Draft Initial Environmental Examination

May 2014

BAN: Third Urban Governance and Infrastructure Improvement (Sector) Project – Lalmonirhat Water Supply Subproject

Prepared by the Local Government Engineering Department, Government of Bangladesh for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 7 May 2014)

Currency Unit	=	BDT
BDT1.00	=	$0.01289
$1.00	=	BDT 77.60

ABBREVIATIONS

ADB	–	Asian Development Bank
AP	–	affected person
DoE	–	Department of Environment
DPHE	–	Department of Public Health Engineering
EARF	–	environmental assessment and review framework
ECA	–	Environmental Conservation Act
ECC	–	environmental clearance certificate
ECR	–	Environmental Conservation Rules
EIA	–	environmental impact assessment
EMP	–	environmental management plan
ETP	–	effluent treatment plant
GRC	–	grievance redressal cell
GRM	–	grievance redress Mechanism
IEE	–	initial environmental examination
LCC	–	location clearance certificate
LGED	–	Local Government Engineering Department
MLGRDC	–	Ministry of Local Government, Rural Development, and Cooperatives
O&M	–	operations and maintenance
PMO	–	project management office
PPTA	–	project preparatory technical assistance
REA	–	rapid environmental assessment
RP	–	resettlement plan
SPS	–	Safeguard Policy Statement
ToR	–	terms of reference

GLOSSARY OF BANGLADESHI TERMS

crore	–	10 million (= 100 lakh)
ghat	–	boat landing station
hartal	–	nationwide strike/demonstration called by opposition parties
khal	–	drainage ditch/canal
khas, khash	–	belongs to government (e.g. land)
katcha	–	poor quality, poorly built
lakh, lac	–	100,000
madrasha	–	Islamic college
mahalla	–	community area
mouza	–	government-recognized land area
parashad	–	authority (pourashava)
pourashava	–	municipality
pucca	–	good quality, well built, solid
thana	–	police station
upazila	–	sub district

WEIGHTS AND MEASURES

ha – hectare
km – kilometer
m – meter
mm – millimeter

NOTES

(i) In this report, "$" refers to US dollars.
(ii) —BDT. refers to Bangladeshi Taka

CONTENTS

EXECUTIVE SUMMARY

1. After the successful implementation of the First and Second Urban Governance and Infrastructure Improvement Projects (UGIIP I and II)[1] in 74 selected *pourashavas*, the Local Government Engineering Department (LGED) within the Ministry of Local Government, Rural Development and Cooperatives (MLGRDC) with the financial assistance of Asian Development Bank (ADB) have planned to implement the third phase of the project titled the Third Urban Governance and Infrastructure Improvement Project (UGIIP-3) in selected 30 *pourashavas* over a period of 6 years (2014 to 2020).

2. The impact will be improved living environment in project towns. The outcome will be improved municipal service delivery and urban governance in project towns. Project towns are pre-selected 30 towns to be supported in an integrated manner under the project.

3. A sector-lending approach will be used for the project as it has been well established and successfully practiced in the UGIIP I and II.

4. The Local Government Engineering Department (LGED) and the Department of Public Health Engineering (DPHE), both under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) and having extensive experience in managing urban and water supply projects financed by ADB, will be the executing agencies of the project.

5. Lalmonirhat water supply subproject is one of the subprojects proposed under UGIIP III. 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.

6. **Categorization.** An environmental assessment using ADB's Rapid Environmental Assessment (REA) checklist for water supply (**Appendix 1**) was conducted and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Lalmonirhat water supply subproject is classified as Environmental Category B as per the SPS as no significant impacts are envisioned. This initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts as a result of the subproject.

7. As per Government of Bangladesh Environment Conservation Act, 1995 (ECA, 1995) and Environment Conservation Rules (ECR, 1997), the subproject is categorized as "red" and location clearance certificate (LCC) and environmental clearance certificate (ECC) must be obtained from the DoE.

8. **Subproject Scope.** The subproject is formulated under this project to provide more accessible, reliable and climate-resilient municipal services in a holistic and integrated manner. Investments under this subproject include (i) improvement of existing water sources (PTWs); (ii) installation of digital water level meter on the overhead tank; (iii) improvement of 3 km water distribution network including replacement of 50milimeters (mm) diameter pipes

[1]The Government of Bangladesh with the assistance of ADB has introduced a system whereby funds/loans for development are disbursed in a phased manner based on the successful accomplishment by the recipient *pourashavas* of a set of performance-criteria in the area of urban governance. UGIIP I and II reflect this approach which aims to incentivize participating *pourashavas* to become well-managed and maintained towns in a sustainable way through systems of governance ensuring citizen's participation and inclusion of women, poor and the minority groups in *pourashava* activities. UGIIP I targeted for 27 and UGIIP II for 47*pourashavas*. The subprojects were (i) water supply (ii) sanitation, (iii) solid waste management, (iv) urban drainage, (v) urban transport & communication and (vi) public use facilities.

by 100mm diameter pipes and laying of new 100 mm pipes; (iv) procurement and installation of water meters in service connections (v) procurement of tools, equipment and transportation; and (vi) civil works including extension of existing Pourashava Water Supply Section (PWSS) Office, construction of security wall in the pump house, and repair of pump operators' quarters in the PWSS office compound.

9. **Implementation Arrangements.** Local Government Engineering Department (LGED) is the executing agency (EA). LGED is responsible for providing support and guidance to *pourashavas* concerning performance criteria and *pourashava* development planning. Department of Public Health Engineering (DPHE) will provide support in water supply and sanitation schemes. Implementation activities will be overseen by a Project Management Office (PMO). The participating *pourashavas* are the implementing agencies, with a project implementation unit (PIU) within the *pourashava* structure. Consultant teams[2] are responsible for (i) detailed engineering design, contract documents preparation and safeguards facilitation; (ii) project management and administration support; (iii) assistance in supervising construction; (iii) strengthening of local governance, conducting required studies/surveys and (iv) awareness raising on behavioral change in water, sanitation and hygiene (WASH) activities and facilitating resettlement procedures.

10. **Description of the Environment.** Subproject components are located in Lalmonirhat urban area or in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at these sites. The subproject sites are located in existing right of ways (ROWs) and government-owned land. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject location. There are no forest areas within or near Lalmonirhat.

11. **Environmental Management.** An environmental management plan (EMP) is included as part of this IEE, which includes (i) mitigation measures for environmental impacts during implementation; (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) a grievance redress mechanism. A number of impacts and their significance have already been reduced by amending the designs. The EMP will be included in civil work bidding and contract documents.

12. Locations and siting of the proposed infrastructures were considered to further reduce impacts. The concepts considered in design of Lalmonirhat water supply subproject are: (i) demand for new piped water supply; (ii) maximum population coverage with pipe layout mostly in residential areas and areas of high growth rate; (iii) avoidance of water-use conflicts; (iv) locating pipelines within right of way (ROW) to reduce acquisition of land; (vii) locating pipelines at least 10 meters from latrines, septic tanks and any main drains to avoid contamination; and (iv) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection. Water pipe laying works should be coordinated with road improvement works to minimize disturbance.

13. Preliminary designs integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the Lalmonirhat water supply subproject, including: (i) structural protection of facilities from future floods; (ii) location of components where there is no risk of flooding or other hazards; and (iii) promote more efficient use of water by reducing losses and wastage to counter increased demands due to higher temperatures. As a result, some measures have already been included in the subproject designs. This means that the impacts and their significance have already been reduced.

[2] Consultant teams are composed of Management Design and Supervision Consultants (MDSC) and Governance Improvement and Capacity Development Consultants (GICDC).

14. Key construction phase impacts identified and addressed in the IEE include: (i) air, noise, and vibration impacts due to construction vehicles, equipment, and machinery in the vicinity of construction sites and inhabited sections; (ii) management of spoils due to excavation for distribution network and civil works; (iii) safety measures during construction; (iv) traffic diversions; (v) management of sites temporarily used for construction activities, including borrow areas, construction camps, etc., and rehabilitation of the sites after completion of temporary use; and (vi) impacts on community health and safety hazards posed to the public, specifically in inhabited areas.

15. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. 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.

16. Mitigation will be assured by a program of environmental monitoring to ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.

17. **Consultation, Disclosure and Grievance Redress.** The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the subproject. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB and LGED 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. **Monitoring and Reporting.** The PMO and Management Design and Supervision Consultants (MDSC) will be responsible for environmental monitoring. MDSC will submit monthly monitoring reports to PMO, and the PMO will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.

19. **Conclusions and Recommendations**. The citizens of Lalmonirhat will be the major beneficiaries of this subproject. With the improved water supply system, they will be provided with a constant supply of better quality water piped into their homes and climate-resilient municipal services. In addition to improved environmental conditions, the subproject will reduce occurrence of water-related diseases. People would 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. Therefore the proposed subproject is unlikely to cause significant adverse impacts and the net environmental benefits to citizens of Lalmonirhat will be positive. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design provided that the EMP is included in the contract and its provisions implemented and monitored to their full extent.

20. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009).

I. INTRODUCTION

1. After the successful implementation of Urban Governance and Infrastructure Improvement Projects (UGIIP I and II)[3] in the selected *pourashavas*, Local Government Engineering Department (LGED) with the financial assistance of Asian Development Bank (ADB) have planned to implement a similar project (UGIIP-3) in selected thirty *pourashavas* over a period of 6 years (2014 to 2020).

2. The impact will be improved living environment in project towns. The outcome will be improved municipal service delivery and urban governance in project towns. Project towns are pre-selected 30 towns to be supported in an integrated manner under the project. UGIIP-3 will improve existing and provide new municipal infrastructures including (i) roads; (ii) drainages; (iii) water supply system; (iv) solid waste management facilities; (v) slaughterhouses; (vi) markets, community center/auditorium, bus and truck terminals and river *ghats*; (vii) public toilets; and (viii) others such as provision for street lighting and improvement of slums.

3. A sector-lending approach will be used for the project as it has been well established and successfully practiced in the UGIIP I and II.

4. The Local Government Engineering Department (LGED) and the Department of Public Health Engineering (DPHE), both under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) and having extensive experience in managing urban and water supply projects financed by ADB, will be the executing agencies of the project.

5. Lalmonirhat water supply subproject is one of the subprojects proposed under UGIIP-3. 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).

6. **Categorization.** An environmental assessment using ADB's Rapid Environmental Assessment (REA) checklist for water supply (**Appendix 1**) was conducted, and results of the assessment show that the project is unlikely to cause significant adverse impacts. Lalmonirhat water supply subproject is classified as environmental category B as per ADB SPS. This initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts as a result of the subproject.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

7. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, loans involving financial intermediaries, and private sector loans.

[3]The Government of Bangladesh with the assistance of ADB has introduced a system whereby funds/loans for development are disbursed in a phased manner based on the successful accomplishment by the recipient *pourashavas* of a set of performance-criteria in the area of urban governance. UGIIP I and II reflect this approach which aims to incentivize participating *pourashavas* to become well-managed and maintained towns in a sustainable way through systems of governance ensuring citizen's participation and inclusion of women, poor and the minority groups in *pourashava* activities. UGIIP I targeted for 33 and UGIIP II for 35 *pourashavas*. The subprojects were (i) water supply (ii) sanitation, (iii) solid waste management, (iv) urban drainage, (v) urban transport & communication and (vi) public use facilities.

8. **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.

9. **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.

10. **Public disclosure.** ADB will post the below 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 project management unit (PMO) during project implementation upon receipt.

B. National Laws

11. Implementation of all subprojects will be governed by the environmental acts, rules, policies, and regulations of the Government of Bangladesh. These regulations impose restrictions on the activities to minimize/mitigate likely impacts on the environment. Many of these are cross-sectoral and several of them are directly related to environmental issues. The most important of these are the Environment Conservation Act, 1995 (ECA, 1995), and the Environment Conservation Rules (ECR, 1997).

12. Table 1 presents specific requirements for the subproject. **Appendix 2** provides the environmental standards for air, surface water, groundwater, drinking water, emissions, noise and vehicular exhaust.

Table 1: Applicable Government of Bangladesh Environmental Legislations

	Legislation	Requirements for the Project	Relevance
1.	Environmental Conservation Act of 1995 and amendments in 2000, 2002 and 2010 [4]	• Restriction on operation and process, which can be continued	The provisions of the act apply to the entire subproject in the construction and operation and maintenance

[4] *ECA Amendment 2000* focuses on ascertaining responsibility for compensation in cases of damage to ecosystems, increased provision of punitive measures both for fines and imprisonment and the authority to take cognizance of

	Legislation	Requirements for the Project	Relevance
		or cannot be initiated in the ecologically critical areas • Regulation on vehicles emitting smoke harmful to the environment • Remedial measures for injuries to ecosystems • Standards for quality of air, water, noise and soil for different areas for various purposes and limits for discharging and emitting waste • Environmental guidelines	(O&M) phases.
2.	Environmental Conservation Rules of 1997 and amendments in 2002 and 2003	• Environmental clearances • Compliance to environmental quality standards	The subproject is categorized as Orange-B and requires locational clearance certificate (LCC) and environmental clearance certificate (ECC). All requisite clearances from DoE shall be obtained prior to commencement of civil works.
3.	Forest Act of 1927 and amendments (2000)	• Clearance for any felling, extraction, and transport of forest produce	Considered in subproject preparation and implementation.
4.	Bangladesh Climate Change Strategy and Action Plan of 2009	• Ensure existing assets is put in place to deal with the likely impacts of climate change. • Enhance the capacity government ministries, civil society and private sector to meet the challenge of climate change	Considered in subproject preparation and implementation.
5.	Bangladesh Labor Law of 2006	• Compliance to the provisions on employment standards, occupational safety and health, welfare and social protection, labor relations and social dialogue, and enforcement • Prohibition of employment of children and adolescent	Considered in the EMP.

C. Government of Bangladesh Environmental Assessment Procedures

13. Under ECA, 1995 and ECR, 1997 industrial units and projects are classified into four categories according to “their site and impact on the environment”, and each category (Green, Orange-A, Orange-B and Red) requires a different level of environmental assessment as a prerequisite for the Department of Environment (DoE) in granting the LCC and ECC that allow the project to proceed.

14. As per Schedule 1 of ECA, 1995 Lalmonirhat water supply subproject is likely to be classified as red category (Table 2). Thus LCC and ECC is required from the DoE prior to commencement of the subproject.

Table 2: Likely Government of Bangladesh Classification of Lalmonirhat Water Supply Subproject

Subproject	Component	Equivalent in Schedule I of ECR 1997	DoE Classification

offences. *ECA Amendment 2002* elaborates restrictions on polluting automobiles; restrictions on the sale, production of environmentally harmful items like polythene bags; assistance from law enforcement agencies for environmental actions; break up of punitive measures; and authority to try environmental cases. In *ECA Amendment 2010,* no individual or institution (government or semi-government/non-government/self-governing can cut any hill or hillock; fill-up or changed any remarked water body however in case of national interest; the mentioned activities can be done after getting clearance from respective the departments.

Subproject	Component	Equivalent in Schedule I of ECR 1997	DoE Classification
Water supply	Source augmentation (includes tube wells, surface water intake, overhead or ground reservoir, pumps and pump house, water treatment plant [WTP] or chlorination facility)	Engineering works (up to 10 hundred thousand Taka capital	Red Per preliminary quantity and cost estimate, Lalmonirhat water supply subproject is BDT36.907 million
	Water transmission (includes pumping main, overhead reservoir, or pumps and pump houses)	Water, power and gas distribution line laying/relaying/extension.	Red
	Network improvements (include ring main, distribution/ carrier mains, bulk valves and flow meter, household connections or household meters)		
	Secondary network (includes secondary drains) and tertiary network (includes main drains and drainage outfalls)		

15. Rule 7 of the ECR,1997 indicates that the application for ECC must be made to the relevant DoE Divisional Officer, and the application for red category projects will include the following:

(i) Completed application for ECC, and the appropriate fee;
(ii) Report on the feasibility of the project;
(iii) Report on the IEE for the project, and terms of reference (TOR) for the EIA; or EIA report prepared on the basis of TOR previously approved by DoE;
(iv) Report on the environmental management plan (EMP);
(v) No objection certificate from the local authority;
(vi) Emergency plan relating to adverse environmental impact and plan for mitigation of the effect of pollution; and
(vii) Outline of the relocation and rehabilitation plan (where applicable).

16. Under the ECR DoE has 60 days to respond to receipt of the ECC application for a red category project.

III. DESCRIPTION OF THE PROJECT

A. The Study Area

17. Lalmonirhat is a district of Rangpur division in the north of Bangladesh and lies between 25º46´ and 26º33´ north latitudes and between 89º01´ and 89º36´ east longitudes. The area of the Lalmonirhat*pourashava*is 17.60 sq.km and its total population as of 2011 is 60,322.

18. Subproject components are located in Lalmonirhat urban area or in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at these sites. The subproject sites are located in existing right of way (RoWs) and government-owned land. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject location. There are no forest areas within or near Lalmonirhat. The location map is shown as Figure 1.

B. Existing Condition and Need for the Project

19. The existing water supply system of Lalmonirhatpourashava is shown in Figure 2.

20. **Water sources**. The current source of piped water supply ofLalmonirhat*Pourashava* is based on ground water resources. Underground water of sufficient quantity in the shallow aquifer is available within the area. The good potential abstraction rate has made the aquifer suitable as source for the town water supply.

21. Several hydrological investigations have been carried out under 37-Towns Feasibility Study Project of DPHE. The investigation includes preparation and analysis of the bore logs of four test wells at different locations (Geasuddin School Compound, PWSS Compound, Nababerhat, BADC Compound) of LalmonirhatPourashava. The borehole depths are 165ft, 200ft, 180 ft and 220ft (within 50m to 67m). From the bore logs it is seen that aquifers of medium sands are encountered at depth from 70ft to 200ft (21m to 61m) below ground level. The aquifers at these places contain sufficient groundwater that can be harnessed through production wells for domestic water supply in the Pourashava. Table2 presents the production and performance data of 5 functional wells in the Pourashava.

Table 2: Existing Production and Performance Data of Tube Wells in Lalmonirhat

PTW No.	Location	Current Yield (cum/hr)	Average Pumping Hours	Total Production (cum)	SWL (m)	DWL (m)	DD (m)	Specific Capacity (m^3/h/m)
01	DPHE Office Compound Ward No.:05	70	10	700	-	-	-	-
04	S-E Corner of Nababerhat Ward No.: 04	90	10	900		7.90	3.75	21.68
05	S-W Corner of Nababerhat Ward No.: 04	80	10	800		18.60	3.65	5.35
07	Attached to District Register Office, Ward No.: 01	90	10	900		5.45	3.35	42.85
08	PWSS office Compound Ward no.: 07	70	10	700	-	-	-	-

Source: PPTA Consultants

22. **Water Quality.**Groundwater is the main source of water supply in LalmonirhatPourashava. The Pourashava Water Supply Section (PWSS) does not have any water quality data and no water quality sampling or testing is done. However the water quality of the production wells at BADC Compound (PTW-06), District Register Office (PTW-07) and Fire Service Road (PTW-10) of LalmonirhatPourashava were analyzed by DPHE Lalmonirhat, under 37-District Towns Feasibility Study of DPHE; the result is furnished in Table3.

Table 3: Water Quality Data – LalmonirhatPourashava

	Water Quality Parameters	Presence of Parameter in				
		Bangladesh Standard	Unit	Sample 01	Sample 02	Sample 03
1	Alkalinity	-	mg/l	58	68	64
2	Arsenic (As)	0.05	mg/l	0.003	0.002	0.002
3	Chloride	150-600	mg/l	22	28	32
4	EC	-	µS/cm	214	127	107
5	Hardness	200-500	mg/l	46	52	48
6	Iron (Fe)	0.3-1	mg/l	0.29	0.76	1.08
7	Manganese (Mn)	0.1	mg/l	0.32	0.26	0.06
8	pH	6.5-8.5	-	7.2	7.3	7.1

Source: DPHE, Lalmonirhat

23. The raw water quality mostly conforms to Bangladesh Drinking Water Quality Standards, 1997 except dissolved manganese, slightly higher than the standard at two locations. DPHE is constructing iron removal plants (IRPs) in Lalmonirhat*pourashava*which will also remove manganese content in the groundwater.

24. **Overhead water storage.** There is one reinforced cement concrete (RCC) overhead storage tank (OHT) of capacity 450m^3 in Lalmonirhat. It is located in BDR Hat (Nababerhat) area. The OHT was constructed by Dutch-funded 18 Towns Water Supply Project under DPHE in 1995-1996. The storage/balancing tank is fed by two nearby PTWs (PTW 04 and 05) only to

store water for distribution when there is no electricity or power. The OHT was rehabilitated recently under 37- District Towns Water Supply Project (37-DTWSP) and looks in good order; only the lacking on the OHT is the absence of water level indicator.

25. **Water distribution pipelines.**The existing water distribution network comprises of about 40.0 km pipe lines of different diameters of uPVC pipes. The piped water supply system in LalmonirhatPourashava was first introduced in 1986 by Department of Public Health Engineering (DPHE) through installation of two production tubewells (PTW 01 & 02) and 5 kilometers of pipelines. About 35 km of pipelines and 5-PTWs were constructed under Dutch funded 18 District Towns water Supply Project of DPHE and was commissioned in 1998. About 3 km of existing pipelines of diameter 50 mm has been replaced by 100 mm diameter uPVC pipelines and three production tube wells have been installing by GOB funded 37 Towns Water Supply Project of DPHE during 2012-13. A statement of distribution network of the Pourashava is shown in Table 4.

Table 4: Details of Existing Distribution Pipelines in Lalmonirhat

	Pipe Diameter (mm)	Length (km)	Material	Remarks
1	200	4.00	uPVC	Total length 40 km of uPVC pipelines of diameter ranging from 50 mm to 200 mm.
2	150	10.00	uPVC	
3	100	23.00	uPVC	
5	50	3.00	uPVC	

Source: PWSS, LalmonirhatPourashava

26. **Service connections.**As reported by the Pourashava, there are total 2,334 house connections, out of which 1,950 are domestic and 46 are commercial. There are a number of connections especially to Mosques, Temples and other religious premises, and some private connections to MuktiJodhhas, which are not billed and are free. There are 30 street connections in the Pourashava. None of the service connections has any water meter. The details of the existing house connections in the Pourashava are given in Table 5.

Table 5: Details of Existing Service Connections in Lalmonirhat

Type of Connection	13 mm dia.		20 mm dia.		25 mm dia.		40 mm dia.		Total
	Running	Close	Running	Close	Running	Close	Running	Close	
Domestic	1780	210	115	11	06	-	03	-	**2125**
Commercial	31	05	10	15	02	-	03	-	**66**
Free Connections									
Mosque	35	-	-	-	-	-	-	-	**35**
Temple	03	-	-	-	-	-	-	-	**3**
Muktijoddha	75	-	-	-	-	-	-	-	**75**
Street Hydrant	30	-	-	-	-	-	-	-	**30**
Total	1954	215	125	26	08	-	6	-	2334

Source: PWSS, Lalmonirhat Pourashava

27. From the above table it is seen that of the total 2,334 service connections, 2,093 are running and the rest 241 connections are closed.

28. As estimated maximum water demand till 2030 is 8,582m^3/day. This has taken into account projected population, 100% domestic service connection, 15% of production as unaccounted for water. As the climate change factor in the northern part of the country is not predominant, climate resilience factor has not been considered in the estimate of water demand.

C. Proposed Components

29. As shown in Table 6, the interventions to improve water supply system and increase service coverage have been proposed based on the results of field investigations, analysis and review of the status of current water supply system and water demand projection for the year 2030. The following proposed components, in addition to on-goingDPHE 37-DTWSP will improve the water supply system in Lalmonirhat.

30. The pumping plants are not well maintained. Necessary repair, replacement and renovation actions are required to be performed aiming at preventing equipment failure or production decline, with the goal of increasing efficiency, reliability, and safety.

31. The OHT (capacity 450 m^3) has been rehabilitated recently under 37-DTWSP and is in good order. Only a water level indicator on the OHT is found missing which needs to be installed.

32. The following activities are to be undertaken in the existing distribution net-work in order to improve its performance and increase service coverage:

i. Installation of New Pipelines: A total of about 3km pipelines of diameter 100 mm is proposed under the subproject.
ii. Replacement of Pipelines: The existing pipelines of 50 mm dia. are to be replaced by 100 mm dia. new pipelines to maintain pressure in the system.
iii. Installation of Wash-out: Wash-out with sluice valve, MS bend and RCC chamber to be constructed at the end points of the distribution net-work. These will be operated regularly to clean the pipelines.
iv. Leak Detection and Repair: Leak detection campaign under high pressured condition in the water distribution system will be carried out to detect visible leaks and repair.
v. Establishment of Service Zones: It is apparent that the distribution network is not scientifically laid or expanded. All PTWs are operated more or less at the same duration and the water is directly injected into the network not knowing what is the quantity injected or having any control on the flow of water from an individual PTW into the network. There is lack of proper and adequate control mechanisms like valves etc.

33. The entire water supply system has been proposed for the division into three service zones with specific PTWs supplying water to demarked zones. Identification of border points of the proposed zones and installation of control valves with RCC chambers at each of the border points are to be done for establishing service zones in the system. Finally concept of district metering area (DMA) should be introduced in the distribution system.

34. The service connections are uPVC pipes and installed more than 18 years before. The standard new service connections with the provision of water meter pits are to be laid for each of the connections.

35. Multi-jet water meter of metrological class B as per ISO 4064 can be recommended for procurement under the project. The meter will be semi-dry dial type. The water meters will be installed within pit for protection.

36. A mini water testing laboratory is required to be established in the Pourashava in order to create facilities to monitor water quality produced and supplied to the consumers. The laboratory should have the testing facilities of the followings: pH, Fe, As, Mg, Fecal Coliform and E.Coli

37. Routine O&M of water supply system suffers due to lack of appropriate tools and equipment. Consequently a set of standard O & M tools and equipmentwill be provided to *pourashava*'sPWSS.

38. Logistics such as transportation facilities, computers etc. are needed for carrying out smooth operation and maintenance of the water supply system.

39. Proper maintenance of water supply system suffers from non-availability of the standard spares/parts and accessories.

40. Civil construction works include vertical Extension of Existing Store, Extension of PWSS Office, Construction of Security Wall and Repair of Pump Operators Quarter.

41. Figures 2 to 4 show the maps of existing, proposed (integration) and proposed (zone wise) Lalmonirhat water supply systems respectively.

Table 6: Proposed Water Supply Interventions in Lalmonirhat Pourashava

	Descriptions	Qty.	Unit
1.0	**Existing Water Sources (PTWs) Improvements**		
1.1	Replacement of bulk water meters	4	Nos.
1.2	Replacement of non-return valves	4	Nos.
1.3	Replacement/installation of control sluice valves	3	Nos.
1.4	Replacement/installation of pressure gauge	5	Nos.
1.5	Maintenance of electrical control panel	3	Nos.
1.6	Replacement of pump column pipe	25	m
1.7	Replacement of pump column pipe socket	8	Sets
1.8	Replacement of turbine pump shaft	25	m
1.9	Replacement of rubber bearing and bush for turbine pump shaft	8	Sets
1.10	Pump house maintenance	2	Nos.
2.0	**Over Head Tank (OHT)**		
2.1	Installation of digital water level indicator on OHT	1	No.
3.0	**Distribution Network Improvement (DNI)**		
3.1	Replacement of existing 50 mm pipes by 100 mm, length 3 km,	3	Km
3.2	Installation of wash-out including sluice valves, MS bends and RCC chambers	10	Nos.
3.3	Leak detection and repair of distribution system	37	Km
3.4	Establishment of 3-service zones in the existing distribution network		
	3.4.1 Installation of sluice valves	11	Nos.
	3.4.2 Construction of RCC chambers	11	Nos.
4.0	**Service Connections and Metering**		
4.1	Procurement & installation of water meters in service connections	2500	Nos.
4.2	Laying of standard service connections including construction of water meter chambers	2500	Nos.
5.0	**Tools, Equipments, Transportation etc**		
5.1	Tools &equipments	1	LS
5.2	Establishment of mini water quality testing lab. in PWSS office	1	LS
6.0	**Civil Works**		
6.1	Extension of existing PWSS office	1	LS
6.2	Construction of Security wall (17 m) in the pump house attached to the district register office	1	LS
6.3	Repair of pump operators quarters in the PWSS office compound	1	LS

Source: PPTA Consultant

D. Implementation Schedule

42. Implementation of UGIIP III is split up into 3 phases: (i) 1st phase = 18 months or 1.5 years; (ii) 2nd phase = 30 months or 2.5 years; and (iii) 3rd phase = 24 months or 2 years.

43. TheLalmonirhat water supply subproject will be implemented during Phase 2 of UGIIP III. Preliminary design of the subproject has been done by the PPTA team and will be finalized during detailed design stage. It is estimated that construction period will cover 30 months.

44. The final detailed implementation schedule will be provided in the updated IEE once the detailed design phase is completed.

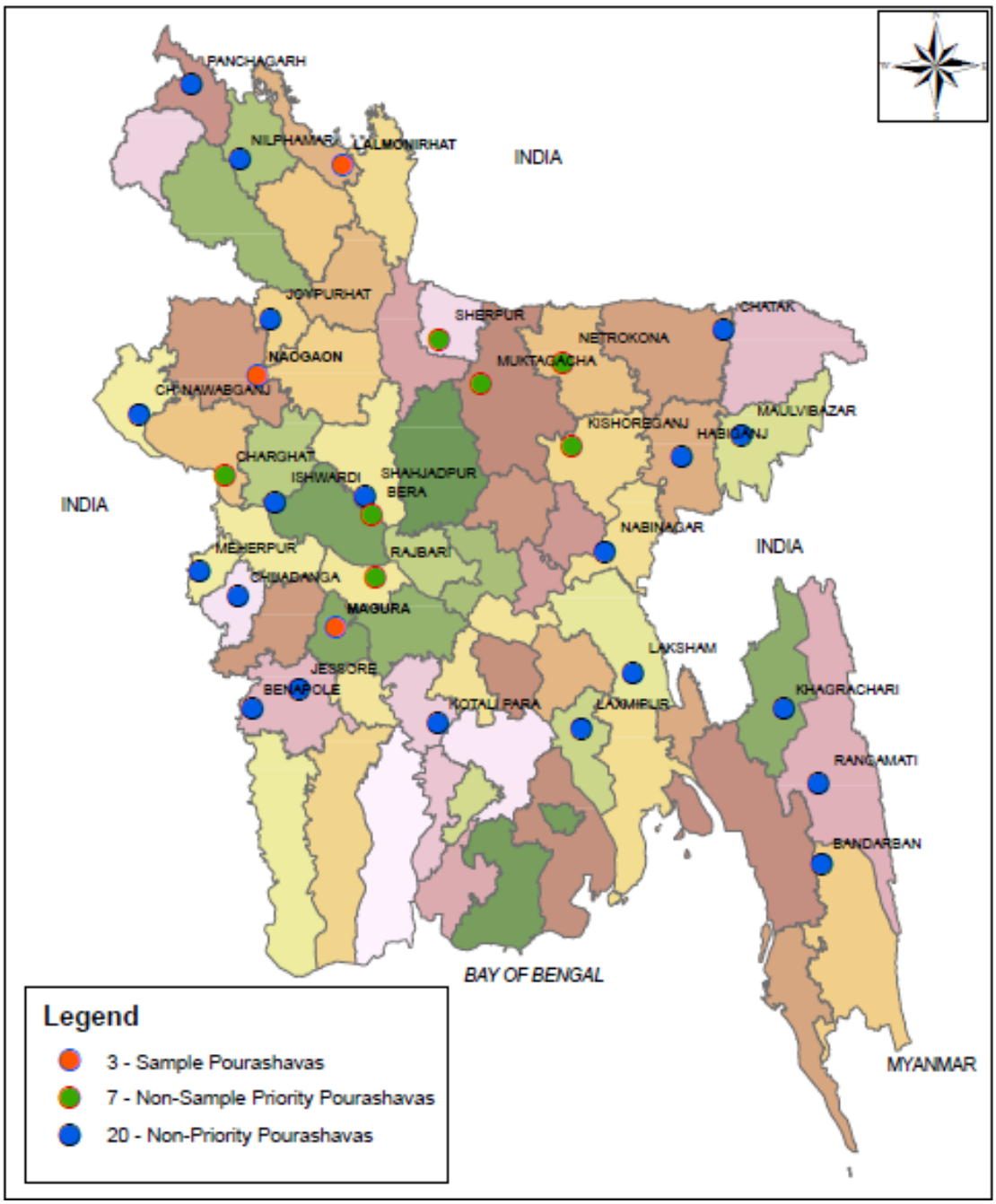

Figure 1: Location Map

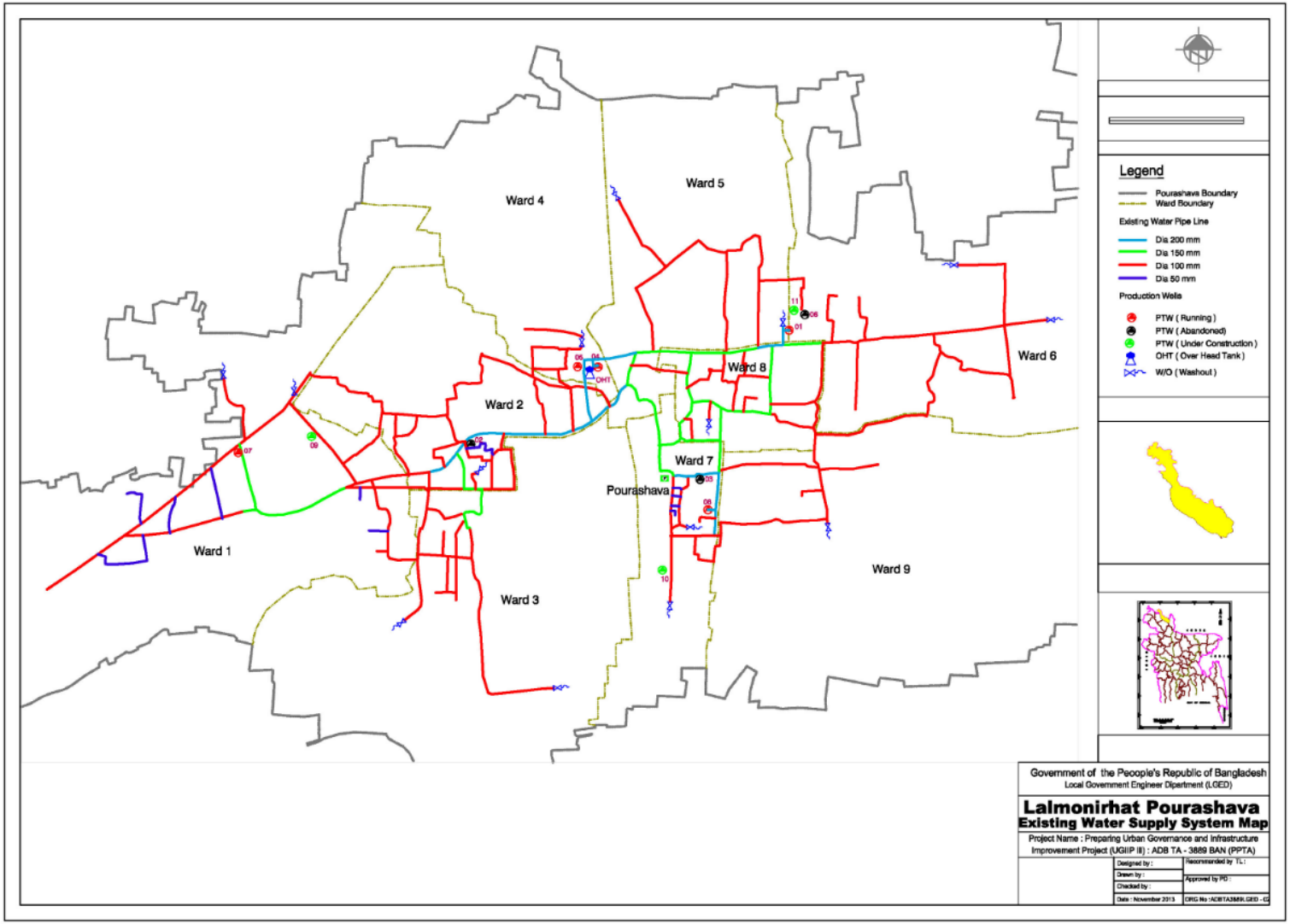

Figure 2: Map of Existing Lalmonirhat Water Supply System

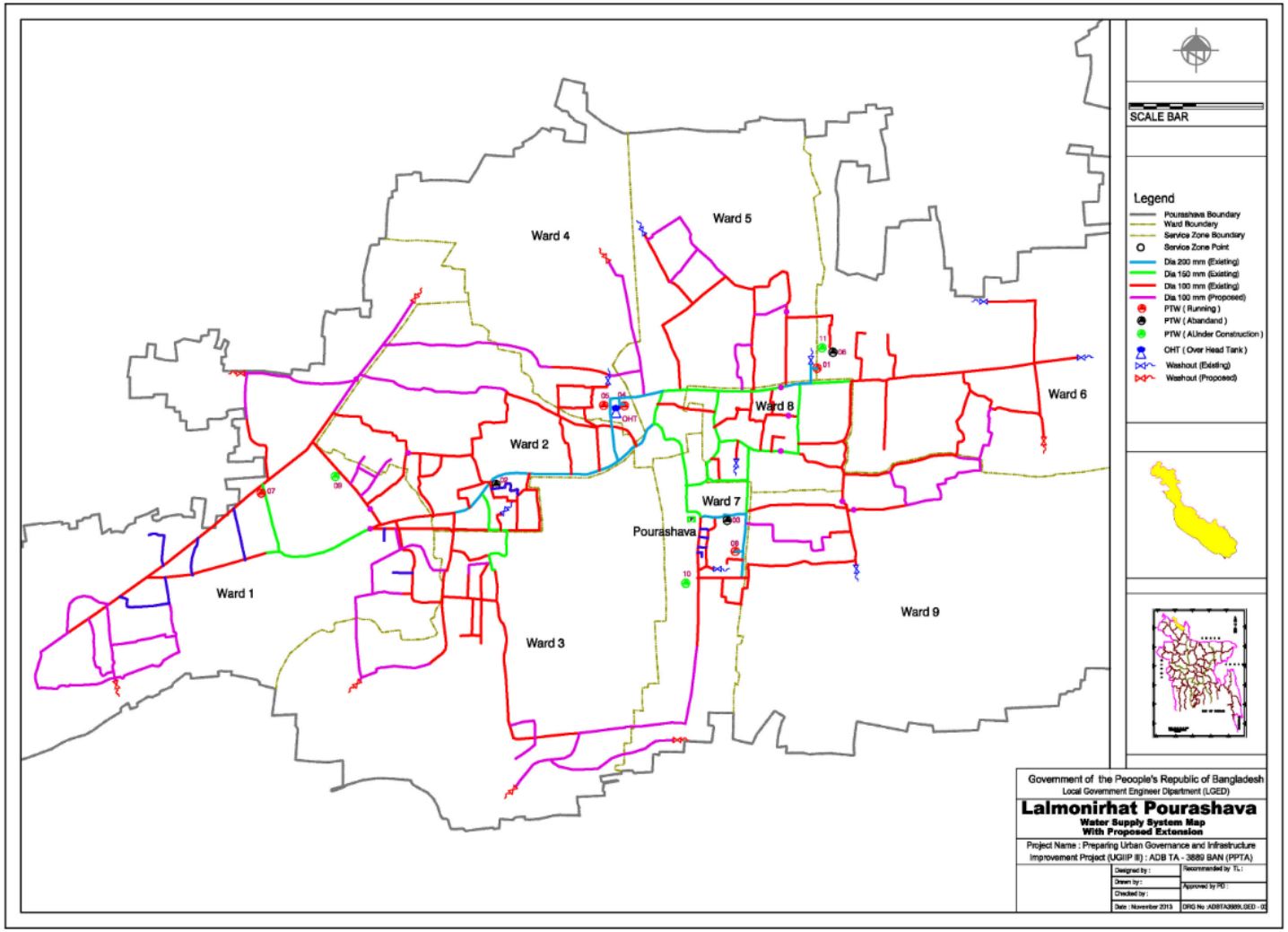

Figure 3: Map of Lalmonirhat Water Supply System with proposed extension (integrated)

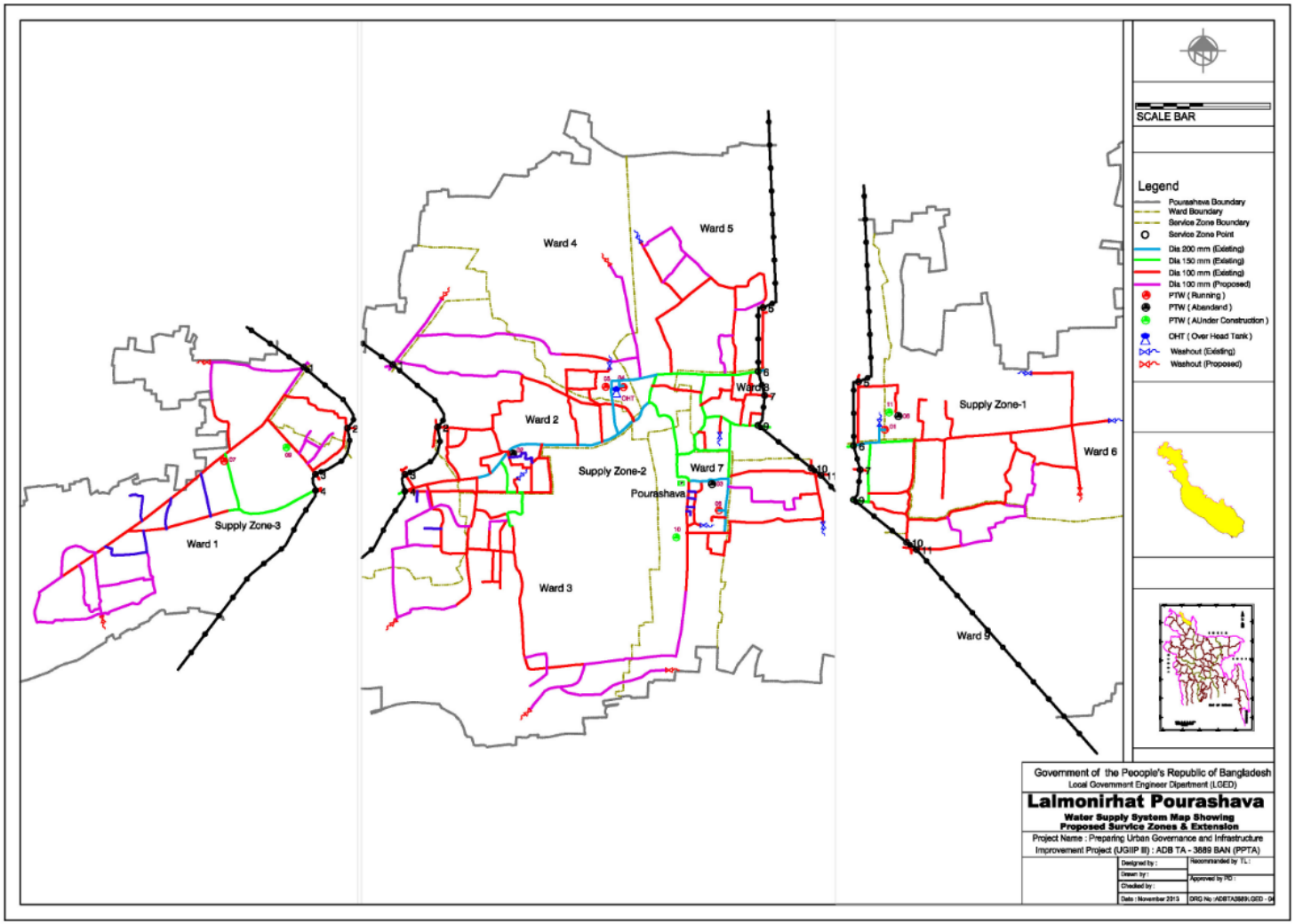

Figure4: Map of Lalmonirhat Water Supply Systems with proposed extension (zone-wise)

IV. DESCRIPTION OF THE ENVIRONMENT

A. Methodology Used for the Baseline Study

45. **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. The literature survey broadly covered the following:

(i) subproject details, reports, maps, and other documents available with the ADB CDTA and PPTA consultants, LGED, and Lalmonirhat*pourashava*;
(ii) relevant acts and extraordinary gazettes, and guidelines issued by Government of Bangladesh agencies; and
(iii) literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and environmental planning documents collected from Government of Bangladesh agencies and websites.

46. Several visits to the subproject sites were made during the PPTA stage to assess the existing environment (physical, biological, and socioeconomic) and gather information with regard to the proposed sites and scale of the proposed subproject. A separate socioeconomic study was conducted to determine the demographic information, archeological and religious places, densely populated pockets, and settlements.

47. **Data analysis and interpretation.** The data collected was analyzed and interpretations made to assess the physical, biological, and socioeconomic features of the project area. The relevant information is presented in the succeeding paragraphs.

48. **Updating during detailed design phase.** The IEE including specific description of the environment and corridor of impact will be updated as necessary based on the final roads design and alignments.

B. Physical Characteristics

49. **Topography.** Lalmonirhat is a land with mixed topography. The topographical condition of the Lalmonirhat is relatively plain, with areas higher in level along the northern and western parts and lower in the eastern and western parts. Urban development is mainly concentrated in the center of the Lalmonirhat which is relatively higher than the rest of the *pourashava*.

50. Lalmonirhat*pourashava* is not normally affected by annual floods in the core area by the overflow of the rivers the Teesta and the Dharala forming the floodplains of the district except the low lying fringe areas of the east and south of the *pourashava*. But the total pourashava area is affected by water logging regularly due to drainage congestion of the present poor drainage system.

51. **Climatic conditions**. The climate of the PS area is moderate with the maximum and minimum mean monthly temperature being 32^{o}C and 23.2^{o}C, respectively observed in August and January. Mean annual rainfall is 2314 mm, with most of it occurring during five months of monsoon, between May to September, which is around 86% of the aggregate precipitation. In the winter months of December-January, at times, temperature comes down substantially that at times adds to the woe of the dwellers.

52. **Surface water and other bodies of water.** There are large number of ponds, ditches, low lying agricultural lands as low pockets in Lalmonirhat which act as retention basin to delay the maximum floods in the monsoon. However the PPTA study identified there are no existing natural or man-made bodies of water adjacent or within the corridors of impact of the subproject. Any water bodies to be identified during detailed design phase will be assessed and reported in the updated IEE.

53. **Air quality.** As there are no major industries in Lalmonirhat the main sources of air pollution are vehicles and non-point sources such as open burning. There are currently no air quality monitoring stations are in operation within the *pourashava* limit. The baseline air quality will be measured by the subproject contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

54. **Acoustic environment.** Subproject components are in the built-up part of Lalmonirhat, with residential, commercial, and institutional establishments. The volume of traffic that passes through these sections is not significant and traffic jams are not frequent. However vehicular movement can be considered as major cause of noise pollution. The baseline noise level will be measured by the subproject contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

55. **Water logged areas.** There are mainly six scattered water logged areas in the Lalmonirhat which are inundated by storm water mainly due to drainage congestion. The total area of these water logged drainage congested areas is about 9 hectares (ha). The areas are located near the bus stand area, Batarmour area, area behind the church, near the food go-down, beside the maternity hospital and the Shahjahan colony area. The depth of inundation of these areas is about 0.20 to 0.25 m and the duration of inundation is 4 to 10 hours after a heavy shower. The reasons of stagnation in the town are technical, social and institutional. Inundation in the town is caused due to inadequate drainage from the unplanned and uncoordinated development of the town.

56. In 1998, Lalmonirhat encountered the most serious flooding. The highest flood level reached above the ground level causing shallow flooding and substantial inconvenience to the people.

C. Biological Characteristics

57. **Flora and fauna.** Subproject components are located in Lalmonirhat urban area or in its immediate surroundings which were converted into urban use for years ago, and there is no natural habitat left at these sites. Animals and plants in the subproject area are those commonly found in urban and built-up areas. No endangered/protected species of either flora or fauna are found in the *pourashava* or its immediate surroundings.

58. **Protected areas.** There are no protected forests, wetlands, mangroves, or estuaries in or near the subproject area.

D. Socioeconomic Characteristics

59. **Area and population**. The *pourashava* with an area of 17.6 km^2 lies within the center of Lalmonirhat*upazilla*. Information about the total number of households, with average size, and population of Lalmonirhat*pourashava* is presented in Table 7.

Table 7: Population of LalmonirhatPourashava

Administrative Unit	Area (sq. km)	Households (nos.)	Total Population	Average Household Size	Density (per sq.km)
Lalmonirhat Pourashava	**17.61**	**13,897**	**60,322**	**4.34**	**3,425**
Ward No - 01	2.06	1876	8271	4.40	4,015
Ward No - 02	1.94	1717	7663	4.46	3,950
Ward No - 03	1.66	1665	7436	4.46	4,479
Ward No - 04	2.35	1889	7913	4.18	3,367
Ward No - 05	2.71	1630	6928	4.25	2,556
Ward No - 06	2.22	1570	6678	4.25	3,008

Ward No - 07	1.62	1038	4463	4.29	2,754
Ward No - 08	1.46	1070	4759	4.44	3,259
Ward No - 09	1.59	1442	6211	4.30	3,906

Source: BBS Community Report, Zilla: Lalmonirhat, 2011

60. **Land use.**Lalmonirhat has a mixed land use and predominantly consists of agricultural lands and residential lands, and the rest include commercial, industrial, administrative, educational, places of worship, health, recreational, restricted, transportation, miscellaneous, mixed uses, graveyard, open spaces, and water bodies. While the heart of the *pourashava* is of high commercial, residential and administrative areas, the fringe areas include mainly low-lying agricultural lands with scattered villages for human settlement.

61. **Literacy.** LalmonirhatSadar has an average literacy rate of 27.7% (7+ years), and the national average of 32.4% literate. (BBS, 2011)

62. **Water supply and water quality**. The *pourashava*'s water supply system comprises of 5 production tube wells, 790 privately owned tube wells, 2,034 water connections, 40 km of transmission and distribution mains. The system operates 10 to 12 hours a day. The supplied water is free of iron and arsenic and hence does not require any treatment. The current demand is 80 liters capita per day and only 50% of the population is served. The non-revenue water is estimated at 25%.

63. **Roads, existing provisions for pedestrians, and transport-related facilities.**Lalmonirhat roads (total of 114.7 km) generally fall into two categories: *kutcha* (earthen) construction and *pukka* (formed) roads. Formed roads are mainly BT asphalt roads with CC roads in a few places for main roads, while minor roads may also be brick-on-edge soling, known locally as HBB. Nearly all roads are built above the existing ground level, not only to avoid inundation during storms, but as the silty loam and alluvial soils typical of the area compact easily, roads need a supporting base layer that is often built up to around one meter above ground level**.** There are no provisions for pedestrians (e.g. footpaths) along the roads. There are no public or private bus services available. There is no designated authority for the management of traffic.

64. Lalmonirhat has only 1 medium-sized bus terminal built under UGIIP I. It has requisite facilities including toilets for women. It can accommodate around 50 to 60 buses if parked in an organized manner, where around 150 buses can be accommodated. And if put to full use, an average 2,000 to 3,000 passengers, both short and long haul, may conveniently use the terminal. However the bus terminal is sporadically used. Instead, often, it is found that buses are parked away from the existing terminal and largely along the road side.

65. **Drainage.** At present, the drainage system of Lalmonirhat includes 17.31 km of *pucca* drains (6.91 km secondary drains and 10.40 km tertiary drains). In addition, there are 5.60 km of *katcha* drains and 4.00 km of *kutchakhal*. PPTA study shows that there is less than 1 km of *pucca* drain per sq km of the pourashava area which indicates a somewhat poor spectacle of the drainage system in Lalmonirhat. Urban dwellers in most areas reported that the present drainage system is inadequate is inadequate.

66. **Sanitation.** The existing sanitary condition in Lalmonirhat is relatively poor. As per Bangladesh Bureau of Statistics data for 2011, 36.7% of the pourashava population have water sealed latrines, 21% have latrines that are not water-sealed, 30.7% of the population have non-sanitary facilities while the remaining 11.6% have no toilets. Lalmonirhat has no sewerage system and disposal/treatment facilities.

67. There are few public toilets in Lalmonirhat but these are in worse conditions as the pits, septic tanks and superstructures are mostly damaged. There is no arrangement for

electricity and water supply. There is no separate provisions for women.

68. Sanitation facilities in schools (primary and secondary) are found not in bad conditions. There is no huge demand of toilets in schools contrary to the findings of the PPTA study which identified school toilets to be constructed in schools visited.

69. **Solid waste management.** Solid waste management in Lalmonirhat consists of collection, transportation and dumping of wastes. There are 61 fixed dustbins located in different parts of the *pourashava* along with 25 to 30 temporary secondary collection points. There are 2 old open trucks and 1 new dump tipper but the tipping arrangement is not functioning and spare parts are not available. The *pourashava* employs 76 road sweepers, 20 drain cleaners and 10 truck loaders. The *pourashava* currently does not have its own solid waste disposal site. Wastes are dumped in vacant low lands, commonly requested by private land owners to reclaim/increase the level of the land.

70. Lalmonirhat generates about 22 metric tons per day computed based on 0.3 kilograms (kg) per capita per day. Segregation at source is not practiced resulting to mixed wastes from households, commercial establishments, hospitals, institutions and others. There is no regular public awareness and public relation activities in the pourashava. Community involvement is absent. Informal sector is prominent in recyclable collection and recycling.

71. **Other existing amenities for community welfare.** The pourashava has 5 kitchen markets (2 are pucca and 3 kutcha), of which three are owned by private and the rest two by the pourashava. PPTA study estimated 4,000 people use to meet their daily needs. The kitchen markets lack in adequate number of waste bins and do not have arrangement for waste collection. Generally, there is no arrangement for drainage within the markets. The PPTA team noted Lalmonirhat has one well-designed and built kitchen market with 10 sheds along with a slaughterhouse however the *pourashava* sparsely use the facility. The *pourashava* could not provide plausible answer to their not being used.

72. There are 1 graveyard, 1 burning crematorium, 1 government hospital, 10 government primary schools, 9 high schools, 2 girls' schools, 4 Colleges, and 1 polytechnic Institute. Apart from these, there are madrasas (community based religious institutes) established with private initiatives and operated and managed privately.

E. Historical, Cultural and Archaeological Characteristics

73. Lalmonirhat was an important junction railway station in the British period and had connection with Assam of India through Lalmonirhat-Mogulhat railway line. After partition in 1947, its importance as a junction station was diminished. Lalmonirhat wields substantial locational importance as it is a gateway to India through Burimari land port and border point.

74. **Archaeological Heritage and Relics**: SubadarMonsur Khan Mosque (known as Nidaria Mosque), Sindhumatidighi, Hussain Sarabor (dry pond), Harano (lost) Mosque (8th century AH), Dharla Bridge at Mughalhat, TusharbandharZamindar Bari, Ijaradar Mosque, KakinaRajbari, Kabi Bari (house and collections of poet Sheikh Fazlul Karim), the tomb of Hazrat Shah Sufi Muhammad Fazlur Rahman (known as Blind Hafez).

75. **Historical Events**: During the War of Liberation the headquarters of Sector 6 was located at Burimari of Lalmonirhatzila. Lalmonirhat was liberated on 6 December 1971.

76. **Marks of War of Liberation**: Mass grave 8, memorial 7, mass killing site 7.

77. It has been noted during the PPTA study that corridors of impact are not within nor adjacent to these sites.

V. ASSESSMENT OF ENVIRONMENTAL IMPACTS AND SAFEGUARDS

A. Methodology

78. Issues for consideration have been raised by the following means: (i) input from interested and affected parties; (ii) desktop research of information relevant to the proposed subproject; (iii) site visits; and (iv) evaluation of proposed design scope and potential impacts.

79. The corridors of impact considered include: (i) existing alignment of pipes to be replaces; and (ii) existing ROWs for the new pipes. Pipe laying will require maximum of 0.5 m for excavation. No additional land is required beyond the ROWs and existing facilities. Area of influence is limited within the alignments, ROWs, and sites for proposed civil works. Categorization of the subproject and formulation of mitigation measures have been guided by ADB's REA checklist for water supply (**Appendix 1**) and ADB SPS, 2009.

B. Screening out Areas of No Significant Impact

80. From the preliminary design and results of the rapid environmental assessment, it is clear that implementation of Lalmonirhat water supply subproject will not have major negative impacts because activities will be localized/site-specific and short in duration; corridors of impact during pipelaying works will be on existing public ROWs, and construction will be conducted within a relatively small area. Because of these there are several aspects of the environment that are not expected to be affected by the subproject (Table 8), thus can be screened out of the assessment at this stage but will be assessed again during detailed design stage and before implementation.

Table 8: Fields in Which the Subproject Is Not expected to have Significant Impacts

Field	Rationale
A. Physical Characteristics	
Topography, landforms, geology and soils	Required amount of materials will not cause alteration of topography, landforms, geology and soils. Erosion hazard is insignificant as trenching and excavation works will be conducted only during construction stage (short-term) and specific to PTWs sites and along public ROWs.
Climatic conditions	Short-term production of dust is the only effect on atmosphere. However, impact is short-term, site-specific and within a relatively small area. There are well developed methods for mitigation.
Water quality	Trenching and excavation, run-off from stockpiled materials, and chemical contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause siltation and reduction in the quality of adjacent bodies of water. However, impact is short-term, site-specific and within a relatively small area. There are well developed methods for mitigation.
Air quality	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites. However, impact is short-term, site-specific and within a relatively small area. There are well developed methods for mitigation.
Acoustic environment	Construction activities will be on settlements, along and near schools, and areas with small-scale businesses. Temporary increase in noise level and vibrations may be caused by excavation equipment, and the transportation of equipment, materials, and people. However, the proposed subproject will be on vacant agricultural land and will follow existing ROW alignment and impact is short-term, site-specific and within a relatively small area. There are well developed methods for mitigation.
B. Biological Characteristics	
Biodiversity	Activities being located in the built-up area of Lalmonirhatpourashava will not cause direct impact on biodiversity values. The construction activities do not anticipate any cutting of trees.
C. Socioeconomic Characteristics	
Land use	No alteration on land use. PTWs and OHT construction and operation will be on government-land and will not affect the surrounding lands. Laying of pipelines will be limited to ROWs.

Field	Rationale
Type of community spread	No alteration on type of community spread.
Existing provisions for pedestrians and other forms of transport	Road closure is not anticipated. Hauling of construction materials and operation of equipment on-site can cause traffic problems. However, the proposed subproject will follow existing ROW alignment and impact is short-term, site-specific and within a relatively small area. There are well developed methods for mitigation.
Socio-economic status	The resettlement impacts are discussed in details in the subproject's resettlement plan. Impacts are limited to economic displacement in the form of loss of land, assets, income sources, and means of livelihoods as a result of involuntary resettlement. Manpower will be required during the 30-months construction stage. This can result in generation of contractual employment and increase in local revenue. Thus potential impact is positive and long-term.
Other existing amenities for community welfare	Although construction of subproject components involves quite simple techniques of civil work, the invasive nature of excavation and the subproject sites being in built-up areas of Lalmonirhatpourashava where there are a variety of human activities, will result in impacts to the sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are temporary and for short duration.
D. Historical, Cultural, and Archaeological Characteristics	
Physical and cultural heritage	There are no scheduled or unscheduled archaeological, paleontological, or architectural sites of heritage significance listed by local and/or national authority and/or internationally (UNESCO) within or adjacent to subproject sites. The subproject components are not located in or near and excavation works will not be conducted in the vicinities of the 2 historical sites.

C. Anticipated Impacts and Mitigation Measures – Planning and Design Phase

81. Planning principles and design considerations have been reviewed and incorporated into the site planning process whenever possible. All locations for the subproject components will be on properties held by the *pourashava*. Access to the subproject sites is thru public ROW and existing roads.

82. The concepts considered in design of Lalmonirhat water supply subproject are: (i) demand for new piped water supply; (ii) maximum population coverage with pipe layout mostly in residential areas and areas of high growth rate; (iii) avoidance of water-use conflicts; (iv) locating pipelines within ROWs; (vii) locating pipelines at least 10 meters from latrines, septic tanks and any main drains to avoid contamination; and (iv) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

83. **Subproject selection criteria.** The project environmental assessment and review framework specifies environmental criteria to avoid or minimize adverse impacts during the identification and finalization of drainage subprojects. Table 9 summarizes site and design considerations as per preliminary design.

Table 9: Site and Design Considerations to Meet EARF Environmental Criteria

	Components	Environmental Selection Guidelines	Remarks
1.	Overall selection guideline	i. Comply with all requirements of relevant national and local laws, rules, and guidelines.	- Requisite LCC and ECC to be obtained prior to commencement of works
		ii. Avoid/minimize where possible locations in protected areas, including notified reserved forests or biodiversity conservation hotspots (wetlands, national reserves, forest reserves, and sanctuaries).	-- Not present in Lalmonirhat *pourashava*
		iii. Avoid possible locations that will result in destruction/disturbance to historical and cultural places/values.	-- Use of "chance find" procedures in the EMP that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.
		iv. Avoid tree-cutting where possible. Retain mature roadside trees which are important/valuable or historically	- Permit for tree-cutting to be obtained by contractor/s prior to commencement of work

	Components	Environmental Selection Guidelines	Remarks
		significant. If any trees have to be removed, plant two new trees for every one that is lost.	- Compensatory plantation for trees lost at a rate of 2 trees for every tree cut, in addition to tree plantation as specified in the design, will be implemented by the contractor, who will also maintain the saplings for the duration of his contract.
		v. Ensure all planning and design interventions and decisions are made in consultation with local communities and include women. Reflect inputs from public consultation and disclosure for site selection.	- All consultations during project preparation are documented and concerns expressed by public addressed in the IEE.
		vi. Synchronize all road improvement and pipe laying works (to extent possible) to minimize disturbance and optimize use of resources (e.g., water pipes laid prior to road improvements).	-included in the preliminary design and EMP
2.	Water supply improvement	i. Utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall).	- No additional abstraction required
		ii. Avoid using water sources that may be polluted by upstream users.	- Not applicable. Water sources are existing PTWs
		iii. Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g. irrigation).	- No additional abstraction required
		iv. Locate all new facilities/buildings at sites where there is low risk of flooding or other hazards that might impair functioning of, or present a risk of damage to water treatment plants, tanks/reservoirs, or their environs.	- No new facilities - Design of facilities to be rehabilitated included flood protection measures
		v. Avoid all usage of pipes that are manufactured from asbestos concrete, and avoid disturbance to existing asbestos concrete pipes (keep in the ground)	- Considered in the preliminary design. Asbestos pipes will not be used. Any asbestos piped to be found will not be removed.
		vi. Ensure water to be supplied to consumers will meet national drinking water standards at all times.	- Considered in the preliminary design. Water to be supplied will be ensured to meet Bangladesh Standards for Drinking Water.
		vii. Include measures to address additional sewage/domestic wastewater due to improved/new water supply system	- Considered in the project

84. **Land acquisition and resettlement.** The existing PTWs, OHT, and offices/structures to be rehabilitated are all located in government-owned lands. There are no encroachers or residential/commercial structures in the ROWs. Cutting of trees will not be required as per preliminary design. This will be reassessed during detailed design stage and if cutting of trees will be required, compensatory plantation for trees lost at a rate of 2 trees for every tree cut will be implemented by the contractor, who will also maintain the saplings for the duration of his contract.

85. **Impacts of groundwater abstraction.** Underground water of sufficient quantity is available within the area. The water quality from all of the test results indicates that aquifer is confined and fully protected by an impermeable layer. The potential abstraction rate is considered not to adversely impact the aquifer and is not envisaged to cause land subsidence or salinity intrusion.

86. **Impacts of distribution network.** A 0.5 m-wide, 3km-long corridor on public ROWs is proposed to accommodate the distribution network. The alignment passes through the built-up areas. There are no environmentally sensitive areas in the vicinity of the proposed

alignment. Traffic management plans and spoil management plans will be prepared as part of the detailed designs.

D. Anticipated Impacts and Mitigation Measures – Construction Phase

87. In the case of this subproject (i) most of the individual elements are relatively small and involve straightforward construction, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in the built-up area of the *pourashava*, will not cause direct impact on biodiversity values.

88. **Construction method.** The infrastructures will be constructed manually according to design specifications. Trenches will be dug by backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed nearby, and the materials (brought to site on trucks and stored on unused land nearby) will be placed in the trench by crane or using a small rig. Once pipes are laid these will be joined as per specification and tested for any cracks of leakages. The minimum working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. Any excavated road will be reinstated.

89. There is sufficient space for a staging area, construction equipment, and stockpiling of materials. However, the contractor will need to remove all construction and demolition wastes on a daily basis.

90. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project sites in built-up areas of Lalmonirhat where there are a variety of human activities, will result to impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are short-term, site-specific and within a relatively small area. There are no impacts that are significant or complex in nature, or that need an in-depth study to assess the impact. Thus, Lalmonirhat water supply subproject is unlikely to cause significant adverse impacts. The potential adverse impacts that are associated with construction activities can be mitigated to acceptable levels with the following mitigation measures (Table 10).

Table 10: Anticipated Impacts and Mitigation Measures – Construction Phase

Field	Impacts	Mitigation Measures
A. Physical Characteristics		
Topography, landforms, geology and soils	Significant amount of gravel, sand, and cement will be required for this subproject. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Utilize readily available sources of materials. If contractor procures materials from existing burrow pits and quarries, ensure these conform to all relevant regulatory requirements. • Borrow areas and quarries (If these are being opened up exclusively for the subproject) must comply with environmental requirements, as applicable. No activity will be allowed until formal agreement is signed between PIU, landowner and contractor.
Water quality	Trenching and excavation, run-off from stockpiled materials, and chemical contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause siltation and reduction in the quality of adjacent bodies of water. The impacts are negative but short-term, site-specific	• Prepare and implement a spoils management plan (see **Appendix 3** for outline). • Prioritize re-use of excess spoils and materials in construction activities. If spoils will be disposed, consult with Lalmonirhat local authority on designated disposal areas. • All earthworks must to be conducted during dry season to maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff.

Field	Impacts	Mitigation Measures
	within a relatively small area and reversible by mitigation measures.	• Location for stockyards for construction materials shall be identified at least 300m away from watercourses. Place storage areas for fuels and lubricants away from any drainage leading to water bodies. • Take all precautions to minimize the wastage of water in the construction activities. • Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies. • Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low lying areas. • While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse and cross drainage channels. • Monitor water quality according to the environmental management plan.
Air quality	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Damp down exposed soil and any sand stockpiled on site by spraying with water when necessary during dry weather; • Use tarpaulins to cover soils, sand and other loose material when transported by trucks. • Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free. • Arrangements to control dust through provision of windscreens, water sprinklers, and dust extraction systems shall be provided at all hot-mix plants, batching plants and crushers (if these establishments are being set up exclusively for the subproject). • Monitor air quality.
Acoustic environment	Construction activities will be on settlements, along and near schools, and areas with small-scale businesses. Temporary increase in noise level and vibrations may be caused by excavation equipment, and the transportation of equipment, materials, and people. However, the proposed subproject will follow existing ROW alignment and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. • Plan activities in consultation with Lalmonirhat local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. • Use of high noise generating equipment shall be stopped during night time. • Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; • Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufacturers' specifications at all times. • All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent-type generators (if required). • Monitor noise levels. Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s. • If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Workers in a posted noise hazard area must wear hearing protection. • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.
Aesthetics	The construction activities do not anticipate any cutting of trees but will produce excess	• Prepare a debris disposal plan • Remove all construction and demolition wastes on a daily basis.

Field	Impacts	Mitigation Measures
	excavated earth (spoils), excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Coordinate with Lalmonirhat local authority for beneficial uses of excess excavated soils or immediately dispose to designated areas. Avoid stockpiling of any excess spoils. • All vehicles delivering fine materials to the site and carrying debris for disposal shall be covered to avoid spillage. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. • Lighting on construction sites shall be pointed downwards and away from oncoming traffic and nearby houses. • In areas where the visual environment is particularly important or privacy concerns for surrounding buildings exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction. • The site must be kept clean to minimize the visual impact of the site. Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas.
B. Biological Characteristics		
Biodiversity	Activities being located in the built-up area of Lalmonirhat*pourashava*. There are no protected areas in or around subproject sites, and no known areas of ecological interest. Preliminary design shows there are no trees at the sites that need to be removed.	• Check if tree-cutting will be required during detailed design stage. No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission of the environment management specialist. • All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees. • Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body in the subproject vicinity. • Prohibit employees from poaching wildlife and cutting of trees for firewood. • Implement compensatory plantation for trees lost at a rate of 2 trees for every tree cut. Maintain the saplings for the duration of contract.
C. Socioeconomic Characteristics		
Existing provisions for pedestrians and other forms of transport	Road closure is not anticipated. Hauling of construction materials and operation of equipment on-site can cause traffic problems. However, the proposed subproject will follow existing ROW alignment. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Prepare and implement a traffic management plan (see **Appendix 4** for sample) • Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Maintain safe passage for vehicles and pedestrians throughout the construction period. • Schedule truck deliveries of construction materials during periods of low traffic volume. • Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required. • Notify affected sensitive receptors by providing sign boards informing nature and duration of construction activities and contact numbers for concerns/complaints. • 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 front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools. • Consult businesses and institutions regarding operating hours and factoring this in work schedules. Ensure there is provision of alternate access to businesses and

Field	Impacts	Mitigation Measures
		institutions during construction activities, so that there is no closure of these shops or any loss of clientage. • Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.
Socio-economic status	Manpower will be required during the 30-month construction stage. This can result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and long-term.	• Employ at least 50% of labor force from communities in the vicinity of the site. This will have the added benefit of avoiding social problems that sometimes occur when workers are imported into host communities, and avoiding environmental and social problems from workers housed in poorly serviced camp accommodation. • Secure construction materials from local market.
Other existing amenities for community welfare	Although construction of subproject components involves quite simple techniques of civil work, the invasive nature of excavation and the subproject sites being in built-up areas of Lalmonirhat *pourashava* where there are a variety of human activities, will result to impacts to the sensitive receptors such as residents, businesses, and the community in general. Excavation may also damage existing infrastructure (such as water distribution pipes, electricity pylons, etc) located alongside the roads. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Obtain details from pourashava nature and location of all existing infrastructure, and plan excavation carefully to avoid any such sites to maximum extent possible; • Integrate construction of the various infrastructure subprojects to be conducted in Lalmonirhat (roads, water supply, etc.) so that different infrastructure is located on opposite sides of the road where feasible and roads and inhabitants are not subjected to repeated disturbance by construction in the same area at different times for different purposes. • Consult with local community to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed. • Existing infrastructure (such as water distribution pipes, electricity pylons, etc.) shall be relocated before construction starts at the subproject sites. • Prior permission shall be obtained from respective local authority for use of water for construction. Use of water for construction works shall not disturb local water users. • If construction work is expected to disrupt users of community water bodies, notice to the affected community shall be served 7 days in advance and again 1 day prior to start of construction. • Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.
Community health and safety	Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Contractor's activities and movement of staff will be restricted to designated construction areas. • Locations of hot-mix plants, batching plants and crushers (if these establishments are being set up exclusively for the subproject) shall be shall be located at least 100 m away from the nearest dwelling preferably in the downwind direction. • Consult with Lalmonirhat local authority on the designated areas for stockpiling of, soils, gravel, and other construction materials. • If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment management specialist and landowner. • Use small mechanical excavators to attain faster trenching progress. For rock and concrete breaking, use non-explosive blasting chemicals, silent rock cracking chemicals, and concrete breaking chemicals.[5] • Under no circumstances may open areas or the surrounding bushes be used as a toilet facility. • Recycling and the provision of separate waste receptacles for different types of waste shall be

[5] These products come in powder forms, and once mixed with water (being the catalyst) simply expand, and crack the rock from hole to hole. This product is environmentally friendly and can be washed away after it has been used.

Field	Impacts	Mitigation Measures
		encouraged. • A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bushes as a toilet facility); (iv) no fires permitted on site except if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff, no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do. • Interested and affected parties need to be made aware of the existence of the complaints book and the methods of communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the environment management specialist's attention immediately; and (iv) taking remedial action as per environment management specialist's instruction. • The contractor shall immediately take the necessary remedial action on any complaint/grievance received by him and forward the details of the grievance along with the action taken to the environment management specialist within 48 hours of receipt of such complaint/grievance.
Workers health and safety	There is invariably a safety risk when construction works such as excavation and earthmoving are conducted in urban areas. 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.	• Comply with requirements of Government of Bangladesh Labor Law of 2006 and all applicable laws and standards on workers' health and safety (H&S). • Ensure that all site personnel have a basic level of environmental awareness training. If necessary, the environmental management specialist and/or a translator shall be called to the sites to further explain aspects of environmental or social behavior that are unclear. • Produce and implement a site H&S plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (iii) providing (H&S) training[6] for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. • Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances • Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work

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

Field	Impacts	Mitigation Measures
		camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; and (iii) sanitation facilities are available at all times. • Provide medical insurance coverage for workers; • Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Ensure moving equipment is outfitted with audible back-up alarms; • Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
D. Historical, Cultural, and Archaeological Characteristics		
Physical and cultural heritage	There are no scheduled or unscheduled archaeological, paleontological, or architectural sites of heritage significance listed by local and/or national authority and/or internationally (UNESCO) within or adjacent to subproject sites. The subproject components are not located in or near and excavation works will not be conducted in the vicinities of the 4 historical sites. Thus risk for chance finds is low.	• Stop work immediately to allow further investigation if any finds are suspected.

E. Anticipated Impacts and Mitigation Measures – Operations and Maintenance Phase

91. In the operations and maintenance (O&M) phase, the water supply system will operate with routine maintenance, which should not affect the environment. The infrastructures 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. O&M will be the responsibility of Lalmonirhat*pourashava*, which will be given training by this project and DPHE 37-DTWSP.

92. Routine repairs and maintenance works will be very small in scale, to conducted manually by small teams of men and works will be very short in duration thus will not cause significant physical impacts.

93. **Hazardous chemicals use and storage**. Water treatment at PTWs and OHT prior to distribution may involve the use of chemicals for disinfection and water conditioning. Recommended measures to prevent, minimize, and control potential environmental impacts associated with the storage, handling and use of disinfection chemicals in PTWs and OHT

include (i) store sodium hypochlorite in cool, dry, and dark conditions for no more than one month, and use equipment constructed of corrosion-resistant materials; (ii) store calcium hypochlorite away from any organic materials and protect from moisture; fully empty or re-seal shipping containers to exclude moisture. Calcium hypochlorite can be stored for up to one year; (iii) minimize the amount of chlorination chemicals stored on site while maintaining a sufficient inventory to cover intermittent disruptions in supply; (iv) develop and implement a prevention program that includes identification of potential hazards, written operating procedures, training, maintenance, and accident investigation procedures; and (v) develop and implement a plan for responding to accidental releases.

94. The potential adverse impacts that are associated with O&M activities can be mitigated to acceptable levels with the following mitigation measures (Table 11).

Table 11: Anticipated Impacts and Mitigation Measures – O&M Phase

Field	Impacts	Mitigation Measures
A. Physical Characteristics		
Air quality	Air emissions from PTWs and OHT operations may include gaseous or volatile chemicals used for disinfection processes (e.g., chlorine).	• Store sodium hypochlorite in cool, dry, and dark conditions for no more than one month, and use equipment constructed of corrosion-resistant materials. • Store calcium hypochlorite away from any organic materials and protect from moisture; fully empty or re-seal shipping containers to exclude moisture. Calcium hypochlorite can be stored for up to one year. • Minimize the amount of chlorination chemicals stored on site while maintaining a sufficient inventory to cover intermittent disruptions in supply. • Develop and implement a prevention program that includes identification of potential hazards, written operating procedures, training, maintenance, and accident investigation procedures. • Develop and implement a plan for responding to accidental releases.
Acoustic environment	Temporary increase in noise level and vibrations. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Plan activities in consultation with Lalmonirhat local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.
B. Biological Characteristics		
Biodiversity	Activities in the built-up area of Lalmonirhat*pourashava*. There are no protected areas in or around subproject sites, and no known areas of ecological interest.	• No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal).
C. Socioeconomic Characteristics		
Workers health and safety	Workers need to be mindful of the occupational hazards working with chemicals at PTWs and OHT. Potential impacts are negative and long-term but reversible by mitigation measures.	• Comply with requirements of Government of Bangladesh Labor Law of 2006 and all applicable laws and standards on workers H&S. • Ensure that all site personnel have a basic level of H&S training. • Produce and implement a O&M H&S plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (iii) providing (H&S) training[7] for all site personnel; (iv)

[7] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential

Field	Impacts	Mitigation Measures
		documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. • Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances • 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; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Mark and provide sign boards. 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. • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

F. Cumulative Impact Assessment

95. The cumulative impact assessment examined the interaction between the subproject's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing, and reasonably foreseeable future projects or activities. The interaction of residual effects associated with multiple projects and/or activities can result in cumulative impacts, both positive and negative. The subproject's potential cumulative effects were considered with respect to valued components in environmental and socioeconomic categories, in four areas:

(i) of any potential residual project effects that may occur incrementally over time;
(ii) consideration of other known relevant projects or activities within the specified study area boundaries, even if not directly related to the project;
(iii) potential overlapping impacts that may occur due to other developments, even if not directly related to the proposed subproject; and
(iv) future developments that are reasonably foreseeable and sufficiently certain to proceed.

96. The project has identified the valued components as water quality, socio-economic and socio-community components, and human health and safety. The spatial boundary of the subproject is the area along alignment of the distribution network.The temporal boundary can be considered as the whole Lalmonirhat*pourashava*.

97. Locations and siting of the proposed infrastructures were considered to reduce impacts. Preliminary designs integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the Lalmonirhat water supply subproject, including: (i) structural protection of facilities from future floods; (ii) standalone power backup for the PTWs and pumping stations; and (iii) promote more efficient use of water by reducing losses and wastage to counter increased demands due to higher temperatures. Residual impacts

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to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

during O&M will be much less than those of the construction phase as the work will be infrequent, affecting small areas only thus considered to be negligible.

98. **Water quality**. Groundwater availability has been extensively studied and analyzed by DPHE in its ongoing 37-DTWSP. The study concluded groundwater level is sufficient in Lalmonirhat and present interventions will meet the current and future demands. The subproject will not cause additional abstraction rather improve distribution and non-revenue water therefore potential residual effects is considered to be negligible and cumulative impact is not significant.

99. **Socioeconomic and socio-community**. Concerns on existing provisions for pedestrians and other forms of transport will occur spatially during construction and O&M activities. Traffic movement along the pipe alignments will be improved once the activities are completed. The subproject will not conflict with existing or planned land use. However, following improvement in infrastructures and services, added residential developments, commercial, and business facilities and increased densities are expected to develop and enhance Lalmonirhat *pourashava*. This can be considered a long-term cumulative benefit of the subproject.

100. Given the scale of the project it is likely that local people will obtain at least temporary socio-economic benefits, by gaining employment in the construction workforce, and thus raising their levels of income. These benefits can bring wider social gains if they are directed at vulnerable[8] groups.

101. Upon completion of the subproject, the socio-community will be the major beneficiaries. With the improved water supply, they will be provided with reliable and climate-resilient municipal services. In addition to improved environmental conditions, the subproject will reduce occurrence of water-related diseases and exposure to climate extremes. People would 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. Beyond reducing the water-borne and water-washed diseases, providing better access to improved municipal services confers many other diverse benefits ranging from the easily identifiable and quantifiable (costs avoided, time saved) to the more intangible and difficult to measure (convenience, well-being). One set of benefits related to health impacts that are relatively easy to quantify, are the cost-offsets (costs avoided due to less illness). Cost savings in health care are mainly due to the reduced number of treatments of diarrheal cases. Also, patients will avoid costs incurred by seeking treatment, including expenditures on care, drugs and transport and the opportunity costs of time spent on seeking care. Another set of benefits related to less illness are the avoided days lost, with respect to formal or informal employment, other productive activities in the household, or school attendance. These are considered a long-term cumulative benefit.

102. **Community and workers health and safety**. No adverse residual effects to human health will occur as a result of construction or O&M activities. While exposure to elevated noise levels, fugitive dust and common air pollutants will occur in proximity to work sites, due to their short-term and localized nature, these effects are expected to be minor and insignificant with no measurable effects on human health.

103. Therefore the project will benefit the general public by contributing to the long-term improvement of municipal services and community livability in Lalmonirhat*pourashava*.

[8]Vulnerable groups as those without legal title to land and other assets; households headed by single earner females, the elderly or disabled; indigenous peoples (based on ADB OM); and households with incomes that are below the poverty line.

VI. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Public Consultation Conducted

104. The public participation process included (i) identifying interested and affected parties (stakeholders); (ii) informing and providing the stakeholders with sufficient background and technical information regarding the proposed development; (iii) creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments, and concerns) with regard to the proposed development; (iv) giving the stakeholders feedback on process findings and recommendations; and (v) ensuring compliance to process requirements with regards to the environmental and related legislation.

105. Public consultations and focus group discussions (FGDs) were conducted by PPTA on 12 to 13January 2014. The objective of the meetings was to appraise the stakeholders about environmental and social impacts of the proposed subproject and safeguards to mitigate the same. A questionnaire was designed and environmental information was collected. Key respondents included project-affected persons, who may suffer temporary access disruptions during construction activities, shopkeepers/businessmen from the subproject area, and daily commuters consulted randomly. Issues discussed and feedback received along with details of date, time, location, and list of participants are given in **Appendix 5**. The environmental concerns and suggestions made by the participants were listed, and discussed, and suggestions accordingly incorporated in the EMP.

B. Future Consultation and Disclosure

106. This IEE and other relevant documents will be made available at public locations in the pourashava and posted on the websites of executing agencies and ADB. The consultation process will be continued and expanded during the project implementation to ensure stakeholders participate fully in project execution, as well as to implement comprehensive information, education, and communication plan.

107. The public consultation and disclosure program with all interested and affected partied will remain a continuous process throughout the project implementation, and shall include the following:

(i) **Consultations during construction phase:** (a) public meetings with affected communities to discuss and plan work programs and allow issues to be raised and addressed once construction has started; and (b) smaller-scale meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and to provide a mechanism through which stakeholders can participate in project monitoring and evaluation.

(ii) **Project disclosure:** (a) public information campaigns (via newspaper, flyers, and media) to explain the project to the wider city population and prepare them for disruptions they may experience once construction is underway; (b) public disclosure meetings at key project stages to inform the public of progress and future plans, and to provide copies of summary documents in local language; (c) formal disclosure of completed project reports by making copies available at convenient locations in the study areas, and informing the public of their availability; and (d) providing a mechanism through which comments can be made.

108. For the benefit of the community, the summary of the IEE will be translated in the local language and made available at (i) offices of executing and implementing agencies, (ii) area offices, (iii) consultant teams' offices; and (iv) contractor's campsites. It will be ensured that the hard copies of IEE are kept at places which are conveniently accessible to people, as a means to disclose the document and at the same time creating wider public awareness.

An electronic version of the IEE will be placed in the official website of executing and implementing agencies and the ADB website after approval of the IEE by ADB.

VII. GRIEVANCE REDRESS MECHANISM

109. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of AP's concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project.

110. **Common GRM.** A common GRM will be in place for social, environmental, or any other grievances related to the project; the resettlement plans (RPs) and IEEs will follow the GRM described below, which is developed in consultation with key stakeholders. 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.

111. *Pourashava*-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign. The project implementation unit (PIU) and governance improvement and capacity development consultants (GICDC) will conduct *pourashava*-wide awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements, and will work with the PMO and management, design and supervision consultants (MDSC) to help ensure that their grievances are addressed.

37. Affected persons (APs) will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes that have already been installed by project *pourashavas* or through telephone hotlines at accessible locations, by e-mail, by post, or by writing in a complaints register in *pourashava* offices. Appendix 7 has the sample grievance registration form. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The project management office (PMO) safeguard officer will have the overall responsibility for timely grievance redressal on environmental and social safeguards issues and for registration of grievances, related disclosure, and communication with the aggrieved party through the PIU designated safeguard focal person.

38. **Grievance redress process**. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor and MDSC on-site personnel will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact phone numbers and names of the concerned PIU safeguard focal person and contractors, will be posted at all construction sites at visible locations.

i. **1st Level Grievance.** The phone number of the PIU office should be made available at the construction site signboards. The contractors and PIU safeguard focal person can immediately resolve on-site in consultation with each other, and will be required to do so within 7 days of receipt of a complaint/grievance.
ii. **2nd Level Grievance.** All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the grievance redress cell (GRC) headed by Panel Mayor of the pourashavawith support from PIU designated

safeguard focal person and MDSC regional environment and resettlement specialists.GRC will attempt to resolve them within 15 days.[9] The PIU designated safeguard focal person will be responsible to see through the process of redressal of each grievance.

iii. **3rd Level Grievance.**The PIU designated safeguard focal person will refer any unresolved or major issues to the PMO safeguard officer and MDSC national environmental and resettlement specialists. The PMO in consultation with these officers/specialists will resolve them within 30 days.

39. Despite the project GRM, 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.

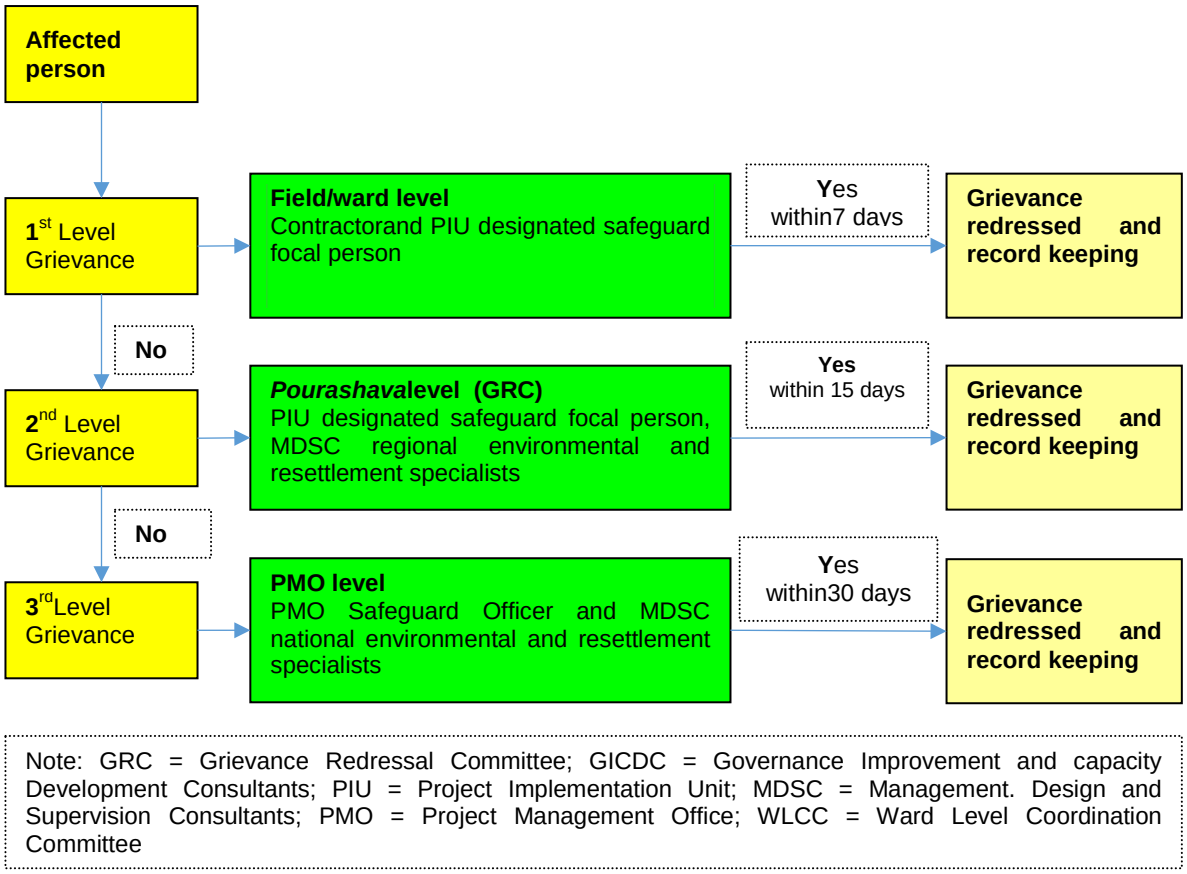
40. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Bangladesh Resident Mission (BRM). The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the PID to be distributed to the affected communities, as part of the project GRM.

41. **Recordkeeping.** Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were effected and final outcome will be kept by PIU. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMO office, *pourashava* office, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

42. **Periodic review and documentation of lessons learned.** The PMO safeguard officer will periodically review the functioning of the GRM in each *pourashava* and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

43. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned PIU at *pourashava*-level; while costs related to escalated grievances will be met by the PMO. Cost estimates for grievance redress are included in resettlement cost estimates.

[9] Grievance redress committees (GRC) will have been formed at Pourashava-level. For example in Lalmonirhat pourashava, the GRC comprises Panel Mayor as Chairperson, and 1 councilor, the pourashava Executive Engineer, Secretary *pourashava* and *pourashava* administrative officer, as members. All *pourashava*-level GRCs shall have at least one-woman member/chairperson and AP representative or independent NGO as committee member. In addition, for project-related grievances, representatives of APs, community-based organizations (CBOs), and eminent citizens must be invited as observers in GRC meetings.



Note: GRC = Grievance Redressal Committee; GICDC = Governance Improvement and capacity Development Consultants; PIU = Project Implementation Unit; MDSC = Management. Design and Supervision Consultants; PMO = Project Management Office; WLCC = Ward Level Coordination Committee

Figure 5: Project Grievance Redress Mechanism

VIII. ENVIRONMENTAL MANAGEMENT PLAN

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

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

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

A. Institutional Arrangement

115. **Executing and implementing agencies.** The Local Government Engineering Department (LGED) and the Department of Public Health Engineering (DPHE), both under

the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) and having extensive experience in managing urban and water supply projects financed by ADB, will be the executing agencies of the project. The participating *pourashavas* will be the implementing agencies.

B. Safeguard Implementation Arrangement

116. **Project management office.** A PMO will be established for the overall management of the project. The PMO will be headed by Project Director (PD) supported by officials including three project managers in charge of (i) municipal infrastructure (excluding water supply and sanitation), (ii) water supply and sanitation, and (iii) governance improvement and capacity development, respectively. the PMO will receive support from national environmental specialist and national resettlement specialist on the MDSC team. Key tasks and responsibilities of the PMO safeguard (environment) officer are as follows:

(i) confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
(ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
(iii) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by project implementation unit (PIU) and contractors;
(iv) establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
(v) facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant;
(vi) supervise and provide guidance to the PIUs to properly carry out the environmental monitoring and assessments as per the EARF;
(vii) review, monitor, and evaluate the effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
(viii) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
(ix) ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public; and
(x) address any grievances brought about through the grievance redress mechanism in a timely manner.

117. **Project implementation unit**. The participating *pourashavas* will establish a PIU within the *pourashava* structure. The PIUs will (i) be responsible for land acquisition; (ii) take necessary action for obtaining rights of way; (iii) plan, implement and monitor public relations activities, gender mainstreaming initiatives and community participation activities at *pourashava* level; (iv) disseminate information related to the project to the public and media; (v) ensure compliance with loan covenants concerning safeguards measures; and (vi) facilitate implementation of safeguards plans. The PIUs will each designate a safeguard officer[10] and will receive assistance from the assigned MDSC regional environmental specialist to:

[10] It is recommended that existing *pourashava* health officer or executive engineer will also work as safeguard officer in addition to his/her regular responsibilities within the *pourashava*.

(i) update IEEs/EMPs during detailed design stage and prepare new IEEs/EMPs in accordance with the EARF;
(ii) conduct environmental compliance audit of existing facilities as per Item F, Appendix 6 of ADB SPS, 2009;
(iii) include IEEs/EMPs in bidding documents and civil works contracts;
(iv) comply with all government rules and regulations;
(v) take necessary action for obtaining rights of way;
(vi) oversee implementation of EMPs including environmental monitoring by contractors;
(vii) take corrective actions when necessary to ensure no environmental impacts;
(viii) submit monthly environmental monitoring reports to PMO,
(ix) conduct continuous public consultation and awareness;
(x) address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs; and
(xi) organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.

118. **Project Management, Design and Supervision Consultants (MDSC).** MDSC will be engaged to work closely with and advise the PMO, to be involved in project supervision including monitoring during construction phase. The MDSC will have one national environmental specialist and three regional environmental specialist as well as one national resettlement specialist and three regional resettlement specialist. The MDSC national environmental specialist will, but not limited to:

(i) work under the general supervision of the team leader and the deputy team leader;
(ii) review the environmental guidelines and requirement of the government of Bangladesh and ADB SPS, 2009, environmental subproject selection guidelines and EARF;
(iii) Guide the implementation of future subprojects;
(iv) provide technical support to the PMO and PIUs including review and update of EARF and guidelines for specific type of subprojects and assist in preparing terms of reference for environmental assessment;
(v) assist and guide the MDSC regional environmental specialists to provide support to environmental management functions including updating subproject IEEs in respect to EMP;
(vi) assist in preparing IEEs and in monitoring impact and mitigation measures associated with subprojects;
(vii) assist PIUs and MDSC regional environmental specialists working in the steps for preparing the EIA/IEE, capacity building and training, preparation of guidelines and procedure and subproject specific guidance;
(viii) provide support and guidance to PIUs in undertaking environmental monitoring
(ix) support PMU in submitting semi-annual environmental monitoring reports to ADB;
(x) facilitate in grievance redress and corrective actions;
(xi) train PIU officials regarding environmental requirement and issues; and
(xii) perform any other task assigned by the team leader, deputy team leader and the project director.

119. The MDSC regional environmental specialists will, but not limited to:

(i) work under the supervision and guidance of the team leader, deputy team leader and MDSC national environmental specialist;
(ii) assist PIUs in preparing and updating IEEs including EMPs in accordance with the EARF, and assist in monitoring impact and mitigation measures associated with subprojects including implementation of EMPs by contractors;
(iii) assist in preparation of IEEs and in the environmental review of subproject consisting of screening at *pourashava* level by PIU through a committee formed with municipal mayor as chairman and representatives from DOE, LGED and other relevant district office as members;
(iv) assist PIUs in the steps for preparing EIA/IEE, capacity building and training, preparation of guidelines and procedure and subproject specific guidance;
(v) support PIU in environmental monitoring and submit monitoring reports to PMU as inputs into the semi-annual monitoring report submitted to ADB;
(vi) undertake mitigation measures and other specific measures in the construction contract;
(vii) facilitate in grievance redress and corrective actions;
(viii) follow subproject selection guidelines and EARF to ensure compliance with the environmental guidelines and requirement of the Government of Bangladesh and ADB SPS, 2009;
(ix) support PMO and MDSC national environment specialist by providing data, information and all other requested assistance;
(x) train PIU officials regarding environmental issues
(xi) perform any other task assigned by MDSC national environment specialist, team leader, deputy team leader and the project director.

120. **Civil works contracts and contractors**. EMPs are to be included in bidding and contract documents and verified by the PIUs and PMO. The contractor will be required to designate an environmental supervisor to (i) coordinate with MDSC on updating the IEE/EMP based on detailed designs, and (ii) ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract.

121. Governance Improvement and Capacity Development Consultants (GICDC). The PMO and PIUs will require support on a range of activities related to governance improvement and capacity development of pourashavas. The GICDC will support PMO and PIUs in implementing urban government improvement action plan (UGIAP) by providing capacity development, community mobilization and other facilitation services. There will be 4 GICDC regional offices consisting of 4 regional coordinators at each regional office. There will be 2community mobilizers in each project pourashava. The regional coordinators will assist pourashavas and the local capacity development experts in the activities related to community participation and inclusive development. The community mobilizers will be posted at the pourashava and will (i) have to work maintaining close liaison with the mayor, councilors, pourashava staffs and communities, (ii) provide assistance and support to PIU regarding planning and implementation of citizen awareness and participation activities, urban planning, equity and inclusiveness of women and urban poor. The GICDC will also have a training specialist who will be responsible for identifying and coordinating capacity building activities at pourashava level.

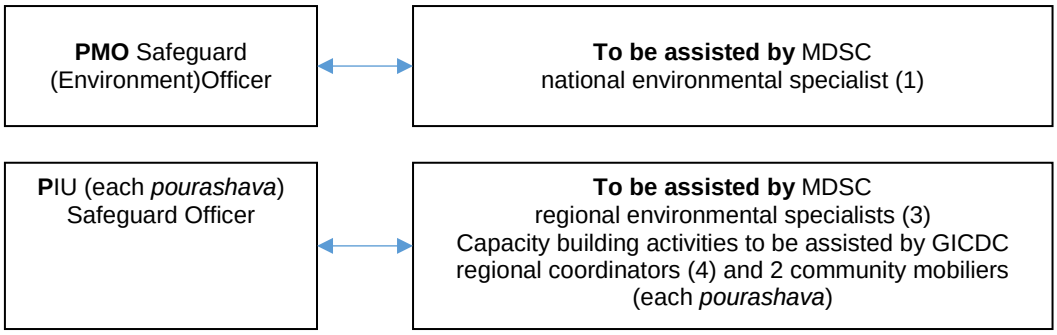


Figure 6: Safeguards Implementation Arrangement

Table 12: Environmental Management and Monitoring Plan – Prior, During, and Post Construction Phase

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
1. Prior to Construction Activities						
Consents, permits, clearances, no objection certificate (NOC), 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 start of civil works. • Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. • Include in detailed design drawings and documents all conditions and provisions if necessary	PMO, PIU, and MDSC	• Incorporated in final design and communicated to contractors.	• Prior to award of contract	• No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PMO and PIU. • Mitigation measures are included as part of TOR of PMO, PIU, and MDSC.
Existing utilities	Disruption of services.	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction activities • Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Require contractors to prepare spoils management plan (see **Appendix 3** for outline) and traffic management plan (see **Appendix 4** for sample) • Water pipe laying works should be coordinated with road improvement works to minimize disturbance.	PMO, PIU, and MDSC	• 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), spoil management plan (see **Appendix 3** for outline), and traffic management plan (see **Appendix 4** for	• During detailed design phase • Review of spoils management plan: Twice (once • after first draft and once • before final • approval)	• No cost required. • Mitigation measures are included as part of TOR of PMO, PIU, and MDSC.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
				sample)		
Updating of IEE based on detailed design	Site-specific impacts not identified, mitigation measures not appropriate and sufficient to address impacts	• Update IEE and EMP based on detailed design • Ensure updated EMP is provided to contractors • Relevant information disclosed	PMO	• Updated IEE and EMP reviewed, approved and disclosed	• Upon completion of detailed design	• No additional cost required
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	• Determine locations prior to award of construction contracts.	PMO, PIU, and MDSC	• 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) for reuse of excess spoils to agricultural land	• During detailed design phase	• No cost required. • Mitigation measures are included as part of TOR of PMO, PIU, and MDSC.
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.	• Prepare list of approved quarry sites and sources of materials	PMO, PIU, and MDSC	• List of approved quarry sites and sources of materials; • (ii) Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	• During detailed design phase, as necessary with discussion with detailed design engineers and PIUs	• No cost required. • Mitigation measures are included as part of TOR of PMO, PIU, and MDSC.
EMP Implementation Training	Irreversible impact to the environment, workers, and community	• Project manager and all key workers will be required to undergo EMP implementation including spoils management, Standard operating procedures (SOP) for construction works; health and safety (H&S), core	Construction Contractor	• Proof of completion (Safeguards Compliance Orientation) • Posting of proof	• During detailed design phase prior to mobilization of workers to site	• Cost of EMP Implementation Orientation Training to contractor is responsibility of

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		labor laws, applicable environmental laws, etc		of completion at worksites • Posting of EMP at worksites		PMO and PIU. • Other costs responsibility of contractor.
2. During Construction Activities						
A. Physical Characteristics						
Topography, landforms, geology and soils	Significant amount of gravel, sand, and cement will be required for this subproject. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Utilize readily available sources of materials. If contractor procures materials from existing burrow pits and quarries, ensure these conform to all relevant regulatory requirements. • Borrow areas and quarries (If these are being opened up exclusively for the subproject) must comply with environmental requirements, as applicable. No activity will be allowed until formal agreement is signed between PIU, landowner and contractor.	Construction Contractor	• - Records of sources of materials	• Monthly by PIU	• Cost for implementation of mitigation measures responsibility of contractor.
Water quality	Trenching and excavation, run-off from stockpiled materials, and chemical contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause siltation and reduction in the quality of adjacent bodies of water. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Prepare and implement a spoils management plan (see **Appendix 3** for outline). • Prioritize re-use of excess spoils and materials in construction activities. If spoils will be disposed, consult with Lalmonirhat local authority on designated disposal areas. • All earthworks must to be conducted during dry season to maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. • Location for stockyards for construction materials shall be identified at least 300m away from watercourses. Place storage areas for fuels and lubricants away from	Construction Contractor	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Number of silt traps installed along trenches leading to water bodies; • Records of surface water quality inspection; • Effectiveness of water management measures; • - No visible	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		any drainage leading to water bodies. • Take all precautions to minimize the wastage of water in the construction activities. • Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies. • Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low lying areas. • While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse and cross drainage channels. • Monitor water quality according to the environmental management plan.		degradation to nearby drainages, *khals* or water bodies due to construction activities		
Air quality	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites. The impacts	• Damp down exposed soil and any sand stockpiled on site by spraying with water when necessary during dry weather; • Use tarpaulins to cover soils, sand and other loose material when transported by trucks. • Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free. • Arrangements to control dust through provision of windscreens, water sprinklers, and dust extraction systems shall be provided at all hot-mix plants, batching plants and	Construction Contractor	• Location of stockpiles; • Number of complaints from sensitive receptors; • Heavy equipment and machinery with air pollution control devices; • Certification that vehicles are compliant with air quality	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	crushers (if these establishments are being set up exclusively for the subproject). • Monitor air quality.		standards.		
Acoustic environment	Construction activities will be on settlements, along and near schools, and areas with small-scale businesses. Temporary increase in noise level and vibrations may be caused by excavation equipment, and the transportation of equipment, materials, and people. However, the proposed subproject will follow existing ROW alignment and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. • Plan activities in consultation with Lalmonirhat local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. • Use of high noise generating equipment shall be stopped during night time. • Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; • Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufacturers' specifications at all times. • All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent-type generators (if required). • Monitor noise levels. Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s. • If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must	Construction Contractor	• Number of complaints from sensitive receptors; • Use of silencers in noise-producing equipment and sound barriers; Equivalent day and night time noise levels	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		post warning signs in the noise hazard areas. Workers in a posted noise hazard area must wear hearing protection. • - Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.				
Aesthetics	The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (spoils), excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Prepare a debris disposal plan • Remove all construction and demolition wastes on a daily basis. • Coordinate with Lalmonirhat local authority for beneficial uses of excess excavated soils or immediately dispose to designated areas. Avoid stockpiling of any excess spoils. • All vehicles delivering fine materials to the site and carrying debris for disposal shall be covered to avoid spillage. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. • Lighting on construction sites shall be pointed downwards and away from oncoming traffic and nearby houses. • In areas where the visual environment is particularly important or privacy concerns for surrounding buildings exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction. • The site must be kept clean to minimize the visual impact of the site. Manage solid waste according to the following preference hierarchy:	Construction Contractor	• Number of complaints from sensitive receptors; • Worksite clear of hazardous wastes such as oil/fuel • Worksite clear of any wastes, collected materials from drainages, unutilized materials and debris • Transport route and worksite cleared of any dust/mud	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		reuse, recycling and disposal to designated areas.				
B. Biological Characteristics						
Biodiversity	Activities being located in the built-up area of Lalmonirhatpourashava. There are no protected areas in or around subproject sites, and no known areas of ecological interest. Preliminary design shows there are no trees at the sites that need to be removed.	• Check if tree-cutting will be required during detailed design stage. No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission of the environment management specialist. • All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees. • Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body in the subproject vicinity. • Prohibit employees from poaching wildlife and cutting of trees for firewood. • Implement compensatory plantation for trees lost at a rate of 2 trees for every tree cut. Maintain the saplings for the duration of contract.	Construction Contractor	• PMO and PIU to report in writing the number of trees cut and planted if tree-cutting will be required (to be determined during detailed design stage) • Number of complaints from sensitive receptors on disturbance of vegetation, poaching, fishing, etc.	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.
C. Socioeconomic Characteristics						
Existing provisions for pedestrians and other forms of transport	Road closure is not anticipated. Hauling of construction materials and operation of equipment on-site can cause traffic problems. However, the proposed subproject will follow existing ROW alignment. The impacts	• Prepare and implement a traffic management plan (see **Appendix 4** for sample) • Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Maintain safe passage for vehicles and pedestrians throughout the construction period.	Construction Contractor	• Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite as per	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Schedule truck deliveries of construction materials during periods of low traffic volume. • Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required. • Notify affected sensitive receptors by providing sign boards informing nature and duration of construction activities and contact numbers for concerns/complaints. • 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 front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools. • Consult businesses and institutions regarding operating hours and factoring this in work schedules. Ensure there is provision of alternate access to businesses and institutions during construction activities, so that there is no closure of these shops or any loss of clientage. • Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.		Traffic Management Plan (see **Appendix 4** for sample); • Number of complaints from sensitive receptors; • Number of signages placed at project location • Number of walkways, signages, and metal sheets placed at project location	design stage and final location of) subproject components	
Socio-economic status	Manpower will be required during the 30-months construction stage. This can result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and	• Employ at least 50% of labor force from communities in the vicinity of the site. This will have the added benefit of avoiding social problems that sometimes occur when workers are imported into host communities, and avoiding environmental and social problems from workers housed in poorly serviced camp	Construction Contractor	• Employment records; • Records of sources of materials • Records of compliance to Bangladesh Labor Law of	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	long-term.	accommodation. • Secure construction materials from local market.		2006 and other applicable standards	during detailed design stage and final location of) subproject components	
Other existing amenities for community welfare	Although construction of subproject components involves quite simple techniques of civil work, the invasive nature of excavation and the subproject sites being in built-up areas of Lalmonirhatpourashava where there are a variety of human activities, will result to impacts to the sensitive receptors such as residents, businesses, and the community in general. Excavation may also damage existing infrastructure (such as water distribution pipes, electricity pylons, etc) located alongside the roads. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Obtain details from pourashava nature and location of all existing infrastructure, and plan excavation carefully to avoid any such sites to maximum extent possible; • Integrate construction of the various infrastructure subprojects to be conducted in Lalmonirhat (roads, water supply, etc.) so that different infrastructure is located on opposite sides of the road where feasible and roads and inhabitants are not subjected to repeated disturbance by construction in the same area at different times for different purposes. • Consult with local community to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed. • Existing infrastructure (such as water distribution pipes, electricity pylons, etc.) shall be relocated before construction starts at the subproject sites. • Prior permission shall be obtained from respective local authority for use of water for construction. Use of water for construction works shall not disturb local water users. • If construction work is expected to disrupt users of community water bodies, notice to the affected community shall be served 7 days in advance and again 1 day prior to	Construction Contractor	• Utilities Contingency Plan • Number of complaints from sensitive receptors	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		start of construction. • Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.				
Community health and safety	Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Contractor's activities and movement of staff will be restricted to designated construction areas. • Locations of hot-mix plants, batching plants and crushers (if these establishments are being set up exclusively for the subproject) shall be shall be located at least 100 m away from the nearest dwelling preferably in the downwind direction. • Consult with Lalmonirhat local authority on the designated areas for stockpiling of, soils, gravel, and other construction materials. • If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment management specialist and landowner. • Use small mechanical excavators to attain faster trenching progress. For rock and concrete breaking, use non-explosive blasting chemicals, silent rock cracking chemicals, and concrete breaking chemicals.[11] • Under no circumstances may open areas or the surrounding bushes be used as a toilet facility. • Recycling and the provision of separate waste receptacles for	Construction Contractor	• Number of permanent signages, barricades and flagmen on worksite as per Traffic Management Plan (see **Appendix 4** for sample); • Number of complaints from sensitive receptors; • Number of walkways, signages, and metal sheets placed at project location • Agreement between landowner and contractors in case of using private lands as work camps, storage areas, etc.	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

[11]These products come in powder forms, and once mixed with water (being the catalyst) simply expand, and crack the rock from hole to hole. This product is environmentally friendly and can be washed away after it has been used.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		different types of waste shall be encouraged. • A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bushes as a toilet facility); (iv) no fires permitted on site except if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff, no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do. • Interested and affected parties need to be made aware of the existence of the complaints book and the methods of communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the environment management specialist's attention immediately; and (iv) taking remedial action as per environment management specialist's instruction. • The contractor shall immediately take the necessary remedial action				

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		on any complaint/grievance received by him and forward the details of the grievance along with the action taken to the environment management specialist within 48 hours of receipt of such complaint/grievance.				
Workers health and safety	There is invariably a safety risk when construction works such as excavation and earthmoving are conducted in urban areas. 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.	• Comply with requirements of Government of Bangladesh Labor Law of 2006 and all applicable laws and standards on workers' health and safety (H&S). • Ensure that all site personnel have a basic level of environmental awareness training. If necessary, the environmental management specialist and/or a translator shall be called to the sites to further explain aspects of environmental or social behavior that are unclear. • Produce and implement a site H&S plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (iii) providing H&S training[12] for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. • Arrange for readily available first aid	Construction Contractor	• Site-specific H&S Plan • Equipped first-aid stations • Medical insurance coverage for workers • Number of accidents • Records of supply of uncontaminated water • Condition of eating areas of workers • Record of H&S orientation trainings • Use of personal protective equipment • % of moving equipment outfitted with	• Visual inspection by PIU an supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

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

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		unit including an adequate supply of sterilized dressing materials and appliances • Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; and (iii) sanitation facilities are available at all times. • Provide medical insurance coverage for workers; • Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Ensure moving equipment is outfitted with audible back-up alarms; • Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in		audible back-up alarms • Permanent sign boards for hazardous areas • Signages for storage and disposal areas • Condition of sanitation facilities for workers		

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and • Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.				
D. Historical, Cultural, and Archaeological Characteristics						
Physical and cultural heritage	There are no scheduled or unscheduled archaeological, paleontological, or architectural sites of heritage significance listed by local and/or national authority and/or internationally (UNESCO) within or adjacent to subproject sites. The subproject components are not located in or near and excavation works will not be conducted in the vicinities of the 4 historical sites. Thus risk for chance finds is low.	• Stop work immediately to allow further investigation if any finds are suspected.	Construction Contractor	• Records of chance finds	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.
E. Others						
Submission of EMP implementation report	Unsatisfactory compliance to EMP	• Appointment of supervisor to ensure EMP implementation • (ii) Timely submission of monitoring reports including pictures	Construction contractor	• Availability and competency of appointed supervisor • - Monthly report	• Monthly monitoring report to be submitted by PIU to PMO • PMO to submit semi-annual monitoring report to ADB	• Cost for implementation of mitigation measures responsibility of contractor.
3. Post-construction Activities						

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	• Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and • (All excavated roads shall be reinstated to original condition. • All disrupted utilities 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 shall be cleaned up. • All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be topsoiled 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. • Request PMO/PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	Construction Contractor	• PMO/PIU 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.	• Prior to turn-over of completed works to pourashava	• Cost for implementation of mitigation measures responsibility of contractor.

Table 13: Environmental Management and Monitoring Plan – O&M Phase

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
A. Physical Characteristics						
Air quality	Air emissions from PTWs operations may include gaseous or volatile chemicals used for	• Store sodium hypochlorite in cool, dry, and dark conditions for no more than one month, and use equipment constructed of corrosion-resistant materials. • Store calcium hypochlorite away from	Lalmonirhatpourashava	• No complaints from sensitive receptors • Inventory of chemicals	• Daily inspection by PTW operator at storage areas of chemicals	• Included in O&M cost

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	disinfection processes (e.g., chlorine and ammonia).	any organic materials and protect from moisture; fully empty or re-seal shipping containers to exclude moisture. Calcium hypochlorite can be stored for up to one year. • Isolate ammonia storage and feed areas from chlorine and hypochlorite storage and feed areas. • Minimize the amount of chlorination chemicals stored on site while maintaining a sufficient inventory to cover intermittent disruptions in supply. • Develop and implement a prevention program that includes identification of potential hazards, written operating procedures, training, maintenance, and accident investigation procedures. • Develop and implement a plan for responding to accidental releases.		• Air emission monitoring • Record of chemical-related accidents	• Quarterly (environmental monitoring of air quality to be finalize in accordance to the LCC and ECC by DoE)	
Acoustic environment	Temporary increase in noise level and vibrations. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Plan activities in consultation with Lalmonirhat local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.	Lalmonirhatpourashava	• No complaints from sensitive receptors	• Duration of repair work	• Included in O&M cost
Biodiversity	Activities in the built-up area of Lalmonirhat pourashava. There are no protected areas in or around subproject sites, and no known areas of ecological interest.	• No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal).	Lalmonirhatpourashava	• No complaints from sensitive receptors	• Duration of repair work	• Included in O&M cost

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
Workers health and safety	Workers need to be mindful of the occupational hazards working in confined spaces such as closed drains. Potential impacts are negative and long-term but reversible by mitigation measures.	• Comply with requirements of Government of Bangladesh Labor Law of 2006 and all applicable laws and standards on workers H&S. • Ensure that all site personnel have a basic level of H&S training. • Produce and implement a O&M health and safety (H&S) plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (iii) providing (H&S) training[13] for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. • Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances • 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; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Mark and provide sign boards. Signage shall be in accordance with international standards and be well known to, and	Lalmonirhatpourashava	• No complaints from sensitive receptors • No complaints from workers related to O&M activities • Zero accident	• Duration of repair work • Daily inspection	• Included in O&M cost

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

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		easily understood by workers, visitors, and the general public as appropriate. • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.				

C. Environmental Monitoring Program

122. Environmental monitoring will be done during construction on three levels:

(i) monitoring development of project performance indicators by the MDSC environmental management specialist;
(ii) monitoring implementation of mitigation measures by the contractor; and
(iii) overall regulatory monitoring of environmental issues by the PMO.

123. In addition to regular monitoring onsite by PIU and MDSC on the EMP implementation of the mitigation measures, monitoring of key environmental parameters is proposed. Table 14 presents the indicative environmental monitoring plan for the subproject which includes relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards, and responsible agencies. This will be updated during detailed design to ensure EMP and monitoring program is commensurate to the impacts of the subproject.

Table 14: Environmental Monitoring Program

	Field	Stage	Parameters	• Location	Frequency	Standards	Responsibility
1.	Air quality	• Prior to construction to establish baseline • Construction phase	SPM PM2.5 PM10 SO2 NOx CO	• PTWs location • OHT location • Along water transmission main 1-km interval from PTWs • Construction campsite locations	• 24-hour monitoring once in a season (except monsoons) for the construction period	• Bangladesh Standards for Ambient Air Quality Schedule-2; Rule 12, Environment Conservation Rules of 1997	Contractor
2.	Noise and vibration levels	• Prior to construction to establish baseline • Construction phase	Equivalent day and night time noise levels	• PTWs location • OHT location • Along water transmission main 1-km interval from PTWs • Construction campsite locations	• Once in a season (except monsoons) for the construction period	• Bangladesh Standards for Noise, Schedule 4; Rule 12, Environment Conservation Rules, 1997	Contractor
3.	Water quality	• Prior to construction to establish baseline • Construction phase	TDS, TSS, pH, hardness, BOD, faecal coliform, total nitrogen, total phosphorus, heavy metals, temperature, DO, hydrocarbons, mineral oils, phenols, cyanide, temperature	• Along *khals* adjacent to construction sites (to be identified by the and MDSC)	• Twice a year (pre-monsoon and post-monsoon) for the entire period of construction	• Bangladesh Standards for Industrial and Project Effluent, Schedule 10; Rule 13, Environment Conservation Rules, 1997	Contractor
4.	Survival rate of landscaping, tree plantation	• O&M phase	Survival rate	• In the areas where re-plantation/ landscaping proposed	• Twice a year for 2 years	• -	Lalmonirhatpourashava

D. Institutional Capacity Development Program

124. The MDSC environmental safeguards specialists will be responsible for trainings on environmental awareness and management in accordance with both ADB and government requirements. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project along with the frequency of sessions is presented in Table 15.

Table 15: Training Program for Environmental Management

Items	**Pre-construction/prior to construction**	**Construction**	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staffs	Experiences and best practices sharing
Purpose	To aware the participants of the environmental safeguard requirements of ADB and GOB and how the project will meet these requirements	To build the capacity of the staffs for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GOB	To share the experiences and best practices aimed at learning lessons and improving implementation of EMP
Contents	**Module 1: Orientation** • ADB Safeguards Policy Statement • Government of Bangladesh Environmental Laws and Regulations **Module 2: Environmental Assessment Process** • ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements • Review of environmental assessment report to comply with ADB requirements • Incorporation of EMP into the project design and contracts	• Roles and responsibilities of officials/contractors/consultants towards protection of environment • Environmental issues during construction • Implementation of EMP • Monitoring of EMP implementation • Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed
Duration	1 day	1 day	1 day on a regular period to be determined by PMO, PIUs, and MDSC
Participants	LGED, DPHE, PMO, and PMO staffs (technical and environmental) involved in the project implementation	PMO PIUs Contractors	PMO PIUs Contractors

E. Staffing Requirement and Budget

125. Costs required for implementing the EMP will cover the following activities:

(i) Updating IEE, preparing and submitting reports and public consultation and disclosure;

(ii) Application for environmental clearances; and
(iii) Implementation of EMP, environmental monitoring program and long-term surveys.

126. The infrastructure involved in each scheme is generally straightforward to build. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by MDSC environmental management specialist assisted by the PMO environmental safeguard officer. Therefore no separate budget required for MDSC environment management specialist.

127. The cost of mitigation measures and surveys during construction stage will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors.

128. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of Lalmonirhatpourashava. All monitoring during the operation and maintenance phase will be conducted by LGED and DPHE, therefore, there are no additional costs.

129. The indicative costs of EMP implementation are shown in Tables 16 and 17 (by source of funds).

Table 16: Indicative Cost of EMP Implementation

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
A.	**Mitigation Measures**						
1.	Compensatory plantation measures	Construction	Per tree	50	1,500	75,000	Civil works contract
B.	**Monitoring Measures**						
1.	Air quality monitoring	- Pre-construction - Construction	Per location	20	30,000	60,000	Civil works contract
2.	Noise levels monitoring	- Pre-construction - Construction	Per location	20	10,000	200,000	Civil works contract
C	**Capacity Building**						
1.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, Government of Bangladesh environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP implementation and environmental monitoring requirements related to mitigation measures; and taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the	Module 1 – immediately upon engagement of the MDSC environmental specialists Module 2 – prior to award of civil works contracts (twice a year for 4 years) Module 3 – prior to start of Phase 2 and upon completion of the project	lump sum		Module 1 – 30,000 Module 2 – 30,000 Module 3 – 30,000	90,000	Covered under MDSC contract

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
	course of implementation; and (iii) lessons learned information sharing						
D.	**Consultants Costs**						
1.	MDSC national environmental specialist (1 person)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	60 person months	320,000 per person month	1,280,000	Remuneration and budget for travel covered in the MDSC contract
2.	MDSC regional environmental specialists (3 persons)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	60 each = 180 person-months	320,000 per person-month	57,600,000	Remuneration and budget for travel covered in the MDSC contract
E.	**Administrative Costs**						
1.	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits, etc	Lump sum		50,000	50,000	These consents are to be obtained by contractor at his own expense.
		Environmental assessment and environmental clearances as per ECA and ECR requirements Obtaining right of way clearances with related national agencies.	Lump sum		100,000	100,000	LGED DPD cost for municipal infrastructures
F.	**Other Costs**						
1.	Public consultations and information disclosure	Information disclosure and consultations during preconstruction and construction phase, including public awareness campaign through media	As per requirement	Lump sum		1,000,000	Covered under MDSC contract
2.	GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)		Lump sum		1,000,000	PMO cost

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
3.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and defect liability period		Lump sum	Contractor's liability	As per insurance requirement	Civil works contract – contractor's insurance

Table 17: Indicative Cost of EMP Implementation – Per Source of Funding

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
A. Contractors							
1.	Compensatory plantation measures	Construction	Per tree	50	1,500	75,000	Civil works contract
2.	Air quality monitoring	- Pre-construction - Construction	Per location	20	30,000	60,000	Civil works contract
3.	Noise levels monitoring	- Pre-construction - Construction	Per location	20	10,000	200,000	Civil works contract
4.	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits, etc	Lump sum		50,000	50,000	These consents are to be obtained by contractor at his own expense.
5.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and defect liability period		Lump sum	Contractor's liability	As per insurance requirement	Civil works contract – contractor's insurance
	Subtotal					**720,000**	
B. MDSC							
1.	Public consultations and information disclosure	Information disclosure and consultations during preconstruction and construction phase, including public awareness campaign through media	As per requirement	Lump sum		1,000,000	Covered under MDSC contract
2.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, Government of Bangladesh environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP	Module 1 – immediately upon engagement of the MDSC environmental specialists Module 2 – prior to award of civil works contracts (twice a year for 4 years) Module 3 – prior	lump sum		Module 1 – 30,000 Module 2 – 30,000 Module 3 – 30,000	90,000	Covered under MDSC contract

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
	implementation and environmental monitoring requirements related to mitigation measures; and taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation; and (iii) lessons learned information sharing	to start of Phase 2 and upon completion of the project					
3.	MDSC national environmental specialist (1 person)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	60 person months	320,000 per person month	1,280,000	Remuneration and budget for travel covered in the MDSC contract
4.	MDSC regional environmental specialists (3 persons)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	60 each = 180 person-months	320,000 per person-month	57,600,000	Remuneration and budget for travel covered in the MDSC contract
	Subtotal					**59,970,000**	
C. Administrative Cost (Recurring) - PMO							
1.	Legislation, permits, and agreements	Environmental assessment and environmental clearances as per ECA and ECR requirements Obtaining right of way clearances with related national agencies.	Lump sum		100,000	100,000	LGED DPD cost for municipal infrastructures
2.	GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)		Lump sum		1,000,000	PMO cost
	Subtotal					**1,100,000**	

IX. MONITORING AND REPORTING

130. PMO will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts, and will be identified in the EIAs/IEEs for the projects. In addition to recording information on the work and deviation of work components from original scope PMO, PIUs, and MDSC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome.

131. MDSC will submit monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. PMO will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Appendix 7. Subproject budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

132. For projects likely to have significant adverse environmental impacts, LGED and DPHE will retain qualified and experienced external experts to verify its monitoring information. LGED and DPHE will document monitoring results, identify the necessary corrective actions, reflect them in a corrective action plan, and for each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by the Local Government Division (LGD) of the Ministry of Local Government, Rural Development, and Cooperatives (MLGRDC).

133. ADB will review project performance against the MLGRDC's 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. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

(i) conduct periodic site visits for projects with adverse environmental or social impacts;
(ii) conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
(iii) review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
(iv) work with EAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance as appropriate; and
(v) prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

X. CONCLUSION AND RECOMMENDATIONS

134. The process described in this document has assessed the environmental impacts of all elements of Lalmonirhat water supply subproject. All potential impacts were identified in relation to design and location, construction, and operation phases.

135. Planning principles and design considerations have been reviewed and incorporated into the site planning process whenever possible. Preliminary designs integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the

subproject. Thus environmental impacts as being due to the project design or location were not significant.

136. Most of the individual elements of the subproject are relatively small and involve straightforward construction and operation, so impacts will be mainly localized and not greatly significant. 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. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. 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.

137. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. Mitigation will be assured by a program of environmental monitoring to ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.

138. The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the subproject. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB and LGED 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.

139. The PMO and MDSC will be responsible for monitoring. The MDSC will submit monthly monitoring reports to PMO, and the PMO will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.

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

141. The citizens of Lalmonirhat will be the major beneficiaries of this subproject. With the new water supply system, they will be provided with a constant supply of better quality water piped into their homes and climate-resilient municipal services. In addition to improved environmental conditions, the subproject will reduce occurrence of water-related diseases and exposure to climate extremes. People would 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.

142. Therefore the proposed subproject is unlikely to cause significant adverse impacts and net environmental benefits to citizens of Lalmonirhat will be positive. 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.

143. Per Government of Bangladesh Environment Conservation Act, 1995 (ECA, 1995) and Environment Conservation Rules (ECR, 1997), the subproject is categorized as “red” and Location Clearance Certificate (LCC) and Environmental Clearance Certificate (ECC) must be obtained from the DoE.

144. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009).

Appendix 1: Rapid Environmental Assessment Checklist

Screening Questions	Yes	No	Remarks
A. Project siting Is the project area…			
• Densely populated?	✓		Lalmonirhat *pourashava* covers an area of 17.60 km^2 with population density of 3,427 persons per km^2.The area is predominantly residential.
• Heavy with development activities?		✓	The area is predominantly residential.
Adjacent to or within any environmentally sensitive areas?			
Cultural heritage site		✓	The subproject components are not within locations in or near sensitive and valuable ecosystems, including protected areas and forests.
Protected area		✓	
Wetland		✓	
Mangrove		✓	
Estuarine		✓	
Buffer zone of protected area		✓	
Special area for protecting biodiversity		✓	
Bay		✓	
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?		✓	Not applicable. The source is groundwater. Water quality tests conducted and findings suggest no issues.
• impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	Not applicable.
• hazard of land subsidence caused by excessive ground water pumping?		✓	The potential abstraction rate is considered not to adversely impact the aquifer and is not envisaged to cause land subsidence.
• social conflicts arising from displacement of communities?		✓	The proposed production tube wells (PTWs) and OHTs will not require acquisition of private land. There are no encroachers/squatters or residential/commercial structures within the identified land.
• conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	Not anticipated. The water source in Lalmonirhat is groundwater, and based on bore tests, there is sufficient water in the aquifers to serve as a sustainable source for future demands.
• unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?		✓	Raw water will be chlorinated prior to distribution. Water quality of treated water is will comply with the Bangladesh Standards for Drinking Water.
• delivery of unsafe water to distribution system?		✓	The subproject will provide treated water through rehabilitated network to prevent leakages and contamination.
• inadequate protection of intake works or wells, leading to pollution of water supply?		✓	The PTWs and OHT will be secured and accessible to only authorized persons.
• over pumping of ground water, leading to salinization and ground subsidence?		✓	The abstraction rate is considered not to adversely impact the aquifer and is not envisaged to cause land subsidence.
• excessive algal growth in storage reservoir?		✓	Not anticipated. The OHT will be fully enclosed. Water will only be stored in a short period of time.
• increase in production of sewage beyond capabilities of community facilities?		✓	Sanitation improvements planned under the project including awareness building.
• 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?		✓	Not applicable.

Screening Questions	Yes	No	Remarks
• impairments associated with transmission lines and access roads?	✓		Anticipated during construction activities. However, impacts are temporary and short in duration. The EMP includes measures to mitigate impacts.
• health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		✓	Chlorine dosing will be done through chlorinators in PTWs. Separate storage areas for the chemicals have been included in the preliminary design of the PTWs.
• health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?		✓	Personal protective equipment will be provided to workers. Regular training will also be conducted to ensure that workers are aware of construction hazards and risks of chemicals during O&M.
• dislocation or involuntary resettlement of people?		✓	No displacement of communities is required in this subproject.
• disproportionate impacts on the poor, women and children, indigenous peoples or other vulnerable groups?		✓	Not applicable.
• noise and dust from construction activities?	✓		Anticipated during construction activities. However, impacts are temporary and short in duration. The EMP includes measures to mitigate impacts.
• increased road traffic due to interference of construction activities?	✓		Anticipated during construction activities. However, impacts are temporary and short in duration. The EMP ensures measures are included to mitigate impacts. Construction contractors will be required to coordinate with local traffic police.
• continuing soil erosion/silt runoff from construction operations?	✓		The construction areas are all flat lands; soil erosion and silt run-off are least expected except during monsoon months. The EMP includes measures to mitigate impacts. Construction contractors will be required to include silt traps or canalizations where required.
• 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?		✓	The O&M Manuals include schedule for regular maintenance and appropriate chemical dosing.
• delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	Not Anticipated. Water quality will be regularly monitored by Lalmonirhat *pourashava* through the mini water testing laboratory to be procured under the subproject. .
• accidental leakage of chlorine gas?		✓	Not anticipated. Chlorine gas will not be used. Sodium or calcium hypochlorite will be used in the chlorination process.
• excessive abstraction of water affecting downstream water users?		✓	Not applicable.
• competing uses of water?		✓	Not applicable.
• increased sewage flow due to increased water supply?	✓		A sanitation action plan will be prepared in Lalmonirhat (covenanted), with support from a team of consultants specializing in sanitation. Investments identified in the action plan will be supported by the project.
• increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	✓		Lalmonirhat will undertake sanitation improvement subproject. No WTP to be constructed under the subproject.
• Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Improved water supply management systems through capacity building and institutional development will ensure reduced burden on services and infrastructure.

Screening Questions	Yes	No	Remarks
• Social conflicts if workers from other regions or countries are hired?		✓	Priority in employment will be given to local residents.
• Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	Not applicable. Construction will not involve use of explosives and chemicals. Trenching will be done manually. Use of chemical during O&M will be limited at PTW sites.
• 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?	✓		Operational area will be clearly demarcated and access will be controlled. Only worker and project concerned members will be allowed to visit the operational sites.

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks[14]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	1	Key facilities will be located/constructed above the highest recorded flood level plus some freeboard.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

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

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

Other Comments: _____

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

Prepared by: PPTA Consultants
Designation: Environment Specialist
Date: Project Preparatory Stage (Dec 2013-April 2014)

Appendix 2: Environmental Standards and Application Fees

The standards for air, water, sound, odor and other components of the environment applicable to the project shall be determined in accordance with the standards specified in Schedules 2, 3, 4, 5, 6, and 8 of ECR, 1997.

	Standards	**ECR, 1997 (Rule 12) http://www.moef.gov.bd/html/laws/env_law/178-189.pdf**
1.	Air	Schedule 2
2.	Inland surface water	Schedule 3
	Drinking water	
3.	Sound	Schedule 4
4.	Sound Originating from Motor Vehicles or Mechanized Vessels	Schedule 5
5.	Emission from Motor Vehicles	Schedule 6
7.	Odor	Schedule 8

The standard limits of discharge of liquid waste and gaseous emissions applicable to the project shall be determined in accordance with the standards specified in Schedule 9 and 10

	Environmental Component	**ECR, 1997 (Rule 13) http://www.moef.gov.bd/html/laws/env_law/178-189.pdf**
1.	Sewage Discharge	Schedule 9
2.	Waste from Industrial Units or Projects Waste (see discharge to inland surface water and irrigated land)	Schedule 10

The fees for issuance of environmental clearance certificate and its renewal shall be payable in accordance with Schedule 13. The fees for analysis of samples of water, liquid waste, air and sound and also the information or data derived from such analysis are described in Schedule 14.

	Fees	**ECR, 1997 (Rule 14 and 15) http://www.moef.gov.bd/html/laws/env_law/178-189.pdf**
1.	Environmental clearance certificate or renewal	Schedule 13
2.	Supplying various analytical information or data or test results of samples of water, effluent, air and sound	Schedule 14

[1]"SCHEDULE – 13

Fees for Environmental Clearance Certificate or Renewal
[See Rules 7(5), 8(2) and 14]

1. Industrial unit or project

Investment (in Taka)	Fees for Environmental Clearance Certificate (in Taka)	Certificate Renewal Fee
(1)	(2)	(3)
(a) Between Tk. 100,000 and 5,00,000	Tk. 1,500	One-fourth of the fees in Column (2).
(b) Between Tk. 5,00,000 and 10,00,000	Tk. 3,000	-Do-
(c) Between Tk. 10,00,000 and 50,00,000	Tk. 5,000	-Do-
(d) Between Tk. 50,00,000 and 10,000,000	Tk. 10,000	-Do-

[1] *Schedule-13 was substituted by Notification S.R.O. No. 234-Law/2002 dated 24/08/2002 and came into force on 26/08/2002 being the date of publication in Bangladesh Gazette extraordinary issue.*

(1)	(2)	(3)
(e) Between Tk. 10,000,000 and 2,00,000,000	Tk. 25,000	One-fourth of the fees in Column (2).
(f) Between Tk. 2,00,000,000 and 5,00,000,000	Tk. 50,000	-Do-
(g) Above Tk. 5,00,000,000	Tk. 1,00,000	-Do-

Appendix 3: Sample Outline Spoils Management Plan

I. Spoils information

   A. Materials type
   B. Potential contamination
   C. Expected volume and sources
   D. Spoil classification

II. Spoils management

   A. Transportation of spoil
   B. Storage of spoil
   C. Contaminated spoil
   D. Approved reuse and/or disposal sites

III. Records of reuse and/or disposal

Appendix 4: Sample Outline Traffic Management Plan

A. Principles

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 every 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/CMC/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

5a. 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 centers. 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 A12** 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:

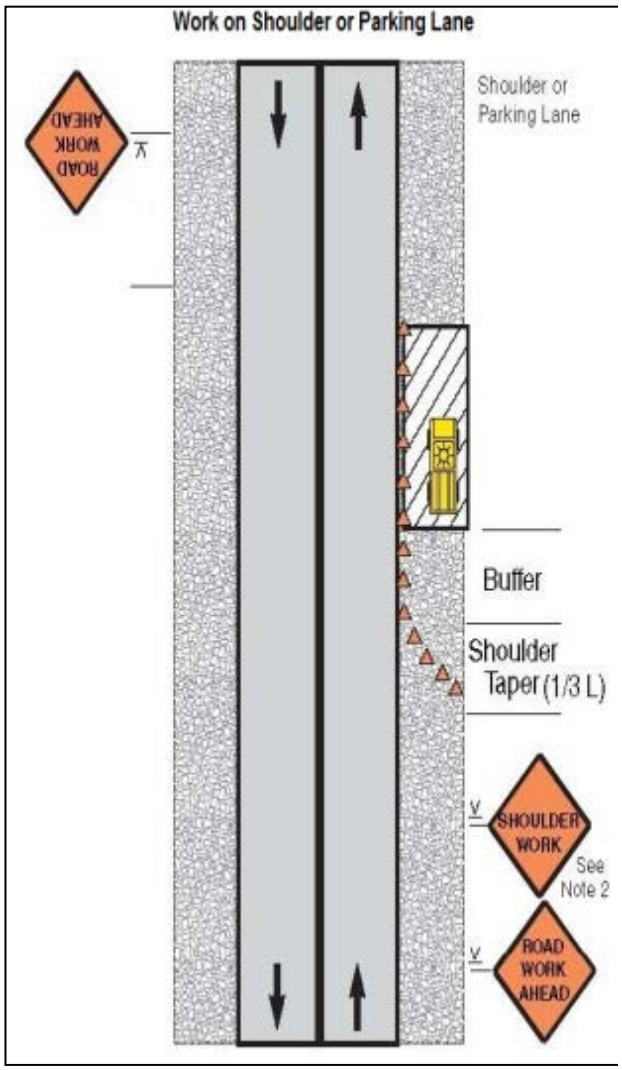
- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two lane road (two flagger operation)
- Lane closure on a four lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- 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. Flaggers/ 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 and shoulder or parking lane closed on divided road



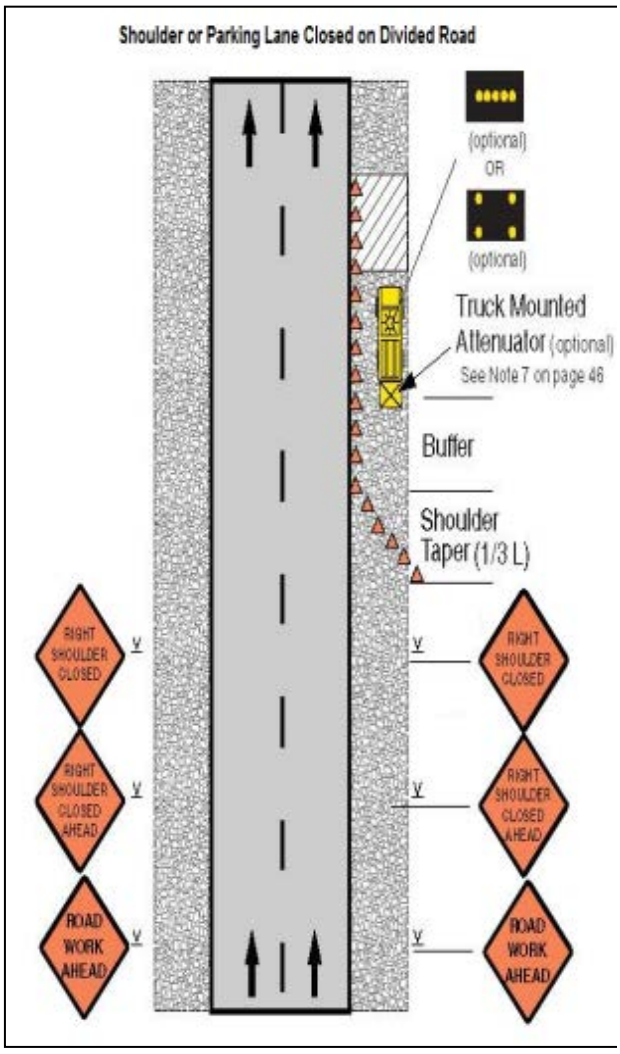


Figure A4 & A5: Work in Travel lane & Lane closure on road with low volume

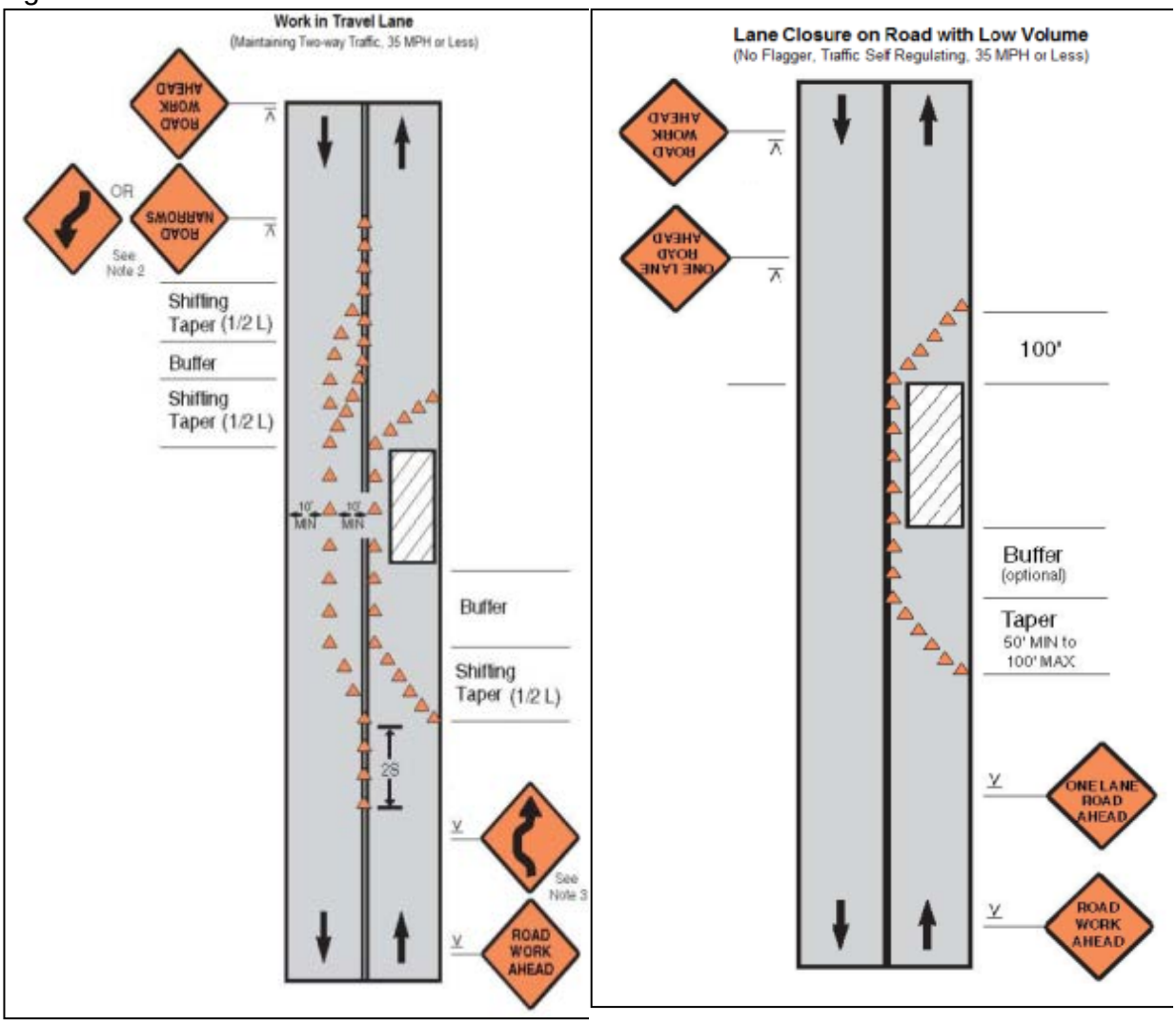
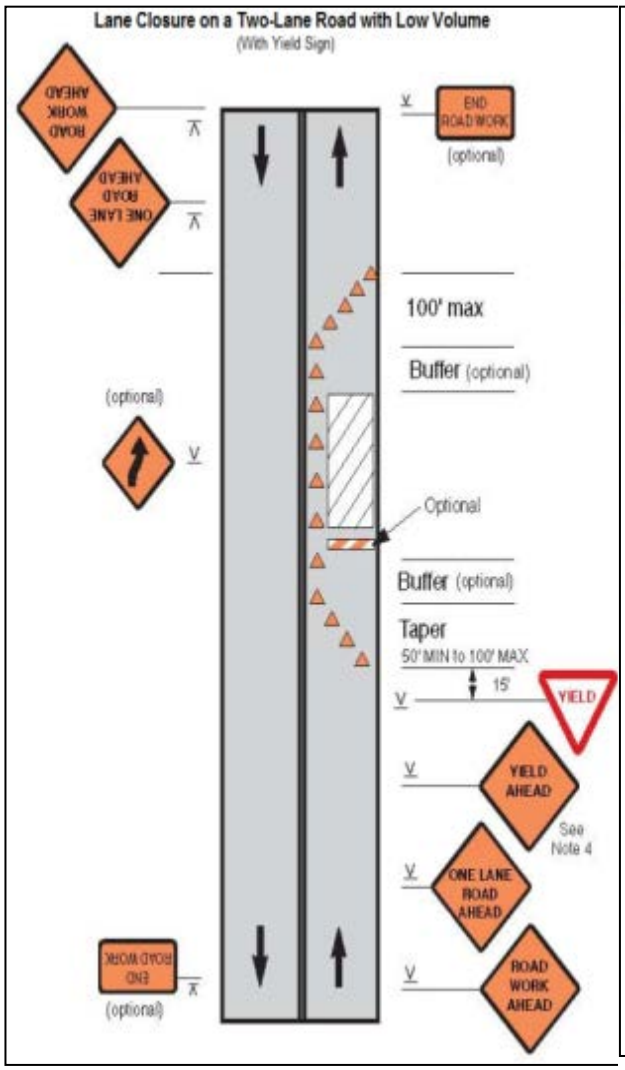


Figure A6 & A7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)



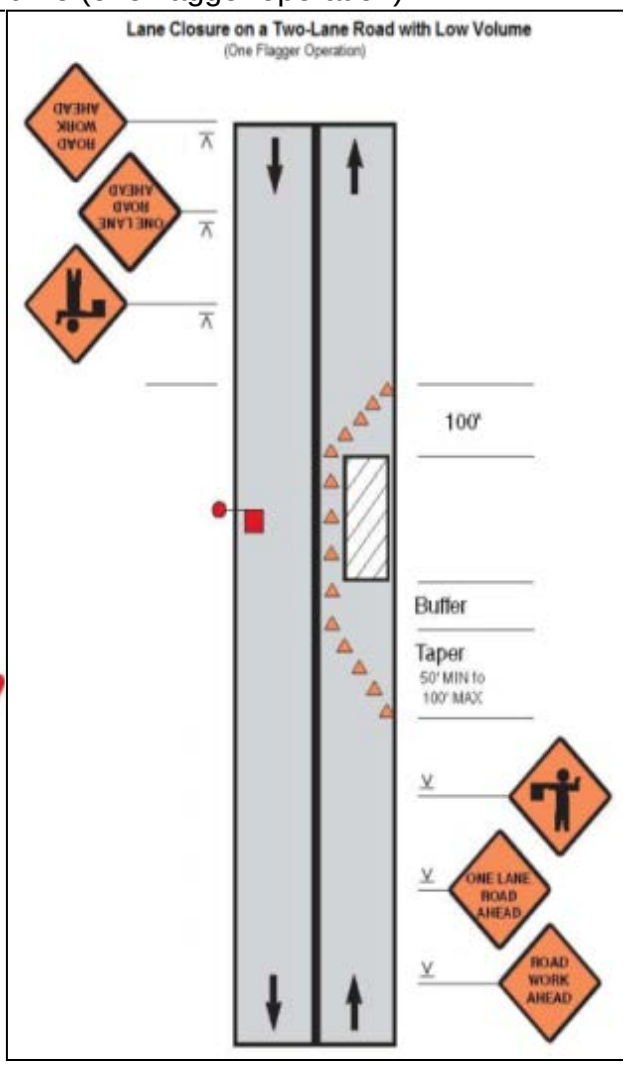


Figure A8 & A9: Lane Closure on a Two-Lane Road (Two Flagger Operation) & Lane Closure on a Four-Lane Undivided Road

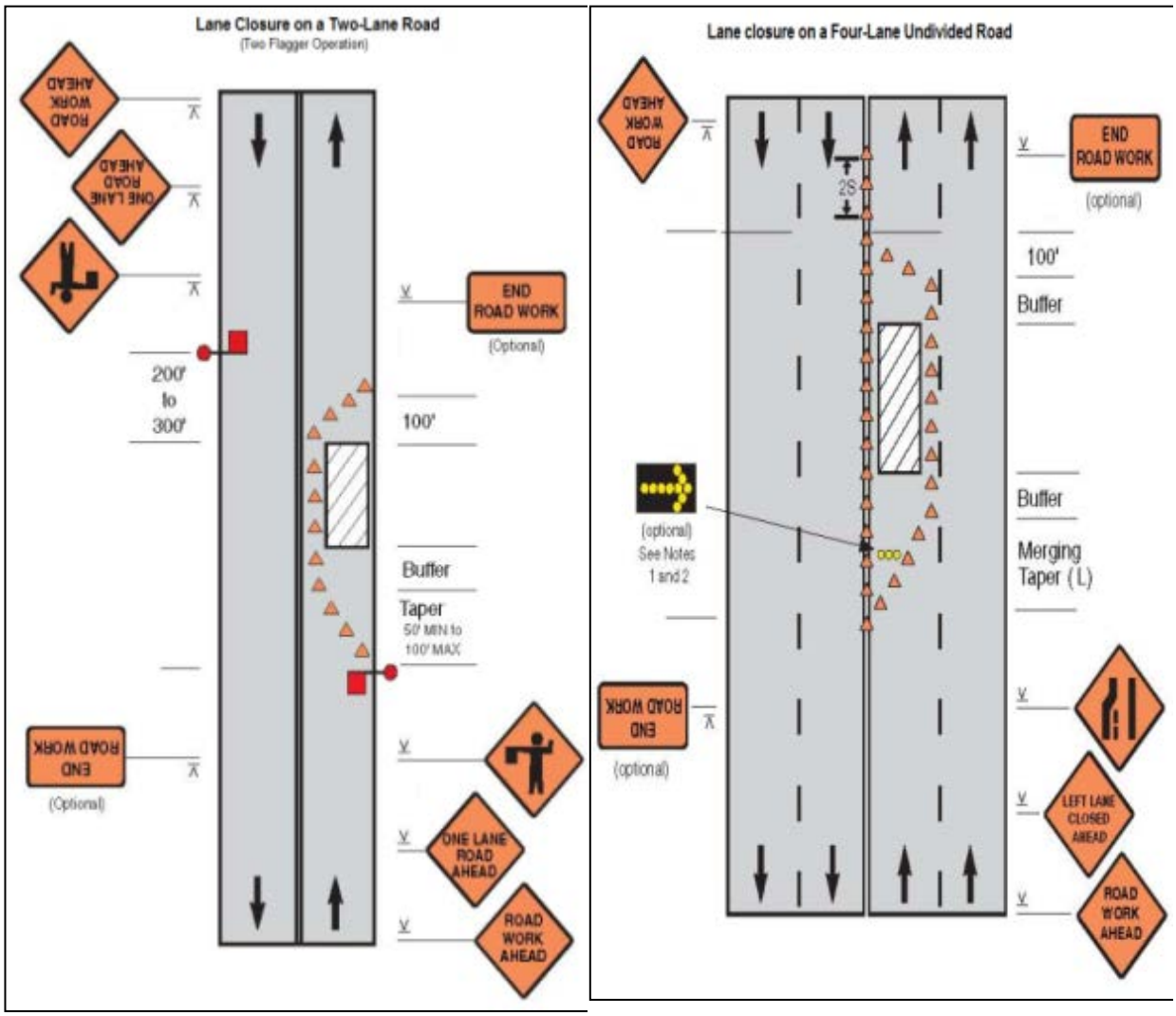


Figure A10 & A11: Lane Closure nn Divided Roadway & Half Road Closure On Multi-Lane Roadway

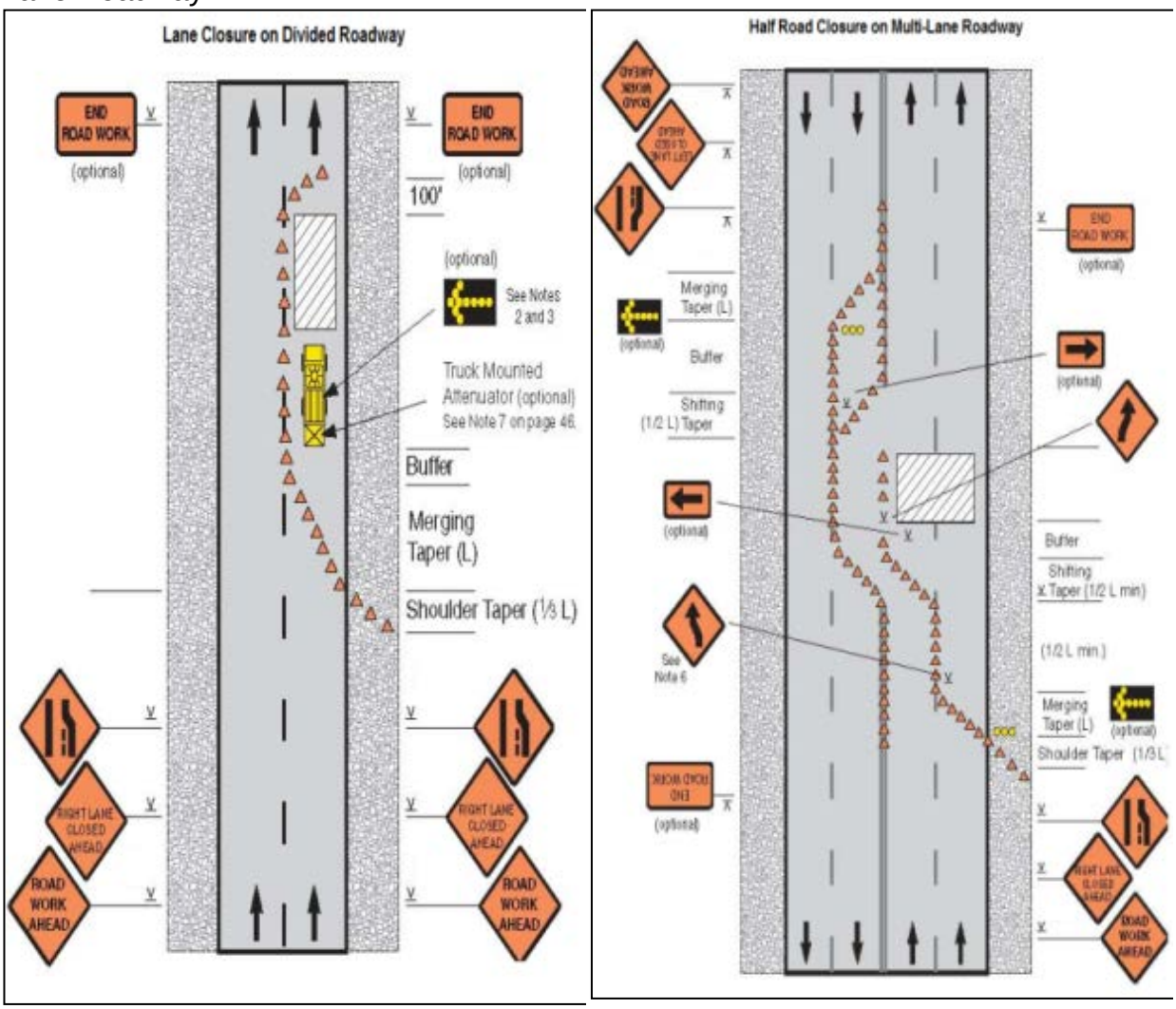
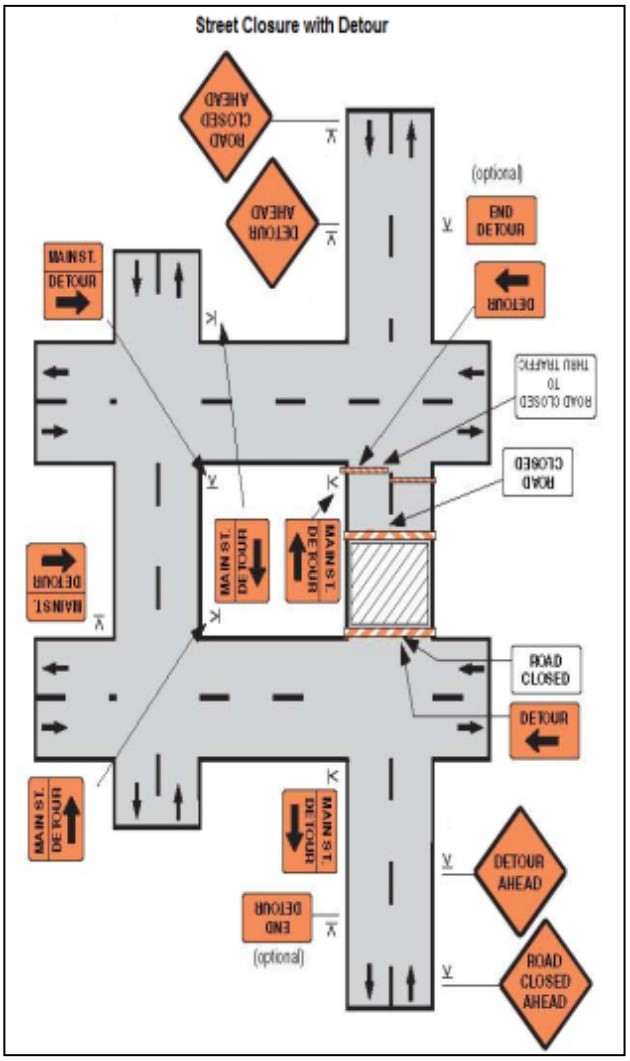


Figure A12: Street closure with detour



Appendix 5: Records of Public Consultations and FGDs

FGD Summaries-Water Supply LalmonirhatPourashava

	Proposed Project Facility/Alignment Related to Which Discussion Held	Date	Venue	No. of Participants & gender	Key Safeguard Issues Discussed	Overall Concerns Expressed Related to Project	Suggestions From People	Willingness to Participate in Project
1	Construction of water distribution line	Jan 12, 2014	MuktojoddhaChattar, UttorSaptana, BGB Gate Road, W:5	M-17 F-0 T-17	Removal of illegal structure from the ROW. People in consultation and cooperation with the local ward level authority and PS will remove illegal structures on the ROW for their greater interest; even they show interest in the donation of small lands for the implementation of the subproject.	The water tariff should be within the purchase affordability of the mass people.	They need speedy implementation of laying the pipes to ensure low/minimum disturbance to traffic and business during construction stage.	Local authority and the people there will extend all sorts of help/assistance for easy, smooth and fast implementation of the subproject.
2	Improvement in Production Tube Well , OHT, Pump House, and Water Distribution network	Jan 13, 2014	Conference Room, LalmonirhatPourashava	M=33 F=4 T=37	**Concerns:** Temporal disturbance due to construction work to the city dwellers in the busy roads/ commercial areas. Opinions: People do not have any objections to the water supply construction works as they believe the subproject would bring immense benefits to them compared to the temporal disturbance. They suggest for speedy construction works in these areas.	The subproject to be operated and maintained by the PS with the technical support from DPHE.	Water should be round 24 hours of supply with adequate pressure. Water tariff should be affordable to them.	People will assist the PS in smooth and speedy implementation of the water supply subproject as the PS desire from them.

(M=No. of male participants; F= No. of female participants; T=Total participants)

PHOTOGRAPH

Photograph: FGD at MuktijoddhaChattar, Ward 5, Lalmonirhat Pourashava, Jan 12, 2014



Photograph: Consultation with people from different sections of the society, Conference Room, Lalmonirhat Pourashava, Jan 13, 2014



PARTICIPANT LIST

Pourashava: Lalmonirhat Pourashava
Component: Water-Overhead Tank, Pump and distribution line
Location: Pourashava Office
Meeting Place: Pourashava Conference Room
Date: Jan 13, 2014 Time: 11:00 am

Sl.No	Name	Occupation/Position
1.	Capt. (R) AzizulHoque	Retired Army Officer
2.	NurulHoqueSarker	ED, Nazir
3.	MdBelal Hossain	Reporter the Daily Korotoa
4.	MdMonwar Ali Mondol	O/C, Lalmonirhat
5.	Md. Amjad Hossain	Forest Extn. & Training Center
6.	Dewanrafiqul Islam	Project Coordinator, Slum Development, Lalmonirhat
7.	SM Wahedul Hassan	Sena Commission
8.	MrsReshmaKhatun	ED, DISA, Lalmonirhat
9.	Md. Abdur Rauf	Project Officer, IRDF, Lalmonirhat
10.	Md. Mostaker Rahman	Sub Asst. Engineer, Lalmonirhat PS
11.	MdAbduzzametVhuttu	Commissioner
12.	Md. Kismot Ali	Commissioner
13.	Abul Hossain	
14.	Md. Golam Mustafa	Contractor
15.	Md. Hafez	Contractor
16.	Amjad Hossain	
17.	Md. Rafiqul Islam	
18.	Bishojit Kumar Banik	Sanitary Inspector
19.	Morolhumayunkabir	Director, LCCI
20.	MdRomjan Ali	Contractor
21.	Shamima Akhtar	AO Lalmonirhat Pourashava
22.	ShamoliBanik	LDA Lalmonirhat Pourashava
23.	Sahanur	ASI LalmonirhatSadar Thana
24.	ASM AshrafujjamanTalukdar	Town Planner Lalmonirhat Municipality
25.	Md Hassan Kamal	Councilor, Lalmonirhat Pourashava
26.	Barun Kumar Roy	Lalmonirhat Pourashava
27.	Md. ShafiulAlam	Accountant, Lalmonirhat Pourashava
28.	AbidKhaleque	Lalmonirhat Pourashava
29.	Md. TobarokUllah	Retd, Asst. Headmaster
30.	Harun-Ur-Rashid	Councilor, Lalmonirhat Pourashava
31.	Md. HasanuzzamanBashunia	Secretary, Lalmonirhat Pourashava

Sl.No	Name	Occupation/Position
32.	Md. ShohelRana	Lalmonirhat Pourashava
33.	Uttom Roy	
34.	Golan Mortaza	Councilor, Lalmonirhat Pourashava
35.	Md. Entazurrahman	Councilor, Lalmonirhat Pourashava
36.	Md. Reazul Islam Rintu	Mayor, Lalmonirhat Pourashava
37.	Md. FazlulHoque	Executive Engineer, Councilor, Lalmonirhat Pourashava
38.	M A MominKhondaker	Environmental Safeguard Specialist, UGIIP III, Dhaka

PARTICIPANT LIST

Pourashava: LalmonirhatPourashava
Component: Water-Overhead Tank, Pump and distribution line
Location: MuktijoddhaChattar, Ward 5, LalmonirhatPourashava
Meeting Place: Roadside Food and Tea Stall
Date: Jan 12, 2014 Time: 3:00 pm

SL	Name	Sex	Address	Occupation
1.	Md. Amzad Hossain	Male	UttorSaptana	Service
2.	NurNabi	Male	UttorSaptana	Business
3.	Nirmol Chandra Roy	Male	UttorSaptana	Agriculture
4.	Montaz Ali	Male	UttorSaptana	Auto Puller
5.	Jobed Ali	Male	UttorSaptana	Agriculture
6.	Md. Rafique	Male	UttorSaptana	Driver
7.	Yousuf Ali	Male	UttorSaptana	Service
8.	EmdadulHaque	Male	UttorSaptana	Business
9.	MdIsrail	Male	UttorSaptana	Business
10.	Fazley Rabbi	Male	UttorSaptana	Student
11.	Abdul Ali	Male	UttorSaptana	Agriculture
12.	KhondokarSamsuzzaman Babul	Male	UttorSaptana	Service
13.	Mojjom	Male	UttorSaptana	Agriculture
14.	MdRobiul	Male	UttorSaptana	Labor
15.	MdShaheen	Male	UttorSaptana	Labor
16.	Robiul Islam	Male	UttorSaptana	Agriculture
17.	Mohammod Ali	Male	UttorSaptana	Driver

Appendix 6: Sample Grievance Registration Form
(To be available in Bangla 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**			
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 use 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 7: Sample Semi-Annual Reporting Format

This template must be included as an appendix in the EIA/IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

I. INTRODUCTION

- Overall project description and objectives
- Description of subprojects
- 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		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

Compliance status with National/ State/ Local statutory environmental requirements

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

Compliance status with environmental loan covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

II. 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:

(i) What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries?
(ii) If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
(iii) 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;
(iv) Are there designated areas for concrete works, and refueling?
(v) Are there spill kits on site and if there are site procedure for handling emergencies;
(vi) Is there any chemical stored on site and what is the storage condition?
(vii) Is there any dewatering activities if yes, where is the water being discharged;
(viii) How are the stockpiles being managed?
(ix) How is solid and liquid waste being handled on site?
(x) Review of the complaint management system;
(xi) 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

III. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

Brief description on the approach and methodology used for environmental monitoring of each subproject

- 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 µg/m3	SO2 µg/m3	NO2 µg/m3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

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	LAeq (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LAeq (dBA) (Monitoring Results)	
			Day Time	Night Time

IV. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

Summary of follow up time-bound actions to be taken within a set timeframe.

V. APPENDIXES

Photos
Summary of consultations
Copies of environmental clearances and permits
Sample of environmental site inspection report
Others.