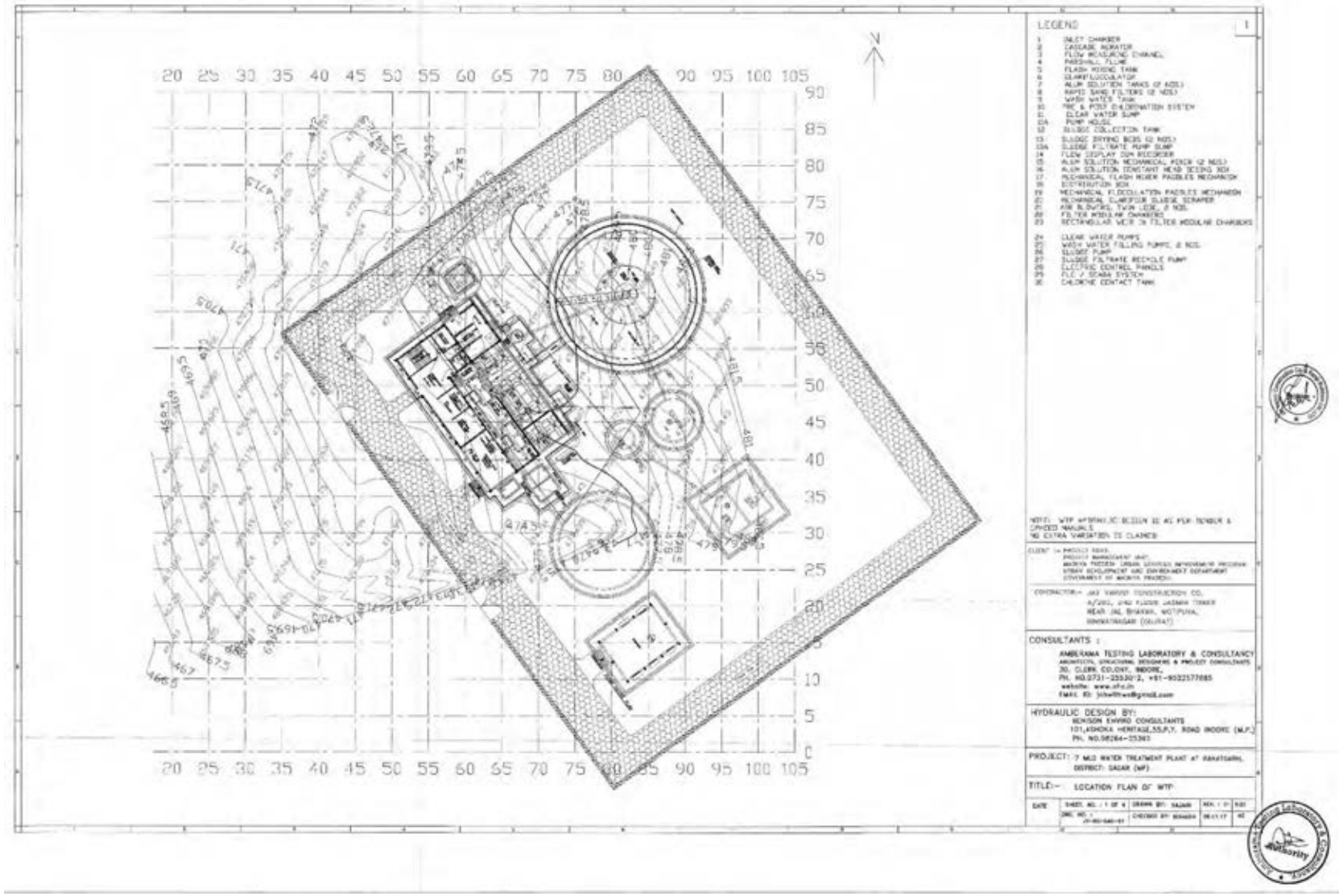


Figure G: Layout Plan of OHT 600 KL for Rahatgarh Town WSS

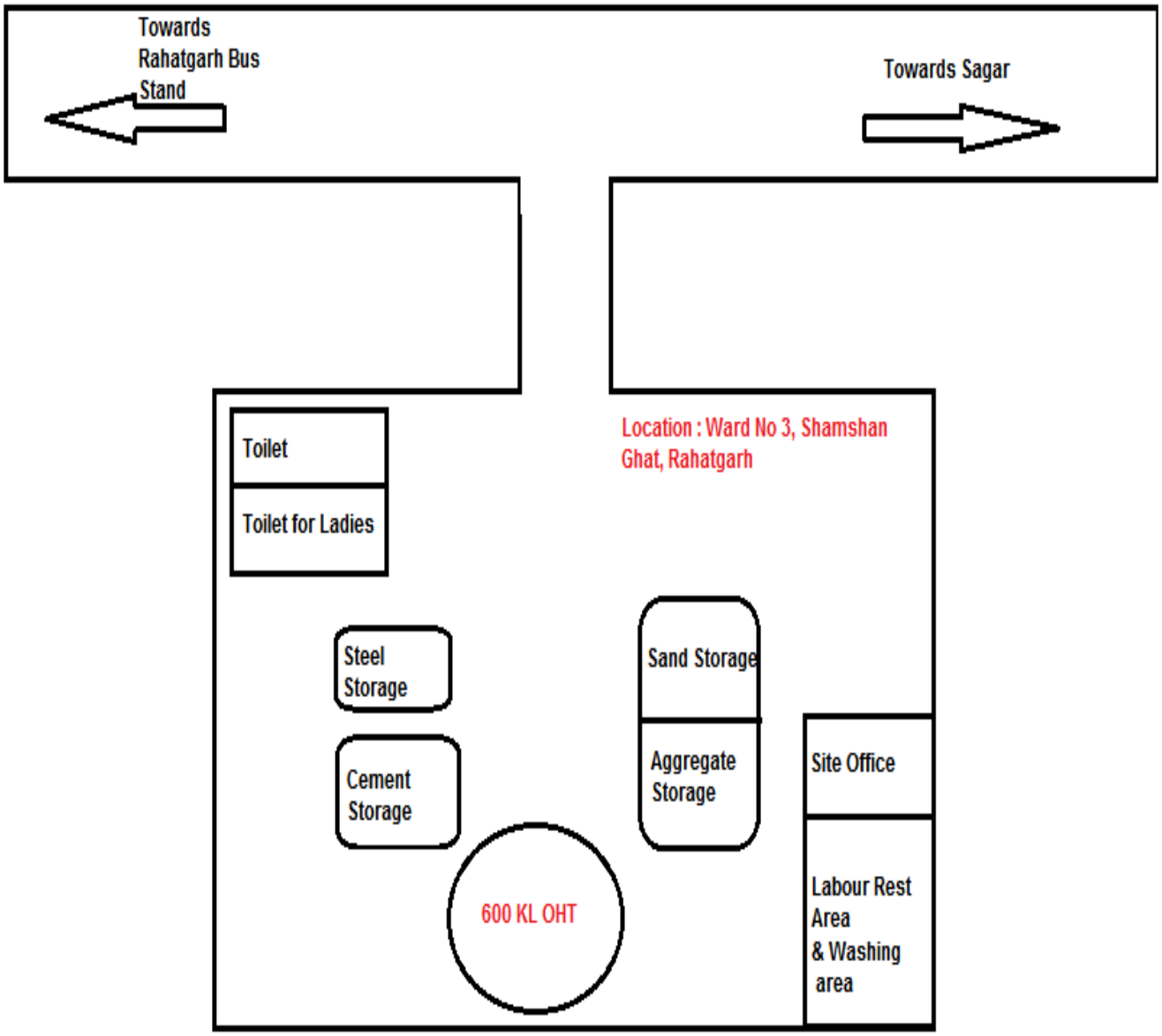


Figure H: Layout Plan of OHT 1200 KL for Rahatgarh Town WSS