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Management, Design, and Supervision Consultant for the Dhaka ESWSP

Initial Environmental Examination for P3.1

Submitted: September 2019

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Executive summary

This IEE covers Package 3.1 and complies the requirements of ADB's SPS 2009. Principal sources of information were the field observation followed by terrestrial flora and fauna data and scoping exercises. Supplementary information was taken from direct consultations with DWASA staff, field observations and site assessment, review of documents and project plans, designs and previous reports on similar projects implemented in other areas in Bangladesh.

There have been no changes in environmental conditions in the subproject sites of package 3.1 based on the detailed design.

A scoping and field reconnaissance were conducted at project sites on 13 and on 14 February 2018 by the MDSC team, to establish the potential impacts and categorization of project activities.

The project has been categorized as category B according to ADB's environmental safeguard requirements and according to ADB's safeguard policy statement 2009. Environmental impacts can be mitigated on site. An IEE is required to determine the significance of environmental impacts. The IEE is regarded as the final environmental assessment report as the impacts have been evaluated to be of local significance only. An EIA study is not required.

The methodology of the IEE study was then elaborated in order to address all interests. Subsequently primary and secondary baseline environmental data were collected from possible sources, and the intensity and likely location of impacts were identified with relation to sensitive receivers. The significance of impacts from construction of P3.1 pipeline was then assessed and, for those impacts requiring mitigation measures were proposed to reduce impacts within acceptable limits. Informal public consultation (PC) was carried out in the project areas.

Section 2 presents laws and regulations related to environmental issues are in place in Bangladesh. Many of these are cross-sectoral and partially related to environmental issues. The most important of these are the Environment Conservation Act, 1995 (ECA, 1995), and the Environment Conservation Rules (ECR, 1997). The ECA 1995 is primarily an instrument for establishing the Department of Environment (DoE), and for controlling industrial and project related pollution. The Act also defines in general terms that if any particular activity is causing damage to the ecosystem, the responsible party will have to apply corrective measures. Until the appearance of ECR, 1997, enforcement of the Act was not possible, as many of the clauses refer to specifications detailed in the Rules. ECA and ECR were further amended to address the growing environmental challenges.

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

Section 3 describes the existing status of the project and proposed P3.1 intervention. The proposed Project describes that, pipeline route passes along the Dhaka City roads connecting to various DMAs. The project is guided by detailed design of the Consultant, reviewed by the Contractors. This Package 3.1 is under civil works contract.

Section 4 details on the description of environmental baseline situation, as topography, climate, rainfall, geology, air quality, noise, and socioeconomic aspects. Ecological resources include description of various habitats types in the project area.

Section 6 focuses on anticipated environmental impacts and mitigation measures at Planning and Design Phase, construction and O&M stages. Mitigation measures are available on site: e.g. dust suppression by water spray, planning of transportation routes and transportation time especially in residential areas, provision of pedestrian access, planting of trees for each tree to be felled, provision of culverts to maintain drainage in low lying areas, provision of waste management plan at construction sites etc. Environmental impacts and mitigation measures are summarized in the EMP.

The detailed design shall identify suitable locations for construction work camps, stockpile areas, storage areas, and disposal areas and other facilities near to the project locations or DNCC disposal sites. However, if it is deemed necessary to locate elsewhere, sites to be considered shall not promote social instability and result in destruction of property, vegetation, irrigation, and water bodies.

The contractor will be free to decide above mentioned locations, a list of feasible locations shall be included in the design specifications and plan drawings for approval by the PMU (DNCC disposal sites).

Section 7 includes Public Consultation, the active participation of stakeholders including local community and NGOs, in all stages of project preparation and implementation. This is essential for successful implementation of the project. It will ensure that the Projects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure are a must as per the ADB policy. Public consultation has been conducted at Azampur Gov. Primary School, Uttara, Dhaka-1230 on 13 November 2018. The main objective of the meeting was to share project related issues like house connection, access to connection permission, illegal connection, project supports, grievance redress mechanism, cooperation & coordination from the community, social safeguard and environmental matters with the participants. Participants of the meetings were teachers, guardians, businessmen, house owners, house wives, civil society representatives. A Total of 29 participants attended the meeting.

Section 8. highlights the grievance redress mechanism. A common GRM will be in place to redress social, environmental or any other project related grievances. The GRM described below has been developed in consultation with stakeholders. Public awareness campaign will be conducted to ensure that awareness on the project and its grievance redress procedures is generated. The campaign will ensure that the poor, vulnerable and others are made aware of grievance redress procedures, and PMU will ensure that their grievances are addressed.

Section 9 presents environmental management and mitigation. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels. The EMP will guide the environmentally-sound construction of the Project and ensure efficient lines of communication between DWASA, project management unit (PMU), consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the Project; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

Section 10 describes the conclusions and recommendations. As such, the proposed project will not have any significant adverse impacts on the environment since the project activities will be limited within the pipeline corridor of land which is already acquired by the Government. The impacts of the project are site-specific, reversible and are confined within the property. There is no s ecologically sensitive area in the vicinity of the construction sites.

Most of the adverse impacts are likely to occur during the construction phase and are considered as temporary in nature. The anticipated adverse environmental impacts are manageable and can be mitigated through proper design and implementation of the proposed mitigation measures.

Based on the analysis conducted in this assessment it is concluded that overall the project will result in significant positive socio-economic benefits, and those potential negative environmental impacts that have been identified are small-scale and local and can be minimized adequately through good design and the appropriate application of mitigation measures. It is therefore recommended that the project be supported by ADB, subject to the implementation of the commitments contained in the EMP and

allocation of appropriate technical, financial and human resources by implementing agencies such as DWASA, Construction Supervision Consultant and Contractors to ensure these commitments are effectively and expediently implemented.

The IEE report will be part of the bidding documents. The contractor has to follow the EMP and to implement properly suggested mitigation measures.

The IEE includes in addition an Environmental Monitoring Plan. A program of monitoring will be required to ensure that all concerned agencies take the specified action to provide the required mitigation, to assess whether the action has adequately protected the environment, and to determine whether any additional measures may be necessary. Regular monitoring of mitigation measures by Contractors will be conducted and overseen on behalf of DWASA. Monitoring of noise, ambient air and water quality will be implemented at selected locations.

Environmental training will help to ensure that the requirements of the EMP clearly understood and followed by all Project personnel throughout the Project period. The primary responsibility of providing training to all project personnel will be that of the Consultant's environmental inspectors.

1 INTRODUCTION

1.1 Background

The Government of Bangladesh has received financing from the ADB, Agence Française de Développement (AFD), and European Investment Bank (EIB), which will be re-lent to Dhaka Water Supply and Sewerage Authority (DWASA) for the implementation of Dhaka Environmentally Sustainable Water Supply Project (DESWSP). The proposed project aims to provide safe, reliable and continuous drinking water as per Government of Bangladesh's standard to about 15 million people of Dhaka-the capital, located in the heart of the country.

DWASA is responsible for providing potable water supply services to about 90% of Dhaka's population, sewerage services, and storm water drainage services throughout its 400km^2 services areas. In fact, the city relies heavily on groundwater sources for water supply, but current abstraction exceeds sustainable yields, water table levels are falling by 2 to 3 m /year and increasing numbers of tube wells become inoperable. Groundwater extraction is expected to be reduced from 1,900 MLD in 2012 to 1,360 MLD by 2020 and 1,260 MLD by 2025. At the same time, the overall supply needs to be increased to cater for the growing population in a larger service area.

Out of the total 2400 MLD currently provided by DWASA, 450 MLD is provided by the two phases of Saidabad Water Treatment Plant (WTP), which abstracts water from the nearby Shitalakhya River, where water quality is deteriorating rapidly, particularly due to high ammonia concentrations during the dry season. This puts sustainable operation of the WTP at serious risk. This in turn makes it essential for DWASA to find an adequate and sustainable source of raw water to achieve its long-term development objectives.

The impact of the project will be drinking water security ensured in selected district metered areas (DMAs). The outcome will be inclusive, gender-responsive, and sustainable drinking water service delivered in Project DMAs.

1.2 Objectives of the IEE Report

This IEE presents Package 3.1 which is the primary distribution water pipeline with 1.4-0.8 m diameter starting from US Embassy to Uttara DMA. The P3.2 is the secondary distribution of pipeline with 0.4-0.8 m diameter will be connected to DMAs. The IEE is conducted if the project is likely to have minor or limited impacts, which can easily be predicted and evaluated, and for which mitigation measures are prescribed easily. However, the IEE is also used to confirm whether the project package P3.1 require an EIA as a follow up.

However, ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The potential environmental impacts of the subproject have been assessed using ADB Rapid Environmental Assessment (REA) Checklist for DESWSP. Then potential negative impacts were identified in relation to pre-construction, construction and operation of the improved infrastructure, and results of the assessment show that the Package 3.1 is unlikely to cause significant adverse impacts. Thus, this updated initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects.

This IEE is based on the preliminary project reports and detailed design prepared by the Consultant (Mott MacDonald), DWASA, and a feasibility report prepared by the Project Preparatory Technical Assistance (PPTA) team and will be finalized during implementation stage under civil works contract.

to reflect any changes and latest project designs. The IEE was based mainly on field reconnaissance surveys and secondary sources of information. No field monitoring (environmental) survey was conducted however, the environmental monitoring program developed as part of the environmental management plan (EMP) will require the contractors to establish the baseline environmental conditions

prior to commencement of civil works. The results will be reported as part of the environmental monitoring report and will be the basis to ensure no degradation will happen during Package 3.1 project implementation.

1.3 Methodology of IEE Report

This IEE is based on the requirements of ADB's SPS 2009. Principal sources of information were the terrestrial flora and fauna data and scoping exercises. Supplementary information was taken from direct consultations with DWASA staff, field observations of Dhaka City review of documents and project plans, designs and previous reports on similar projects implemented in other areas in Bangladesh.

A scoping and field reconnaissance were conducted at project sites, to establish the potential impacts and categorization of project activities. The methodology of the IEE study was then elaborated in order to address all impacts. Subsequently primary and secondary baseline environmental data were collected from possible sources, and the intensity and likely locations of impacts were identified with relation to sensitive receivers. The significance of impacts from construction of P3.1 primary distribution pipeline was then assessed and, for those impacts requiring mitigation measures were proposed to reduce impacts within acceptable limits. Informal public consultation (PC) was carried out in project areas.

1.4 Report Structure

This Report contains the following seven (7) sections including the executive summary at the beginning of the report:

- Introduction;
- Description of the project
- Policy, legal and administrative framework;
- Description of the environment;
- Anticipated environmental impacts and mitigation measures;
- Environmental management plan, and,
- Conclusion and recommendation.

The IEE report has been formatted following the outline of the draft IEE approved in 2013 which is based on ADB's SPS (2009) Annex to Appendix 1 (pp. 41-43).

2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 Relevant Government Policies, Acts, Rules and Strategies in Bangladesh

A wide range of laws and regulations related to environmental issues are in place in Bangladesh. Many of these are cross-sectoral and partially related to environmental issues. The most important of these are the Environment Conservation Act, 1995 (ECA, 1995), and the Environment Conservation Rules (ECR, 1997). The ECA 1995 is primarily an instrument for establishing the Department of Environment (DoE), and for controlling industrial and project related pollution. The Act also defines in general terms that if any particular activity is causing damage to the ecosystem, the responsible party will have to apply corrective measures. Until the appearance of ECR, 1997, enforcement of the Act was not possible, as many of the clauses refer to specifications detailed in the Rules. ECA and ECR were further amended to address the growing environmental challenges.

In addition to the Environmental Conservation Act and Rules, there are a number of other policies, plans and strategies which deal with the water sector, agricultural development, coastal area, protected area disaster management and climate change. These are the National Water Policy, 1999; the Forest Act 1927 (last modified 30th April 2000); National Forest Policy, 1994; the National Conservation Strategy1992;; National Environmental Management Action Plan (NEMAP), 1995; Coastal Zone Policy, 2005; Coastal Development Strategy, 2006; National Agricultural Policy, 1999; National Fisheries Policy, 1996; National Livestock Development Policy, 2007; Standing Orders on Disaster, 1999 (revised in 2010); Bangladesh Climate Change Strategy and Action Plan, 2009; National Plan for Disaster Management, 2010-2015. Some of these policies and legislations are described in this chapter for reference.

2.1.1 Environment Conservation Act, 1995

The national environmental legislation known as Environmental Conservation Act, 1995 (ECA'95) is currently the main legislative document relating to environmental protection in Bangladesh, which replaced the earlier environment pollution control ordinance of 1992 and has been promulgated in Environmental Conservation Rules, 1997 (ECR'97). This Act is amended in 2000 and 2002. The main objectives of ECA'95 are: i) conservation of the natural environment and improvement of environmental standards; and ii) control and mitigation of environmental pollution.

The main strategies of the act can be summarized as:

- Declaration of ecologically critical areas, and restriction on the operation and process, which can be continued or cannot be initiated in the ecologically critical areas
- Regulation with respect to vehicles emitting smoke harmful to the environment
- Environmental clearances
- Remedial measures for injuries to ecosystems
- Regulation of projects and other development activities
- Promulgation of standards for quality of air, water, noise and soil for different areas for various purposes
- Promulgation of standard limit for discharging and emitting waste
- Formulation and declaration of environmental guidelines

Department of Environment (DoE) implements the Act. DoE is under the Ministry of Environment and Forest and is headed by a Director General (DG). The DG has complete control over the DoE.

2.1.2 Environment Conservation Rules, 1997

The Environment Conservation Rules provide a first set of rules under the Environment Conservation Act, 1995. These rules are further amended in 2002 and 2003. These provide, amongst other items, standards and guidelines for:

- Categorization of industries and development projects
- Procedure for obtaining environmental clearance
- Environmental quality standards in relation to water pollution, air pollution and noise, as well as permitted discharge/emission levels of water and air pollutants and noise by projects

The Rules incorporate "inclusion lists" of projects requiring varying degrees of environmental investigation. The Government is also empowered to specify which activities are permissible and which restricted in the ecologically critical area. Under this mandate, MOEF has declared Sunderban, Cox's Bazar-Tekhnaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Yanguar Haor, Marzat Baor and Gulshan-Baridhara Lake as ecologically critical areas and accordingly has prohibited certain activities in those areas.

Environmental Conservation Rules (1997) classifies industrial units and development projects into four categories for the purpose of issuance of Environmental Clearance Certificate (ECC). These categories are:

i. Green
ii. Orange A
iii. Orange B, and
iv. Red

Green Category projects are considered relatively pollution-free and hence do not require initial environmental examination (IEE) and EIA. An environment clearance certificate (ECC) from the Department of Environment (DoE) is adequate.

Orange Category projects fall into two categories. Orange A projects are required to submit general information, a feasibility report, a process flow diagram and schematic diagrams of waste treatment facilities along with their application for obtaining DoE environmental clearance. Orange B projects are required to submit an Initial Environmental Examination (IEE) report, along with their application and the information and papers specified for Orange B projects.

Red Category projects are those which may cause ‘significant adverse’ environmental impacts and are, therefore, required to submit an EIA report. It should be noted that they may obtain an initial site clearance on the basis of an IEE report, and subsequently submit an EIA report for obtaining environmental clearance along with other necessary papers, such as feasibility study reports and no objections from local authorities.

As per ECR ’97 all existing and new industries and projects in Orange B and Red category require an Environmental Management Plan (EMP) to be prepared (after conducting an IEE or EIA) and submitted along with other necessary papers while applying for environmental clearance.

2.1.3 Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009

The Government of Bangladesh prepared the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2008 and revised in 2009. This is a comprehensive strategy to address climate change challenges in Bangladesh. It is built around the following six themes:

- **Food security, social protection and health** to ensure that the poorest and most vulnerable in society, including women and children, are protected from climate change. All programs focus on the needs of this group for food security, safe housing, employment and access to basic services, including health.

- **Comprehensive disaster management** to further strengthen the country's already proven disaster management systems to deal with increasingly frequent and severe natural calamities.
- **Infrastructure** to ensure that existing assets (e.g., coastal and river embankments) are well maintained and fit for purpose and that urgently needed infrastructures (cyclone shelters and urban drainage) is put in place to deal with the likely impacts of climate change.
- **Research and Knowledge management** to predict that the likely scale and timing of climate change impacts on different sectors of economy and socioeconomic groups; to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking on climate change.
- **Mitigation and low carbon development** to evolve low carbon development options and implement these as the country's economy grows over the coming decades.
- **Capacity building and Institutional strengthening** to enhance the capacity government ministries, civil society and private sector to meet the challenge of climate change

2.1.4 National Water Policy 1999

The National Water Policy was promulgated in 1999 with the intention of guiding both public and private actions to ensure optimal development and management of water in order to benefit both individuals and the society at large. The policy aims to ensure progress towards fulfilling national goals of economic development, poverty alleviation, food security, public health and safety, a decent standard of living for the people and protection of the natural environment. According to the policy, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation and maintenance) will have to enhance environmental amenities and ensure that environmental resources are protected and restored while executing their activities. Environmental needs and objectives will be treated equally with the resources management needs. The policy has several clauses related to the protection and conservation of the natural environment to ensure sustainable development.

2.1.5 National Safe Drinking Water Supply and Sanitation Policy 1998

The National Safe Drinking Water Supply and Sanitation Policy (NSDWSSP, 1998) was adopted in 1998, and sets out the basic framework for the improvement of public health quality and to ensure an improved environment, together with a set of broad sectoral action guidelines. The policy offered the following various objectives to achieve the goal:

- To manage water supply and sanitation related basic needs for all;
- To bring about a positive change of peoples' attitude towards water and sanitation;
- To reduce the outbreak of water-borne diseases;
- To increase the efficiency of the Local Government and associated communities for handling the problems related to water supply and sanitation;
- To improve sustainable water supply and sanitation system;
- To promote proper conservation, management and use of surface water and to control water pollution in light of the scarcity of groundwater;
- To take necessary steps to capture and use rain water.

2.1.6 National Agricultural Policy, 1999

The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food through increasing production of all crops including cereals and ensure a dependable food security system for all. One of the specific objectives of National Agricultural Policy is to take necessary steps to ensure environmental protection as well as 'environment-friendly sustainable agriculture' through increased use of organic manure and strengthening of the integrated pest management program. The policy also suggests creating awareness so that the chemical fertilizers and pesticides used for increased crop production do not turn out to be responsible for environmental pollution. Water logging

and salinity are identified as one of the serious problems in some parts of the country including the coastal areas for agricultural activities and environmental damage. The policy recommends for crop rotation and salt tolerant crop varieties.

2.1.7 National Fisheries Policy, 1996

The National Fisheries Policy, 1996 recognizes that fish production has declined due to environmental imbalances, adverse environmental impact and improper implementation of fish culture and management programs. The policy suggests following actions:

- Shrimp and fish culture will not he expanded to the areas which damage mangrove forest in the coastal region;
- Biodiversity will be maintained in natural water bodies and in marine environment;
- Chemicals harmful to the environment will not be used fish shrimp farms;
- Environment friendly fish shrimp culture technology will be used;
- Control measures will be taken against activities that have a negative impact on fisheries resources and vice-versa;
- Laws will be formulated to ban the disposal of any untreated industrial effluents into the water bodies.

2.1.8 National Livestock Development Policy, 2007

The National Livestock Development Policy has been prepared to address the key challenges and opportunity for a comprehensive sustainable development of the Livestock sub-sector through creating an enabling policy framework. The policy recognizes that there are no guidelines for environmental protection and bio-security when establishing poultry farms. The use of antibiotics in feeds is thought to be common and a cause of public health concern. The policy recommends for developing and enforcing specific guidelines for establishing environment-friendly commercial poultry farms.

In relation to compliance with DoEDoE EIA Guideline, was necessary for DWASA to obtain only environmental clearance for this project. DWASA received exemption for IEE earlier for this project and approval of TOR for EIA study. Based on required documents, EIA report was prepared and submitted on August 2014 and approved the EIA on 21 May 2015 (Appendix E). However, over the time there are some additional distribution pipeline work included in this project, hence the EIA required further updated. Accordingly, the updated EIA was prepared and submitted to DWASA in April 2018. The PMU further submitted the EIA to DoEDoE for environmental clearance (EIA document is exclusively for DoEDoE as Red Category Project, and this updated IEE is for ADB only).

Further to note, applicable statutory requirements for EIA is as follows:

Forest Clearance: No forest exists on P3.1 site

No Objection Certificate: Within 60 working days from the date of application to DoE

Site Location Clearance: Within 60 working days from the date of application to DoE

Environmental Compliance Certificate and other Permit: Within 30 to 60 working days from the date of application to DoE

Annual Renewal of Environmental Clearance Certificate: 30 days before expiry

The current DoEDoE environmental clearance procedure is provided in Appendix F.

The environmental clearance is issued for EIA DoEfor all project packages of DESWSP including P 3.1 (Ref: EIA, DESWSP, DWASA, Enviro Consultants Ltd, April 2018).

2.1.9 Relevant International Environmental Agreements

Bangladesh has signed and ratified a number of international treaties, conventions and protocols relating to environmental protection. The following protocols are of particular relevance to the DESWSP.

- Rio Declaration, Convention on Biological Diversity, Rio De Janeiro, 1992 (Ratified 1994)
- RAMSAR, 1971(Ratified 1992)
- International Plant Protection Conservation, Rome, 1951 (Ratified 1978)
- Basel Convention, Basel, 1989 (Ratified 1993)
- United Nations Framework Conservation on Climate Change, New York, 1992 (Ratified 1994)
- Montreal Protocol, 1987 (Ratified 1994)
- World Heritage Convention, 1972 (Ratified 1983)

Among them, following Table 1 summarizes the relevant to this project activity.

Table 1: International environmental conventions relevant to the project activities

International	Details	Relevance
Rio Declaration 1992	United Nations Conference on Environment and Development (UNCED) adopted the global action program for sustainable development called 'Rio Declaration' and 'Agenda 21 'Principle 4 of the Rio Declaration', 1992, to which Bangladesh is a signatory along with a total of 178 countries.	No sensitive species are located in the project area. There is no threat to the conservation of flora or fauna.
Convention on Wetland of International Importance Especially as Waterfowl Habitats, Ramsar (1972)	The Ramsar Convention was adopted on 2 February 1971 and entered into force on 21 December 1975. Bangladesh ratified the Convention on 20 April 2002. Bangladesh has two Ramsar Sites (i) parts of Sundarban Reserved Forest (Southwest of Bangladesh), and (ii) Tanguar Haor Northeast of Bangladesh).	No impact

2.1.10 Environmental Standards

As noted previously this IEE of DESWSP has been classified as Category "B" for Environmental Assessment. The categorization was carried out based on ADB's Safeguard Policy Statement 2009.

The Environmental Safeguards can be considered to use the term environment in a broad sense. The Policy states, inter alia that an assessment shall be conducted to identify direct, indirect, cumulative and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups and gender issues) and physical cultural resources in the context of the projects area of influence.

The Policy then goes onto list the Safeguard Requirements for Environment, focusing on:

- Biodiversity Conservation and Sustainable Natural Resources Management;
- Pollution Prevention and Abatement;
- Health and Safety - worker and community
- Physical Cultural Resources (Archaeology etc.); and
- the Grievance Redress Mechanism (GRM)

However, the Contractor shall ensure compliance with the labor laws and pertinent occupational health and safety regulation of Bangladesh, IFC's EHS Guidelines. The Contractor shall ensure that all workers are supplied with and use the relevant protection safety equipment on the construction site. Abstain from employing child labor (detailed in Appendix B).

The objectives of ADB's safeguards are to:

- avoid adverse impacts of projects on the environment and affected people, where possible;
- minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and

- help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

ADB Safeguard requirements on the environment are described in detail in Appendix 1 of SPS Safeguard Policy Statement 2009. They refer to the following:

- environmental assessment
- environmental planning and management (EMP)
- information disclosure
- consultation and participation
- grievance redress mechanism
- monitoring and reporting
- unanticipated environmental impacts
- pollution prevention and abatement
- health and safety
- physical and cultural resources

Contractor's site-specific EMP satisfactorily meets these ADB's SPS requirements.

2.2 ADB Environmental Requirements

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

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:

Category A:

Projects could have significant adverse environmental impacts. An Environmental Impact Assessment (EIA) is required to address significant impacts.

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.

Category C:

Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.

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.

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.

Public disclosure:

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

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

2.3 IFC EHS Guidelines on Air Quality, Noise and Waste Water Quality

The IFC EHS Guidelines on Noise, Air Quality, Water Quality and supporting Performance Standard recognizes that increased economic activity and urbanization often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations.

However, these guidelines and standard outlines a project-level approach to resource efficiency and pollution prevention and control in line with internationally disseminated technologies and practices. In addition, these guidelines and standard promotes the ability of autonomous and private sector agencies to adopt such technologies and practices as far as their use is feasible in the context of the DESWSP project that relies on commercially available skills and resources.

During the project life-cycle, the client will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention principles and techniques that are best suited to avoid, or where avoidance is not possible, minimize adverse impacts on human health and the environment. The principles and techniques applied during the project life-cycle will be tailored to the hazards and risks associated with the nature of the project and consistent with good international industry practice (GIIP), as reflected in various internationally recognized sources, including the World Bank Guidelines.

The Community Health, Safety, and Security (*Performance Standard 4*) recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration and/or intensification of impacts due to project activities. While acknowledging the public authorities' role in promoting the health, safety, and security of the public, this IFC Performance Standard addresses the client's responsibility to avoid or minimize the risks and impacts to community health, safety, and security that may arise from project related-activities, with particular attention to vulnerable groups.

Ambient Air Quality

Projects with significant sources of air emissions, and potential for significant impacts to ambient air quality, should prevent or minimize impacts by ensuring that:

- Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legislated standards (DoE), or in their absence, the current WHO Air Quality Guidelines (Table 2), or other internationally recognized sources;
- Emissions do not contribute a significant portion to the attainment of relevant ambient air quality guidelines or standards. As a general rule, this Guideline suggests 25 percent of the applicable air quality standards to allow additional, future sustainable development in the same airshed.

ADB Safeguard Policy Statement Requirements

During the design, construction, and operation of the project the Project Management Unit (DWASA) will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's

Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of Bangladesh regulations differ from these levels and measures, the Project Management Unit (PMU) will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS (Table 2: WHO Ambient Air Quality Guidelines).

The following Table 2 presents the air quality guidelines:

Table 2 Air Quality Guidelines

Table 2: WHO Ambient Air Quality Guidelines

	Averaging Period	Guideline Value in µ/m3
Sulfur dioxide (SO2)	24-hour 10 minutes	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline
Nitrogen dioxide (NO2)	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM10	1-year 24-hour	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM2.5	1-year 24-hour	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Details are provided in IFC Environmental, Health, and Safety Guidelines, General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality

Noise Level

Prevention and Control

Noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception. The preferred method for controlling noise from stationary sources is to implement noise control measures at source. Methods for prevention and control of sources of noise emissions depend on the source and proximity of receptors.

Noise reduction options that should be considered include:

- Selecting equipment with lower sound power levels Installing silencers for fans
- Installing suitable mufflers on engine exhausts and compressor components
- Installing acoustic enclosures for equipment casing radiating noise
- Improving the acoustic performance of constructed buildings, apply sound insulation

- Installing acoustic barriers without gaps and with a continuous minimum surface density of 10 kg/m^2 in order to minimize the transmission of sound through the barrier. Barriers should be located as close to the source or to the receptor location to be effective & others.

Noise impacts should not exceed the levels presented in Table 3 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Following is the Noise-level Guidelines:

Table 3: World Bank Group's Environment, Health and Safety Noise Level Guidelines

		One Hour (dB(A)
Receptor	Day Time (07:00 – 22:00)	Night Time (22:00 -07:00)
Residential; institutional; educational55	55	45
Industrial; commercial	70	70

Highly intrusive noises, such as noise from aircraft flyovers and passing trains, should not be included when establishing background noise levels.

Wastewater and Ambient Water Quality

This guideline applies to projects that have either direct or indirect discharge of process wastewater, wastewater from utility operations or storm water to the environment. These guidelines are also applicable to industrial discharges to sanitary sewers that discharge to the environment without any treatment. Process wastewater may include contaminated wastewater from utility operations, storm water, and sanitary sewage. It provides information on common techniques for wastewater management, water conservation, and reuse that can be applied to a wide range of industry sectors. This guideline is meant to be complemented by the industry-specific effluent guidelines presented in the Industry Sector Environmental, Health, and Safety (EHS) Guidelines. Projects with the potential to generate process wastewater, sanitary (domestic) sewage, or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety, or the environment. In the context of their overall ESHS management system, facilities should:

- Understand the quality, quantity, frequency and sources of liquid effluents in its installations. This includes knowledge about the locations, routes and integrity of internal drainage systems and discharge points
- Plan and implement the segregation of liquid effluents principally along industrial, utility, sanitary, and storm water categories, in order to limit the volume of water requiring specialized treatment. Characteristics of individual streams may also be used for source segregation.
- Identify opportunities to prevent or reduce wastewater pollution through such measures as recycle/reuse within their facility, input substitution, or process modification (e.g. change of technology or operating conditions/modes).
- Assess compliance of their wastewater discharges with the applicable: (i) discharge standard (if the wastewater is discharged to a surface water or sewer), and (ii) water quality standard for a specific reuse (e.g. if the wastewater is reused for irrigation).

Wastewater Management: Wastewater management includes water conservation, wastewater treatment, storm water management, and wastewater and water quality monitoring.

Details are provided in IFC Environmental, Health, and Safety Guidelines, General EHS Guidelines: Environmental Wastewater and Ambient Water Quality.

2.4 Bangladesh Environmental Policies and Standards

The technical committees of Department of Environment have published several standards that promote environmental safety. The impact of these efforts is felt in cleaner air and water, eco-friendly

homes and office buildings; enhanced waste management and recycling programs; new innovations in oil spill response and improved environmental assessment processes.

A wide range of laws and regulations related to environmental issues are in place in Bangladesh. 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). The ECA 1995 is primarily an instrument for establishing the Department of Environment (DoE), and for controlling industrial and project related pollution. The Act also defines in general terms that if any particular activity is causing damage to the ecosystem, the responsible party will have to apply corrective measures. Until the appearance of ECR, 1997, enforcement of the Act was not possible, as many of the clauses refer to specifications detailed in the Rules.

In addition to the Environmental Conservation Act and Rules, there are a number of other policies, plans and strategies which deal with the water sector, agricultural development, coastal area, protected area disaster management and climate change. These are the National Water Policy, 1999; the Forest Act 1927 (last modified 30th April 2000); National Forest Policy, 1994; the National Conservation Strategy1992;; National Environmental Management Action Plan (NEMAP), 1995; Coastal Zone Policy, 2005; Coastal Development Strategy, 2006; National Agricultural Policy, 1999; National Fisheries Policy, 1996; National Livestock Development Policy, 2007; Standing Orders on Disaster, 1999 (revised in 2010); Bangladesh Climate Change Strategy and Action Plan, 2009; National Plan for Disaster Management, 2010-2015. Some of these policies and legislations are described in this chapter for reference.

Air Quality

Table 4: Bangladesh Standards for Ambient Air Quality Schedule-2, Rule 12, Environment Conservation Rules of 1997 (Micrograms /Cubic Meter)

Sl.No.	Area	Suspended Particulate Matter (SPM)	Sulfur Dioxide (SO 2)	Car bon Monoxide (CO)	Oxides of Nitro gen (NOx)
Ka	Industrial and mixed	500	120	5000	100
Kha	Commercial and mixed	400	100	5000	100
Ga	Residential and rural	200	80	2000	80
Gha	Sensitive	100	30	1000	30

Source: Schedule-2, Rule 12, Environment Conservation Rules of 1997 (Page 3123, Bangladesh Gazette, 28 August 1997) (Own authentic translation from original Bengali).

Note:

1. Sensitive area includes national monuments, health resorts, hospitals, archaeological sites, educational institutions and other government designated areas (if any).
2. Any industrial unit located not in a designated industrial area will not discharge such pollutants, which may contribute to exceed the ambient air quality above in the surrounding areas of category ‘Ga’ and ‘Gha’.
3. Suspended particulate matters mean airborne particles of diameter of 10 micron or less.
4. Source: Department of Environment (DoE)

Noise

Table 5: Noise quality standards, by zone and time of day

Zone Class	Limits in dB (A)	
	Daytime (6 am – 9 pm)	Nighttime (9 pm – 6 am)
Silent zone	45	35
Residential zone	50	40
Mixed (residential/commercial/industrial) zone	60	50

Zone Class	Limits in dB (A)	
	Daytime (6 am – 9 pm)	Nighttime (9 pm – 6 am)
Commercial zone	70	60
Industrial zone	75	70

Source: Schedule 4, Rule-12, Environment Conservation Rules, 1997. (Page 3127, Bangladesh Gazette, 28 August 1997). Own authentic translation from original Bengali

Note :

1. Daytime is reckoned as the time between 6 a.m. and 9 p.m.
2. Nighttime is reckoned as the time between 9 p.m. and 6 a.m.
3. Silent zones are areas up to a radius of 100 m around hospitals, educational institutions, or special establishments declared or to be declared as such by the government. Use of vehicular horn, other signals, and loudspeakers is prohibited in silent zones.

Source: Department of Environment (DoE), Bangladesh

Drinking Water Quality

National Environment Quality Standards

At present, there are environmental standards in operation in Bangladesh also promulgated under the Environment Conservation Rules of 1997. There are standards prescribed for varying water sources, ambient air, noise, odour, industrial effluent and emission discharges, vehicular emissions, etc. The standards, commonly known as Environmental Quality Standards (EQS), are legally binding. The Bangladesh standards for ambient air, noise, odour, sewage, industrial effluent, and emission are furnished here. These are all in an authentic translation from original Bengali, citing the specific source (Table 6, 7, 8,9).

Table 6: National Standard for Inland Surface Water

Best Practice-Based Classification	pH	BOD (mg/l)	DO (mg/l)	Total Coliform Number/100
a. Source of drinking water for supply only after disinfecting	6.5-8.5	2 or less	6 or above	50 or less
b. Water usable for recreational activity	6.5–8.5	3 or less	5 of more	200 or less
c. Source of drinking water for supply after conventional treatment	6.5–8.5	6 or less	6 or more	5,000 or less
d. Water usable by fisheries	6.5–8.5	6 or less	5 or more	---
e. Water usable by various process and cooling industries	6.5–8.5	10 or less	5 or more	5,000 or less
f. Water usable for irrigation	6.5–8.5	10 or less	5 or more	1,000 or less

Source: Department of Environment (DoE)

Notes:

1. In water used for pisciculture, maximum limit of presence of ammonia as Nitrogen is 1.2 mg/l.
2. Electrical conductivity for irrigation water – 2250 µmhoms/cm (at a temperature of 25°C); sodium less than 26%; boron less than 0.2%.

Table 7: National Standard of Drinking Water

Parameter	Unit	Standards	Parameter	Unit	Standards
1. Aluminum	mg/l	0.2	26. Hardness (as CaCO3)	mg/l	200 – 500
2. Ammonia (NH3)	mg/l	0.5	27. Iron	mg/l	0.3 – 1.0
3. Arsenic	mg/l	0.05	28. Kjeldahl nitrogen (total)	mg/l	1
4. Balium	mg/l	0.01	29. Lead	mg/l	0.05

Parameter	Unit	Standards	Parameter	Unit	Standards
5. Benzene	mg/l	0.01	30. Magnesium	mg/l	30 – 35
6. BOD5 20°C	mg/l	0.2	31. Manganese	mg/l	0.1
7. Boron	mg/	1.0	32. Mercury	mg/l	0.001
8. Cadmium	mg/l	0.005	31. Manganese	mg/l	0.1
9. Calcium	mg/l	75	32. Mercury	mg/l	0.001
10. Chloride	mg/l	150 – 600*	33. Nickel	mg/l	0.1
11. Chlorinated alkanes			34. Nitrate	mg/l	10
carbontetrachloride	mg/l	0.01	35. Nitrite	mg/l	<1
1.1 dichloroethylene	mg/l	0.001	36. Odor	mg/l	Odorless
1.2 dichloroethylene	mg/l	0.03	37. Oil and grease	mg/l	0.01
tetrachloroethylene		0.03	38. pH	--	6.5 – 8.5
trichloroethylene		0.09	39. Phenolic compounds	mg/l	0.002
12. Chlorinated phenols			40. Phosphate	mg/l	6
pentachlorophenol	mg/l	0.03	41. Phosphorus	mg/l	0
2.4.6	mg/l	0.03	42. Potassium	mg/l	12
trichlorophenol					
13. Chlorine (residual)	mg/l	0.2	43. Radioactive materials (gross alpha activity)	Bq/l	0.01
14. Chloroform	mg/l	0.09	44. Radioactive materials (gross beta activity)	Bq/l	0.1
15.Chromium (hexavalent)	mg/l	0.05	45. Selenium	mg/l	0.01
16. Chromium (total)	mg/l	0.05	46. Silver	mg/l	0.02
17. COD	mg/l	,, 4	47. Sodium	mg/l	200
18. Coliform (fecal)	n/100 ml	0	48. Suspended particulate matters	mg/l	10
19. Coliform (total)	n/100 ml	0	49. Sulfide	mg/l	0
20. Color	Hazen unit	15	50. Sulfate	mg/l	400
21. Copper	mg/l	1	51. Total dissolved solids	mg/l	1,000
22. Cyanide	Mg/l	0.1	52. Temperature	°C	20-30
23. Detergents	mg/l	0.2	53. Tin	mg/l	2
24. DO	mg/l	6	54. Turbidity	NTU	101
25. Fluoride	mg/l	1	55. Zinc	mg/l	5

[1] The FS advises producing treated water that conforms to WHO guidelines and Bangladesh drinking water quality ECR 1997. One of the two most important parameters reduced by the WTP is turbidity (the other is microbiological matter, by providing a multi-stage barrier). In Section 10.3, the FS quotes WHO and Bangladesh standards of 10 and 5 NTU respectively. We recommend that the turbidity in the treated water leaving the WTP should never exceed 1.0 NTU and that the operational guideline should be set at 0.5 NTU, to be achieved 95% of the time. The design of the process units and their controls should accommodate these recommendations. Operational procedures must be devised to achieve these recommendations. Computerized monitoring equipment must be provided, and staff trained in its use to display real-time trends and record events. Laboratory staff must monitor, record, and report treated water quality parameters to review past trends and predict operational changes, if required.

Source: Department of Environment (DoE)

*In coastal area 1000. Reference: Bangladesh Gazette, Addendum, August 28, 1997

SUMMARY OF SELECTED INTERNATIONAL WATER QUALITY STANDARD AND GUIDELINE

Table 8: Selected drinking water quality guideline

WHO Categories	Parameters	Units	Bangladesh	WHO, 1993	EU, 1993	US-EPA
Bacteriological quality	Total coliforms Total coliforms	Counts/100 ml Number of samples/month	0	0	0 (i)	5%
	Fecal coliforms	n/100ml	0			
Inorganic Chemicals (of health significance)	Arsenic	mg/l	0.05	0.01(p)	0.01(c)	0.05
	Barium	mg/l	0.01	0.7		2
	Boron	mg/l	1	0.5 (p)	1 (c)	
	Cadmium	mg/l	0.005	0.003	0.005(c)	0.005
	Chromium	mg/l	0.05 (hexa) 0.05 (Total)	0.05(p)	0.05 (c)	0.1
	Copper	mg/l	1	2 (p)	2 (c)	1.3 (r:1.0)
	Cyanide	mg/l	0.1	0.07	0.05 (c)	0.2
	Fluoride	mg/l	1	1.5	1.5 (c)	4.0(r: 2.0)
	lead	mg/l	0.05	0.01	0.01 (c)	0.015
	Nickel	mg/l	0.1	0.02	0.02 (c)	
	Nitrate-NO3	mg/l	10	50	50 (c)	10
	Nitrite-NO2	mg/l	<1	3	0.5 (c)	1
	Manganese	mg/l	0.1	0.5 (p)	0.05 (l)	0.05 (r)
	Mercury	mg/l	0.001	0.001	0.001 (c)	0.002
	Selenium	mg/l	0.01	0.01	0.01(c)	0.05
Pesticides	Dieldrin	µg/l		0.03	0.03 (c)	
	Atrazine	µg/l		2	0.03 (c)	3
	DDT	µg/l		2	0.1 (c)	
	Gamma-HCH(Lindane)	µg/l		2	0.1 (c)	0.2
	Permethrin	µg/l		20	0.1 (c)	
	Pesticides total	µg/l			0.5 (c)	
Disinfectants and disinfectant by-products	Chlorine	mg/l		5		
Radioactive constituents	Gross Alpha activity Gross Beta activity	Bq/litre Bq/litre	0.01 0.1	0.1 1		
Aesthetic guidelines	Turbidity	NTU	10	5 (a)		
	Aluminum	mg/l	0.2	0.2 (a)	0.2 (i)	0.05-0.2(r)
	Ammonia - N	mg/l	0.5	1.5 (a)	0.5 (i)	
	Chloride	mg/l	150-600	250 (a)	250 (i)	250 (r)
	Copper	mg/l	1	1		
	Hydrogen sulfide - H2S	mg/l		0.05(a)		
	Iron	mg/l	0.3-1	0.3(a)	0.2 (i)	0.3 (r)

WHO Categories	Parameters	Units	Bangladesh	WHO, 1993	EU, 1993	US-EPA
	Manganese	mg/l	0.1	0.1	0.05 (i)	0.05 (r)
	Dissolved Oxygen	mg/l	6		>5 (i)	
	pH		6.5-8.5	<8 (a)	6.9-9.5(i)	6.5-8.5 (r)
	Sodium	mg/l	200	200 (a)	200 (i)	
	Sulfate	mg/l	400	250 (a)	250 (i)	250 (r)
	Sulfides	mg/l	0		0.05(i)	
	Total dissolved solids	mg/l	1000	1000		500 (r)
	Electrical conductivity	µS/cm			2500 (i)	
	Zinc	mg/l	5	3 (a)		
	Residual chlorine	mg/l	0.2	0.6-1		
	Ca	mg/l	75			
	Detergent	mg/l	0.2			
	Magnesium	mg/l	30-35			
	Odor	mg/l	Odorless			
	Oil and grease	mg/l	0.1			
	Phenolic compound	mg/l	0.002			
	Colour	Hazen unit	15			
	Phosphate	mg/l	6			
	Phosphorus	mg/l	0			
	Potassium	mg/l	12			
	Temp.	OC	20-30			
	Tin	mg/l	2			
	Silver	mg/l	0.02			
	Suspended particular matter	mg/l	10			
	Hardness as CaCO3	mg/l	200-500			
	Kjeldhl Nitrogen total	mg/l	1			
	BOD5at 20 OC	mg/l	0.2			
	COD	mg/l	4			
	Benzene	mg/l	0.01			

Source: EU, 1998. Drinking water standards (EU Directive 98/83/EC). (i) Indicator parameter; (c) chemical parameter

US-EPA, 1974. Safe Drinking Water Act (SDWA), plus subsequent amendments. Maximum Contaminant Level (MCL) values (health, enforceable);

(r) Secondary Drinking Water Regulations (aesthetically recommended, but nonenforceable)

WHO, 1993. Guidelines for Drinking Water Quality. Second edition. (p) Provisional guideline value; (a) aesthetic guideline.

Table 9: Government, Laws, Regulations, Environmental Standards & ADB Requirement

Laws, Regulations, and Standards	Details	Relevance	Status of compliance for Package 3.1
Environment Conservation Act, 1995	Provides for the conservation of the environment, improvement of environmental standards and control and mitigation of environmental pollution. In line with these provisions of the Act, the Environment Conservation Rules, 1997 have been framed.	The provisions of the act apply to the entire Project interventions in the construction	complied

Laws, Regulations, and Standards	Details	Relevance	Status of compliance for Package 3.1
	This Act provides for (i) remedial measures for injury to ecosystem; (ii) provides for any affected person due to environmental pollution to apply to DoE for remediation of the damage; (iii) discharge of excessive environmental pollutants; (iv) inspection of any activity for testing any equipment or plant for compliance to the environment act, including power to take samples for compliance; (v) power to make rules and standards with reference to environment; and (vi) penalty for non-conformance to environment act under the various sections.	and operation stages.	
Environment Conservation Rules (ECR), 1997	The Rules outline the processes and requirements of environmental clearances for specific type of projects indicated therein and stipulates that “no industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate (ECC) from the Director General” of the Department of the Environment. Schedule 1 of the Rules classifies industrial units and projects into four categories according to their site and impact on the environment, namely (i) green, (ii) orange-A, (iii) orange–B, and (iv) red. The Rules specify the procedures for issuing ECC for the various categories of projects. For Red Category: (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 for the EIA; or EIA report prepared on the basis of TOR previously approved by DoE (Appendix 2), plus (in the case of an industrial project): layout plan showing location of ETP, process flow diagram, design and time schedule of the ETP; (iv) report on the 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).	The project activities are categorized under this rule and as per categorization required environmental assessments were done	Complied complied
Environment Court Act, 2000	Enacted to establish Environment Courts and make rules for the protection of environmental pollution. Environment Courts are situated at the District-level, but Government may by notification in the official Gazette, establish such courts outside the districts. Environment Courts were given power to directly take into cognizance any offense relating to environmental pollution. Proceeding of Environmental Courts will be similar to Criminal Courts. One important feature of this Act is that it has been given the retrospective effect of any crime committed under environmental laws and thus any crime previously committed but is not taken before any court can be taken before the Environment Court or any special Magistrate.	The Court has jurisdiction over, in accordance with the Act provisions, the trial of an offense or for compensation under an environmental law, imposing penalties for violation etc.	
National Policy for Arsenic Mitigation, 2004	Provides a framework for the provision of water supply for areas/aquifers with high arsenic levels. Roles for agencies are specified for development of water supply systems, certification of arsenic removal technology, and disposal of treatment sludge. Arsenic-prone area also identified.	Considered in design and project preparation. Water supply is considered under this policy.	
Pourashava Ordinance	These ordinances have clearly assigned responsibilities to the LGIs to ensure urban	The Project integrated	

Laws, Regulations, and Standards	Details	Relevance	Status of compliance for Package 3.1
(Second Amendments) 1988; Municipal Administration Ordinance 1960	health for their residents. It has given them the mandate to ensure and provide a wide range of primary and public health services including primary health care, sanitation, water supply, drainage, food and drink, birth and death registration, vector and infectious disease control, etc. As independent autonomous bodies, the LGIs, as necessary, may take all required actions to ensure good health for tourist and concerned population within its jurisdiction. They have the authority to address all related issues with their legal and administrative mandate.	community and workers health and hygiene at the construction stage, and this will be taken forward during the operation and maintenance of the infrastructure facilities for tourists, local community and other concerned peoples.	
National Forestry Policy, 1994	Rules related to forest protection, often a domain of environmental management, are found in the Policy. Due to the death of forests, afforestation is actively pursued with targets to "implement programs of tree plantation and afforestation on fallow and hinterland, the bank of the pond and homestead land, which are under private ownership."	It is desirable to incorporate tree planting in the Project (Where it is practical).	
Bangladesh Labor Act, 2006	The Act provides the guidance on employer's extent of responsibility and workers' extent of rights to compensation in case of injury by accident while working.	Provides for the safety of workforce during the construction period.	
National Water Policy, 1999	The Policy explicitly states 6 main objectives: (i) address the use and development of groundwater and surface water in an efficient and equitable way; (ii) ensure the availability of water to all parts of the society; (iii) accelerate the development of public and private water systems through legal and financial measures and incentives, including appropriate water rights and water pricing rules; (iv) formulate institutional changes, encouraging decentralization and enhancing the role of women in water management; and (v) provide a legal and regulatory framework that encourages decentralization, consideration of environmental impacts, and private sector investment.	Water supply should be under this consideration	
Bangladesh Standard Specification for Drinking Water, 1990	Formulation and revision of national standards. Now it is incorporated into the schedule of ECR 1997	Water supply should be under this consideration	
National Agriculture Policy, 1999	The act deals with the programs related to make the nation self-sufficient in food through increasing production of all crops, including cereals, and ensure a dependable food security system for all	Ministry of Agriculture	
The National Water Policy, 1999	Protection, restoration and enhancement of water resources;	Ministry of Resources	
National Biodiversity Strategy and Action Plan (2004)	Conserve, and restore the biodiversity of the country for well-being of the present and future generations; Maintain and to improve environmental stability for ecosystems; Ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations; Guarantee the safe passage and conservation of globally endangered	Ministry of Environment and Forest Bangladesh Wild Life Advisory Board	

Laws, Regulations, and Standards	Details	Relevance	Status of compliance for Package 3.1
	migratory species, especially birds and mammals in the country; and Stop introduction of invasive alien species, genetically modified organisms and living modified organisms.		
The Protection and conservation of Fish Act 1950 subsequent amendments in 1982	Deals with the protection/conservation of fishes in Government owned water bodies	Department of Fisheries	
The embankment and Drainage Act 1952	Describe the protection of embankment and drainage facilities	Ministry of Water Resources	
Inspection and Enforcement Manual 2008	This manual has been written to provide national standard and uniformity environmental sampling for the inspections, investigations in the Department of Environment (DoE) in Bangladesh.	Will be considered at the time of environmental monitoring during the implementation of EMP	
Acquisition and Requisition of Immovable Properties Ordinance 1982	The government made rules in the exercise of the powers conferred upon by section 46 of the acquisition and requisition of the immovable property ordinance, 1982 (Ordinance No. II of 1982). ARIPO sets the Government rules and regulations governing all cases of land acquisition.	If any acquisition is required, this will be considered	

EIA = Environmental Impact Assessment, EMP =Environmental Management Plan, ETP = effluent treatment plant, IEE = Initial Environmental Examination, km = kilometer, LGI = Local Government Institution, TOR = terms of reference.

3 Description of the Project

3.1 Existing Water Supply Situation and Need for the Project

At present DWASA provides around 2400 MLD of water per day to the population of Dhaka. Approximately 85% of this water comes from over 600 deep tube wells (production tube wells) spread throughout the city area. The aggregate transmission and distribution network length is around 3,000 km with over 250,000 service connections. The project is needed because DWASA presently provides an inadequate water supply service to the residents of Dhaka, which has insufficient pressure, suffers significant losses, is rapidly depleting the groundwater resource, and delivers insufficient cost recovery to the government. The project will address all of these issues by refurbishing the existing network to repair leaks, increase capacity and pressure, remove illegal connections, and provide a new system of metering to streamline leak detection and aid cost recovery.

The proposed other Packages are: P1 and P2 project intends to withdraw up to 1,050 MLD from Meghna River in two phases for transmission to Dhaka city and for distribution after treatment (Figure 1 and 2).

The P1 consists of the following components:

- Construction of an intake at the village of Bishnondi from the Meghna River, with pumping and other facilities to deliver an uninterrupted supply of water into the transmission mains. This intends to withdraw up to 1,050 MLD from Meghna River in two phases for transmission to Dhaka city and for distribution after treatment.
- Construction of raw water transmission pipelines connecting the raw water intake with the Gandharbpur water treatment plant (WTP);
- Construction of a 500-MLD surface water treatment plant at Gandharbpur;

The P2 includes;

- Construction of treated water transmission mains from the Gandharbpur treatment plant to the injection point connecting with the distribution system inside Dhaka.

The P3.1 is the primary distribution network followed by secondary distribution system P3.2. This IEE deals with P3.1 (Figure 3).

Figure 1: Location of the P1, P2, P3.1 & P3.2 components

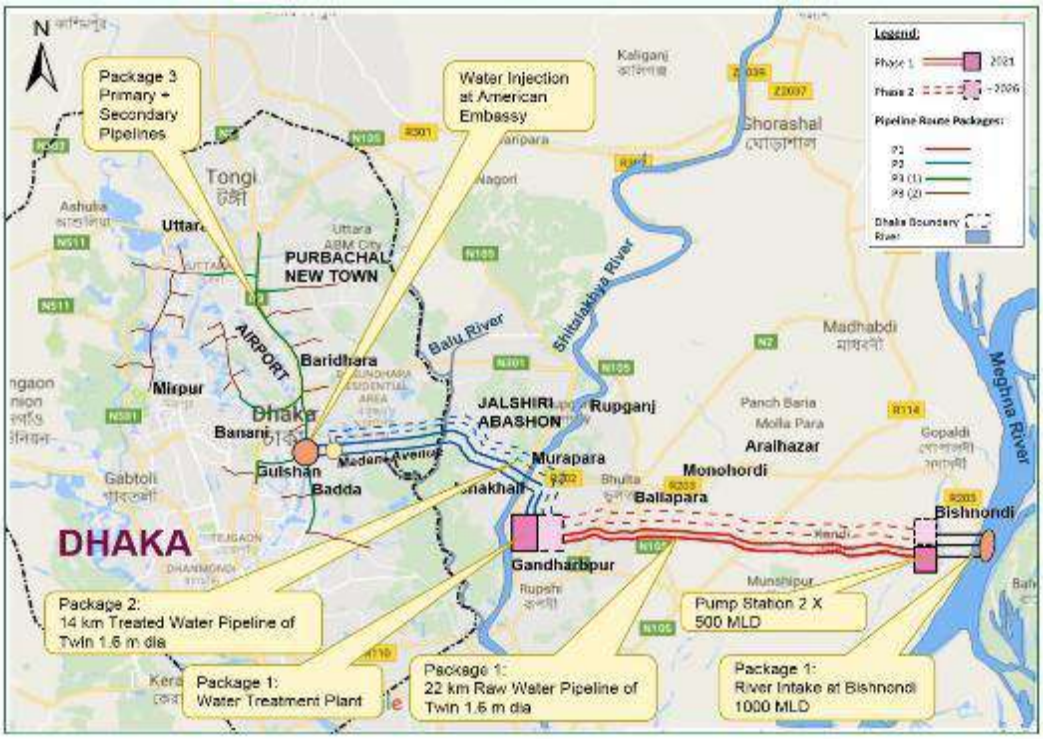
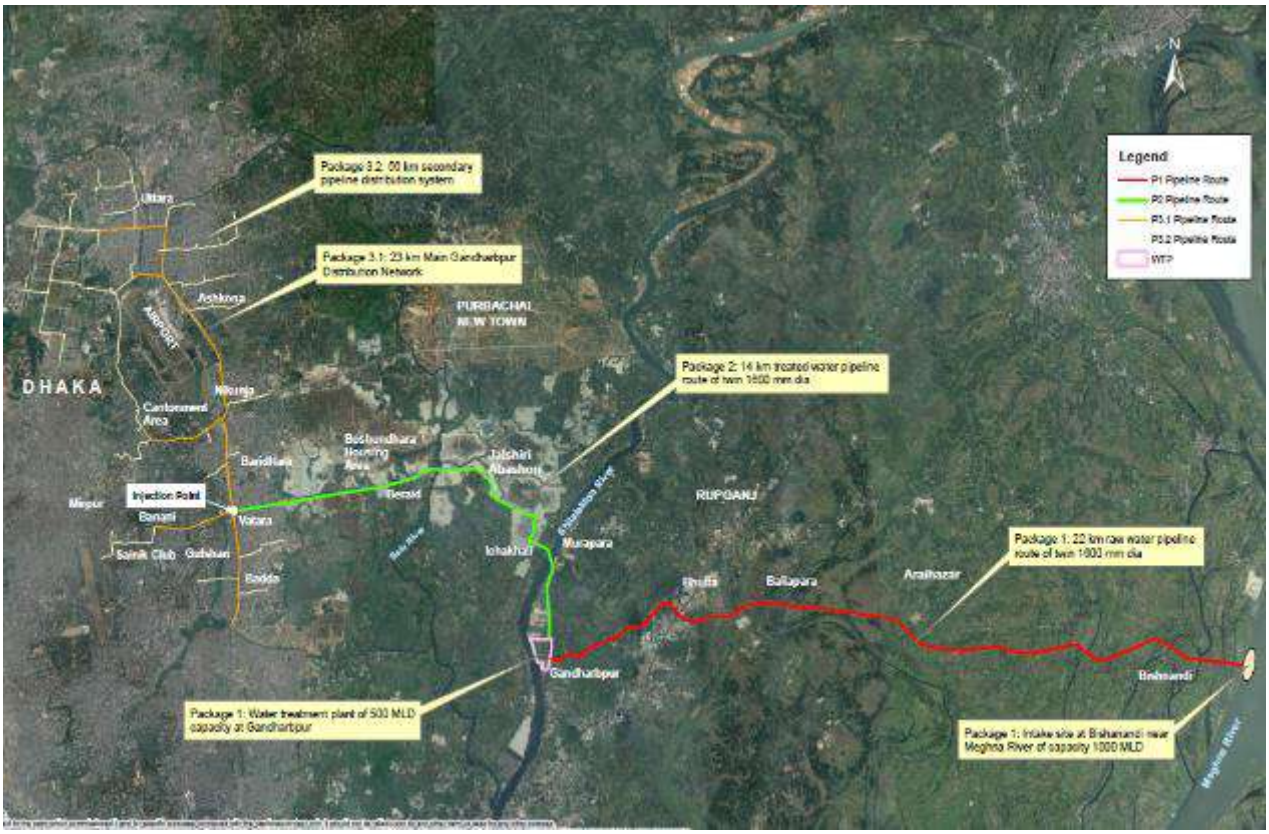


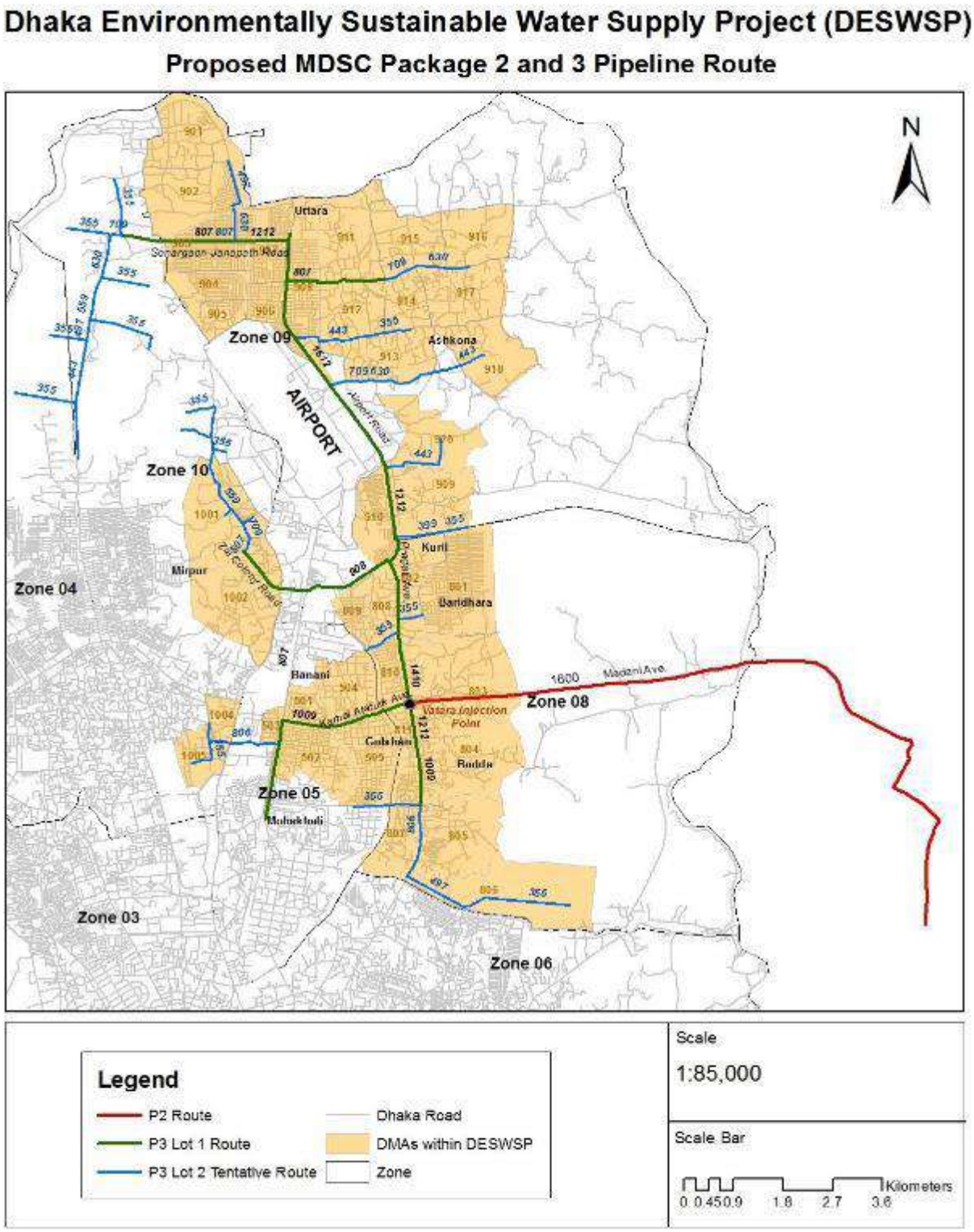
Figure 2: Project Area of P1, P2 and P3 components (aerial photograph)



3.2 Project Area

P3.1 is the primary distribution water pipelines with 1.4-0.8 m dia starting from US Embassy to Uttara DMA. Location of the P3.1 & P3.2 is presented in Figure 3.

Figure 3: Topographic map of MDSC P2, P3.1 and P 3.2



The Package P 3.1 reinforcements starting from US Embassy to DMAs at Uttara and Airport areas. Various project elements of P3.1 component is shown in the following Table-10.

Table 10: Activities of the P3.1

Sl. No	Component	Elements of the components
Package 3	P3.1 Distribution reinforcement 21 km: within the existing network	• Pipelines; Access roads; .

Further on, from the injection point, 1,000 mm-1,800 mm diameter feeder mains will be laid along major arterial roads, connecting at strategic points based on the Dhaka water distribution model designed and operated for DWASA by IWM under the DMC.

3.3 Project Goals and Objectives

The objectives of the Dhaka Environmentally Sustainable Water Supply Project (DESWSP)

Phase 1 are to:

1. Design and build modern, reliable WTP facilities to provide 500MLD of treated water
2. Construct a 14km treated water transmission pipeline from the Gandharbpur WTP to the injection point of the existing distribution network (Package 2)
3. Implement distribution reinforcements (Package 31, and package 3.2).

As already mentioned, this IEE refers to Package 3.1.

3.4 Implementation Schedule

The implementation schedule of P3.1 is anticipated for 3 years (2019 to 2022).

4 Description of The Environment

There have been no changes in environmental conditions in the subproject sites of package 3.1 based on the detailed design.

4.1 Physical Resources in Project Area

As part of the IEE, an environmental baseline survey carried out in areas surrounding the project site. The specific objectives of the baseline study were to gather information on the existing physical environment, biological-ecological environment and socio-economic environment of the areas in and around the project site to gather and assess peoples' perception on different aspects of the proposed project in and around the project area.

This Chapter describes the existing physical environment of areas in and around the project site based on the baseline survey and other studies carried out as a part of the present study. Relevant information on climate, topography and drainage, geology and soils, hydrology and water resources, air quality, noise level, and water quality have been described in this Chapter.

4.1.1 Topography

Dhaka is located in central Bangladesh on the eastern banks of the Buriganga River. The city lies on the lower reaches of the Ganges Delta and covers a total area of 815.85 km2. It consists of seven principal thanas (administrative areas) — Dhanmondi, Kotwali, Motijheel, Paltan, Ramna, Mohammadpur, Sutrapur, Tejgaon — and 14 auxiliary thanas — Gulshan, Lalbagh, Mirpur, Pallabi, Sabujbagh, Dhaka Cantonment, Demra, Hazaribagh, Shyampur, Badda, Kafrul, Kamrangir char, Khilgaon and Uttara. In total the city has 130 Wards and 725 mohallas. Dhaka district has an area of 1463.60 km2; and is bounded by the districts of Gazipur, Tangail, Munshiganj, Rajbari, Narayanganj, Manikganj. Tropical vegetation and moist soils characterize the land, which is flat and close to sea level. This leaves Dhaka susceptible to flooding during the monsoon seasons owing to heavy rainfall and cyclones.

4.1.2 Climate

Located to the North of the Tropic of Cancer, the North Central Region (NCR) of Bangladesh has a sub-tropical monsoon climate with more sharply defined seasons than the much of the rest of the country. The water year is defined as beginning on April and ending on March. It is divided into four more-or-less distinct seasons, corresponding to by a twice-yearly reversal of air movement over the region.

- Pre-monsoon : April to May
- Monsoon : June to September
- Post-Monsoon : October to November
- Dry season : December to March.

For about four months in winter (December through March) air flows from the north-east, while for about four months in summer (June through September) it flows from the south-west. These airflows (monsoons) are respectively the "north-east monsoon" and the "south-west monsoon". Agricultural activity is closely linked to the monsoon periods, rabi crops (mainly boro rice) being cultivated with irrigation during the dry north-east monsoon, while kharif crops (almost exclusively aus and aman rice) are grown during the south-west monsoon when the rainfall is abundant.

The first inter-monsoon reversal occurs in April-May, when the change of wind direction is from north-east to south-west via the north-west. The second occurs in October-November, when the change is from south-west

to north-east via the south-east. These periods of changing wind direction correspond to the pre-monsoon and post-monsoon seasons.

The pre-monsoon hot season is characterized by high temperatures and thunderstorms. April is the hottest month in the country with mean temperatures ranging from 27°C in the east and south, to 31°C in the west-central part of the country. After April, increasing cloud-cover reduces the temperature. Wind direction is variable during this season, especially during the early part. Rainfall, mostly caused by thunderstorms, at this time can account for 10 to 25 percent of the annual total.

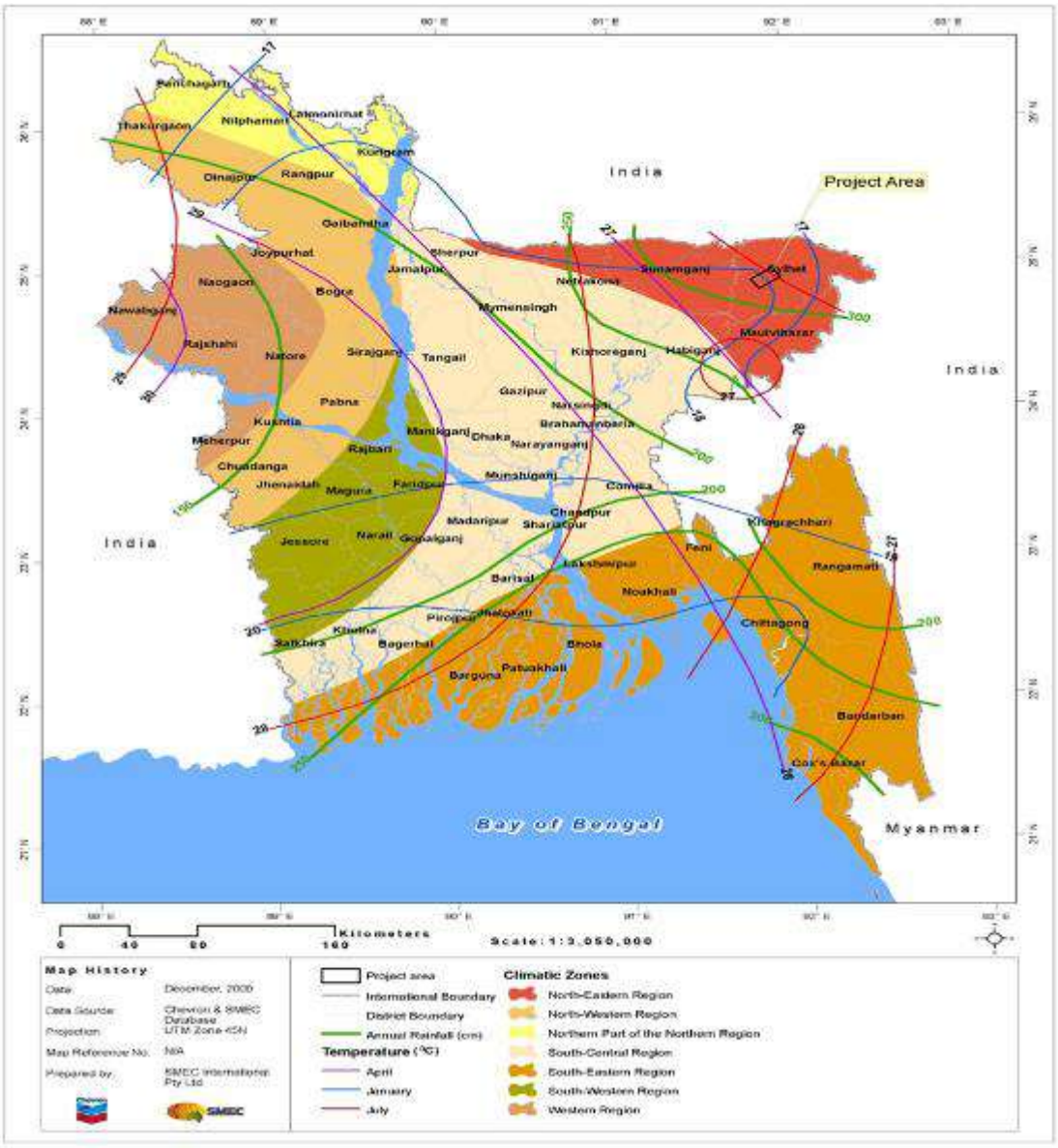
Southerly or south-westerly winds, very high humidity, heavy rainfall and long periods of consecutive days of rainfall characterize the rainy season, which coincides with the summer monsoon. This is caused by the tropical depression that enters the country from the Bay of Bengal. About 80% of the annual precipitation occurs during the four months monsoon season from June to September.

Low temperatures, cool air blowing from the west or northwest, clear skies and low rainfall characterize the cool dry season. The average temperature in January varies from 17°C in the northwest and north-eastern parts of the country to 20°C to 21°C in the coastal areas. Minimum temperatures in the extreme northwest in late December and early January reach between 3°C to 4°C.

Several climatic zones occur within Bangladesh. The study area occurs within the north-central zone as illustrated in Figure 4. This region includes most of east Dhaka. Mean maximum temperature is rarely above 32°C but mean minimum is 10°C and below. Average humidity is relatively high and winter rain is minor.

Dhaka experiences a hot, wet and humid tropical climate. The city is within the monsoon climate zone, with an annual average temperature of 250C and monthly means varying between 18 °C in January and 29 °C in August. Nearly 80 percent of the annual average rainfall of 1,854 millimeters occurs between May and September. Dhaka is facing serious environmental threats from pollution caused by the city's rapid expansion, congestion and industrial activities. Increasing air and water pollution emanating from traffic congestion and industrial waste is affecting public health and the quality of life in the city. Water bodies and wetlands around Dhaka are facing extinction as they are filled in to construct multi-storied buildings and other real estate developments. Coupled with pollution, such erosion of natural habitats threatens to destroy much of the regional biodiversity.

Figure 4: Climatic Zones of Bangladesh



4.1.3 Geology

Dhaka is situated on the southern tip of a Pleistocene terrace, the Madhupur Tract. Two characteristic geological units cover the city and surrounding areas; the Madhupur Clay of the Pleistocene age and alluvial deposits of recent age. The Madhupur Clay is the oldest sediment exposed in and around the city area and characterized by reddish plastic clay with silt and very fine sand particles. This Madhupur Clay unconformable overlies the Dupi Tila Sand of Plio-Pleistocene age, which is composed of medium to coarse yellowish-brown sand and occasional gravel.

The channels and depressions within the city are floored by recent alluvial floodplain deposits and are subdivided into Lowland Alluvium and Highland Alluvium. The alluvial deposits are composed of fine sand, silt and clay in different combinations.

The alluvial soils of these floodplains mainly consist of ridges of loamy material like silty clays and silty sands with large areas of shallow clays in the basins. The soil pattern can become more irregular close to river channels due to more recent deposits. With regard to the youngest activities (natural as well as anthropogenic) organic soils of swamps may be found locally as well as areas where the ground level has been raised using loose sands (hydraulic sand filling) dredged and pumped from nearby rivers.

4.1.4 Air Quality

The presence of gaseous pollutants, like Carbon Monoxide (CO), Sulphur Dioxide (SO2), Nitrogen Oxide (NOx), Ozone (O3) and Methane (CH4) has been found by the DoE in the air of Dhaka city in alarming quantity. But more alarming is the presence of fine dust (particulate pollutants or particulate matter) in the air. Most damaging particles are of the sizes of 10 microns diameter and smaller (PM 10 and 2.5) as they can penetrate and lodge deep inside the lungs. According to the WHO, chronic exposure to such particles increases the risks of developing cardiovascular and respiratory diseases and even cancer in the lung and the urinary tract or bladder in human body.

The Department of Environment of Bangladesh acknowledges the threat and is working to keep air pollution in check under the CASE (Clean Air and Sustainable Environment) project. To abate air pollution risks CASE monitors and publishes the air quality charts on monthly basis.

4.1.5 Water Resources

The river system in the Dhaka watershed includes Dhaleswari, Turag, Tongi Khal, Buriganga, Balu, Bangshi, and Shitalakhya Rivers. Dhaka is primarily surrounded by three rivers: Buriganga on the southwest, Turag in the northwest, and Balu in the northeast. The Shitalakhya River flowing by the southeastern part of Greater Dhaka is also included in the surrounding river system. More than 40 canals within the city were originally used for drainage.

Dhaka region is in the natural floodplain of various rivers in the area and functioned as an important breeding ground for many aquatic species in the past. This function is still evident in the seasonal flooding that affects large parts of the city. The floodplain function has been further degraded by the construction of embankments to protect the city from flooding, and particularly from infilling to reclaim land, which reduces the water retention capacity of these areas and increases flooding both upstream and downstream.

Most of the canals are non-functional due to disposal of solid and liquid wastes, as such, several areas of the city have become vulnerable to water logging. All the rivers receive untreated sewage and industrial liquid wastes and municipal waste through the major canal systems, as well as from direct disposal. The surface water quality in the two river systems and other surface water bodies, e.g. khals and ponds, is quite poor with very high biological oxygen demand (BOD5), chemical oxygen demand (COD), and E-coli content, indicating discharge of untreated industrial effluents and domestic sewage. The organic pollution of the rivers is mainly caused by the poor state of sewerage and sanitation systems of the Dhaka urban area (EIA, Enviro Consultants; February 2018).

4.2 Ecological Resources in Project Area

4.2.1 Vegetation

In Dhaka, like other cities, all the existing vegetation is man-made or altered by man to a great extent. There is almost no natural vegetation. In the city, this green cover contains the remnant biotic diversity of this part of erstwhile green and vast landscape of Madhupur tract. Most of the vegetated areas of the city are publicly owned. This vegetation occurs in or around such organizations that are important to people for various purposes. So, the importance is enhanced. Most areas, old or new, of Dhaka city are unplanned and have little scope for creating any green space or enhancing the existing ones, if any still worthy to be called so. But the importance and necessity of green space is great and unavoidable in an overcrowded city like Dhaka. So, the authorities

concerned (Arboriculture Section of RHD, LGED, Forest Department, NGOs) as well as the respective area dwellers must be consciously eager to preserve whatever green spaces the city still have and call all others to join effort. The newly developed Hatir Jheel area is covered with ornamental plants, regarded as a recreational area. Other areas are Sahwardi Uddan, Baldha Garden, Ramna Garden and National Botanical Garden.

4.2.2 Wildlife

Despite rapid urbanization, the ornithologists say some 200 bird species still choose Dhaka city as their abode. Dhaka currently boasts the largest population of the lokkhi pecha (barn owl, Tyto alba) in the city's history. Significant numbers of this creature can be found in the Gulshan and Banani areas. As the lokkhi pecha needs a small hole to lay its eggs, ventilators or spaces where air-conditioners are placed are ideal spots for laying eggs for these birds. Therefore, the lokkhi pecha is a very common sight and has adapted to the changes in its environment, aiding it to thrive.

Mongooses, another resilient creature, are still found in Dhaka, especially in wetlands or marshes where there is an abundance of small bushes, or in areas where garbage is dumped. Mongooses are also found inside graveyards, as well as in suburban areas such as Uttara, Mohammadpur, Keraniganj, Demra, and Jatrabari.

Around 20 years ago, Rhesus monkeys could be seen roaming around many places in Dhaka. But now they can only be seen in New and Old DOHS, Baridhara and around Gulshan Lake. These tree-bound creatures are still found in Old Dhaka, although trees are rapidly disappearing there. Perhaps that is because people of the Hindu community, many of whom live in Old Dhaka, have a soft corner for the little primates for religious reasons, and so are quite indulgent towards them. Jackals, present in central Dhaka even thirty years ago, have had a serious decline in their numbers over the years. However, one can still see jackals near the Mirpur Ceramic factory and in the premises of the BGB (Border Guard of Bangladesh) headquarters and its adjoining areas on rare occasions. At times, pump civets or jungle cats can be spotted in Ashulia, Savar and the Uttara belt, although these are also on the verge of extinction, due to needless hunting and loss of habitat. Holdegal titi or hottiti, once seen around Central Dhaka, are now only to be found in peripheral areas such as Ashulia, Savar and Uttara. Besides these creatures, Dhaka is also home to bats, monitor lizards (gui shap), squirrels, snakes, garden lizards (rokto chosha), pangolin (bonrui); although almost all of them are on the brink of extinction.

4.3 Economic Development

4.3.1 Demography

The population of Dhaka city (areas under the jurisdiction of the Dhaka city corporation) stands at approximately 6.7 million. The city, in combination with localities forming the wider metropolitan area, is home to an estimated 11.9 million. The population is growing by an estimated 4.2 percent per annum, one of the highest rates amongst Asian cities. The continuing growth reflects ongoing migration from rural areas to the Dhaka urban region, which accounted for 60 percent of the city's growth in the 1960s and 1970s. More recently, the city's population has also grown with the expansion of city boundaries, a process that added more than a million people to the city in the 1980s.

4.3.2 Economic Activity

Dhaka is the fastest growing city in the world, but all its economic activities are unplanned, which poses a question whether the growth of the city would be sustainable. Dhaka is the commercial center of Bangladesh. According to Cambridge University's 2014 analysis, the total nominal Gross State Product (GDP) of Dhaka was US$37 billion, accounting for 35% of Bangladesh's economy. Dhaka is also home to major Bangladeshi industrial conglomerates such as Beximco Holdings Ltd, Bashundhara Group, Jamuna Group, Pran-RFL Group, BSRM, etc. Many foreign establishments such as Glaxo Smith Kline, Heidelberg Cement, ReckittBenckiser, HSBC, British American Tobacco, and Nestle have their regional headquarters located in Dhaka.

Additionally, Dhaka is characterized by roadside markets and small shops that sold a wide variety of goods. Recent years have seen the widespread construction of shopping malls, multiplexes, hotels and restaurants attracting Dhaka's growing middle-class and wealthy residents. Along with Bangladeshi cuisine and South Asian variants, a large variety in Western and Chinese cuisine are served at numerous restaurants and eateries.

4.3.3 Transport

Cycle rickshaws and auto rickshaws are the main mode of transport for the inhabitants of the city, with close to 400,000 rickshaws running each day — the largest number for any city in the world. However, only about 80,000 rickshaws are licensed by the city government. Relatively low-cost and non-polluting, cycle rickshaws nevertheless cause traffic congestion and have been banned from many parts of the city. Public buses are operated by the state-run Bangladesh Road Transport Corporation (BRTC) and by private companies and operators. Scooters, taxis and privately-owned automobiles are becoming increasingly popular with the city's growing middle-class. The government has overseen the replacement of two-stroke engine taxis with "Green taxis," which run on compressed natural gas.

Dhaka has 1,868 kilometers of paved roads. It is connected by highways and railway links to Chittagong, Khulna, Mymensingh, Rajshahi, Faridpur and Sylhet. Highway links to the Indian cities of Kolkata and Agartala have been established by the BRTC which also runs regular bus services to those cities from Dhaka. The Kamalapur Railway Station and the Airport (Biman Bandar) Railway Station are the main railway stations providing trains on suburban and national routes operated by the state-run Bangladesh Railway. The Sadarghat Port on the banks of the Buriganga River serves the transportation of goods and passengers upriver and to other ports in Bangladesh, and South Asia. The Hazrat Shahjalal International Airport is the largest and busiest in the nation. The state-run Biman Bangladesh Airlines is the primary airline corporation based at the airport, although private carriers are gaining popularity.

5 Socio Cultural Resources

Dhaka is the most populous city of Bangladesh and is characterized by its busy urban life with vibrant and versatile culture including many festivities, variety of cuisine, entertainment industry, shopping experience and sites of interests. Despite the growing popularity of music groups and rock bands, traditional folk music remains widely popular. The works of the national poet Kazi Nazrul Islam and national anthem writer Rabindranath Tagore have a widespread following across Dhaka. The Baily Road area is known as Natak Para (Theatre Neighborhood) which is the center of Dhaka's thriving theatre movement. Indian and Western music and films are popular with large segments of Dhaka's population.

5.1 Archaeology, Cultural and Historical Places

The following are archaeological and cultural sites of Dhaka City. Proposed P3.1 Project does not affect these places.

The Old City of Dhaka is home to over 2000 buildings built between the 16th and 19th centuries, which form an integral part of Dhaka's cultural heritage.

- Lalbagh Fort is 6.6km away from P3.1 intervention
- Ahsan Manzil is 6.73km away from P3.1 intervention
- Dhakeshwari Temple is 5.87km away from P3.1 intervention
- Shankhari Bazar is 6.5km away from P3.1 intervention
- Swamibagh Temple is 5.95 km away from P3.1 intervention
- Ramna Kali Mandir is 4.8km away from P3.1 intervention
- Dhaka Sadarghat is 7 km away from P3.1 intervention
- Armanitola Star Mosque, Armenian quarter is 6.14 km away from P3.1 intervention
- Farashganj, French quarter is 7.21 km away from P3.1 intervention

The project P3.1 is not located within any sensitive historical, cultural, and archaeological area. However, the distance from P3.1 and locations of these physical and cultural resource (PCR) sites are detailed in Appendix I.

5.2 Public Consultation

The formal consultation meetings carried out with the communities are summarized in Table 11. In addition, during the site visits and social surveys, extensive smaller group discussions on specific environment and social issues were held. Suggestions and concerns of the affected persons focused mostly on temporary impact. Specific concerns with respect to pedestrian and vehicle movement, dust, noise, solid waste and liquid drilling mud pollution participation of communities during drilling, carrying out drilling activities without any adverse impacts on the water quality of the river, etc. have formed the basis for formulation of Table 11.

Table 11: Public Consultation

Sl. No.	Place, Date	Participants	Purpose of Consultation	Key Issues Discussed
2	Dhaka North City Corporation, Uttara,	CEO, Executive Engineer and commissioner of Dhaka	Consultations with the local commissioner and CEO of Dhaka North City corporation at Uttara on the GI 132 borehole drilling and	• Awareness campaign should be done before starting the borehole drilling. • The major problem is pedestrian and vehicle movement during borehole drilling and pipeline construction since the area is very busy all the time.

Sl. No.	Place, Date	Participants	Purpose of Consultation	Key Issues Discussed
	Sector-6, of the proposed P3 pipeline location Date: 16.04.2107	north city corporation No. of participants:9	pipeline laying on P3 component activities and understanding grievances of the communities, if any	• The area of borehole drilling will be cordon off by caution tape in order to restrict the area. • No trees and establishment will be affected during the borehole drilling. • CEO request to perform the drilling work at night so the disturbance and noise generation will be less. Noise less equipment should be used • Dust pollution should be suppressed by water spraying • The community said that they have not any objection regarding soil test through borehole drilling and pipe laying along the P3 alignment. • Executive engineer of DNCC ask to provide the GI borehole log drawing for locating the utilities services at road side for avoiding cutting and damages by shifting the borehole location slightly if any. • Income loss should be compensated • The contractor should be asked for to avoid any damage of trees, utility service line damage, pedestrian and vehicle movement and have flexibility of freedom to shift the location of borehole point by few feet.

Additional public meetings have been held on 13 September, 29 September and 13 November on 2018. Activities to be implemented during construction and operation of P3.1 have been presented and discussed. The meeting minutes, attendance sheets and conclusions are found in Appendix G. The consultations met the ADB SPS requirements for meaningful consultations. The details participations and percentage of females of those meetings are tabulated bellow:

Table 12: Details of Public Consultations participations

PC Meeting Date	% Female	Total Participants
16.04.17	0	09
13.09.18	68	22
29.09.18	3	82
13.11.18	17	29

Details are provided in Appendix-G.

6 Anticipated Environmental Impacts and Mitigation Measures

Potential environmental impacts of the proposed P3.1 is presented in this section. Mitigation measures listed in this section are applicable to all the components of Package 3.1. Mitigation measures to minimize/mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to monitor and to evaluate the impact.

Screening of potential environmental impacts are categorized into three categories considering P3.1 project: design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

i. Design impacts include impacts arising from Investment Program design, including technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.
ii. Construction impacts include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
iii. O&M impacts include impacts arising from the operation and maintenance (O&M) activities of the infrastructure facility. These include routine management of operational waste streams, repair of pipe leakages, and occupational health and safety issues.

6.1 Planning and Design Phase

Location impacts include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.

Technical design of the Primary distribution pipelines (P3.1), follows the relevant MDSC (MML) planning and design guidelines, focusing on providing a robust system which is easy to operate, sustainable, efficient and economically viable. Following environmental considerations are to be included in the project:

i. Pressurized distribution system: designing the entire system to maintain optimal flow and terminal pressure, and optimizing the overall energy usage
ii. Minimizing water losses from pipelines by perfect jointing and alignments using appropriate techniques
iii. Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies.

6.2 Construction Phase

Main civil works in the P3.1 include laying of water supply pipelines (distribution lines). All works will be confined to linear sites, and construction will include general activities like site clearance, and excavation for foundations. Since these works are confined to the boundary of identified sites, there is no direct interference of construction work with the surrounding land use. However, construction dust, noise, use of local roads for transportation of construction material, waste, labor camps etc., will have temporary negative impacts, which needs to be avoided or mitigated properly. Distribution lines will cover all habitations and will be laid along main and all internal roads in the project area. Pipelines will be buried along the roads using open cut method.

Sufficient care will be taken while laying so that existing utilities and cables are not damaged, and pipes are not thrown into the trenches or dragged, but carefully laid in the trenches. As trenches are only 3.4m deep, there risk of collapse of trenches or damage to surrounding structures is minimal or negligible. However, necessary precautions will be taken depending on the soil conditions, and if required measures such as bracing or shoring in the trench will be provided. Once they are laid, pipes will be joined as per specification and then tested for any cracks or leakages.

Although pipe laying work involves quite simple techniques of civil work, the invasive nature of excavation and pipeline alignment in the built-up areas where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general (near injection point-Badda). These anticipated impacts are temporary and for short duration, however, needs to be mitigated.

Other anticipated impacts during the construction phase are discussed below along with appropriate mitigation measures to avoid, minimize or mitigate those impacts to acceptable levels.

Air Quality:

Construction work, especially from earthwork activities, coupled with dry and windy working conditions, material and debris transport, and works along the public roads carrying significant traffic, have high potential to generate dust. Also, emissions from construction vehicles, equipment, and machinery used for excavation and construction will induce impacts on the air quality. Anticipated impacts include dust and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons. Dust generation will be significant during pipeline laying along the roads. Increase in dust/ particulate matter in ambient air is detrimental and may have adverse impacts on people and environment. To mitigate the impacts, construction contractors will be required to:

For Pipeline Works;

i. Barricade the construction area
ii. Initiate site clearance and excavation work only after barricading of the site is done
iii. Confine all the material, excavated soil, debris, equipment, machinery (excavators, cranes etc.), to the barricaded area
iv. Limit the stocking of excavated material at the site; remove the excess soil from the site immediately to the designated disposal area (DNCC designated disposal sites at Matuail, Gabtoli and Uttara).
v. Undertake the work section wise
vi. Conduct work sequentially - excavation, pipe laying, backfilling; conduct pipe testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done.
vii. Remove the excavated soil of first section to the disposal site; as the work progresses, sequentially, by the time second section is excavated, the first section will be ready for back filling,
viii. Backfilled trench at any completed section after removal of barricading will be the main source of dust pollution. The traffic, pedestrian movement and wind will generate dust from backfilled section. Road restoration shall be undertaken immediately.

Surface Water Quality. Run-off from stockpiled materials and chemicals from fuels and lubricants during construction works can contaminate surface water quality of the water bodies, streams, Gulshan Lake, Hatir Jheel Lake, and other open water bodies', canals. Project area receives considerable rainfall, although mostly confined during the monsoon months. There are a number of water bodies/ponds along the roads, where pipelines will be laid. It is important that runoff from the construction areas, which may contain silt and chemical traces do not enter these water bodies. Impact will be temporary but needs to be mitigated.

Construction contractor will be required to:

i. All earthworks be conducted during the dry season to prevent the problem of soil run-off during monsoon season;
ii. Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
iii. Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used
iv. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies
v. Place storage areas for fuels and lubricants at least 50 m away from any drainage leading to water bodies
vi. Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling
vii. Dispose any wastes generated by construction activities in designated sites; and
viii. Conduct surface quality inspection according to the Environmental Management Plan (EMP).

Groundwater Quality. Another physical impact that is often associated with trench excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. In the project area, groundwater depth is shallow, there are numerous water bodies and ponds, and it also receives high rainfall during the monsoon. Conducting excavation works during non-monsoon season will certainly help, but due to high water table, water may collect in pits as they are excavated. To avoid this the contractor needs to implement the following measures:

i. Pump out the water collected in the pits, and channelize water into low areas, under bridges and culverts to ponds or wetlands preventing any erosion of land.
ii. Consider safety aspects related to pit collapse due to accumulation of water

Generation of Construction Wastes. Solid wastes generated from the construction activities are excess excavated earth (spoils), discarded construction materials, cement bags, wood, steel, oils, fuels and other similar items. Domestic solid wastes may also be generated from the workers' camp. Improper waste management could cause odor and vermin problems, pollution and flow obstruction of nearby watercourses and could negatively impact the landscape.

The following mitigation measures to minimize impacts from waste generation shall be implemented by the contractor:

i. Prepare and implement a Construction Waste Management Plan
ii. As far as possible utilize the debris and excess soil in construction purpose, for example for raising the ground level or construction of access roads etc.,
iii. Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed to designated areas immediately (DNCC designated sites)
iv. If immediate disposal is required, the site shall be selected preferably from barren, infertile lands; site should be located away from residential areas, water bodies and any other sensitive land uses.
v. Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; create a compost pit at workers' camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material shall be collected separately and sold in the local recycling material market.
vi. Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed of in disposal sites approved by DNCC;
vii. Prohibit burning of construction and/or domestic waste;
viii. Ensure that wastes are not haphazardly thrown in and around the project site; provide proper collection bins and create awareness to use the dust bins.

ix. Conduct site clearance and restoration to original condition after the completion of construction work; PMU to ensure that site is properly restored prior to issuing of construction completion certificate

Further to note that, following a meeting with DNCC on 26 May 2019 with Dr. Tarek, PD of a project, DNCC. Followings are the meeting results (also detailed in Appendix-J):

4. Presently DNCC has no such identified dumping site for hazardous waste. Amin Bazar dumping site is for kitchen waste only and it is almost full. Matuail dumping site condition is same.
5. DNCC have a proposal for new dumping site which is in Ministry to get approval and will take time to materialize, not within coming 2 -3 years.
6. DNCC thinks in Madani Avenue waste are not hazardous. Those are mostly rubbish, building materials, plastic bags and kitchen waste which can be dumped in DNCC Transfer station or dumping site with DNCC permission and may cost for the contractor for transportation to DNCC.
7. Outside Dhaka city there are hardly any hazardous waste along the pipe route. Contractor may sell the excavated soil to the developer or individual land owners to raise their land because presently they are filling their land with costly river sand and demand is very high.
8. Inside Dhaka, contractor may sell or give free the excavated soil to the interested inhabitants but need to find those interested land owners.
9. DNCC helped to take excavated soil of Metro Rail Project to DNCC dumping site at Amin Bazar to develop their future extension land. PMU together with contractor may approach for this kind of assistance if there is a possibility.

Noise and Vibration Levels. Most of the works are to be implemented in urban setting, with densely populated habitation areas and surrounding extensively urban establishment. Noise and vibration impacts are likely to be minimal as most of the pipeline route sites located along the streets over the DNCC/RHD road shoulders. The sensitive receptors are the general population in these areas. Increase in noise level may be caused by breaking of bitumen roads for laying of pipelines, operation of construction equipment like concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearby houses/buildings. This impact is negative but short-term, and reversible by mitigation measures. The construction contractor will be required to:

i. Plan activities in consultation with PMU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
ii. Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor;
iii. Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
iv. Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
v. Consult local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.

Accessibility. Excavation along the roads for laying of pipelines, hauling of construction materials and operation of equipment on-site can cause traffic problems. Works related to primary and secondary pipeline laying will be confined to the DMA sites, therefore there is moderate or direct interference of these works with the traffic and accessibility, electric supply underground cables, underground telephone cables. Hauling of construction material, equipment, construction waste, etc., to and from the work site may increase the road traffic on local roads, which are not in good condition. This will further inconvenience the local community and road users. Potential impact is negative but short term and reversible by mitigation measures.

i. Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites
ii. Drive vehicles in a considerate manner
iii. Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

Pipeline Works

i. Confine work areas along the roads to the minimum possible extent; all the activities, including material and waste/surplus soil stocking should be confined to this area. Provide barricading; avoid material/surplus soil stocking in congested areas – immediately removed from site/ or brought to the as and when required;
ii. Leave spaces for access between mounds of soil to maintain access to the houses / properties;
iii. Provide pedestrian access in all the locations; provide wooden/metal planks over the open trenches at each house to maintain the access;
iv. Inform the affected local population 1 week in advance about the work schedule;
v. Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum;
vi. Keep the site free from all unnecessary obstructions;
vii. Coordinate with Police for temporary road diversions, where necessary, and for provision of traffic aids if transportation activities cannot be avoided during peak hours.

Socio-Economic – Employment. Manpower will be required during the construction stage. This can result in generation of temporary employment and increase in local revenue. Thus, potential impact is positive and long-term. The construction contractor will be required to employ local labor force as far as possible.

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

i. Comply with national labor laws;
ii. Develop and implement site-specific occupational health and safety (OHS) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OHS Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
iii. Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
iv. Provide medical insurance coverage for workers;
v. Secure all installations from unauthorized intrusion and accident risks;
vi. Provide health and safety 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;
vii. Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
viii. Ensure moving equipment is outfitted with audible back-up alarms;
ix. The use of hearing protection shall be enforced actively;
x. Provide supplies of potable drinking water;
xi. Provide clean eating areas where workers are not exposed to hazardous or noxious substances

Land Use, Impact and Risk Analysis

The analysis of project impacts and risks is the technical heart of the environmental assessment process, providing a comprehensive net appraisal of the project's effects on the environment and socioeconomic conditions. Potential impacts and risks have been evaluated according to laws and regulations of Bangladesh and ADB's requirements as set out in the safeguard policy statement (SPS 2009).

Type and Scope of Impacts and Risks

Impact analysis considered potential environmental impacts and risks of the project, while focusing on the major ones identified through scoping exercise. The analysis has covered both adverse and beneficial effects over time to fully describe the net project effect. Adverse environmental impacts are negative impacts on physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and cultural resources. Notable benefits could be environmental (e.g. landscaping along the treated water pipeline route for enhancing aesthetic view and protection of pipeline corridor, indirectly reduces emissions of pollutants and greenhouse gases), and social (e.g. the project provides jobs).

Impact analysis should consider the following features when they are potentially affected by the project, Table-13.

- **Physical** – surface and ground water, air, soil, land use, landform/topography, noise, vibration, geology, seismicity and other natural hazards, resource use, waste, greenhouse gases, etc.
- **Biological** – terrestrial and aquatic flora and fauna, habitat and ecosystems, endangered or critically endangered species, protected areas, etc.
- **Socioeconomic** – occupational health and safety, community health and safety, impacts on vulnerable groups and gender issues, impacts on livelihoods (e.g. river pollution or river flow reduction decreases downstream fishing yields)
- **Physical cultural resources** – movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance.

However, the above features are not affected by the P3.1 Project, except during construction period, localized water and air pollution, noise, waste generation, etc will occur.

Table 13: Land Use P3.1, Impacts and Risk Factors

Sl. No	Section (in meter)	Description	Risk Factor (intensity in ascending order +/- 1 to 5)	Remarks
1.	000 to 970 (section D)	Pipeline dia 1200mm DI pipe starts from Nutun Bazar injection point along Progoti Sarani on the western edge of the road of DNCC towards south direction	-3	At 970m pipe crosses under the existing culvert
2.	993 to 1907 (section D)	Pipeline dia 1200mm DI pipe continues along Progoti Sarani on the western edge of the road of DNCC	-0	At 1907m pipe dia reduces to 1000mm DI
3.	1907 to 2292 (section D)	Pipeline dia 1000mm DI pipe continues along Progoti Sarani on the western edge of the road of DNCC	0	At 2292m pipe dia reduces to 800mm DI
4.	2292 to 2592 (section D)	Pipeline dia 800mm DI pipe continues along Progoti Sarani on the western edge of the road of DNCC	0	At 2592m DI pipe changes to HDPE pipe

Sl. No	Section (in meter)	Description	Risk Factor (intensity in ascending order +/- 1 to 5)	Remarks
5.	2592 to 3274 (section D)	Pipeline dia 800mm HDPE pipe continues up to Rampura bridge along Progoti Sarani on the western edge of the road of DNCC	0	At 3274m Rampura bridge
6.	000 to 480 (Section E)	Pipeline dia 630mm HDPE pipe starts from Natun Bazar injection point and continues towards west to Kakoli along Kamal Ataturk Road on the northern edge of the road of DNCC	-1	At 480m pipeline crosses an existing culvert diverting through Gulshan lake
7.	480 to 1447 (Section E)	Pipeline dia 630mm HDPE pipe continues towards west to Kakoli along Kamal Ataturk Road on the northern edge of the road of DNCC	-1	At 1447m pipeline crosses an existing culvert diverting through Banani Lake and reduces to 500mm DI
8.	1447 to 2400 (Section E)	Pipeline dia 560mm HDPE pipe continues towards west to Kakoli along Kamal Ataturk Road on the northern edge of the road of DNCC	0	Pipeline ends at Airport road
9.	000- 200 (Section F)	Pipeline dia 2X1400mm DI pipe starts from Nutun Bazar injection point along Progoti Sarani on the eastern edge of the road of DNCC towards north direction	-2	At 200m pipeline crosses median from east to west side of the road
10.	200 to 2865 (Section F)	Pipeline dia 2X1400mm DI pipe continues point along Progoti Sarani on the eastern edge of the road of DNCC towards north direction up to Kuril shaft location	-3	At 2865m Kuril Shaft Location for Railway and Highway crossings
11.	2865 to 2950 (Section F)	86m tunnel crossing of 2.5 m dia to cross railway and highways	-3	Railway and Highway crossings
12.	000 to 1200 (Section G)	Pipeline dia 800mm HDPE turns towards west from shaft location along northern edge of the Airport road	-1	At 1200m pipe crosses under the existing culvert infront of Radisson hotel
13.	1238 to 1658 (Section G)	Pipeline dia 800mm HDPE turns towards west from shaft location along northern edge of the Airport road	0	At 1658m pipe bends towards Zia Colony road
14.	1658 to 2363 (Section G)	Pipeline dia 800mm HDPE pipe continues along Zia Colony road on the northern edge of the road owned by Dhaka Cant. Board	-2	-
15.	2363 to 2555 (Section G)	Pipeline dia 710mm HDPE pipe continues along Zia Colony road on the northern edge of the road owned by Dhaka Cant. Board	0	At 2555m pipe dia reduces to 300mm HDPE
16.	2555-2588 (Section G)	Pipeline dia 300mm HDPE pipe continues along Zia Colony road on the northern edge of the road.	0	-
17.	000 to 1700 (Section H)	Pipeline dia 1600mm DI turns towards north from shaft location along western edge of the Airport road	-1	At 1700m an existing culvert crosses near Nikunja-2
18.	1700 to 4461 (Section H)	Pipeline dia 1600mm DI continues towards north along western edge of the Airport road	-1	At 4461m an existing culvert crosses in Jasimuddin

Sl. No	Section (in meter)	Description	Risk Factor (intensity in ascending order +/- 1 to 5)	Remarks
19.	4461 to 4838 (Section H)	Pipeline dia 1600mm DI continues towards north along western edge of the Airport road	0	At 4838 pipe dia reduces to 1400mm
20.	4838 to 5645 (Section H)	Pipeline dia 1400mm DI continues towards north along western edge of the Airport road	0	At 5645m pipeline dia reduces to 1200mm
21.	5645 to 6394 (Section H)	Pipeline dia 1200mm DI continues towards north along western edge of the Airport road	0	At 6394m pipeline reduces to 450mm HDPE
22.	6394 to 6966 (Section H)	Pipeline dia 450mm HDPE continues towards north along western edge of the Dhaka Mymensingh Highway road	0	Pipeline ends at Abdullahpur
23	000 to 700 (Section J)	Pipeline dia 1000mm DI starts from Muscat Plaza towards west along Sonargaon Jonapath Road at the southern edge	-1	At 700m pipeline crosses underneath a pipe culvert
24.	700 to 984 (Section J)	Pipeline dia 1000mm DI continues along southern edge of Sonargaon Jonopath road	0	At 984m pipeline reduces to 800mm HDPE
25.	984 to 2245 (Section J)	Pipeline dia 800mm HDPE continues along southern edge of Sonargaon Jonopath road	-1	At 2197m DI pipeline crosses a bridge underneath in front of Rupayan city
26.	000 to 668 (Section K)	Pipeline dia 900mm DI starts from Jasimuddin road bus stand towards west along Jasimuddin Road at the southern edge	0	Pipeline ends at the end of Jasimuddin road

Pipe line detail, Contract : P3.1

Name of Section	Dia wise Length of Pipes in kilometer										Total Length (Km)	ROW (M)	Owner	Vegetation	Trees	Utilities	Area for Material storage	Excess materials
	1600	1400	1200	1000	900	800	710	630	560	450								
Section D			1.91	0.418		0.941					3.269	10.00	DNCC	Nil	Nil	Gas, electricity, water pipe	Private/ DWASA land	21707
Section E								1.42	0.978		2.398	8.00	DNCC	Nil	Nil	Sewer, gas, water & electricity line	Private/ DWASA land	10569
Section F		5.33									5.33	10.00	DNCC	Nil	Nil	Gas, water and Electrical	Private/ DWASA land	45412
Section G						2.363	0.192				2.555	8.00	RHD/ Cant Board	Nil	Nil	Gas & elictrical line	Private/ DWASA land	13487
Section H	4.838	0.842	0.693							0.591	6.964	10.00	RHD	Nil	Nil	Gas, Electricity & Drainage	Private/ DWASA land	61680
Section J				0.985		1.21					2.195	10.00	DNCC	Nil	Nil	Sewer	Private/ DWASA land	12631
Section K					0.983						0.983	8.00	DNCC	Nil	Nil	Gas line	Private/ DWASA land	5696
Length	4.838	6.172	2.603	1.403	0.983	4.514	0.192	1.42	0.978	0.591	**23.694**							
Trench Width	2.600	2.400	2.200	2.000	1.900	1.800	1.710	1.630	1.560	1.450	Total Volume							
Trench Depth	3.750	3.550	3.350	3.150	3.050	2.950	2.860	2.780	2.710	2.600								
Volume	47171	52585	19184	8839	5696	23969	939	6435	4135	2228	171181						Total	171181

Maps showing the existing land use are provided in the Biddings Documents in SECTION 4 TECHNICAL REQUIREMENTS APPENDIX A.

6.3 Operation and Maintenance Phase

6.3.1 Operation and Maintenance Impacts

Anticipated impacts of water distribution system during operation and maintenance (O&M) will be related to detection and repair of leaks, pipe bursts. These are, however, likely to be minimal, as proper design and selection of good quality pipe material shall mean that leaks are minimal. Leak repair work will be similar to the pipe-laying work. Therefore, no notable operation phase impacts are anticipated from the P3.1 Project.

However, the stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required.

Recurrence of pipe bursting and leakage problems can be managed by the leak detection, rectification and water auditing surveys. DWASA will be required to ensure that the leak detection and rectification time is minimized.

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

7 Public Consultation and Information Disclosure

7.1 Public Consultation

The active participation of stakeholders including DNCC, local community, NGOs, etc., in all stages of project preparation and implementation is essential for successful implementation of the project. It will ensure that the P3.1 Project is designed, constructed, and operated with utmost consideration to metropolitan needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure are a must as per the ADB policy.

Public consultation has been conducted at Azampur Gov. Primary School, Uttara, Dhaka-1230 on 13 November 2018. The main objective of the meeting was to share project related issues like house connection, access to connection permission, illegal connection, project supports, grievance redress mechanism, cooperation & coordination from the community, social safeguard and environmental matters with the participants. Participants of the meetings were teachers, guardians, businessmen, house owners, house wives, civil society representatives. A Total of 29 participants attended the meeting and 17% of them are female.

Most of the main stakeholders have already been identified and consulted during preparation of this IEE, and any others that are identified during project implementation will be brought into the process in the future. The stakeholders of P3.1 are: DNCC, residents, shopkeepers, NGOs and business people who live and work near sites where facilities will be built RHD, BWDB, LGED, beneficiary community in general, and the ADB (Table 12; Appendix G).

7.2 Information Disclosure

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

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

DNCC and DSCC and relevant stakeholders will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction.

8 Grievance Redress Mechanism

8.1 Complaints and Grievance Mechanism

A Grievance Redress Committee (GRC) has been formed at PMU level and will be established at the community level in each Union to resolve complaints and grievances informally through community participation. The GRC formed with representatives from the DWASA, local elected representatives from the Local Government Institutions (LGI), INGO, AHs, women AHs to allow voices of the affected communities to be heard and ensure a participatory decision-making process. The representative of the INGO will have the responsibility as Member Secretary of GRC. The GRC decision will be disposing up on a priority basis and be publicized among the local communities. Where the complaining parties are not satisfied with the GRC decisions, they can file their cases in the court of law.

The GRC will be established at the community level at Union Parishad through a gazette notification from the Ministry of Local Government, Rural Development and Cooperatives (MLGRDC).

The Member Secretary of GRC will be regularly available and accessible for AHs to address concerns and grievances. Female member of GRC and the female APs of the AHs will participate in the grievance redress session when the complainants will be a female. Legal advisor and DORP will support the GRC regularly and assist the APs to formulate their complaints. The grievance cases will be recorded with details and results of the cases. The EMA will review the cases;

8.2 Scope and Jurisdiction of GRC

The scope of work and Jurisdiction of GRC are:

1. The Grievance Redress Committees (GRCs) will be established to ensure stakeholders' participation in the implementation process and fair compensation to affected persons.
2. The APs can also call upon the resettlement NGO to assist them in presenting their grievances or queries to the GRC.
3. The GRCs will receive grievance cases from the affected persons through the resettlement implementation NGO.
4. Other than disputes relating to ownership right and award of compensation by the Deputy Commissioner under the Court of Law, GRCs will review grievances involving all resettlement assistances, relocation, and other supports. Grievances will be redressed within 21 days from the date of lodging the complaints. In cases of complicated cases requiring additional investigations it will be resolved within a period of one month.
5. Grievances of indirectly displaced persons and/or persons displaced during project implementation will also be addressed by the GRC.
6. Where land acquisition will not be involved but relocation of structures or vacating land for cultivation will be required, the GRCs will facilitate resolution of complaints regarding categorization of vulnerable affected persons, types of structures, and eligibility for compensation and assistance within the set guidelines and provisions of the resettlement plan.
7. Any complaints of ownership or other suits to be resolved by the judiciary system will not be resolved in GRCs. GRC will resolve all complaints, grievances related to compensation entitled by affected persons.

8. The decisions of the GRC should be ideally be arrived at through consensus, failing which resolution will be based on majority vote. Any decision made by the GRC must be within the purview of social, resettlement and environmental policy framework.
9. A minimum of 4 (four) members shall form the quorum for the meeting of GRC.
10. If needed the GRC members may undertake field visit to verify and review the issues at dispute, including titles/share, reasons for any delay in payment or other related matters.
11. In case the resolution is not accepted by the AP, the grievance will be forwarded to Project Director for final decision.

8.3 Filling Grievance Cases and Documentation

AHs will be able to file their grievances without any fear and intimidation. Where required, the implementing NGO will assist the AHs in drafting the grievances. All grievances must be submitted in writing to the Convener, GRC. The complainant may be represented by AHs him/herself or appointed agent such as locally elected officials/legal advisors. The judgment made by the GRC will be communicated to the concerned AH in writing. If dissatisfied, and with the agreement of the GRC, the AH may request a further review of the judgment of GRC by the Project Director. In such case, the case will be forwarded to the PD with all documents. If the disputant still remains unsatisfied, he/she can go to the court of law.

GRC procedures and operational rules will be publicized widely through community meetings and pamphlets in the local language so that AHs are aware of their rights and obligation, and procedures of grievance redress.

To ensure access and fast response to any project-related grievances from the affected people and communities, contact numbers and names of focal persons in the DWASA PMU/SIU responsible for any complaints and grievances will be posted in public areas, contractor's field offices, UP offices, and NGO field offices.

All GRC documents will be maintained by the INGO for review and verification by MDSC and ADB. DWASA field offices will act as secretariat to the GRCs. As a result, the record will be up-to-date and easily accessible on-site.

The GRC meeting will be held in the respective field office of DWASA, DORP Office or other location as agreed by the Committee. If needed, the GRC members may take field visits to verify and review the issues at dispute, including ownership/shares, reasons for any delay in payments or other relevant matters. The complaints and grievances from the AHs will be addressed through the process described in the Table below.

Table 14: Grievance Resolution Process

Steps	Action Level	Process
Step 1	Counseling	The NGO will recommend that the DPs submit their complaints to the GRC. NGO staff assists the DPs filing the complaints (maximum 7 days); Complaints and grievances from displaced person will first be heard during personal contact and focus group discussion at the village levelwith the involvement of the SIU social safeguard officer. If not resolved within 14days; The DORP will counsel AHs for gaps in information about the policy and eligibility for compensation and resettlement assistances. The DPs will sign and formally submit the written report to the GRCs at the office of the NGO assisting DWASA in implementing the RP; If the complaint found outside the mandate of the GRC, the DORP will advise the aggrieved AHs to lodge their complaints in the court of law at the district level. If the complaint is within the jurisdiction of GRC, the DORP will advise the aggrieved AHs to formally lodge their complaints with the GRC.

Steps	Action Level	Process
Step 2	GRC Resolution	Member Secretary of the GRC will scrutinize the complaints and prepare case file for hearing and resolution. A formal hearing will be held before the GRC at a date fixed by the Member Secretary of GRC in consultation with the convener and other aggrieved AHs. On the date of hearing, the aggrieved AHs will appear before the GRC at a place set in consultation with the AHs and DWASA and procedure proof in support of his/her claim. The Member Secretary will note down the statement of the complainants and documents with all proofs. GRC will deliver its decision on complaints/grievances within 21 days from the date of grievance received. The decisions from majority of the members will be considered final from the GRC and will be issued by the Convener and signed by other members of the GRC. The case records will be updated and the decision will be communicated to the complainant AHs by the Member Secretary of the GRC at the village level.
Step 3	Decision from PMU, DWASA	If any aggrieved AHsis not satisfied with the GRC decisions, the next option will be to lodge grievances to the Project Director of the DESWSPat Dhaka within two weeks after receiving the decision from the GRC. The AHs, in the complaint, must produce documents supporting his/her claim. The PD with the assistance of the Resettlement Experts, MDSC will review the proceedings of the GRC hearing and convey its decisions to the aggrieved AHs within two weeks after receiving the complaint.
Step 4	Decision from PD	If the resolution from PMU fails to satisfy the aggrieved AHs, they will facilitate to forward their case for further review and settlement with the office of the Chief Engineer, DWASA at Dhaka. The aggrieved AHs will submit the petition with all documentary evidences of complaints and the resolution proceeding of step 2 and 3 within two weeks after the decisions from the PMU.
Step 5	GRC Minutes Communicating	The GRC minutes, approved by the project director, will be received at the conveners' office. The approved verdict is communicated to the complainant DP in writing.
Step 6	Decision from Court	If the grievance redress system fails to satisfy aggrieved AHs, they can go/pursue further action by submitting their case to the appropriate court of law at the District level.

8.4 Approval of GRC and Entitlements of GRC Members

Upon formation, all GRC members will attend a training and orientation meeting prior to commencement of their work. The training will be conducted by the project staff and consultants/Resettlements Experts.

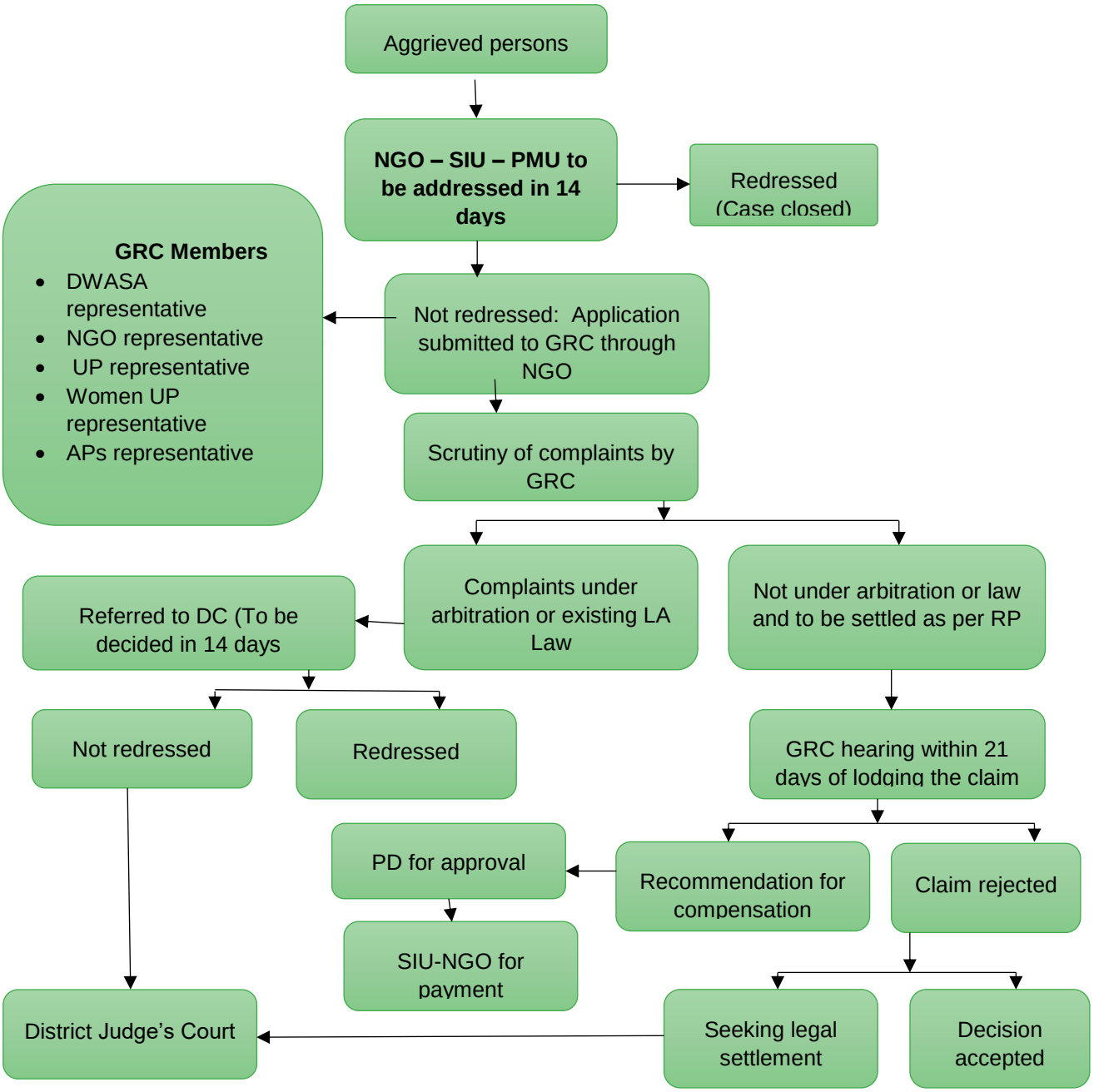
The GRC members (except DWASA and DORP representative) will be entitled to Tk.1000/meeting as honorarium from the implementing budget. Light snacks/refreshments will be provided during the meetings under the RP budget. DORP will make necessary stationery and other logistic available.

The Project Director, PMU, DESWSP will finally approve any decisions and proceeding of the GRC meetings. The approved GRC decisions will be implemented on site within the framework of the Resettlement Plan.

The details procedures for redress of grievances and the appeals process will be shared and documented.

The GRC could hear the grievances once in 15 days. Since the entire resettlement, process has to be completed before construction works starts. The GRC could meet more than once in every 15 days depending upon the number of such cases. The GRC will inform the concerned AHs of their decisions within 21 days of the hearing of the grievances. The GRC will continue during the whole construction period (Appendix H provides the composition of GRC members at PMU level).

Figure 5: Grievance Redress Mechanism (GRM)



8.5 Grievance Redress Monitoring

The Deputy Project Director (Resettlement), PMU, DESWSP will keep records of all the grievances and their redress in monthly cumulative formats, which are to be signed by the Convener of the GRC. The format will contain information on the number of grievances received, resolved, and number of unresolved grievances. The monitoring information and findings on grievances will be included in the quarterly report to ADB.

8.6 Summary

The basic concern of the affected people is to get proper compensation for their lost land and livelihoods in a smooth manner without the interference of any middlemen. The discontents of the locals can be mitigated following proper resettlement plan, which has already been prepared as a separate document. At present no AP's are identified along P3.1 site, but during the construction period if some people appears to be affected, at that time, GRC Committee will provide compensation as per ADB Safeguard Policy 2009.

9 Environmental Management and Mitigation

9.1 Environmental Management Plan

An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels. The EMP will guide the environmentally-sound construction of the P3.1 Project and ensure efficient lines of communication between DWASA, project management unit (PMU), consultants and contractors. The EMP will:

i. ensure that the activities are undertaken in a responsible non-detrimental manner;
ii. provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site;
iii. guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject;
iv. detail specific actions deemed necessary to assist in mitigating the environmental impact of the Project; and
v. ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on-and off-site, document checks, and interviews with workers and beneficiaries.

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

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

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

The following Tables 15, 16, 17 & 18 show the potential environmental impacts, proposed mitigation measures and responsible agencies for implementation and monitoring.

Further to conclude, the environmental management will cover following activities:

- Preparation of a detailed Environmental Management and Monitoring Plan (EMMP) but with sections, which deal with any additional matters relating to specific project activities. The EMMP will address fully the nature and extent of other related departments involvement in environmental management, and will provide cost estimates for environmental management and monitoring;

- Preparation of detailed designs which give due consideration to minimization of adverse impacts and benefit enhancement;
- Preparation of tender and construction contract documentation which contains appropriate clauses to allow control of impacts arising from construction activities;

Responsibility for reviewing of IEE, preparation of the EMMP, detailed design, and the preparation of tender and contract documentation lies with the study and design consultants, who are providing this service to DWASA. Overall responsibilities for environmental management in these respects will, therefore, lie with the consultant's Team Leader, supported by his environmental team, and the contract document specialist.

The management, design and supervision consultant will be responsible for preparing site plans showing the extent of land that will have to be acquired in order to accommodate the project works, together with an estimate of land and property acquisition costs, for inclusion in the project budget. Appendix A to D provides recommendations for tender documents.

EMP implementation will be included in PAM during loan processing, in bid documents and in contract documents. Environmental safeguard requirements are included in the bid and contract documents.

Table 15: Pre-construction Phase Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Existing Utilities	Impact on telephone lines, electric underground cables, water lines within proposed P3.1 and P3.2 routes	(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii)Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services.	DBO Contractor in collaboration with and approval of PMU	(i) List of affected utilities and operators; (ii) Bid document to include requirement for a contingency plan for service interruptions waste management plan and traffic management plan	Project cost
Construction work camps, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the project location; (ii) Do not consider residential areas; (iii) Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. (v) prepare Layout plan of the work camp including description of precautionary measures (vi) prepare sewage management plan, e.g. installation of (temporary) cesspits, safe disposal of sewage from the camp (vii) prepare waste management plan, collection, segregation and disposal of waste, combustible waste to be disposed properly as adviced by Resident Engineer. non- combustible, non-recyclable garbage sent to the designated landfill site, (viii) prepare layout plan of equipment maintenance area, lubricant and fuel storage area, car wash area must be at least 50m away from surface water	DBO Contractor to finalize locations in consultation and approval of PMU	(i) List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas. (ii) Written consent of landowner/s	Project cost

Table 16: Construction Phase Environmental Impacts and Mitigation Measures

Location	Potential Impact	Duration/ Extent	Magnitude	Mitigation Measures	Responsibility
all construction sites	Loss of trees	perm	mod	Trees within the corridor of impact (area required for construction) will be felled after approval by the construction supervision Three trees of the same species shall be planted for each tree to be felled	CSC
All construction sites	Assets/facilities lost, including common property resources and religious structures	perm	Mmod	Designs to be worked out to minimize impacts on these assets. Compensation and assistance will be provided in accordance with the provisions of the RP.	Design Build Contractor, and CSC
	Impact on fish ponds and fish	perm	mod	Designs to ensure cross-drainage through the provision of balancing culverts and sufficient cross-movement, including movement of fishes, shall be done to minimize severance impacts on khals and fish ponds cut across by the alignment.	
	Soil erosion	perm	Mmod	The measures to address soil erosion at the proposed facilities will consist of measures as per design, or as directed by the SC to control soil erosion, sedimentation, and water pollution. All temporary sedimentation, pollution control works, and maintenance thereof will be deemed incidental to the earthwork or other items of work.	Design-Build Contractor and CSC
	Construction Stage				
	-Malaria risk of accidents Risk of diseases (dengue fever, HIV Aids)	Temporary	Moderate	At every workplace, a readily available first aid unit, including an adequate supply of sterilized dressing material and appliances, will be provided as per the factory rules. Suitable transport will be provided to facilitate the transfer of injured or ill persons to the nearest hospital. At every workplace and construction camp, equipment and nursing staff will be provided. The contractor will, at his own expense, conform to all disease prevention instructions given to him by the CSC. All relevant provisions of the Bangladesh Labor Act, 2006 and Bangladesh National Building Code, 2006 will be adhered to, concerning the provision of adequate safety measures during construction. The contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches, and safe means of entry and egress.	Design Build Contractor and CSC
	Insufficient hygiene in the construction camps and sites	temp	Mmod	All temporary accommodations will be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking, and washing. Safe drinking water in sufficient quantity for the workforce will be provided at the construction site as well as at the construction camps. dequate toilets, separate for women and men, shall be provided at the construction sites, with septic tanks. Sewage management plan for the work camp has to be prepared by the contractor and agreed with the construction	Design Build Contractor and CSC

Location	Potential Impact	Duration/ Extent	Magnitude	Mitigation Measures	Responsibility
				supervision. Garbage bins will be provided in the camps and regularly emptied, and the garbage disposed of in a hygienic manner. A waste management plan for the work camp has to be prepared by the contractor and agreed with the construction supervision.	
				Adequate health care will be provided for the workforce. Unless otherwise arranged for by the local sanitary authority, the local medical health or municipal authorities will make arrangement for disposal of excreta. On completion of the works, all such temporary structures will be cleared away, all rubbish disposed, excreta tank and other disposal pits or trenches filled in and effectively sealed off, and the outline site left clean and tidy, at the contractor's expense. The site will be restored to pre-project conditions through the removal of all extraneous material on site.	
	Risk caused by force majeure	Ttemp	Mminor	All reasonable precaution will be taken to prevent danger to the workers and the public from fire, flood, drowning, etc. Specifically, the contractor will (i) provide medical and accident insurance for workers; (ii) provide first aid in the construction campsite; and (iii) provide access to hospitals/clinics within the project site that can be accessed in case of emergency by arranging necessary transport for safe carriage of the injured.	Design Build Contractor and CSC
	Child labor Risk of contractors or subcontractors hiring child labor in the construction activities.	Temporary	Minor	National laws on child labor will strictly followed. No child labor will be allowed by the contractors or subcontractors in any of the project activities.	Contractor and CSC
	Risk of injury<	temp	mod	Awareness of workers about hazardous materials and proper handling methods. Warning signs, labels and signals. Provide helmets, safety shoes and other PPE for workers in accordance with accident prevention and work safety procedures	
	Dust Pollution • Impact Sources Emissions from construction related traffic and machinery. • Dust from works, carrying machinery equipment to the site, and traffic from trucks and vehicles. Road damage	empTemporary	Mod	A The contractor will (i) take every precaution to reduce the levels of dust at construction sites, and not exceeding the pre-project ambient air quality standards; (ii) fit all heavy equipment and machinery with air pollution control devices that are operating correctly; (iii) reduce dust by spraying stockpiled soil, excavated materials, and spoils; (iv) cover with tarpaulin vehicles transporting soil and sand; and (v) cover stockpiled construction materials with tarpaulin or plastic sheets. Implement measures in Environmental Code of Practice of Air Quality Management. Dust generation will be restricted as much as possible and water sprinkling carried out as appropriate, especially where earth moving and excavation are carries out.	Design Build Contractor and CSC

Location	Potential Impact	Duration/ Extent	Magnitude	Mitigation Measures	Responsibility
				Emissions during trench digging, excavations, equipment and traffic will comply with ADB EHS guidelines and will be monitored. pray of water is suggested in the road and construction sitesCapacity of truck load should stay below capacity of road	
	Air pollution (SPM, PM2.5, PM10, SOx, NO2 and CO) • Impairment of air quality may have an impact on workers, local residents and surrounding environment • Air pollution generated from exhaust of engines. Emission from drilling vehicle and machine			Trenching and transport vehicles shall move only in designated areas and roads. Water spraying to access roads to reduce dust emissions Machines and vehicles must be regularly examined and maintained to comply with requirements of technical specifications Repair and maintain access roads, as necessary	Design Build Contractor and CSC
	Noise and Vibration from construction equipment	Temp	Mod	The contractor will ensure (i) regular maintenance of vehicles, equipment, and machinery to keep noise from these at a minimum; and (ii) all vehicles and equipment used for construction will be fitted with exhaust silencers. During routine servicing operations, the effectiveness of exhaust silencers will be checked, and if found to be defective, will be replaced.	Design Build Contractor and CSC
	Disturbance to business, people, activities and socio-cultural resources due to construction work	temp	mod	The contractor will provide the following measures during the laying of transmission mains for sections in the vicinity of habitations and commercial and institutional areas, to minimize access and livelihood disruption: (i) place walkways and metal sheets where required to maintain access across trenches for people and vehicles; (ii) increase workforce in front of critical areas such as institutions, places of worship, business establishments, hospitals, and schools; (iii) consult businesses and institutions regarding operating hours and factoring this into work schedules; and (iv) provide signboards for pedestrians to inform them of nature and duration of construction works and contact numbers for concerns/complaints.	Design Build Contractor and SC
	Emission from construction vehicles, equipment, and machinery	temp	Mmod	All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant requirements of DoE. Copies of conformance will be submitted regularly to the CSC.	Design Build Contractor and CSC
	Socio-economic benefits from employing local people in construction work	temp	mod	To the extent possible labour force should be drawn from the local community	Design Build Contractor and CSC
	soil contamination due to leakages with mineral oil	temp	mod	• Provide double walled fuel tanks or store single walled fuel tanks in collecting basin for refuelling construction engines • Provide modern non-leaking equipment • Provide mineral oil adhesive agent	Design Build Contractor and CSC

Location	Potential Impact	Duration/ Extent	Magnitude	Mitigation Measures	Responsibility
				Collect contaminated soil and dispose it on a landfill	
	Excavation of contaminated soil and waste	temp	mod	Proper disposal of contaminated soil and waste at designated landfill	Design Build Contractor and CSC
	Contamination of ground water and surface water	temp	mod	• Prevent pollutants from contaminating the soil and the ground water • Storage of lubricants and fuel at least 50 m from water bodies • Storage of fuel and lubricants in double hulled tanks • Daily control of machinery and vehicles for leakages • Collection of waste during construction activities • Provide uncontaminated water for dust suppression Enclose the construction area to prevent unauthorized access	Design Build Contractor and CSC
	ust pollution and water pollution due to stockpiling of construction materials and excavated earth from trenches	temp	mod	Due consideration will be given to material storage and construction sites such that it doesn't cause any hindrance to daily traffic movement. The contractor will (i) consult with implementing agency on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; (ii) avoid stockpiling of earth fill, especially during the rainy season, unless covered by tarpaulins or plastic sheets; (iii) prioritize reuse of excess spoils and materials in the construction works; and (iv) protect surface water bodies from any source of contamination, such as oily wastes, debris, and spoils that will degrade its quality. • Excavated material shall not enter surface waters, surface water banks or impede flows - in particular, the following shall be done: • do not dump material in surface waters, at river banks or in flooding areas, in case rivers have been blocked remove the material	Design Build Contractor / CSC
	Disturbance of residents and local business	temp	mod	The movement of construction materials and equipment, to the extent possible, will be planned along major roads, with the exception of access roads to the site. In the event of movement of construction vehicles and equipment on the narrow roads, strengthening of these roads will be carried out, and timing of movement of heavy vehicles worked out to avoid peak hours and nighttime, and to ensure minimal disturbances to the communities and the resident population along these roads. Construction traffic has to be consulted with traffic police and local affected institutions.	Design Build Contractor and CSC
	Disturbance/nuisance/noise due to construction activity including haulage of material/waste	temp	mod	• Plan transportation routes in consultation with rural authorities, road department, and Police • Schedule transportation activities by avoiding peak traffic periods • Clean wheels and undercarriage of haul trucks prior to leaving construction site	Design Build Contractor and CSC

Location	Potential Impact	Duration/ Extent	Magnitude	Mitigation Measures	Responsibility
				• Educate drivers: limit speed between 20-25 km/h in settlements and avoid use of horn • Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement • Provide prior information to local people about work; • No night time construction activities including material/waste haulage • Construction activities must be prohibited from 9pm to 7am Noise barriers must be installed in housing areas to reduce the noise level.	
	ollution of soil and water with hazardous substances (mineral oil, grease and lubricant) Oil spillage, grease and lubricant	temp	mod	aintenance of machinery will be conducted at safe distance (at least 50m) from watercourses so that no oil spills can enter the water.	Design Build Contractor and CSC
	ontamination of soil and water resourcesgro	perm	mod	For effluents to be discharged from work place, camps, and offices, treatment arrangements such as retention ponds and septic tanks will be incorporated in the facility designs. A sewage management plan has to be prepared by the contractor and agreed with the construction supervision.	
	Impact on archeological sites - chance findings	perm	mod	In the event of an archaeological chance find at the construction site, the contractor will prevent workmen or any other persons from removing and damaging any chance find artifacts and will, immediately upon discovery thereof, inform the SC of such discovery and carry out the CSC's instructions for dealing with the same, awaiting which all work will be stopped for 100 m in all directions from the site of discovery. The CSC will seek direction from the Department of Archaeology before instructing the contractor to resume work on the site.	Design Build Contractor and CSC
	Loss of access to residents, businesses, and institutions during construction.	Ttemp	Mmod	The contractor will provide safe and convenient passage for vehicles and pedestrians through diversions to and from side roads, and property access connecting the project roads. The contractor will ensure that (i) the construction works do not interfere with the convenience of the public or access to, use, and occupation of public or private roads, or any other access to properties, whether public or private. Temporary access to properties adjacent to the construction site will be provided through the construction of ramps with concrete slabs for use of pedestrians and light vehicles; (ii) in critical areas such as institutions, operating hours are factored into work schedules and workforce is increased for speedy completion; (iii) advance information on works to be undertaken including appropriate signages, is provided; and (iv) the diversion is done in coordination with the traffic police division for necessary rerouting of traffic and traffic management.	Design-Build Contractor and CSC
	Damages to utilities and services during construction	Ptemp	mod	The contractor will be required to: (i) plan for immediate attendance by the service providers to any damages to utilities during construction; (ii) replace (or compensate for) public and private physical structures damaged due to construction or vibration; and (iii) provide prior public information about the	Design-Build

Location	Potential Impact	Duration/ Extent	Magnitude	Mitigation Measures	Responsibility
				likely disruption of services. In consultation and with support from DWASA, the contractor will provide alternative arrangements for water supply in the event of disruption beyond a reasonable time, for instance, through tankers.	Contractor and CSC
	• Loss or impairment of private property Clearing of construction camps and restoration	temp	mod	Written compensation arrangement and consent between property owner and contractor The contractor will prepare site restoration plans for approval by the CSC. The plan will be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish properly disposed by authorized contractor, excreta or other disposal pits or trenches filled in and effectively sealed off, and the site left clean and tidy, at the contractor's expense. The site will be restored to pre-project conditions through the removal of all extraneous material on site. During the site clearance and earthwork, it the necessary to be careful about the following: • No soil erosion occurs, plantation can be done to protect soil erosion • No landslides occur • No siltation occurs at the disposal site of soil and debris.	Design Build Contractor and CSC
	Impact on soil and topography due to abstraction of construction material / due to construction activities	perm	mod	Responsibility of the contractor to- (i) obtain approval of implementing agency if new quarries and borrow sites are necessary, abstract construction material like gravel and sand from licensed quarries only (ii) store stripped materials as not to disrupt natural drainage and protect them to prevent erosion and migration of soil particles into surface waters; (iii) provide temporary ditches and/or settling basins to collect run-off water and to prevent erosion and contamination of surface water; (iv) plant exposed areas with suitable vegetation at the earliest opportunity and prevent ponding of water through temporary drains discharging to natural drainage channels; (v) restore sites after construction activities by stabilizing contours and slopes, spreading stripped materials to promote percolation and re- growth of vegetation, and draining any standing water. Land utilized for quarry sites access roads will also be restored,	Design-Build Contractor and CSC
	Disposal of bituminous wastes / construction waste / debris / cut material / hazardous material	temp	mod	For project components involving demolition of structures, the contractor will prepare and implement a waste management plan. Safe disposal of the extraneous material will be ensured in the pre-identified disposal locations. To enable minimization of waste disposal and do this in an environmentally safe manner, the waste management plan will consider to (i) recover used oil and lubricants and reuse in adequate storage facilities or remove from the site; (ii) manage solid waste according to the following preference hierarchy: reuse, recycle, or dispose of in designated areas; (iii) reuse bituminous waste generated in road construction, based on its suitability for reuse, to the maximum extent possible. Cut material generated because of construction will be utilized as filling material. Remaining material	Design Build Contractor and CSC

Location	Potential Impact	Duration/ Extent	Magnitude	Mitigation Measures	Responsibility
				if any will be disposed of safely at the disposal sites; (iv) remove all wreckage, rubbish, or temporary structures that are no longer required; and (v) restore pre-project environmental conditions through the implementation of environmental restoration work.	
All construction sites	Impacts due to excavation and generation of surplus soil	temp	mod	surplus soil for beneficial purposes such as in construction or to raise the ground-level of low-lying sites	Design Build Contractor and CSC
All construction sites	Erosion due to excavation/refilling	temp	mod	• Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer • •Avoid scheduling of excavation work during the monsoon season • Confine construction area including the material storage (sand and aggregate) so that runoff from upland areas will not enter the site Ensure that drains are not blocked with excavated soil	Design Build Contractor and CSC
All construction sites	Stripping, stocking, and preservation of topsoil	temp	mod	• The topsoil from productive agricultural lands, borrow areas, and areas to be permanently covered will be stripped to a specified depth of 200 mm and stored in stockpiles. The stockpile will be designed such that the slope does not exceed 1:2 (vertical to horizontal), and the height of the pile will be restricted to 2 m. Stockpiles will not be surcharged or otherwise loaded, and multiple handling will be kept to a minimum to ensure that no compaction will occur. The stockpiles will be covered with gunny bags or tarpaulin. It will be ensured by the contractor that the topsoil will not be unnecessarily trafficked, either before stripping or when in stockpiles. Such stockpiled topsoil will be returned to cover the disturbed area and cut slopes.	Design-Build Contractor and CSC

Abb.: temp – temporary; mod – moderate; perm – permanent

Table 17: Operation Phase - Environmental Impacts and Mitigation Measures

Location	Potential impact	Duration / Extend	Mag	Mitigation Measures	Responsibility
P3 area	Environmental conditions	perm	mod	DWASA will undertake seasonal monitoring of air, water, noise, and soil quality through an approved monitoring agency. The parameters to be monitored, frequency and duration of monitoring, as well as the locations to be monitored will be as per the monitoring plan prepared.	DWASA, O&M Contractor
P3 area	Check for blockage and leakage problems	temp	mod	leak detection and water auditing to reduce the water losses	DWASA

Location	Potential impact	Duration / Extend	Mag	Mitigation Measures	Responsibility
	reducing the water losses				

Table 18: Construction Stage Environmental Monitoring Plan

Monitoring Field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Cost and Source of Funds
Construction disturbances, nuisances, public and worker safety	All work sites	Implementation of dust control, noise control, traffic management, and safety measures.	Weekly during construction	Supervising staff and safeguards specialists	No costs required
Ambient air quality	13 locations (to be selected during implementation to represent the overall project area	PM10, PM2.5 NOx, SO2, CO	Once before start of construction Quarterly (yearly 4-times) during construction (2-year period considered)	Contractor	part of construction costs
Ambient noise	Selected locations (same as air quality monitoring)	Day time and night time noise levels (24 hours)	Once before start of construction Quarterly (yearly 4-times) during construction (2-year period considered)	Contractor	part of construction costs

9.1.1 Implementation Arrangements

DWASA is the Executing and Implementing Agency for the DESWSP, responsible for management, coordination and execution of all activities funded under this project. PMU, established within the DWASA, will implement the project. PMU will be headed by a Project Director (PD). The environmental officer already recruited in PMU in July 2015, responsible to deal with project related environmental issues, coordinate with the MDSC environmentalists and conduct stakeholder's consultation meetings. PMU with the support of MDSC Consultant will be responsible for planning, implementation, monitoring, supervision, and coordination of all activities under the DESWSP.

The DWASA will be responsible for day-to-day monitoring of project activities and will ensure compliance with the statutory and legal requirements of the Government, and ADB. The DWASA will prepare and submit an updated IEE and Project Monitoring Reports to ADB. The DBO contractor will bring responsibility of implementation of EMP. EMP implementation will be the part of the DBO contract document. All cost for implementing EMP will be the part of the civil works contract and to be quoted by the contractor in their proposal as per this IEE.

This IEE will be the part of the contract document. Environmental monitoring will be done during construction in three levels; namely

- monitoring development of project performance indicators done by the Environmental Specialist of the Design Supervision Consultant (Dr Thomas Balling,International Expert and Syed Latif, National Expert.
-
- monitoring implementation of mitigation measures done by the Contractor;
- and overall regulatory monitoring of the environmental issues done by Safeguard Officer (Environmental Mr Saidur Rahman) and Safeguard Officer (Social and Gender, Mr Tofazzal Hossen), PMU of the DWASA.

The environmental monitoring plan for the Project is presented in Table 18. The table shows proposed monitoring of all relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards and responsible agencies. The monitoring of the environmental attributes in the first season (first year of implementation) will be carried out prior to the start of implementation works at the site and shall form a baseline for the environmental parameters. Monitoring will be the responsibility of civil works contractors who would likely outsource this responsibility (Bid Document Package 3.1, Section 8, Part-B, Specific Provision of the PCC, Clause 4.18 Protection of Environment).

9.1.2 Capacity Building

At DWASA, the present capacity on safeguards planning and implementation is not adequate to handle safeguard issues. To ensure effective implementation of environmental aspects as outlined in this IEE, a DWASA environmental safeguard officer/responsible person will be recruited to oversee Environment Management Plan (EMP) implementation ADB components. The Design Supervision Consultant's Environmental Specialists will train and assist the DWASA according to the training program outlined below, to ensure smooth implementation and monitoring of the EMP.

The proposed capacity building program will include:

i. sensitization of DWASA staff and stakeholders on environmental management, including on the ADB, and Government of Bangladesh requirements on environment;

ii. capacity building programs to improve the capability of environment staff at all levels in carrying out/monitoring and implementing environmental management measures for the Project; and

iii. capacity building programs on environmental issues including quality monitoring.

The Environmental Specialist of the Project Management Design and Supervision Consultant (PMDSC) will provide the basic training required for environmental awareness followed by specific aspects of infrastructure improvement projects along with environmental implications for projects. Specific modules customized for the available skill set will be devised after assessing the capabilities of the members of the Training Program and the requirements of the Project. The entire training would cover basic principles of environmental assessment and management mitigation plans and programs, implementation techniques, monitoring methods and tools. The proposed training program along with the frequency of sessions is presented in Table 19. Further to note that, environmental training will be implemented before construction activities will start.

9.1.3 Environmental Budget

IEE costs include monitoring costs during construction and capacity building costs on environmental management of which are absorbed into contractor's work packages. The costs for training proposed include the costs incurred toward site visits, travel to the training program by participants, printing of training materials, and other logistic arrangements. The costs involved towards preparation of training material and training are covered in the consultancy budget for the Design Supervision Consultant. The budget for the environmental management costs for the Project is presented in Table 19 below.

The cost estimates mentioned in Table 19 is an indicative price. The bidder can provide their own reasonable quoted rate. The bidder will include the detail cost of EMP in the Summary Cost Table.

Further to note, this budget (USD 15,478.75 indicated in Table-20 of IEE) should be reviewed by the Contractor, and used for implementing the EMP.

As such, these costs must be included in the Contract Document along with a copy of IEE. The EMP implementation integrated in PAM, and in bid and contract document should be reviewed by Contractor.Further to mention that the contractors will include the costs for EMP and OHS implementation during project implementation.

Table 19: Training Modules for Environmental Management

Program	Description	Participants	Form of Training	Duration	Trainer /Agency
Introduction and sensitization to environment issues	Sensitization on Environmental concerns Environmental impacts of urban infrastructure improvement projects Environmental regulations of the Government and ADB environmental regulations Coordination between departments for implementation of environmental issues	DWASA engineers / management team, officials responsible for implementing the Project, and other DWASA Officials and Environmental Inspectors	Workshop	One-day workshop during construction	Project Management, Design and Supervision Consultant's Environmental Specialist/ DWASA

Program	Description	Participants	Form of Training	Duration	Trainer /Agency
Project training on hazards, health, safety and environmental issues pertaining to the Project	Sensitization and training for engineering and Management professionals, to be involved in on-site execution and operation of the proposed facilities.	DWASA engineers/ management Team, environmental inspectors	Workshops, site visits	Two days before and during construction	MDSC
EMP implementation	Implementation of EMP Identification of environment impacts Monitoring and reporting for EMP Public interactions and consultations Coordination for consents with various departments Monitoring formats filling and review of impacts	DWASA engineers, officials responsible for implementing the Project, and other DWASA / Design Supervision Consultant staff	Lectures and field visit	Two-day session at construction stage	Project Management, Design and Supervision Consultant's Environmental Specialist

Table 20: Cost Estimates to Implement the EMP

Sl. No.	Particulars	Stages	Unit	Total number	Rate (BDT)	Cost (BDT)	Costs covered by
• Mitigation Measures							
A 1	Environmental mitigation / enhancement measures integrated into the designs and costs included as part of civil works	Construction					DB Contractor (Design Build Contractor)
	Sub-Total (A)					300,000.00	
• Monitoring Measures							
B 1	Air Quality monitoring	Construction	Per location	12	20,000.00	240,000.00	DB Contractor
B 2	Noise level	Construction	Per location	12	7,500.00	90,000	DB Contractor
B 3	Noise level	Operation	Per location	1	7,500.00	7,500.00	DWASA
B 4	Water Quality monitoring	Construction	Per location	4	8,000.00	32,000	DB Contractor
B 5	Water Quality monitoring	Operation	Per location	3	8,000.00	24,000.00	DWASA
B 6	Adequacy of solid waste management system	Post construction & operation	Per visit	9	10,000.00	90,000.00	DWASA

Sl. No.	Particulars	Stages	Unit	Total number	Rate (BDT)	Cost (BDT)	Costs covered by
B 7	Survival Rate of Plantation and landscaping	Operation	Per location	4	25,000.00	100,000.00	DWASA
B 8	Socioeconomic monitoring	Operation	Per location	4	25,000.00	100,000.00	DWASA
	Sub-Total (B)					683,500.00	
C	Capacity Building						
C 1	Introduction and sensitization to environmental issue	Pre-construction	LS	-	-	50,000.00	DB Contractor
C 2	Project training on hazards, health, safety, and environmental issues	Pre-construction	LS	-	-	100,000.00	DB Contractor
C 3	EMP implementation	Construction	LS	-	-	100,000.00	DB Contractor
	Sub-Total (C)					250,000.00	
	Total (A+B+C)					12,33,500.00	
	Total (in USD) @ 80.0 Taka					15,478.75	

10 Conclusion and Recommendations

The impacts during the construction of P3.1 pipeline is primarily due to the trenching and clearing of the solid wastes and are briefly described in the following paragraphs.

The proposed project will not have any significant adverse impacts on the environment since the project activities will be limited within the pipeline corridor. The impacts of the project are site-specific, reversible and are confined within the property. The construction sites do not impair any ecologically sensitive area or cultural site of importance.

Most of the adverse impacts are likely to occur during the construction phase and are considered as temporary in nature. The anticipated adverse environmental impacts are manageable and can be mitigated through proper design and consideration of the proposed mitigation measures.

There will be water pollution, sanitation, and health hazards due to presence of workers camp. Adequate water supply and toilet facilities will be established at the construction camp.

Construction health and safety plan, waste management plan and sewage management plan shall be required from the contractor, including provision of first-aid facilities to provide measures and procedures in addressing occupational health and safety at the construction site.

Based on the analysis conducted in this assessment it is concluded that overall the project will result in significant positive socio-economic benefits, and those potential negative environmental impacts that have been identified are small-scale and local and can be minimized adequately through good design and the appropriate application of mitigation measures. It is therefore recommended that the project be supported by ADB, subject to the implementation of the commitments contained in the EMP and allocation of appropriate technical, financial and human resources by implementing agencies such as DWASA, Construction Supervision Consultant and Contractors to ensure these commitments are effectively and expediently implemented.

Appendices

A. Recommendations for Tender Documents Construction Supervision and O&M Contract MDSC, DESWSP

The physical works of P3.1 are being designed by an engineering consultant (MML), who is also preparing the tender documents. Construction will be carried out by a contractor selected by international competitive bidding (ICB) in accordance with the Asian Development Bank's (ADB) rules for procurement of works. The Bank's Standard Bidding Documents for Works have a specific format, agreed between many of the multilateral development banks and based on the well-known standard documents developed over the years by the International Federation of Consulting Engineers (FIDIC).

As such, this Appendix provides guidance on environmental and social topics which should be considered for incorporation into the project contracts.

In order to protect the sensitive environment, accelerate the flow of benefits and to establish a high-quality example for project sites and other buffer areas to follow, it is recommended that the following points should be included in this document:

The Clauses need to be included in the tender documents are:

1. The Contractor shall follow the Environmental Management Plan (EMP). The Contractor can access EMP on request.

2. In order to ensure the compliance with proposed mitigation and monitoring measurements required under the EMP, the Contractor shall closely liaise and coordinate with the Consultant's Environmental and Social Safeguard Specialists.

3. Environmental and Social Officers (at least qualified Graduate in environmental science/ engineer with relevant experience) as per field requirement shall be appointed by the Contractor.

4. The Contractor shall ensure compliance with the labor laws and pertinent occupational health and safety regulation of Bangladesh, and ADB. The Contractor shall ensure that all workers are supplied with and use the relevant protection, safety equipment on the construction site. Abstain from employing child labor.

6. The Contractor is responsible for the fulfilment of the conditions stated in the «Permit for emissions into the environment and EMP.

8. Monitoring: The O&M contractor is likely to be in the best position to elaborate and implement the necessary physical monitoring programs:

B. General Requirements for Workers Health and Safety

The key salient features of the general requirements for the workers' health and safety are presented in Table-A2.1.

Table-A2.1: General Requirements for Workers Health and Safety

Issues	***Requirements***
Health and Hygiene	• Cleanliness • Proper ventilation and temperature • Protection against dust • Disposal of wastes and effluents • Proper illumination • Provision of adequate latrines and urinals • Sufficient spittoons and dustbins.
Safety	• Safety for building and equipment • Precautions in case of fire • Fencing of machinery • Precautions during work on or near machinery in motion • Monitoring against carrying of excessive weights
Compensation for accidents at work	• Contractor's responsibility for compensation • Amount of compensation • Report on fatal accident and treatment • Compensation on contract and contract registration • Scope for appeal
Dust and Fumes	• For any dust or fumes or other impurities likely to be injurious to the workers, effective measures shall be taken to prevent its accumulation and its inhalation by workers.
Latrines and urinals	• Sufficient latrines and urinals shall be provided • Shall be maintained in clean and sanitary condition • Shall be adequately lighted and ventilated.
Precautions in case of fire	• Firefighting apparatus should be provided and maintained.
First aid	• First aid facility should be provided and maintained. • Shall be kept with a responsible trained person who shall be available during the working hours
Disposal of wastes and effluents	• Provide with proper disposal system for solid waste and effluents.

Issues	***Requirements***
Compensation	• If personal injury is caused to workmen by accident arising in the course of employment, employer (Contractor) shall be liable to pay compensation • Monthly payment as compensation for temporary disablement should be considered in a reasonable way.

C. Set Up and Management of Contractors Camp

1. Camp Set Up and Management

Careful planning and a concern for health, safety and the environment are essential for good project management under MDSC of DESWSP. The Contractors' field camps should provide adequate working, eating and sleeping arrangements for field personnel and should be appropriately equipped to encourage employees to work safely and efficiently.

Consider the following factors when selecting a camp site:

a) Time of residence: Will the camp be in operation for a field season or year-round?
b) Duration: Temporary or a permanent establishment
c) Accessibility: Transportation access may impact the site selection
d) Required permits:

2. Risks and Hazards Associated with Contractor Camps

The following are the possible risks associated with the camp.

- Fires caused by improper fuel storage, fuel use, and fuelling practices; faulty equipment or failure to turn off equipment; exploding fuel tank; clothes draped above heaters or on electrical wires; failure to extinguish open fires or cooking fires;
- Illnesses spread by contaminated water, food or sewage contaminated drinking water;
- Diseases spread by local mosquitoes, insects, parasites, and vermin.
- Electrocution, electric shock, or burns caused by inadequate or improper wiring, lack of qualified personnel to install or repair electrical equipment, and lack of adequate employee training;
- Cuts, burns caused by spilled hot food or liquids, misuse of kitchen equipment, hot equipment (generators, heating stoves/ovens);
- Injuries or occupational illness caused by exposure to hazardous materials.

3. Alcohol and Drug Policies

Contractors should have a clear and concise policy to address alcohol and drugs at project and camp sites. The policy should conform to regulations of the Government of Bangladesh. The Contractors should respect the wishes of local communities, especially when working in or near a "clustered" community. There should be a provision for employees to sign off that they understand the policy and regulations.

4. Workplace Hazardous Materials Information System (WHMIS)

Usually less obvious hazardous products are those used in camp kitchens such as cleaning agents (oven cleaner) and chlorine bleach, chemicals required for water treatment (not always applicable if the pipe supply exist). The degree of risk depends on the quantity, toxicity, concentration, whether the material is flammable, explosive or under pressure.

Site location: Consider the arrangement of the camp in relation to the required setback from water bodies, the organization and optimum space requirements for storage, water and sewage systems, fuel storage area, road access, core handling areas, as required.

Fire: Assess the potential fire hazards, whether for lightning strike. Consider the prevailing wind direction and the requirements of emergency evacuation plans when organizing the site layout. Include an examination of Material Safety Data Sheets (MSDS) for controlled products that may pose a fire risk.

Wind: Pay special attention to wind direction and the possibility of (1) the spread of fire to or from fuel storage areas, (2) blowing dust from road, (3) the potential cooling effect of wind in warm climates. Locate vehicles, fuels, waste disposal areas etc., downwind from camps. Avoid windswept areas such as ridges or gullies to minimize wind damage.

Waste Management

Proper waste management is fundamental to camp safety. Project management should determine how waste products are ultimately handled – whether they are recycled or subject to various treatment and disposal options. Depending on the regulations, it may be advisable to seek expert advice to develop a waste management program. It is essential to eliminate potential camp sewage discharge or spills that may contaminate surface and ground water, eliminate potential disease-causing organisms and smells from accumulations of waste deposits that attract wildlife, including vermin.

General tips regarding waste management.

- Secure required permits and follow all applicable regulations of the Environment Department of Bangladesh, waste classification, management and disposal, including for any hazardous waste products that may be produced at the site.

Waste storage areas:

- All waste storage areas should have restricted access to limit entry by employees, the public and animals.
- Provide fly-tight garbage containers in convenient locations. Maintain containers so they do not become foul smelling, unsightly or breeding place for flies.

Camp sewage: Treat and maintain camp sewage as appropriate for the site and size of camp. A proper sewage and/or latrine system is necessary to control potential water contamination, odors and diseases. Construct and maintain latrines (when permitted) where chemical or water flush or other types of toilets are not used.

- Construct and maintain all camp sewage toilets correctly;
- Prevent flies, insects, and rats from gaining access to waste materials;
- Prevent surface or ground water from entering the pit or vault;
- Prevent waste material in the privy from contaminating any water supply;
- Self-closing seat covers are advisable and should be in operation at all times.

If latrines are permitted, latrines must conform to public health standards or to any conditions stipulated in work permits. Locate a latrine at least 100 m from any stream or shoreline. It should be downwind from camp and at least 30 to 40 meters away from the kitchen area. Locate hand washing facilities between the latrine and camp to promote hygiene. A good place is at the beginning of the access path to the latrine.

D. Traffic Management Plan

1. INTRODUCTION

This Traffic Management Plan (TMP) provides the traffic management procedures to be followed by the vehicle users of Contractors' while implementing the construction/reconstruction works of ESWSP activities. The vehicle operators should be careful that, road users are not limited to motorists - they include pedestrians, such as school children and people with disabilities, cyclists and emergency vehicles.

2. Traffic Management Objectives and Strategies

The objectives of the TMP are to:

- Provide for a safe environment for all road users;
- Provide protection to Contractors' operators and the general public from traffic hazards that may arise as a result of the driving of vehicles;
- Minimize the disruption, congestion and delays to all road users;
- Ensure access to adjacent private/commercial premises is maintained at all times.

To achieve the above objectives, the Traffic Management Plan will:

- Ensure whenever possible, that a sufficient number of traffic lanes to accommodate vehicle traffic volumes are provided.
- Ensure that delays and traffic congestion are kept to a minimum and within acceptable levels
- Ensure that appropriate/sufficient warning and information signs are installed and that adequate guidance is provided to delineate the travel paths through the event site.
- Ensure that the roads are free of hazards and that all road users are adequately protected from activities of road users
- Ensure that all needs of road users, motorists, pedestrians, cyclists, public transport passengers and people with disabilities are accommodated at and through the site of the event.

A Traffic Management Plan is a key workplace document that has legal standing. As such it is critical that the structure and content of the Plan is sufficient to explain the potential hazards, the assessed risks and the proposed treatments for the proposed work activities and work site. The TMP should include all of the following. Where any of the following sections are not applicable, the TMP should indicate this accordingly.

<u>Introduction</u>

- Purpose and Scope,
- Objectives and Strategies.

<u>Project Overview</u>

- Project Location,

- Project Details and Site Constraints/Impacts

Project Representatives (Principal for the Works; Principal Contractor)

Safety Plan
- Occupational Safety and Health;
- Competencies;
- Responsibilities- Role, responsibility and authority of key personnel, management hierarchy including site representatives and contact details of the responsible personnel;
- Communicating TMP requirements;
- Prior approvals (if any) granted by the RHD (Roads and Highways department), City Corporation or Municipality with relevant reference number.

Trip Hazards & Environmental Conditions
- Weather;
- Vegetation;
- Existing signage;
- Structures.

Worksite Access
- Pedestrians;
- Cyclists;
- Works vehicles;
- Emergency vehicles;
- Public Transport;
- Property Access;
- School crossings;
- Impact on adjoining Road Network;
- Heavy and Oversized Vehicles and Loads;
- Legal and Other Requirements.

Emergency Arrangements and Contingencies
- Emergency Services;
- Dangerous Goods;
- Damage/Failure to Services (Traffic signals, street lighting, power, gas);
- Contingency Planning (Road crash or vehicle breakdown, serious injury or fatality);
- Emergency Contacts.

E. Approval letter of EIA DESWSP DWASA

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Dhaka-1207
www.doe.gov.bd

Memo No: DoE/Clearance/5231/2013/264 Date: 21 /05/2015

Subject: Approval of Environmental Impact Assessment (EIA) Report for Water Treatment Plant under Dhaka Environmentally Sustainable Water Supply Project of Dhaka WASA.

Ref: 1) Application dated 05/02/2015.

With reference to the above, the Department of Environment (DOE) is pleased to approve Environmental Impact Assessment Report for Water Treatment Plant at Gandharbpur, Rupganj under Dhaka Environmentally Sustainable Water Supply Project of Dhaka WASA .This approval authorizes and regulates the following activities:

1. Project Proponent may undertake activities for land development and infrastructural development of the said Sub-Component;
2. Project Proponent may open L/C (Letter of Credit) for importing machineries for the Sub-Component which shall also include machineries relating to pollution control devices;
3. Activities must be carried out in a competent manner. This includes:
   (a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
   (b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.
4. Construction works shall be restricted to day time hours so as to avoid/mitigate the disturbance of local lives as well as implementation schedules of the works shall be notified in advance to nearby residents.
5. Storage area for soils and other construction materials shall be carefully selected to avoid disturbance of the natural drainage.
6. Proper construction practices shall be followed that minimize loss of habitats & nursery sites.
7. In order to control noise pollution, vehicles & equipment shall be maintained regularly; working during sensitive hours and locating machinery close to sensitive receptor shall be avoided.
8. Proper and adequate on-site precautionary measures and safety measures shall be ensured so that no habitat of any flora and fauna would be demolished or destructed.
9. All the required mitigation measures suggested in the EIA report are to be strictly implemented and kept operative/functioning on a continuous basis.

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10. Any heritage sight, ecological critical area, and other environmentally and/or religious sensitive places shall be avoided during construction phase.
11. Resettlement plan should be properly implemented and people should be adequately compensated, where necessary.
12. Construction material should be properly disposed off after the construction work is over.
13. The Environmental Management and Mitigation Plan included in the EIA report shall strictly be implemented and kept functioning on a continuous basis.
14. Comprehensive Environmental Performance report, upon completion of the project shall have to be submitted to the Narayanganj District Office of DOE at Narayanganj with a copy to the Head Office of DOE in Dhaka describing actual intervention and rehabilitation at the project site.
15. Violation of any of the above conditions shall render this approval void.
16. The project authority shall apply for Environmental Clearance along with NOCs from other relevant agencies for operational activity to the Narayanganj District Office of DOE at Narayanganj with a copy to the Head Office of DOE in Dhaka.
17. This EIA Approval has been issued with the approval of the appropriate authority.

21.05.2015

(Syed Nazmul Ahsan)
Director (Environmental Clearance,c.c)
Phone # 8181778

Project Director
Dhaka Environmentally
Sustainable Water Supply Project
Dhaka WASA
WASA Bhaban(8th Floor), Room # 906
98, Kazi Nazrul Islam Avenue
Kawran Bazar, Dhaka-1215

Copy Forwarded to :

1. The Secretary, Ministry of Environment and Forests, Bangladesh Secretariat, Dhaka.
2. Director, Department of Environment, Dhaka Regional Office, Dhaka.
3. Deputy Director /Office In-charge, Department of Environment, Narayanganj District Office, Narayanganj.
4. Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

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F. Compliance with DoE EIA Guideline

The DoE has issued EIA Guidelines for Industries (this document was released in December 1997) and addresses the IEE and EIA for several industrial sectors and development projects. Each Project Proponent shall conduct an EIA and is expected to consult and follow the DoE Guidelines.
In this case, it is necessary for DWASA to obtain site clearance followed by environmental clearance for this project (EIA as Red Category) considering submission of following documents.

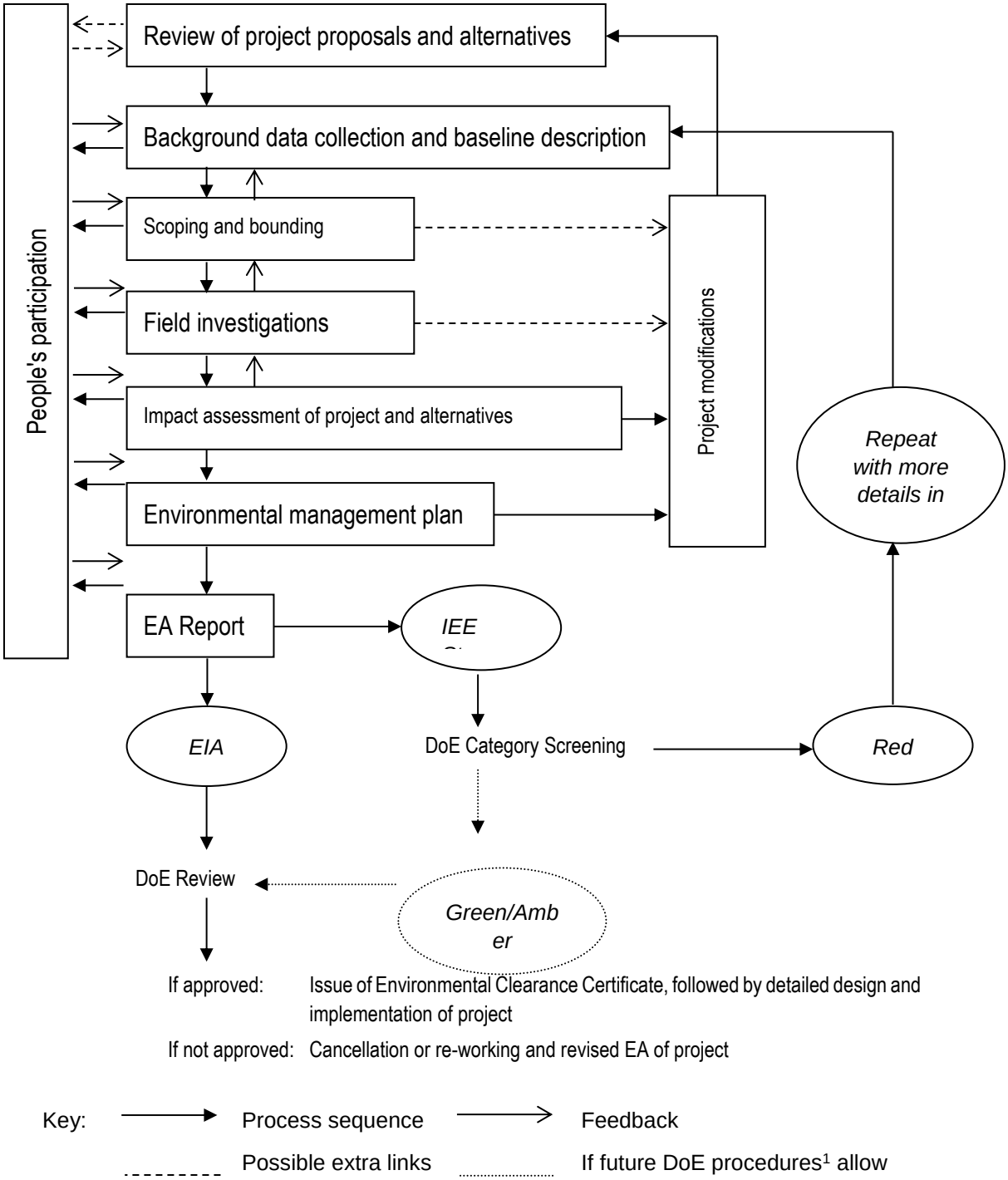
a) Feasibility Study Report of the project;
b) EIA report including environmental management plan (EMP) and emergency response plan for the mitigation of adverse environmental impacts (Submitted Updated EIA prepared by EnviroConsult Ltd);
c) An NOC (No Objection Certificate) from the local authorities concerned;
d) Outline of relocation plans (where applicable) and;
e) Other information as deemed necessary

As per ECR 1997 DESWSP falls under the red category of project. The following Figure F1 presents key
steps in the environmental assessment process and DoE Clearance, Figure F2 displays DoE

Environmental Clearance procedure

Key Steps in the Environmental Assessment Process & DoE Clearance

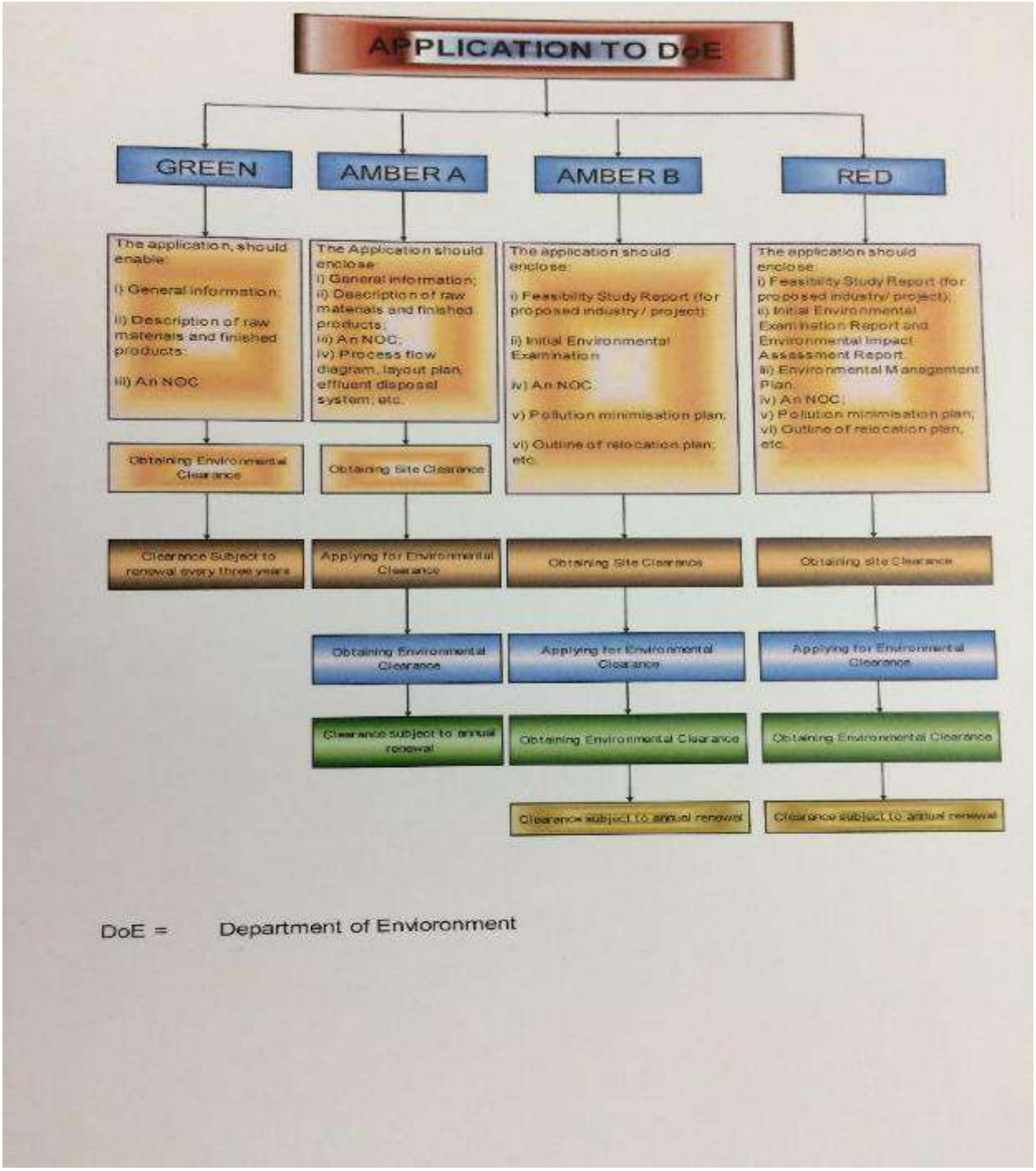
Figure: F1 Key Steps in the EA Process



Note: 1. DoE procedures currently classify all FCD/I projects in the Red Category
2. This diagram is only indicative of the processes involved. The actual activities and sequence may vary slightly, depending on the size, complexity and likely impacts of the

proposed components. Similarly, the number of consultations under the people's participation programme, and their place in the planning process, may also vary.

Figure F2 DoE Environmental Clearance Procedure



G. Public Consultation

Public Consultation (13 Nov 2018) IEE P3.1

Dhaka Environmentally Sustainable Water supply Project (DESWSP)

Social Safeguards/Resettlement and Environmental Awareness Program

Venue : Azampur Gov. Primary School, Uttara, Dhaka-1230

Date **:** 13 November 2018

Introduction: Social Safeguards/Resettlement and Environmental Awareness Meeting is one of the major activities of Safeguards Implementation Unit (SIU) of DESWS Project. This activity is a Platform to disseminate messages among water users in the community especially to the House Owners. We used to choose School's as venue because of targeting the female like guardians, teachers, housewives and house owners. We always distribute a project leaflet to the participants in the meeting and request teacher's discussing the leaflets in different classes. The leaflet consists of Project related information as well as messages. If it is then a huge no of families are informed of the Project. On the other hand it is an ADB concern whether mass people are informed of or not during Resettlement/Environmental Plan Preparation. We conduct a Public Consultation Meetings. Meeting covers the area of Jasimuddin, Uttara to House building, Uttara, Dhaka for package ICB3.1.

Objective of the Meeting**:** The main objective of the meeting is to share project related issues like house connection, access to connection permission, illegal connection, project supports, grievance redress mechanism, cooperation & coordination from the community, social safeguard and environmental matters with the participants. Actually this is not a decision making meeting. We conduct a question & answer session in the meeting how beneficiaries can get support from the project. In this procedure we collect recommendations or opinion from the participant's for implementing the project smoothly.

Participants of the meetings:

Teachers, Guardians, Businessmen, House Owner, House Wives, Civil Society Representatives and Project Personnel's were the participants. A Total of 29 participants attended in meetings. Where Female was 17%

Discussions are been made in the meeting with issue based information…

The following DWASA Representative: DWASA representative informed the house why DESWS Project?

- The Govt. is going to establish DESWS Project in Package ICB P3.1of DHAKA City.

- Population is increasing in Dhaka City day by day and consequently demand of water also increasing.

- Existing Water Supply System is underground water producing by DTW

- Current pipe and fittings are not fit for much water supply

- Targeting to reduce 40% water loss.

- New establishment is needed to cut the Road for Pipe installation.

- Support is needed from community.

- Environmentally Sustainable Water Supply Project.

- The waste soil will be removed from the narrow roads immediately and from the wider road within 24 hours.

- Old line will be disconnect after establishing new supply line

- Sound pollution will be reduced.

- Enclosure will be ensured during construction work.

- Plain Sheet will be used for as bridge entering houses

MDSC Representative: MDSC Representative informed the technical issues.

- Three types of pipe installation method will be used.
- High quality materials will be used establishing the new project.
- Connection from transmission line to preserver will be established by project cost.
- Ensuring 24 hour water supply with sufficient pressure.
- Respective Authority will be responsible for repair work.
- Ensuring sufficient water supply

Conclusion:

Participants of the meeting have shown their mixed reaction. Some of them couldn't be trust for their past experience and some of them said wait and see. But MDSC representative invited them to observe another WASA construction system. However, hoping that DESWS Project of Dhaka WASA will do the work well, the meeting was concluded.

Venues: East Point School & College, 977, East Badda, Post Office Road, Badda, Dhaka-1212/Uttar Khan Collegiate High School, Uttar Khan, Dhaka-1230/Momota Combined High School (MCHS), Dakkhin Khan, 13 & 26 September 2018, Dhaka-1230

A. Total Meeting: 03

Introduction: Resettlement Awareness Meeting is one of the major activities of Safeguard Implementation Unit (SIU) at DESWS Project. This activity is a Platform to disseminate messages among water users in the community especially to the House Owners. We used to choose School's as venue because of targeting the Female like guardians, teachers, housewives and house owners. We always distribute a project leaflet to the participants in the meeting and request teacher's discussing the leaflets in different classes. The leaflet consists of Project related information as well as messages. If it is then a huge number of families are informed of the Project. On the other hand, it is an ADB concern whether mass people are informed of or not during Resettlement Plan Preparation. We did conduct at least 3 Public Consultation Meetings at 3 different places to cover all area of the Package ICB-3.2. This is the summarized picture of the meetings.

Objective of the Meeting: The main objective of the meeting is to share project related issues like new pipelines installation, project supports, grievance redress mechanism, cooperation & coordination from the community, social safeguard and environmental matters with the participants. Actually this is not a decision making meeting. We conducted a question & answer session in the meeting how and what the process to be benefited from the project. In this procedure we collect recommendations or opinions from the participant's for implementing the project smoothly.

Participants of the meetings:

House Owner, House Wives, Guardians, Teachers, Retired Govt. Officials, Civil Society Representatives and Project Personnel of DWASA and MDSC were the participants. A Total of among 69 participants attended in three meeting where Male 41, Female 25 (36%).

The following discussions have been made in the meeting with issue based information:

DESWS Project Representative: DESWS Project representative informed the meeting why DESWS Project?

Dhaka is the most over populated City in the World. Density of the Dhaka City population is increasing rapidly. This is why the demand of water supply is also increasing proportionately. But the water supply system in Dhaka City is remaining traditional i.e. underground water. Water production rate of the DTW's are reducing every year. On the other hand; system loss is up to 40%. The water table of the country is downing lower day by day and the pumps are failing repeatedly. Consequently water supply crisis is a common phenomenon in this city. If the Govt. doesn't take the initiative mitigating the crisis then Dhaka City might be declare as abandoned city for living. As such, Bangladesh Govt. has taken an initiative mitigating water supply by using surface water. As a result, the proposed project (DESWSP) is going to implement in this city. So, we need all out support and cooperation from the community. The DWASA representative also shares the objectives of the project among the audience.

- Reducing water loss at least 10% from 40%
- Increasing Govt. revenues
- Stopping illegal house connection
- Increasing water supply pressure
- Ensure adequate and not stop water flow round the clock
- Ensure quality of water
- Stopping water borne and vector borne diseases
- Stopping abusing water etc.

DWASA: Safeguard Officer also shares the objectives of the project among the meeting.

- The Current Project is environmentally sustainable though there is less scope polluting environment in this project.
- During open cut some soil dust could causes a little pollution but contractors are bound to remove the dust within 24 hours from the place.
- During HDD, sound pollution could be happening but the contractor will use the machine by avoiding class time, prayer time and avoiding hospital as well as clinic areas.
- There should be put an enclosure covers the trenches
- Labor & worker might be abiding by the safeguard policy and worn safeguard compliance.
- Compensation will be provided to Affected Persons (AP's) as per Grievance Redress Mechanism (GRM).

Management Design and Supervision Consultant (MDSC) Representative: MDSC representative shared the following issues and ideas.

- In this project Govt. is going to established DMA (District metering Area) system
- Govt. is going to use surface water instead of underground water.
- After final installation the new pipeline the older pipeline will be stopped.
- Project personnel are trying to reduce sufferings for the people
- We are seeking your all-out support and cooperation

MDSC Representative (Engr): MDSC Representative canvasses for support and assistance from each and every corner. He shared the followings**.**

Three types of pipe installation methods will be used for construction work:

a) HDD (Horizontal Directional Drilling)
b) PB (Pipe Bursting
c) OT (Open Trench)

Question and Answer from the House Owners:

Q. Will we face any problem of water crisis during construction works?

A. No problem would face of water crisis during construction work we expect. If any problem occurred then WASA will arrange water supply especially.

Q. How much depth the main supply line will be installed?

A. Three to Five-meter depth.

Q. In which roads the pipeline will be installed by HDD machine?

A. The Roads over 10 meters wider will be under HDD machine operation.

Q. Who will conduct the repair and maintenance works of the road trench cut and the pits?

A. Respective authority like Roads & Highway, City Corporation or others will conduct the repair works.

Conclusion:

The representative of journalists appreciated the initiative of the Govt. taken this type of project by the financial support of ADB. He said that if the water supply starts from surface water then the use of underground water will be stopped and the Dhaka City dwellers might be saved from the natural disaster like earthquake and or land slide. The judgment of the project name; Environmentally Sustainable Water Supply Project (DESWS Project) will be very rational.

Enclosure:
1. Attendance Sheet
2. Photographs

Attachment: Attendance Sheet

ATTENDANCE SHEET OF PUBLIC CONSULTATION MEETING
Initial Environmental Examination (IEE) Study of

Geotechnical Investigation Study of P3 Component of
Dhaka Environmentally Sustainable Water Supply Project (DESWSP)

Venue : City Corporation Office Uttara, Sector 6

Date: 16.04.2017

SL No	Name	Address	Mobile no.	Profession	Signature
1	MD. AFSAR UDDIN KHAN	Uttara Commissiner	01715619261		[illegible]
2	MD. HEMAYET HOSSAIN	DNCC, Zone-1 CEO	01712-721475		[illegible]
3	MD. MIZANUR RAHMAN	XEN, DESWSP	01706[illegible]		[illegible]
4	Md. Enamul Kabir	XEN, Zone-1 DNCC.	01711-341018		[illegible]
5	Md. Harunur Rashid	CE - MDSC	0174288[illegible]		[illegible]
6	[illegible]	PD, DESWSP	01922198190		[illegible]
7	Md. Belal Ullah	E.A.F DESW	01[illegible]		[illegible]
8	Md. Main Uddin	Work Assistant	01724-276771		[illegible]
9	Dr. J.C. Saha	Env. Expert MDSC	01713117822		[illegible]
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P-1

Meeting on
Resettlement Awarness program
Date : 13/09/2018

Attendance Sheet

SL	Name	Phone No.	Signature
1	Afroza Akter	01914899237	Rita
2	Fatema khatun	01984502302	Fate
3	Salma Akter	01728295821	Salma
4	Sabina yeasmen	01721338668	Sabi
5	Sanchita Rani Das	01738376835	Sanchita
6	Israt mahmuda	01934645708	Israt
7	Jasmin Akther	01942666870	Jasmin
8	Bithi Islam	01610888203	Bithi
9	Tahmina Islam	01871115975	Asia
10	Kamrun naher	01687320303	Kamrun
11	Afroza Begum.	01969342115	Afroza
12	Salina Akther Jahan	01714943963	Salina

P-2

Meeting on

Resettlement Awareness program

Date: 13/09/2018

SL	Name	Phone No.	Signature
13	Md. Zohirul Islam	01758-132698	
14	Akhi	01722-047083	
15	Palash	01834962912	
16	Aknamul	01673588949	
17	F.M. Manoar Ali DESIGN Engr.	01712-099926	
18	Dr. Rafeza Akter NRE	01718217941	Rafeza
19	Md. Al-Amin EE. PMU	01716-496853	Al-Amin
20	Md. Shahidul Islam PMU, DESWSP	01712-676317	
21	Mahrin Binte Islam, AE, DESWSP	01670428222	
22	Tofazzal Hossen SDO, DESWSP, DWASA	01745 421948	
23			
24			
25			
26			
27			

Meeting on Resettlement Awareness Progam

Attendance Sheet

Date: 26/09/18

Name of Work:

SL	Name	ORG & Designation	Signature
1.	Md. Nizamul Haque	Assistant Teacher. Uttarkhan colle giate school.	26.09.18
2.	Md. Anwar Hossain	Ass: teacher. Uttarkhan Collegiate School, Dhaka.	26.9.18
3.	MD. Al amin Hosen	Assistant Teacher Uttarkhan Collegiate School.	26.9.18
4.	Md. Kamal Hossain	Assistant teacher Uttarkhan collegiate School.	26.9.18
5.	Md. Sohel Rana	Assitant Teacher Uttarkhan collegiate School.	26.09.18
6.	Rabiqul Islam	Assi tant teacher Uttarkhan Colle-giate school	26.9.18
7.	Zakir Hassan	Assistant teacher Uttarkhan collegiate school	26.9.18
8.	MD. Rezaul Karim	DO.	
9.	Md. Akkas Ali Mia	Assist. Teach.	26.9.18

Meeting on Resettlement Awareness Progam

Attendance Sheet

Date: 26/09/18

Name of Work:

SL	Name	ORG & Designation	Signature
10.	Hasen Ali Talukder	Asst. Teacher	
11.	Sumon Ahmed	Asst. Teacher uttarkhan, collegiate school	
12.	Sima Sen	DO	
13.	MD. Nurul Huda	DO	
14.	Apurba lal halder	DO	
15.	Aminul Islam Bhuiyan	Do	
16.	Kawser Alom	DO	
17.	Mr Adi	D o	
18.	Tofazzal Hossen	DESWSP, DWASA,	

Meeting on Resettlement Awareness Progam

Attendance Sheet

Date: 26/

Name of Work: 26/09/18

SL	Name	ORG & Designation	Signature
19.	Md. Tariqul Islam	A.E. DESWSP, DWASA	
20.	M. D Habibur Rahman mir	uttarkhan collegiate sch Ass- teacher	
21.	Md. Shahidul Islam PMU, DESWSP. DWASA	PMU, DESWSP DWASA.	
22.	A.y.M. IMTIAZUL HAQUE.	MDSC, DESWSP. Mott_MacDonald.	
23.	MD. QURAISARUL ISLAM	DTL/ MDCC Mott MacDonald	
24.	Md. Azadul Haque	Head Teacher uttarkhan collegiate school	
25.	Md. Mominozzaman	DWASA	
26.	[illegible]	[illegible]	
27.	[illegible]	-	

Office of the Project Director
Dhaka Environmentally Sustainable Water Supply Project (DESWSP)
Dhaka Water Supply and Sewerage Authority
WASA Bhaban, 98, KaziNazrul Islam Avenue (9th Floor)
Kawran Bazar, Dhaka-1215
Email: pddeswspgwtp@gmail.com

Attendance Sheet
Date : 13-11-2018

Name of Work:

SL	Name	ORG & Designation	Signature
1.	[illegible]	[illegible]	[illegible]
2.	Md. Shahidul Islam Procurement officer PMU, DESWSP, DJOASA.	PMU. DJOASA	
3.	[illegible]	ব্যবস্থা	Anik
4.	মো: মাহফুজ হাসান রাহুল	ব্যবস্থা	Rahul
5.	মো: কবির [illegible]	ব্যবস্থা	Kabir
6.	[illegible]	[illegible]	[illegible]
7.	[illegible]	[illegible]	[illegible]
8.	[illegible]	[illegible]	[illegible]
9.	মোঃ [illegible]	[illegible]	[illegible]

Office of the Project Director
Dhaka Environmentally Sustainable Water Supply Project (DESWSP)
Dhaka Water Supply and Sewerage Authority
WASA Bhaban, 98, Kazi Nazrul Islam Avenue (9th Floor)
Kawran Bazar, Dhaka-1215
Email: pddeswsp.wasa@gmail.com

Attendance Sheet

Name of Work:

SL	Name	ORG & Designation	Signature
10	মো: সোহেল	ঠিকাদার	MD. Sohel
11	[illegible]	[illegible]	[illegible]
12	মো: রবিউল / [illegible]	[illegible]	Robiul
13	মো: মানু / [illegible]	[illegible]	[illegible]
14	মো: রাকিব / [illegible]	[illegible]	Rakib
15	মো: [illegible] / [illegible]	[illegible]	[illegible]
16	মো: [illegible] / [illegible]	[illegible]	[illegible]
17	মো: [illegible] / [illegible]	[illegible]	Masud
18	[illegible]	[illegible]	[illegible]

Office of the Project Director
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Kawran Bazar, Dhaka-1215
Email: pddeswspgetp@gmail.com

Attendance Sheet

Name of Work:

SL	Name	ORG & Designation	Signature
19	Ayesha Siddiqua	শিক্ষক	[signature]
20.	Anima Sarker	শিক্ষক	Anima
21	Parvin Akhter	শিক্ষিকা	[signature]
22	Rina	চাকুরিজীবি	Rina
23.	Md Sayedul Islam	ব্যবসা	[signature]
24	Md. Azizul	চাকুরীজীবি	[signature]
25.	Md. Saidur Rahman	Safeguard Officer (Env) DESWSP DWASA	[signature]
26	F.M. Mansur Ali	Design Engr. MDSC/DWASA	[signature]
27.	Md. Saiful Islam	Asstt. Engineer Dhaka WASA	[signature] 13/11/18

Office of the Project Director
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Dhaka Water Supply and Sewerage Authority
WASA Bhaban, 98, KaziNazrul Islam Avenue (9th Floor)
Kawran Bazar, Dhaka-1215
Email: pddeswspowb@gmail.com

Attendance Sheet

Name of Work:

SL	Name	ORG & Designation	Signature
28.	MIZAN	MDC	
29.	Tofazzal Hossen	DESWSP, DWASA. Safeguardsofficer	
30.			

Attachment: Photograph

Photo 1: **Consultation with CEO of DNCC at Uttara, Dhaka-1230. 16.04.2107**

Photo 2:**Social Safeguards/Resettlement & Enviromental Awareness Meeting at Azampur Gov. Primary School. Uttara, Dhaka-1230. 13 November 2018**

Photo 3: **Social Safeguards/Resettlement & Enviromental Awareness Meeting at Azampur Gov. Primary School. Uttara, Dhaka-1230. 13 November 2018**

Photo 4: Participants attention to social and environmental briefing, 13 September 2018

Photo-5: Participants attention to social and environmental briefing, 13 September 2018

Photo 6: Project briefing, 26 September 2018

Photo 7: Discussions by participants, 26 September 2018

H. Grievance Redress Committee Members in PMU

Following ADB Safeguard Policy Statement (SPS), 2009 established time bound grievance committees together with procedures at three levels to address or resolve unusual incidences occurs during implementation of the project activities. The solution of incidences would be based on the complaints raised from APs and community people. In case of any unsettle dispute, GRC through submission of formal reference from DWASA will resolve the problem.

Formation of GRC

Grievance Redress Committee (GRC) constituted comprising of a panel of five members; 1st is DWASA representative, 2nd MDSC representative 3rd DWASA Representative as well as the other two are also from DWASA Safe Guard Officer (Social & Gender) as member Secretary.

The GRC under ICB Package 3.1 is as below:

GRC Composition

S.I	Name	Designation at GRC	Institution	Designation
1	Executive Engineer, DESWSP	Convener	DWASA	EE, DESWSP
2	Resettlement Specialist	Member	Consultant (MDSC)	Resettlement and Awareness Expert
3	Assistant Engineer	Member	DESWSP DWASA	AE DESWSP
4	Assistant Engineer (Female)	Member	DESWSP DWASA	AE DESWSP
5	Safeguard officer (Social and Gender)	Member Secretary	DESWSP DWASA	Safeguard Officer (S&G) DESWSP

Procedures of resolving grievances

Step 1

In case of any grievances, the complainant approaches to the Safeguard Implementation Unit (SIU) officials for clarification, or submits any formal complaints. The SIU will provide clarification to the displaced persons (DPs) and try to resolve the problem at the local level with the involvement of SIU social safeguards officer, If not resolved.

Step 2

The SIU will recommend that APs submit their complaints to the GRC. The SIU will assist the DPs filing the complaints and organizes hearing within 14 days of receiving the complaints.

Step 3

GRC to scrutinize applications determine whether the submitted cases are within their mandate. Cases related to compensation under the Acquisition & Requisition of Immovable Property Ordinance (ARIPO) will be referred to DC through DWASA, SIU for further review and action .GRC invites representatives of APs to attend the meetings.

Step 4

If within the GRC mandate and not related to compensation under ARIPO, GRC will hold session with aggrieved APs, minutes recorded. If resolved, the project director approves. If not resolved;

Step 5

The DP may accept GRC decision; if not, he/she may file a case in the court of law for further appeal.

Step 6

The GRC minutes, approved by the project director will be received at the conveners' office.

The approved verdict is communicated to the complainant AP in writing. APs will be able to submit their grievance/complaint about any aspects of resettlement plan implementation and compensation. Grievances can be shared with DWASA verbally or in written form, but in case of verbal form, the SIU representatives in the GRC will write it down at the first instance during the meeting at no cost to APs. The AP will sign and formally submit the written report to the GRCs at the office of the SIU, PMU, and DWASA in implementing the RP. Any AP can also take their case to the court following the country legal system at any stage without going through the project GRM, if they wish to do so.

The GRCs has been activated with power to resolve resettlement and compensation issues not to be addressed under legal suit in the courts. The GRCs is ready to receive grievance cases from the affected persons through the resettlement awareness. The NGO will assist the APs in lodging their resettlement complaints in a proper format acceptable to the GRCs after they get ID cards from DWASA or are informed about their entitlements and losses.

The appeal procedure and conflict resolution:

(i) All complaints from the APs will be received at the field office of the resettlement awareness SIU the member secretary of the GRCs, with a copy for the concerned City Corporation

Ward Commissioner's representatives.

(ii) The representative of the SIU in the GRCs, upon receipt of complaints, will inform the convener (DWASA representative) of the GRC and convener will organize a hearing session from the complainants in the concerned City Corporation/Word Commissioner office, where the complaint was received.

(iii) The GRC will review the proceedings and pass verdicts to convey to the concerned AP through the SIU. If there are matters relating to arbitration or compensation under the existing law, the matter will be referred to the DC and the courts. The DC has to make decision within maximum of 14 days.

(iv) The GRC will settle the disputes within a maximum of 21 days of receiving the complaints from the APs.

(v) Resolution of the GRCs will be sent to the PD for approval, and after approval these will be adopted in the process of resettlement for issuance of ID cards, determination of loss and entitlements, and payment thereof.

In the event that the established GRM is not in a position to resolve the issue, the affected person can also 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 Project Information Disclosure (PID) to be distributed to the affected communities, as part of the project

GRM

The final members of the GRC are as follows:

উন্নয়নের গণতন্ত্র
শেখ হাসিনার মূলমন্ত্র

ওয়াসা

Office of the Project Director
Dhaka Environmentally Sustainable Water Supply Project (DESWSP)
Dhaka Water Supply and Sewerage Authority
WASA Bhaban, 98, Kazi Nazrul Islam Avenue (9th Floor)
Kawran Bazar, Dhaka-1215
Web site- www.deswsp-dwasa.com , Email: pddeswspgwtp@gmail.com, Fax & Tel:88-02-8189095

Memo no: 46.113.618.00.00. GN- 97/DESWSP/ 1234 Date- 22.08.2019

Office Order

Sub: Formation of Environmental Safeguard Grievance Redress Committee (GRC) for Gandharbpur Water Treatment Plant related works under DESWS Project, Dhaka WASA .

With due regards based on subject mentioned this is to notify you that Environmental Safeguard **Grievance Redress Committee (GRC)** for Gandhorbpur Water Treatment Plant related works (WTP, Intake Raw water transmission main , Finish Water transmission and distribution Feeder line) of DESWSP the PMU has formed Environmental Safeguard Grievance Redress Committee (GRC) and approved the same by the competent authority.

Environmental Safeguard Grievance Redress Committee (GRC) for Gandhorbpur Water Treatment Plant related works

Sl.	Name and Designation	Position in GRC
1.	Md. Shafiqur Rahman, DPD, DESWSP, DWASA.	Convener
2.	Mostafizur Rahman, Executive Engineer, DESWSP, DWASA.	Member
3.	Md. Al-Amin, Executive Engineer, DESWSP, DWASA.	Member
4.	National Environment Expert (Representative from MDSC), DESWSP, DWASA.	Member
5.	Md. Saidur Rahman, Safeguard Officer (Environment), DESWSP, DWASA.	Member Secretary
6.	Representative from contractor of WTP related works	Member

TOR of Environmental Safeguard Grievance Redress Committee (GRC) for Gandhorbpur Water Treatment Plant related works:

1. Environmental Safeguard Grievance Redress Committee (GRC) will be established to ensure stakeholders' participation in the implementation process and fair compensation to vulnerable affected persons (APs) for environmental safeguard issues related effects.
2. The APs can also call upon the representative of contractor/ MDSC/ PMU to assist them in presenting their grievance or queries to the GRC.
3. The GRC will receive grievance cases from the affected persons through the representative of contractor/ MDSC/ PMU.

উন্নয়নের গণতন্ত্র
শেখ হাসিনার মূলমন্ত্র

Office of the Project Director
Dhaka Environmentally Sustainable Water Supply Project (DESWSP)
Dhaka Water Supply and Sewerage Authority
WASA Bhaban, 98, Kazi Nazrul Islam Avenue (9th Floor)
Kawran Bazar, Dhaka-1215
Web site- www.deswsp-dwasa.com , Email: pddeswspgwtp@gmail.com, Fax & Tel:88-02-8189095

4. Other than disputes relating to ownership right and award of compensation by the Deputy Commissioner (DC) under the Court of Law, GRC will review grievances involving all environmental safeguard related resettlement assistances, relocation, and other supports. Grievances will be redressed within 21 days from the date of lodging the complaints. In case of complicated cases requiring additional investigations it will be resolved within a period of one month.
5. Grievance of indirectly displaced persons and/or persons displaced during project implementation due to environmental effect will also be addressed by the GRC.
6. Where relocation of structure or vacating land of cultivation will be required the GRC will facilitate resolution of complaints regarding categorization of vulnerable affected persons, type of structures, and eligibility for compensation and assistance within the set guidelines and provisions of the resettlement plan.
7. Any complaints of ownership or other suits to be resolved by the judiciary system will not be resolved in GRC. GRC will resolve all complaints, grievance related to compensation entitled by affected persons.
8. The decisions of the GRC should be ideally be arrived at through consensus, failing which resolution will be based on majority vote. Any decision made by the GRC must be within purview of environmental policy framework of GOB, ADB's Environmental Safeguard Policy Statement.
9. A minimum of 4 (four) members shall form the quorum for the meeting of GRC.
10. If needed the GRC members may undertake field visit to verify and review the issues at dispute, including titles/share, reasons for any delay in payment or other related matters.
11. In case of resolution is not accepted by the AP, the grievances will be forwarded to the Project Director for final decision.

Working Area of the GRC: The concern committee will administer the stated ToRs.

Md. Mahmudul Islam
Project Director
DESWS Project, Dhaka WASA.

CC. (not order in seniority)
1. DPD-1/2, DESWS Project, Dhaka WASA
2. Executive Engineer-1/2/3, DESWS Project, Dhaka WASA
3. Assistant Engineer.....DESWS Project, Dhaka WASA .
4. Safeguard Officer (Env)/ (S&G) ..... DESWS Project, Dhaka WASA
5. Team Leader/ DTL , MDSC, DESWS Project, Dhaka WASA
6. National Resettlement Specialist/ Environmental Expert , MDSC, DESWS Project, Dhaka WASA
7. Team Leader, DORP, DESWS Project, Dhaka WASA
8. Team Leader EMA , DESWSP DWASA
9. Contractor Representative , GWT SNC

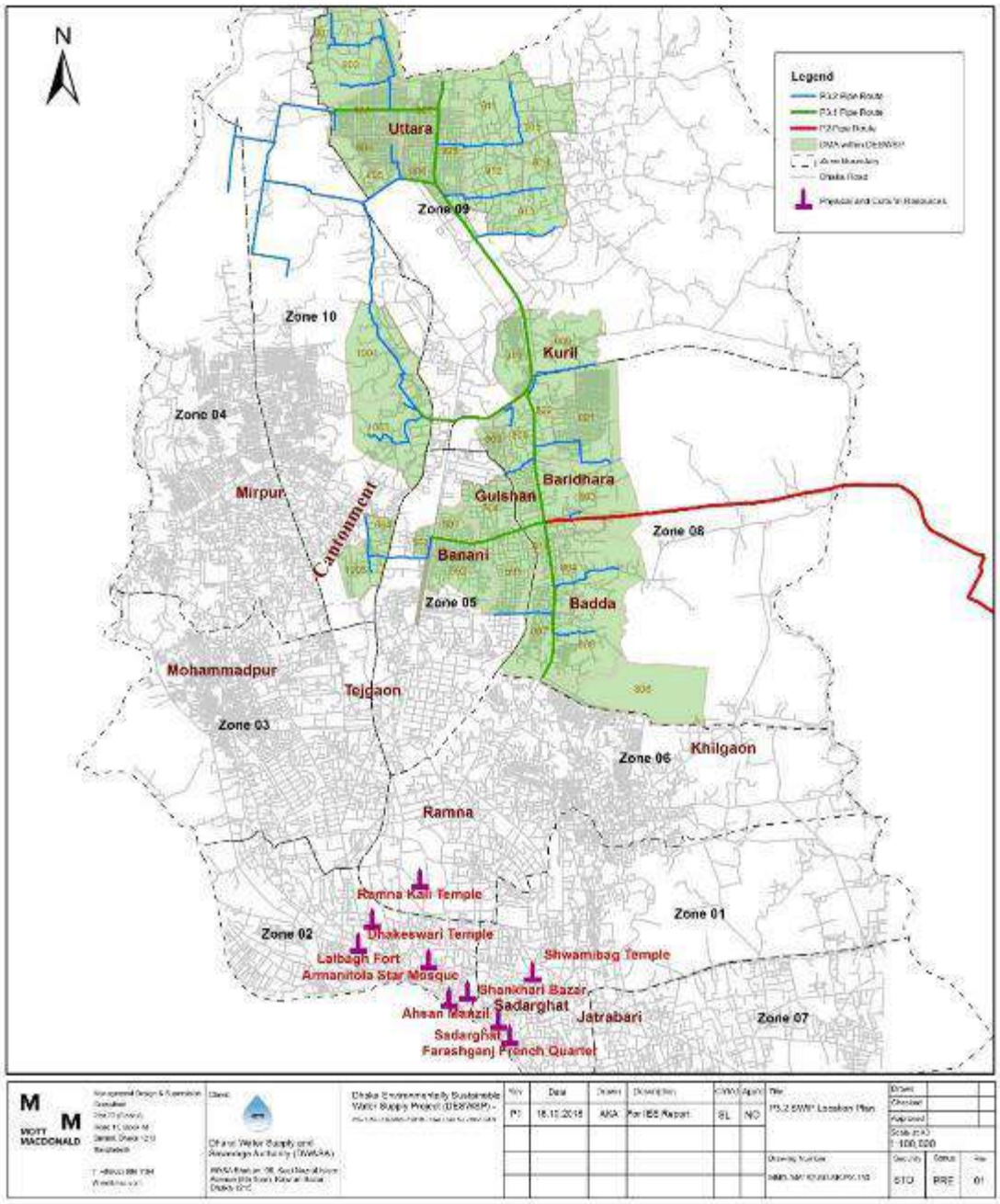
G File P/o

I. Location of PCR Sites from P3.1

Physical & Cultural Resources Sites	P3.1 (Km)
Lalbagh Fort	6.6
Ahsan Manzil	6.73
Dhakeshwari Temple	5.87
Shankhari Bazar	6.5
Swamibagh Temple	5.95
Ramna Kali Mandir	4.8
Dhaka Sadarghat	7
Armanitola Star Mosque, Armenian quarter	6.14
Farashganj, French quarter	7.21

Dhaka Environmentally Sustainable Water Supply Project (DESWSP)

Location of the Project's P3.1 and P3.2 Sites from Sensitive Historical, Cultural and Archeological Area



J. Waste Disposal and Transfer Sites

Waste disposal sites (Landfills) of Dhaka are usually situated outside the city boundary, this also increases the transport cost of disposing wastes. In Dhaka, Matuail is the sanitary landfill of South Dhaka and Gabtoli (Amin Bazaar) is the landfill of North Dhaka. Currently, the construction of a sanitary landfill is going on in Amin Bazaar landfill. The sanitary landfill is a result of the initiative by JICA. In the Sanitary landfill, the wastes carried by the truck are measured first and then they are dumped at the dumping platform. Subsequently, the trucks are unloaded using excavator and manually. Finally, the bulldozers compact the waste at the dumping platform.

In Dhaka City, out of the two main landfills, Matuail Landfill is a semi-aerobic landfill, where methane-dioxide, oxygen and odorous gases release through pipes, so the smell of the landfill is less toxic. Matuail Landfill is under Dhaka South City Corporation (DNCC), which consists of an area of about 40 hectares. JICA had stated in the master plan that out of 40 hectares, only 20 hectares area were still unused in 2005. The DSCC official confirmed that at present all the lands are covered in waste and by 2017 the capacity of dumping will be exhausted. Currently they are dumping the waste adopting pyramid method (having a slope of 1/3). The records of the trips by trucks are documented in a computer system at *Nagar Bhaban* (Central office of DSCC) to understand the truck movements. They have garbage bracket to prevent the trucks from slipping into the water in the rainy season.

Gabtoli (Amin Bazaar) is an open dumping landfill at the moment. Even though the work of sanitary dumping site is going on, Amin Bazaar is expected to be fully exhausted and sealed by 2017- 2018. The total area of Amin Bazaar is 20 hectares.

Ultimate disposal of urban solid waste is done crudely in open dumps, lowlands or water bodies in an unsanitary manner. As a result, the surrounding environment of the dumpsites is barely hygienic. The increasing demand for landfill is also a big problem for the authority to find suitable lands for dumping wastes.

However, DoE, DWASA, MDSC and contractors have to discuss and to find out alternative options for proper waste disposal because none of the three sites (landfills, transfer station) is suitable for disposal of construction waste including spoiled soil from P3.1 construction sites because these disposal sites do not have capacity anymore.

Following are the photographs of disposal site

1. Matuail Site: This site has an area of 40 hectare, with an average height of 5meter, but now its height is 18 meter. JICA and DCC funded this site.

Photograph of Matuail Disposal Site

Photograph of Matuail Disposal Site

2. Gabtoli (Amin Bazar) Site:

Photograph of Gabtoli (Amin Bazar) Disposal Site

Photograph of Gabtoli (Amin Bazar) Disposal Site

3. Uttara Secondary Waste Transfer Station: This area is not a dumping site, rather this is a transfer station.

Photograph of Secondary Transfer station, Uttara.

K. EMP Budget in Contract Document

BILL PART NR 2

GENERAL AND PRELIMINARIES

Item	Item Description	Unit	Quantity	Unit Rate				Amount			
				Local Currency Portion (BDT)	Foreign Currency Portion (FOREX 1)	Foreign Currency Portion (FOREX 2)	Foreign Currency Portion (FOREX 3)	Local Currency Portion (BDT)	Foreign Currency Portion (FOREX 1)	Foreign Currency Portion (FOREX 2)	Foreign Currency Portion (FOREX 3)
a	b	c	d	e	f	g	h	i = d x e	j = d x f	k = d x g	l= d x h
Carried to Summary of Bill Part Nr 2											
2.3 HEALTH & SAFETY Allow for all costs and charges in connection with:											
2.3.1	Provision and management of Health and Safety in accordance with Appendix A to the Particular Conditions of Contract (Provisional Sum)	LS	1				-	45,360,000	0	0	0

TOTAL FOR 2.3 HEALTH & SAFETY				
Carried to Summary of Bill Part Nr 2				

BILL PART NR 2

Note that all prices are to EXCLUDE Value Added Tax (VAT), Advance Income Tax (AIT) and Import duties on Plant and Materials except customs clearing & forwarding agent commission cost and related VAT and AIT imposed on commission which shall be paid by the Contractor.					
GENERAL AND PRELIMINARIES					
Item	Item Description	Unit	Quantity	Unit Rate	Amount
				(BDT)	(BDT)
a	b	c	d	e	f = d x e
2.4 ENVIRONMENTAL & SOCIAL REQUIREMENTS					
Allow for all costs and charges in connection with:					
2.4.1	Environmental & Social Requirements in accordance with Particular Conditions of Contract (PCC) - Safeguards Policy Statement Requirements, including Environmental Management Plan	LS	1		
2.4.2	Environmental Mitigation Measures in accordance with IEE (Provisional Sum)	LS	1		300,000
2.4.3	Environmental Monitoring Measures in accordance with IEE (Provisional Sum)	LS	1		362,000
2.4.4	Environmental Capacity Building in accordance with IEE (Provisional Sum)	LS	1		250,000
TOTAL FOR 2.4 ENVIRONMENTAL & SOCIAL REQUIREMENTS					912000
Carried to Summary of Bill Part Nr 2					
	SUMMARY				
	TOTAL SECTION 2.1 CONDITIONS OF CONTRACT				411,920,000
	TOTAL SECTION 2.2 SPECIFICATIONS				1,260,675,000
	TOTAL SECTION 2.3 HEALTH & SAFETY				45,360,000
	TOTAL SECTION 2.4 ENVIRONMENTAL & SOCIAL REQUIREMENTS				912,000
TOTAL BILL NR 2					1,718,867,000

325334/OM01/BS B2-9

Source: Contract Document P3.1

L. Environmental Clearance for DESWSP (all packages)

Table L-1: List of no objection certificates for P 3.1

Certificate	Date	Authority	Status of Application
RHD	Applied on 06 August 2019	RHD	Pending for Approval
Road crossing at RAJUK area		RAJUK	Pending
DNCC Road cutting permission	Applied on 06 August 2019	DNCC	Pending for Approval
Road crossing at Cantonment Board	08 March 2017	Cantonment Board	Approval for pipe line instalment with conditions

ENGLISH TRANSLATION OF THE MEMORANDUM OF PD, DESWSP to DHAKA (N) CITY CORPORATION FOR ROAD CUTTING PERMISSION

WASA Logo

DHAKA ENVIRONMENTALLY SUSTAINABLE WATER SUPPLY PROJECT

DHAKA WATER SUPPLY & SEWERAGE AUTHORITY

DESWSP, DHAKA WASA

Memo No. : 46.113.618.00.00.G-203/DESWSP/1182 Date: 06/08/19

Superintending Engineer

Dhaka Road Circle, Dhaka

Roads & Transport Head Office

Elenbari-1215

Subject: In regard to the road cutting permission for installation of transmission and distribution of water treatment plant under the package 3.1 of "Dhaka Environmentally Sustainable Water Supply Project (DESWSP)" using OT (open Trench) method in the areas of Notun Bazar to Rampura Road, Notun Bazar to Kakoli, Notun Bazar to Kuril and Uttora and Sonargao Jonopath.

This is to inform in respect of the above-mentioned subject that under the funding of foreign organization ADB the work of Dhaka Environmentally Sustainable Water Supply Project is in progress. Safe water supply in a sustainable and environmentally friendly manner will be ensured through treated surface/ river water to areas of Dhaka city and suburban areas under construction/ potential urban areas through pressurized water supply system managed in appropriate and people's friendly way. In this view, untreated water from a long-distanced River Meghna will be brought to the Treatment Plant at Gandharbpur, Rupgonj (Eastern bank of the River Shitalakhya) and will be treated. The treated water will be brought to the injection point at Baridhara through installation of pipes in the alignment of treated water transmission line from Gandharbpur crossing Shitalakhya at Murapara passing through Horinagram then crossing Balu river in the Naora mouza at the North of RAJUK proposed Madani avenue in the South of Jalshiri residential area then through the existing Madani avenue. Then (water) will be supplied to various areas of the city/ existing District Metered Area (DMA). The Installation of distribution pipe line will be completed through two packages (Package - P3.1 & Package - P3.2). This is to mention that the tender for Package – P3.1 (Primary Distribution Pipe line) has already been invited and received. The evaluation of the Technical Bids of the Single-Stage Two Envelope tender is ongoing, and the field work is expected to start in coming February/2020. The road cutting in areas of Notun Bazar to Rampura Road, Notun Bazar to Kakoli, Notun Bazar to Kuril and Uttora and Sonargao Jonopath will be necessary for installation of the Primary Distribution Pipe lines using OT method. This is also important to determine the amount of money to be allocated for the road damage compensation in the Annual Performance Plan. The locations map for the road cutting in those areas is attached herewith. The following is the details of road cutting under Package 3.1.

Location of Pipeline	Diameter of Pipe (mm)	Length of Road Cutting (m)	Width of Road Cutting (m)	Amount of Road Cutting (Sq. m)	Type of Road	Comments
Kuril to Uttora	DN1600	4838	2.67	12,917.46	Bituminous	
	DN1400	792	2.47	1,956.24	Bituminous	
	DN1200	764	2.16	1,650.24	Bituminous	
	OD450	556	1.15	639.40	Bituminous	
Kuril to Radisson Hotel	OD800	1658	1.60	2,652.80	Bituminous	
Culvert # 3 & 4	DN1600	15	2.67	80.10	Bituminous	
	DN800	15	1.65	24.75	Bituminous	
Jasim Uddin Road	DN900	667	1.75	1,167.25	Bituminous	
Receiving Shaft	DN7000	-	-	38.47	Bituminous	
Junction	5 No	10	3.5	175.00	Bituminous	
PRB	3 No	40	1.75	210.00	Bituminous	
Road Crossing	4 No	50	1.75	350.00	Bituminous	
Utility Crossing	2 No	10	3.00	60.00	Bituminous	
Isolation	1 No	10	2.50	25.00	Bituminous	
Total Amount of Road Cutting =				**20,781.00**		

WASA Logo

DHAKA ENVIRONMENTALLY SUSTAINABLE WATER SUPPLY PROJECT

DHAKA WATER SUPPLY & SEWERAGE AUTHORITY

DESWSP, DHAKA WASA

Memo No. : Date:

Page # 02

Under the circumstances, this is to request earnestly to send to the project the demand note for road cutting compensation according to the measurement and the road cutting permission as described above for the installation of transmission and distribution of water treatment plant under the package 3.1 of “Dhaka Environmentally Sustainable Water Supply Project (DESWSP)” using OT (open Trench) method in the areas of Notun Bazar to Rampura Road, Notun Bazar to Kakoli, Notun Bazar to Kuril and Uttora and Sonargao Jonopath.

Attachment: Map of the proposed alignment.

SD/-

(Md. Mahmudul Islam)

Superintending Engineer and
Project Director

(DESWSP), Dhaka WASA

Copy to:

1. Chief Engineer, Roads and Highways Department, Dhaka.
2. Deputy Project Director -1/2, DESWSP, Dhaka WASA.
3. Executive Engineer-1/2/3, DESWSP, Dhaka WASA.
4. Management Design & Supervision Consultant (MDSC).

ENGLISH TRANSLATION OF THE MEMORANDUM OF PD, DESWSP to DHAKA (N) CITY CORPORATION FOR ROAD CUTTING PERMISSION

WASA Logo

DHAKA ENVIRONMENTALLY SUSTAINABLE WATER SUPPLY PROJECT

DHAKA WATER SUPPLY & SEWERAGE AUTHORITY

DESWSP, DHAKA WASA

Memo No. : 46.113.618.00.00.G-203/DESWSP/1182 Date: 6.8.19

Chief Executive Officer

Dhaka North City Corporation

Dhaka

Subject: In regard to the road cutting permission for installation of transmission and distribution of water treatment plant under the package 3.1 of "Dhaka Environmentally Sustainable Water Supply Project (DESWSP)" using OT (open Trench) method in the areas of Notun Bazar to Rampura Road, Notun Bazar to Kakoli, Notun Bazar to Kuril and Uttora and Sonargao Jonopath.

This is to inform in respect of the above-mentioned subject that under the funding of foreign organization ADB the work of Dhaka Environmentally Sustainable Water Supply Project is in progress. Safe water supply in a sustainable and environmentally friendly manner will be ensured through treated surface/ river water to areas of Dhaka city and suburban areas under construction/ potential urban areas through pressurized water supply system managed in appropriate and people's friendly way. In this view, untreated water from a long distanced River Meghna will be brought to the Treatment Plant at Gandharbpur, Rupgonj (Eastern bank of the River Shitalakhya) and will be treated. The treated water will be brought to the injection point at Baridhara through installation of pipes in the alignment of treated water transmission line from Gandharbpur crossing Shitalakhya at Murapara passing through Horinagram then crossing Balu river in the Naora mouza at the North of RAJUK proposed Madani avenue in the South of Jalshiri residential area then through the existing Madani avenue. Then (water) will be supplied to various areas of the city/ existing District Metered Area (DMA). The Installation of distribution pipe line will be completed through two packages (Package - P3.1 & Package - P3.2). This is to mention that the tender for Package – P3.1 (Primary Distribution Pipe line) has already been invited and received. The evaluation of the Technical Bids of the Single-Stage Two Envelope tender is ongoing and the field work is expected to start in coming February/2020. The road cutting in areas of Notun Bazar to Rampura Road, Notun Bazar to Kakoli, Notun Bazar to Kuril and Uttara and Sonargaon Jonopath will be necessary for installation of the Primary Distribution Pipe lines using OT method. This is also important to determine the amount of money to be allocated for the road damage compensation in the Annual Performance Plan. The locations map for the road cutting in those areas is attached herewith. The following is the details of road cutting under Package 3.1.

Location of Pipeline	Diameter of Pipe (mm)	Length of Road Cutting (m)	Width of Road Cutting (m)	Amount of Road Cutting (Sq. m)	Type of Road	Comments
P3.1 Interface: Natun Bazar	DN1600	60	5.04	302.40	Bituminous	
	DN1200	25	4.11	102.75	Bituminous	
Notun Bazar to Rampura	DN1200	1916	2.16	4138.56	Bituminous	
	DN1000	412	1.95	803.40	Bituminous	
	DN800	942	1.65	1554.30	Bituminous	
Notun Bazar to Kakoli	OD630	1418	1.33	1885.94	Bituminous	
	OD560	854	1.26	1076.04	Bituminous	
Notun Bazar to Kuril	DN1400	2709	4.63	12542.67	Bituminous	
Sonargaon Janopath	DN1000	985	1.95	1920.75	Bituminous	
	OD800	1210	1.60	1936.00	Bituminous	
Jasim Uddin Road	DN900	667	1.75	1167.25	Bituminous	
Subastu	DN1200	15	2.16	32.40	Bituminous	
Sonargao Janopath-1	DN1000	10	1.95	19.50	Bituminous	
Sonargao Janopath-2	DN600	50	1.33	66.50	Bituminous	
Gulshan Lake	DN600	20	1.33	26.60	Bituminous	
Banani Lake	DN500	15	1.26	18.90	Bituminous	
Launching Shaft	DN900	-	-	63.58	Bituminous	

WASA Logo

DHAKA ENVIRONMENTALLY SUSTAINABLE WATER SUPPLY PROJECT

DHAKA WATER SUPPLY & SEWERAGE AUTHORITY

DESWSP, DHAKA WASA

Memo No. : Date:

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Location of Pipeline	Diameter of Pipe (mm)	Length of Road Cutting (m)	Width of Road Cutting (m)	Amount of Road Cutting (Sq. m)	Type of Road	Comments
Junction	20 No	10	3.50	700.00	Bituminous	
PRB	14 No	40	1.75	980.00	Bituminous	

Location of Pipeline	Diameter of Pipe (mm)	Length of Road Cutting (m)	Width of Road Cutting (m)	Amount of Road Cutting (Sq. m)	Type of Road	Comments
Road Crossing	11 No	50	1.75	962.50	Bituminous	
Utility Crossing	8 No	10	3.00	240.00	Bituminous	
Isolation	1 No	10	2.50	25.00	Bituminous	
Total Amount of Road Cutting =				**30,569.00**		

Under the circumstances, this is to request earnestly to send to the project the demand note for road cutting compensation according to the measurement and the road cutting permission as described above for the installation of transmission and distribution of water treatment plant under the package 3.1 of “Dhaka Environmentally Sustainable Water Supply Project (DESWSP)” using OT (open Trench) method in the areas of Notun Bazar to Rampura Road, Notun Bazar to Kakoli, Notun Bazar to Kuril and Uttara and Sonargaon Jonopath.

Attachment: Map of the proposed alignment.

SD/-

(Md. Mahmudul Islam)

Superintending Engineer and
Project Director

(DESWSP), Dhaka WASA

Copy to:

5. Chief Engineer, Dhaka North City Corporation, Dhaka.
6. Deputy Project Director -1/2, DESWSP, Dhaka WASA.
7. Executive Engineer-1/2/3, DESWSP, Dhaka WASA.
8. Management Design & Supervision Consultant (MDSC).

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DHAKA ENVIRONMENTALLY SUSTAINABLE WATER SUPPLY PROJECT
DHAKA WATER SUPPLY & SEWERAGE AUTHORITY
DESWSP, DHAKA WASA

Memo No.: 46.113.618.00.00.G-203/DESWSP/ 1182 Date: 06/08/19

তত্ত্বাবধায়ক প্রকৌশলী
ঢাকা রোড সার্কেল, ঢাকা
সড়ক ও জনপথ, সরক ভবন
এলেনবাড়ী-১২১৫

বিষয়ঃ ঢাকা ওয়াসার "ঢাকা এনভায়রনমেন্টালী সাসটেইনেবল ওয়াটার সাপ্লাই প্রজেক্ট (DESWSP)" এর Package- P3.1 এর অধীনে নতুন বাজার হতে রামপুরা রোড, নতুন বাজার হতে কাকলী, নতুন বাজার হতে কুড়িল ও উত্তরা এবং সোনারগাঁ জনপথ এলাকায় পানি শোধনাগারের ট্রান্সমিশন ও ডিস্ট্রিবিউশন পাইপ লাইন স্থাপনের উদ্দেশ্যে প্রস্তাবিত রুটে OT (Open Trench) পদ্ধতিতে রাস্তা খননের অনুমোদন প্রদান প্রসঙ্গে।

উপর্যুক্ত বিষয়ের প্রেক্ষিতে জানানো যাচ্ছে যে, "ঢাকা এনভায়রনমেন্টালী সাসটেইনেবল ওয়াটার সাপ্লাই প্রকল্পের কাজ বৈদেশিক সংস্থা ADB'র অর্থায়নে এগিয়ে চলছে। পর্যায়ক্রমে ভূগর্ভস্থ পানির উপর নির্ভরশীলতা কমিয়ে টেকসই ও পরিবেশ বান্ধব ভূ-উপরিস্থ/ নদীর পানি পরিশোধন করে ঢাকা মহানগরী ও এর আশপাশের শহরতলীসহ Under constraction/ Potential Urban Area-তে Pressurized System এ সুষ্ঠু ও জনবান্ধব ব্যবস্থাপনায় নিরাপদ পানি সরবরাহ নিশ্চিত করা হবে। এ লক্ষ্যে সুদূর মেঘনা নদী থেকে ট্রান্সমিশন লাইনের মাধ্যমে অপরিশোধিত পানি রূপগঞ্জের গন্ধর্বপুরে (শীতলক্ষ্যা নদীর পূর্ব পাড়ে) এনে তা পরিশোধন করা হবে। পরিশোধিত পানি ট্রান্সমিশন লাইনের এ্যালাইনমেন্টে পাইপ বসিয়ে গন্ধর্বপুর মুড়াপাড়া হয়ে শীতলক্ষ্যা নদী ক্রস করে হরিণাধাম হয়ে জলসিড়ি আবাসন প্রকল্পের দক্ষিণে রাজউক প্রস্তাবিত মাদানী এভিনিউ এর উত্তর পাশে নাওরা মৌজা দিয়ে বালু নদী ক্রস করে বেড়াইদ মৌজা হয়ে বিদ্যমান মাদানী এভিনিউ দিয়ে বারিধারা ইনজেকশন পয়েন্টে আনা হবে। অতঃপর ডিস্ট্রিবিউশন লাইনের মাধ্যমে মহানগরীর বিভিন্ন এলাকা/ বিদ্যমান District Metered Area (DMA)-তে সরবরাহ করা হবে। Distribution Pipe line স্থাপন কাজটি ২ (দুই) টি প্যাকেজে বিভক্ত করে (Package-P3.1 & Package-P3.2) বাস্তবায়ন করা হবে। উক্তের, Package-P3.1 (Primary Distribution Pipe lines) এর দরপত্র আহবান ও দরপত্র গ্রহণ ইতোমধ্যে সম্পন্ন হয়েছে। Single-Stage Two Envelope প্রক্রিয়ায় আহ্বানকৃত উক্ত দরপত্রের Technical দরপত্র মূল্যায়ন চলমান রয়েছে এবং বর্ণিত প্যাকেজের কাজটি সম্ভাব্য আগামী ফেব্রুয়ারী/২০২০ নাগাদ মাঠ পর্যায়ে কাজ শুরু হবে। Primary Distribution Pipe lines কাজটি বাস্তবায়নের প্রেক্ষিতে নতুন বাজার হতে রামপুরা রোড, নতুন বাজার হতে কাকলী, নতুন বাজার হতে কুড়িল ও উত্তরা এবং সোনারগাঁ জনপথ পর্যন্ত বিভিন্ন ব্যাসের পাইপ লাইন নির্মাণের জন্য OT পদ্ধতিতে রাস্তা খননের প্রয়োজন। এছাড়াও বর্ণিত কর্ম পরিকল্পনা রাস্তা খননের ক্ষতিপূরণ বাবদ প্রয়োজনীয় আর্থিক বরাদ্দের পরিমাণ নির্ধারণের বিষয়টি জরুরী বিবেচ্য। উক্ত এলাকার রাস্তা খননের লোকেশন ম্যাপ এতদসঙ্গে সংযুক্ত করা হলো। Package-P3.1 এর অধীনে রাস্তা খননের বিবরণ নিম্নরূপঃ-

পাইপ লাইনের লোকেশন	পাইপের ব্যাস (মিঃমিঃ)	রাস্তা খননের দৈর্ঘ্য (মিঃ)	রাস্তা খননের প্রস্থ (মিঃ)	রাস্তা খননের পরিমাণ (বর্গমিঃ)	রাস্তার প্রকৃতি	মন্তব্য
কুড়িল হতে উত্তরা	DN১৬০০	৪৮৩৮	২.৬৭	১২,৯১৭.৪৬	বিটুমিনাস	
	DN১৪০০	৭৯২	২.৪৭	১,৯৫৬.২৪	বিটুমিনাস	
	DN১২০০	৭৬৪	২.১৬	১৬৫০.২৪	বিটুমিনাস	
	OD৪২০	৫৫৪	১.১৫	৬৩৭.৪০	বিটুমিনাস	
কুড়িল হতে রেডিসন হোটেল	OD৮২০	১৬২৮	১.৫০	২৫৪২.৮০	বিটুমিনাস	
কনকর্ডিয়া ৩ ও ৪	DN১৬০০	৩৫	২.৬৭	৮০.১০	বিটুমিনাস	
	DN৮০০	১৫	১.৬৫	২৪.৭৫	বিটুমিনাস	
জসিম উদ্দিন রোড	DN৯০০	৬৬৭	১.৭৫	১,১৬৭.২৫	বিটুমিনাস	
রিসিভিং শাফট	DN৭০০০			৩৮.৪৭	বিটুমিনাস	
জংশন	৪টি	১০	৩.৫	১৭৫.০০	বিটুমিনাস	
পিআরভি	৩টি	৪০	১.৭৫	২১০.০০	বিটুমিনাস	
রাস্তা ক্রসিং	৪টি	৫০	১.৭৫	৩৫০.০০	বিটুমিনাস	
ইউটিলিটি ক্রসিং	২টি	১০	৩	৬০.০০	বিটুমিনাস	
আইসোলেশন	১টি	১০	২.৫	২৫.০০	বিটুমিনাস	
			মোট খননের পরিমাণ=	২০,৭৮১.০০		

চলমান পাতা # ০২

WASA Bhaban (9th floor), 98, Kazi Nazrul Islam Avenue, Kawran Bazar, Dhaka-1215, Bangladesh
Tel: 88-02-8189095. www.deswsp-dwasa.com,

DHAKA WASA

DHAKA ENVIRONMENTALLY SUSTAINABLE WATER SUPPLY PROJECT
DHAKA WATER SUPPLY & SEWERAGE AUTHORITY
DESWSP, DHAKA WASA

Memo No. : 46.113.618.00.00.G-203/DESWSP/১১৮২ Date : ৬.৮.১৯

প্রধান নির্বাহী কর্মকর্তা
ঢাকা উত্তর সিটি কর্পোরেশন
ঢাকা।

বিষয়ঃ ঢাকা ওয়াসার "ঢাকা এনভায়রনমেন্টালী সাসটেইনেবল ওয়াটার সাপ্লাই প্রজেক্ট (DESWSP)" এর Package- P3.1 এর অধীনে নতুন বাজার হতে রামপুরা রোড, নতুন বাজার হতে কাকলী, নতুন বাজার হতে কুড়িল ও উত্তরা এবং সোনারগাঁও জনপথ এলাকায় পানি শোধনাগারের ট্রান্সমিশন ও ডিস্ট্রিবিউশন পাইপ লাইন স্থাপনের উদ্দেশ্যে প্রস্তাবিত রুটে OT (Open Trench) পদ্ধতিতে রাস্তা খননের অনুমোদন প্রদান প্রসঙ্গে।

উপর্যুক্ত বিষয়ের প্রেক্ষিতে জানানো যাচ্ছে যে, "ঢাকা এনভায়রনমেন্টালী সাসটেইনেবল ওয়াটার সাপ্লাই প্রকল্পের কাজ বৈদেশিক সংস্থা ADB'র অর্থায়নে এগিয়ে চলছে। পর্যায়ক্রমে ভূগর্ভস্থ পানির উপর নির্ভরশীলতা কমিয়ে টেকসই ও পরিবেশ বান্ধব ভূ-উপরিস্থ/ নদীর পানি পরিশোধন করে ঢাকা মহানগরী ও এর আশপাশের শহরতলীসহ Under construction/ Potential Urban Area-তে Pressurized System এ সুষ্ঠু ও জনবান্ধব ব্যবস্থাপনায় নিরাপদ পানি সরবরাহ নিশ্চিত করা হবে। এ লক্ষ্যে সুদূর মেঘনা নদী থেকে ট্রান্সমিশন লাইনের মাধ্যমে অপরিশোধিত পানি রূপগঞ্জের গন্ধর্বপুরে (শীতলক্ষ্যা নদীর পূর্ব পাড়ে) এনে তা পরিশোধন করা হবে। পরিশোধিত পানি ট্রান্সমিশন লাইনের এ্যালাইনমেন্টে পাইপ বসিয়ে গন্ধর্বপুর মুড়াপাড়া হয়ে শীতলক্ষ্যা নদী ক্রস করে হরিণাধাম হয়ে জলসিড়ি আবাসন প্রকল্পের দক্ষিণে রাজউক প্রস্তাবিত মাদানী এভিনিউ এর উত্তর পাশে নাওরা মৌজা দিয়ে বাপু নদী ক্রস করে বেড়াইদ মৌজা হয়ে বিদ্যমান মাদানী এভিনিউ দিয়ে বরিধারা ইনজেকশন পয়েন্টে আনা হবে। অতঃপর ডিস্ট্রিবিউশন লাইনের মাধ্যমে মহানগরীর বিভিন্ন এলাকা/ বিদ্যমান District Metered Area (DMA)-তে সরবরাহ করা হবে। Distribution Pipe line স্থাপন কাজটি ২ (দুই) টি প্যাকেজে বিভক্ত করে (Package-P3.1 & Package-P3.2) বাস্তবায়ন করা হবে। উল্লেখ্য, Package-P3.1 (Primary Distribution Pipe lines) এর দরপত্র আহবান ও দরপত্র গ্রহণ ইতোমধ্যে সম্পন্ন হয়েছে। Single-Stage Two Envelope প্রক্রিয়ায় আহ্বানকৃত উক্ত দরপত্রের Technical দরপত্র মূল্যায়ন চলমান রয়েছে এবং বর্ণিত প্যাকেজের কাজটি সম্ভাব্য আগামী ফেব্রুয়ারী/২০২০ নাগাদ মঠ পর্যায়ে কাজ শুরু হবে। Primary Distribution Pipe lines কাজটি বাস্তবায়নের প্রেক্ষিতে নতুন বাজার হতে রামপুরা রোড, নতুন বাজার হতে কাকলী, নতুন বাজার হতে কুড়িল ও উত্তরা এবং সোনারগাঁও জনপথ পর্যন্ত বিভিন্ন ব্যাসের পাইপ লাইন নির্মাণের জন্য OT পদ্ধতিতে রাস্তা খননের প্রয়োজন। এছাড়াও বার্ষিক কর্ম পরিকল্পনা রাস্তা খননের ক্ষতিপূরণ বাবদ প্রয়োজনীয় আর্থিক বরাদ্দের পরিমাণ নির্ধারণের বিষয়টি জরুরী বিবেচ্য। উক্ত এলাকার রাস্তা খননের লোকেশন ম্যাপ এতদসঙ্গে সংযুক্ত করা হলো। Package-P3.1 এর অধীনে রাস্তা খননের বিবরণ নিম্নরূপ:-

পাইপ লাইনের লোকেশন	পাইপের ব্যাস (মিমিঃ)	রাস্তা খননের দৈর্ঘ্য (মিঃ)	রাস্তা খননের প্রস্থ (মিঃ)	রাস্তা খননের পরিমাণ (বর্গমিঃ)	রাস্তার প্রকৃতি	মন্তব্য
P3.1ইন্টারফেস নতুন বাজার	DN১৬০০	৬০	৫.০৪	৩০২.৪০	বিটুমিনাস	
	DN১২০০	২৫	৪.১১	১০২.৭৫	বিটুমিনাস	
নতুন বাজার হতে রামপুরা	DN১২০০	১৯১০	২.১৬	৪১৩৬.৫৬	বিটুমিনাস	
	DN১০০০	৪১২	১.৯৫	৮০৩.৪০	বিটুমিনাস	
	DN৮০০	১৪২	১.৬৫	১৫৫৪.৩০	বিটুমিনাস	
নতুন বাজার হতে কাকলী	OD৬৩০	১৪১৮	১.৩৫	১৮৮৫.১৪	বিটুমিনাস	
	OD৫৬০	৮৫৪	১.২৬	১০৭৯.০৪	বিটুমিনাস	
নতুন বাজার হতে কুড়িল	DN১৪০০	২৭০৯	৪.৬৩	১২৫৪২.৬৭	বিটুমিনাস	
সোনারগাঁও জনপথ	DN১০০০	৯৬৫	১.৯৫	১৯২০.৭৫	বিটুমিনাস	
	OD৮০০	১২১০	১.৬	১৯৩৬.০০	বিটুমিনাস	
ভাসিয়া ট্রেডিং রোড	DN৯০০	৬৮৭	১.৭৫	১২০৭.২৫	বিটুমিনাস	
সুধাস্ত	DN১২০০	১৫	২.১৬	৩২.৪০	বিটুমিনাস	
সোনারগাঁও জনপথ-১	DN১০০০	১০	১.৯৫	১৯.৫০	বিটুমিনাস	
সোনারগাঁও জনপথ-২	DN৬০০	৫০	১.৩৩	৬৫.৫০	বিটুমিনাস	
গুলশান লেক	DN৬০০	২০	১.৩৩	২৬.৬০	বিটুমিনাস	
বনানী লেক	DN৫০০	১৫	১.২৬	১৮.৯০	বিটুমিনাস	
পশ্চিম শাহজাহান	DN১০০০			৬৫.৫৮	বিটুমিনাস	

চলমান পাতা # ০২

WASA Bhaban (10th floor), 98 Kazi Nazrul Islam Avenue, Kawran Bazar, Dhaka-1215, Bangladesh
Tel : 88-02-8189095, www.deswsp-dwasa.com,

DHAKA ENVIRONMENTALLY SUSTAINABLE WATER SUPPLY PROJECT
DHAKA WATER SUPPLY & SEWERAGE AUTHORITY
DESWSP, DHAKA WASA

Memo No. : Date :

পাতা # ০২

পাইপ লাইনের লোকেশন	পাইপের ব্যাস (মিঃমিঃ)	রাস্তা খননের দৈর্ঘ্য (মিঃ)	রাস্তা খননের প্রস্থ (মিঃ)	রাস্তা খননের পরিমাণ (বর্গমিঃ)	রাস্তার প্রকৃতি	মন্তব্য
জাংশন	২০টি	১০	৩.৫	৭০০.০০	বিটুমিনাস	
ভিআরবি	১৪টি	৪০	১.৭৫	৯৮০.০০	বিটুমিনাস	
রাস্তা ক্রসিং	১১টি	৫০	১.৭৫	৯৬২.৫০	বিটুমিনাস	
ইউটিলিটি ক্রসিং	৮টি	১০	৩	২৪০.০০	বিটুমিনাস	
আইসোলেশন	১টি	১০	২.২	২২.০০	বিটুমিনাস	
মোট খননের পরিমাণ=				৩০,৫৬৬.০০		

এমতাবস্থায়, ঢাকা ওয়াসার "ঢাকা এনভায়রনমেন্টালী সাসটেইনেবল ওয়াটার সাপ্লাই প্রজেক্ট (DESWSP)" এর Package- P3.1 এর অধীনে নতুন বাজার হতে রামপুরা রোড, নতুন বাজার হতে কাকলী, নতুন বাজার হতে কুড়িল ও উত্তরা এবং সোনারগাঁ জনপথ এলাকায় পানি শোধনাগারের ট্রান্সমিশন ও ডিস্ট্রিবিউশন পাইপ লাইন স্থাপনের উদ্দেশ্যে প্রস্তাবিত রুটে OT (Open Trench) পদ্ধতিতে রাস্তা খনন কাজ সম্পন্ন করার লক্ষ্যে উপরোক্ত বর্ণনা ও সংযুক্ত পরিমাপ অনুযায়ী রাস্তা খননের ক্ষতিপূরণ বিলের ডিমান্ড নোট এবং রাস্তা খননের অনুমতি পত্র অত্র প্রকল্প বরাবর প্রেরণের জন্য বিশেষ ভাবে অনুরোধ করা হলো।

সংযুক্তঃ প্রস্তাবিত এ্যালাইনমেন্টের নকশা।

(মোঃ মাহমুদুল ইসলাম)
তত্ত্বাবধায়ক প্রকৌশলী ও প্রকল্প পরিচালক
(DESWSP), ঢাকা ওয়াসা।

অনুলিপিঃ
১. প্রধান প্রকৌশলী, ঢাকা উত্তর সিটি কর্পোরেশন, ঢাকা।
২. উপ-প্রকল্প পরিচালক-১/২, DESWSP, ঢাকা ওয়াসা।
৩. নির্বাহী প্রকৌশলী-১/২/৩, DESWSP, ঢাকা ওয়াসা।
৪. Management Design & Supervision Consultant (MDSC).

WASA Bhaban, 98 Kazi Nazrul Islam Avenue, Kawran Bazar, Dhaka-1215, Bangladesh
Tel : 88-02-8189065, www.deswsp-dwasa.com

Valid upto 10/12/1

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.6700.140.72.138.18. 1148 Date: 11 /12/2018

Subject: Environmental Clearance for Dhaka Environmentally Sustainable Water Supply Project under Dhaka WASA.

Ref: Your application dated 30/07/2018 and 28/11/2018.

Dear Sir,

Please refer to your letter of 30th July 2018 and 28th November 2018 on the captioned subject, I have the pleasure to convey the approval of Environmental Clearance in favor of Dhaka Environmentally Sustainable Water Supply Project under Dhaka WASA.

A copy of the said Environmental Clearance Certificate is attached herewith for your kind information and necessary action at your end.

11.12.2018

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone: 8181673

Project Director
Dhaka Environmentally Sustainable Water Supply Project
Dhaka WASA, WASA Bhaban (9th Floor)
98, Kazi Nazrul Islam Avenue, Kawran Bazar
Dhaka-1215.

Copy Forwarded to :

1) Private Secretary to the Hon'ble Secretary, Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat, Dhaka.
2) Director, Department of Environment, Dhaka Metropolitan/Regional office, Dhaka.
3) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

Government of the People's Republic of Bangladesh
Department of Environment
Paribesh Bhaban, E-16, Agargaon
Sher-e-Bangla Nagar, Dhaka-1207
www.doe.gov.bd

Environmental Clearance Certificate

Section 12 of the Environment Conservation Act, 1995 (Amended 2002)

Clearance Certificate Number: 1148

File number: 22.02.6700.140.72.138.18.

Clearance Certificate Issue Date: 11, December 2018

Renewal date not later than: 10, November 2018

A. Clearance Certificate Type

Environmental Clearance Certificate

B. Clearance Certificate Holder

Project Director
Dhaka Environmentally Sustainable Water Supply Project
Dhaka WASA, WASA Bhaban (9th Floor)
98, Kazi Nazrul Islam Avenue, Kawran Bazar
Dhaka-1215.

C. Premises to which this Clearance Certificate Applies

Project Director
Dhaka Environmentally Sustainable Water Supply Project
Dhaka WASA, WASA Bhaban (9th Floor)
98, Kazi Nazrul Islam Avenue, Kawran Bazar
Dhaka-1215.

D. Activities for which this Clearance Certificate Authorizes and Regulates

The following components will be implemented through Dhaka Environmentally Sustainable Water Supply Project under Dhaka WASA -
Component 1 : Water Treatment Plant (WTP) (capacity 500MLD)
Component 2 : Water Intake Structure (capacity 1050 MLD)
Component 3 : 21.7 kilometer Raw Water Transmission Pipeline
Component 4 : 13 kilometer Treated Water Transmission Pipeline
Component 5 : 23 kilometer Distribution Reinforcement within the existing network
Component 6 : 56 kilometer Distribution Reinforcement, small distribution pipe to DMA

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E. Terms and Conditions for Environmental Clearance Certificate

1. **Limit Condition for Discharges to Air and Water**: The Environmental Clearance Certificate must comply with schedule 2 and 10, rule 12 of the Environment Conservation Rules, 1997.

2. **Noise Limit**: The Environmental Clearance Certificate must comply with the Noise Pollution (Control) Rules, 2006.

In case of non-coverage of ECR 1997 the World Bank Environment, Health and Safety Guideline shall be adhered to.

3. **Operating conditions:**

3.1 Activities must be carried out in a competent manner. This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

3.2 All plant and equipment installed at the premises or used in connection with the Environmental Clearance activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.

3.3 Construction works shall be restricted to day time hours so as to avoid/mitigate the disturbance of local lives as well as implementation schedules of the works shall be notified in advance to nearby residents.

3.4 Storage area for soils and other construction materials shall be carefully selected to avoid disturbance of the natural drainage.

3.5 This shall be ensured that soil is obtained from nearby areas, which are free of invasive plants. Re-vegetation and replanting shall be undertaken if rehabilitation works involve extensive vegetation clearance.

3.6 Vegetation clearance shall be minimizing at the construction phase as to minimize soil erosion. Soils for embankments shall be properly tested and compacted to ensure stability.

3.7 Proper construction practices shall be followed that minimize loss of habitats and fish breeding, feeding & nursery sites.

3.8 Proper and adequate sanitation facilities shall be ensured in labor camps throughout the proposed project period.

3.9 In order to control noise pollution, vehicles & equipment shall be maintained regularly; working during sensitive hours and locating machinery close to sensitive receptor shall be avoided.

3.10 No solid waste can be burnt in the project area. An environment friendly solid waste management should be in place during whole the period of the project in the field.

3.11 Proper and adequate on-site precautionary measures and safety measures shall be ensured so that no habitat of any flora and fauna would be demolished or destructed.

3.12 All the required mitigation measures suggested in the EIA report are to be strictly implemented and kept operative/functioning on a continuous basis.

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3.13 Any heritage sight, ecological critical area, and other environmentally and/or religious sensitive places shall be avoided during project construction phase.
3.14 Resettlement plan should be properly implemented and people should be adequately compensated, where necessary.
3.15 Construction material should be properly disposed off after the construction work is over.
3.16 The Environmental Management Plan included in the EIA report shall strictly be implemented and kept functioning on a continuous basis.

4.1 Monitoring and Recording conditions:

4.1.1 The results of any monitoring required to be conducted by this Clearance Certificate must be recorded.

4.1.2 The following records must be kept in respect of any samples required to be collected for the purposes of this Clearance Certificate:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

4.2 Requirement to monitor concentration of pollutants discharged

For each monitoring, the Clearance Certificate holder must monitor (by sampling and obtaining results by analysis) the following parameter: air quality, water quality and Noise.

5. Reporting Conditions: Environmental Monitoring Reports shall be made available simultaneously to Head quarters and Dhaka Metropolitan/Regional office of the Department of Environment on a quarterly basis during the whole period of the project.

6. Notification of environmental harm: The Clearance Certificate holder or its employees must notify the Department of Environment of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident.

F. Recording of pollution complaints

The certificate holder must keep a legible record of all complaints made to the certificate holder or any employee or agent of the certificate holder in relation to pollution arising from any activity to which this Environmental certificate applies. The record must include details of the following:

(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;

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(e) the action taken by the certificate holder in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the certificate holder, the reasons why no action was taken.

The record of a complaint must be kept for at least 4 years after the complaint was made. The record must be produced to any authorized officer of the DOE who asks to see them.

G. Validity of the Clearance Certificate

This Environmental Clearance is valid for one year from the date of issuance and the project authority shall apply for renewal to the Head Office of DOE with a copy to Dhaka Metropolitan/Regional office at least 30 days ahead of expiry.

Violation of any of the above conditions shall render this clearance void.

11.12.2018

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone: 8181673

4/4

ENGLISH TRANSLATION OF THE MEMORANDUM OF CANTONMENT BOARD PERMISSION

Cantonment Board

Dhaka Cantonment

www.canttboard-dhaka.gov.bd

Telephone: 9835565

Military: 7210

Letter No. – DhaCaBo/PW/60/6/209 Date: 24
Falgun 1423

08

March 2017

Subject: Regarding implementation of Dhaka Environmentally Sustainable Water Supply Project by Dhaka WASA targeted to supply potable water to Dhaka City area

Reference: Memo No.- 46.113.618.00.00G-28/DESWSP/2411 of dated 27 December 2016 of the Superintendent and Project Director, DESWSP, Dhaka WASA

In reference to the above-mentioned memos about the subject mentioned, this is to inform that this is approved in principle to install large diameter water transmission line under the Dhaka Environmentally Sustainable Water Supply Project at Army Line Point and Zia Colony Point.

2. This is to note that the estimate for the damage due to road cutting will be determined after joint verification by the representatives from Dhaka WASA and the Cantonment Board. The final permission for road cutting would be given on payment of the cost of damage.

3. This is sent for information and action.

Sd/-
(S. M. Abdul Qader)
Cantonment Executive Officer
Dhaka Cantonment
Tel: 9835565, E-mail:
ceocbd@gmail.cm

Distribution:

Outgoing:

Action:

9. The Superintending Engineer and Project Director, DESWSP, Dhaka WASA, Wasa Bhaban, 98 Kazi Nazrul Islam Avenue, Kawran Bazar, Dhaka.
10. Record.

To Inform: For kind information

Station Head Quarters, Dhaka Cantonment

Team Leader, MDSC, DESWS Project, Dhaka WASA

Deputy Director-1/2, DESWS Project, Dhaka WASA

Package-2

ক্যান্টনমেন্ট বোর্ড
ঢাকা ক্যান্টনমেন্ট
www.cantboard-dhaka.gov.bd
দূরালাপনী : ৯৮৩৫৫৬৫
সামরিক : ৭২১০

পত্র নং-ঢাক্যাবো/পিডব্লিউ/৬০/৬/২০০১

২৪ফাল্গুন ১৪২৩
তারিখ : ০৮ মার্চ ২০১৭

বিষয় : ঢাকা মহানগরী এলাকায় সুপেয় পানি সরবরাহের লক্ষ্যে ঢাকা ওয়াসা কর্তৃক বাস্তবায়নাধীন "ঢাকা এনভায়রনমেন্টালী সাসটেইনেবল ওয়াটার সাপ্লাই প্রজেক্ট" এর আওতায় স্থাপিতব্য বৃহৎ ব্যাসের পানি সঞ্চালন লাইন প্রসঙ্গে।

সূত্র: তত্ত্বাবধায়ক প্রকৌশলী ও প্রকল্প পরিচালক, DESWSP, ঢাকা ওয়াসার ২৭ ডিসেম্বর ২০১৬ তারিখের মেমো নং-৪৬.১১৩.৬১৮.০০.০০.G-28/DESWSP/2411

উপর্যুক্ত বিষয় ও সূত্রের প্রেক্ষিতে জানানো যাচ্ছে যে "ঢাকা এনভায়রনমেন্টালী সাসটেইনেবল ওয়াটার সাপ্লাই প্রজেক্ট" এর আওতায় স্থাপিতব্য বৃহৎ ব্যাসের পানি সঞ্চালন লাইন স্থাপনের জন্য সৈনিক লাইন পয়েন্ট ও জিয়া কলোনী পয়েন্টের জন্য (শুধুমাত্র ক্যান্টনমেন্ট বোর্ডের আওতাধীন এলাকা) নীতিগত অনুমোদন দেয়া হলো।

২। উল্লেখ্য যে পরবর্তীতে রাস্তা কর্তনের নকশা ও এলাইনমেন্ট পাওয়া গেলে ঢাকা ওয়াসা ও ক্যান্টনমেন্ট বোর্ডের প্রতিনিধি কর্তৃক সরেজমিন যৌথ পরিমাপ গ্রহণ করে রাস্তা কর্তনের ক্ষতিপূরণ নির্ধারণ করা হবে। ক্ষতিপূরণ বিল পরিশোধ সাপেক্ষে রাস্তা কর্তনের চূড়ান্ত অনুমতি প্রদান করা হবে।

৩। অবগতি ও পরবর্তী কার্যক্রম গ্রহণের প্রেরণ করা হলো।

* In principle, the cantonment Board approved pipe line installation through Sainik club and Zia colony.
* Final approval will be after getting road cutting drawing and pipe alignment and subsequent payment of compensatory money for road restoration.

CEO

(এম. আব্দুল কাদের)
ক্যান্টনমেন্ট এক্সিকিউটিভ অফিসার
ঢাকা ক্যান্টনমেন্ট
ফোন : [illegible], E-mail : [illegible]@gmail.com

08/03/2017

বিতরণ :
বহির্গমন :
কার্যক্রম :
তত্ত্বাবধায়ক প্রকৌশলী ও প্রকল্প পরিচালক
DESWSP, ঢাকা ওয়াসা, ওয়াসা ভবন
৯৮, কাজী নজরুল ইসলাম এভিনিউ, কাওরান বাজার, ঢাকা।

অবগতি : সদয় জ্ঞাতার্থে।
স্টেশন সদর দপ্তর, ঢাকা সেনানিবাস।
Team Leader, MDSC, DESWS Project, Dhaka WASA.
উপ-প্রকল্প পরিচালক-১/২, DESWS প্রকল্প, ঢাকা ওয়াসা।

MDSC, DESWSP
Received: 09/04/17

Name	I	A	Sign
Harun		✓	[illegible]
P.R	✓		
Shimmin	✓		
D.B	✓		

File: 346152/

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M. Template for noise monitoring

SN	Location	Result in dB - A		DoE (Bangladesh) Noise Standard for Mixed Area (Schedule-1), Leq	
		Leq		Day Time (6 AM-9 PM)	Night Time (9 PM- 6 AM)
		Day	Night		
01	Chaitankanda			60	50
02	Shejan Point			60	50
03	Gandhabpur			60	50
04	Murapara			60	50
05	Gulshan			60	50
06	Uttara			60	50
Method/Instrument				**Sound Level Meter Model: SL – 4033SD**	

N. Template for ambient air quality monitoring

S. N	Locations	Concentration						
		SPM µg/m^3	**$PM_{2.5}$ µg/m^3**	**PM_{10} µg/m^3**	**SO_2 µg/m^3**	**NO_X µg/m^3**	**O_3 µg/m^3**	**CO ppm**
01	Chaitankanda							
02	Shejan Point							
03	Gandhabpur							
04	Murapara,							
05	Gulshan							
06	Uttara							
Duration (hrs)		8	24	24	24	24	8	1
DoE Standard		200	65	150	365	100	157	40
Method of Analysis		Gravimetric	Gravimetric	Gravimetric	West Geake	Jacob & Hochheiser	Photometric	Digital Meter

O. Outline for semi-annual monitoring report

Contents

P. Checklist for monthly environmental reporting – contractor

This checklist shall be used as a basis for the preparation of environmental reports. Reports will be prepared package wise by the contractor and submitted to MDSC on a monthly basis. The contractor shall report on topics as follows:

- Compliance of works with EMP and IEE requirements
- Compliance of works with environmental requirements of DoE as set in environmental clearance
- Compliance of works and management of contractor's camp according to waste management plan
- Management of contractor's camp according to sewage management plan
- Application of dust suppression
- Emissions from construction machinery
- Transportation, storage and use of hazardous material
- Management of excess material generated during works
- Management of works in close vicinity of water bodies in compliance with EMP
- Implementation of environmental monitoring
- Management of works in the vicinity of trees to be protected / or removed
- Management of work in the vicinity of habitats and cultural resources
- Compliance with H&S plan
- Implementation of occupational and community H&S

Consultation of affected persons during construction

Abbreviations

ADB	Asian Development Bank
AAQ	Ambient Air Quality
BFRI	Bangladesh Fisheries Research Institute
BIWTA	Bangladesh Inland Waterways Transport Authority
BWDB	Bangladesh Water Development Board
BNBC	Bangladesh National Building Code
BOD	Biochemical Oxygen Demand
CSC	Construction Supervision Consultant
DBC	Design Build Contractor
DESWSP	Dhaka Environmentally Sustainable Water Supply Project
DMC	Design Management Consultants
DoE	Department of Environment
DoF	Department of Fisheries
DTW	Deep Tube Well
DWASA	Dhaka Water and Sewerage Authority
ECA	Environment Conservation Act
ECR	Environment Conservation Rules
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EM&MP	Environmental Management & Monitoring Plan
GW	Ground Water
IEE	Initial Environmental Examination
IWM	Institute of Water Modeling
LAP	Land Acquisition Plan

MoEF	Ministry of Environment and Forest
NGO	Non-governmental Organization
PMU	Project Management Unit
RAP	Resettlement Action Plan
RoW	Right of Way
SC	Supervision Consultant
STW	Shallow Tube Well
SW	Surface Water
SWTP	Surface Water Treatment Plant
WSF	Water Safety Framework
WSP	Water Safety Plan
WTP	Water Treatment Plant

Units

°C	degree Celsius
CFU	Colony-Forming Unit
dB	decibels
ha	hectare
km	kilometer
km/h	kilometer per hour
m	meter
mg/l	milligram per liter
MLD	million liters per day
mm	millimeter
µg/m^3	micro-gram per cubic meter
NTU	Nephelometric Turbidity Unit
ppm	parts per million

Currency Equivalents

(As of 26 November 2015)

Currency unit	–	Taka (Tk)
Tk.1.00	=	$0.01283
$1.00	=	Tk. 77.95

NOTE

In this report, "$" refers to US dollars.

Weights and Measures

km	–	kilometer
km^2	–	square kilometer
m^2	–	square meter
mm	–	millimeter
m^3/day	–	cubic meter per day

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