Annex A: Approved Terms of Reference

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

Memo No: DoE/Clearance/5725/2017/107 Date: 22/02/2017

Subject: Terms of Reference (TOR) for Environmental Impact Assessment (EIA) of the Preparatory Study on the Dhaka Mass Rapid Transit Development Project (Line-5 From Vatara to Hemayetpur).

Ref: Your Application dated 29/06/2016.

With reference to your letter dated 29/06/2016 for the subject mentioned above, the Department of Environment hereby gives approval of Terms of Reference (TOR) for Environmental Impact Assessment (EIA) of the Preparatory Study on the Dhaka Mass Rapid Transit Development Project (Line-5 from Vatara-Hemayetpur) subject to fulfilling the following terms and conditions.

I. The Project Authority shall conduct a comprehensive Environmental Impact Assessment (EIA) study considering the overall activity of the said Project in accordance with the TOR submitted to the DOE and additional suggestions provided herein.

II. The EIA shall incorporate the following components/items in addition to the issues mentioned in the proposed TOR for EIA.

(a) Executive summary
(b) Introduction: (Background, brief description, scope of study, methodology, limitation, EIA team, references)
(c) Legislative, regulation and policy consideration (covering the potential legal, administrative, planning and policy framework within which the EIA will be prepared)
(d) Environmental Baseline Data

d.1. Project Data Sheet

i. **Project location and area**
The location of the project and area involved

ii. **Project Concept**
An outline of description of the concept and objectives of the project, the types of activities expected, and the development plans for achieving the objectives.

iii. **Project Components**
Components of the project concerning the types of activities proposed to be located in the area, other infrastructure, utilities and service requirements.

iv. **Project Activities**
A list of the main project activities to be undertaken during: site clearing and construction, operation of activities and associated developments.

v. **Project schedule**
The phase and timing for development of the Mass Rapid Transit (MRT) Line-5 from Vatara to Hemayetpur, infrastructure and other facilities required.

vi. **Resources and utilities demand**
Resources required to develop the project, such as soil and construction material and demand for utilities (water, electricity, sewerage, waste disposal and others), as well as infrastructure (road, drains, and others) to support the project.

d.2. Physical and chemical components

i. **Map and survey information**
Location map.
Cadastral map showing land plots (project and adjacent area).

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Topographic map for identifying catchment boundaries, general land use and terrain.
survey map showing contour information.
Aerial photograph.

ii. **Geology and soil**
Geological map showing geological units, fault zone, and other natural features.
Soil map and soil profile analysis. This may only be established from soil survey and geotechnical investigation (important for analysis for soil stability, cut and fill).
Soil properties and composition.

iii. **Hydrology and drainage**
Catchment boundaries of rivers/canals which drain the project.
Hydrological characteristics of rivers in and around the project area including flow and sediment load for varies return period.
Flood characteristics and historical records of flood events covering areas affected, height of flood and frequency.
Ground water potential and aspects of aquifer, such as recharge zones, ground water abstraction etc.
Drainage system and drainage characteristics in the project area.

iv. **Water quality and use**
Water quality of the receiving water bodies likely to be affected by the project.
Sources of pollutants from existing and known future activities within the catchment of the rivers

v. **Air quality and noise**
Baseline data of the project site with respect to air quality and noise level.
Air pollutant and noise sources from existing and known sources.

d.3. Ecological components

i. **Habitats**
   a. Aquatic habitat likely to be impacted by the project
   b. Terrestrial habitat likely to be impacted by the project

ii. **Species and Population**
   a. Identification of population of flora and fauna to assess their conservation status of being rare, endemic and endangered.
   b. Biodiversity of the project site.

d.4. Social and Economic Factors

i. Population.
Population within and around the project area.
Organizational structure of communities and the degree of public awareness and response to the proposed project.

ii. Human settlement.
Size and distribution of human settlement.
Community infrastructure, utilities and services available.
Housing and future requirements within the impacted area.
Historical/archaeological features of significance.

iii. Economic activities.
Economic activities of population in and around the project area. Activities should include those that are dependent on resources which may be impacted by project.
Income dependence on economic activities impacted directly or indirectly by the project.
Employment and economic returns to the population by the project.

d.5. Infrastructure and utilities

i. Availability of infrastructure to support the proposed project. Attention should focus on different transportation requirements due to project increase in traffic to and from the project area.

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ii. Availability of utilities and services, especially water, gas and electricity supply, sewerage and waste disposal facilities to cater to the projected demand for such utilities and services.

(e) **Prediction Of Impacts**

i. Soil erosion and sedimentation.
ii. Floods and Cyclones/Tornados.
iii. Water quality.
iv. Air quality.
v. Noise.
vi. Solid, Toxic and Hazardous waste.
vii. Ecology.
viii. Traffic.
ix. Socio-Economy.

(f) **Evaluation Of Impacts**

The judgment of significance of impacts can be based on one or more of the following, depending on the environmental factor being evaluated. These are -

i. impact identification and scoping matrix.
ii. possible impacts in planning, construction and operation stage.
iii. comparison with laws, regulation or accepted national or international standards.
iv. reference to pre-set criteria such as conservation or protected status of a site, feature or species.
v. consistency with pre-set policy objectives.
vi. consultation and acceptability with the relevant decision makers, local community or the general public.

(g) **Mitigation Of Impacts**

Mitigation measures which may be considered including -

i. mitigation measures for planning, construction and operation stage.
ii. changing project layout, transport routes, disposal routes or locations, timing or engineering design.
iii. introducing pollution controls, waste treatment, phased implementation and construction, engineering measures, monitoring, landscaping, social services or public education.
iv. compensation to restore, relocate or provision of concession for damage.

Sl.	ITEM	REQUIREMENT
a	Soil erosion prevention	An outline of measures to control soil erosion.
b	water pollution	Measures to treat sewage water.
c	Air pollution	During construction: measures to minimize fugitive dust from exposed soil surface and those caused by motor vehicles. During operations: measures to minimize air pollution through selection of types of industries allowed in the area.
d	Noise	During construction: measures to minimize noise from traffic and construction activities During operation: application of buffer zones to minimize noise as well as that due to traffic.
e	Solid and hazardous waste	Management options need to be identified. The need for centralized waste collection, treatment and disposal facilities need to be given due consideration.
f	Flood/Cyclones/ Tornados	An outline of measures to minimize flooding/cyclones/ tornados. A diagram to show likely drainage system and flood retention sites, diversion channels, etc.
g	Land use	The project area should be effectively zoned for different categories of activities and types of recommendation should be

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		outlined. A diagram showing land use distribution for the project area.
h	Habitat and species	Measures to protect or conserve habitat and species with recommended buffer zones. A diagram showing conservation areas.
i	Socio-economic issues	Outline of steps or measures to be taken to resolve social conflicts and related socio-economic issues.
j	Utilities and services	A diagram to show additional utilities and services required to satisfy projected demands of the project area.
k	Road and traffic	Road access and improvements required to meet projected traffic densities.

(h) **Environmental Management Plan**
For each significant major impact, proposed mitigation measures will be set out for incorporation into project design or procedures, impacts, which are not capable of mitigation, will be identified as residual impacts Both technical and financial plans shall be incorporated for proposed mitigation measures..
An outline of the Environmental Management Plan shall be developed for the project.
In Environmental Monitoring Plan, a detail technical and financial proposal shall be included for developing an in-house environmental monitoring system to be operated by the proponent's own resources (equipments and expertise).

(i) Consultation with Stakeholders/Public Consultation (ensures that consultation with interested parties and the general public will take place and their views taken into account in the planning and execution of the project)
Beneficial Impacts (summarize the benefits of the project to the Bangladesh nation, people and local community and the enhancement potentials)

(j) Emergency Response Plan & disaster Impact Assessment

(k) Conclusion and Recommendations

(l) Without approval of EIA report by the Department of Environment, The Project Authority shall not be able to open L/C in favor of importable machineries.

(m) Without obtaining Environmental Clearance, The Project Authority shall not be able to start the physical activity of the project.

(n) The Project Authority shall submit the EIA along with a filled-in application for Environmental Clearance in prescribed form, the applicable Environmental Clearance fee in a Treasury Chalan, the applicable VAT on clearance fee in a separate treasury chalan, the No Objection Certificate (NOC) from local authority, NOC from Forest Department (if it is required in case of cutting any forested plant, private or public) and NOC from other relevant agencies for operational activity etc. to the Head Office of DoE in Dhaka with a copy to the Dhaka Metropolitan and Dhaka District Office of DOE in Dhaka.

22.02.2017

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone # 02-8181673

Executive Director
Dhaka Transport Co-ordination Authority
Nagar Bhaban (Level 14-15) , Fulbaria, Dhaka.

Copy Forwarded to :

1) The Secretary, Ministry of Environment and Forests, Bangladesh Secretariat, Dhaka.
2) Director, Department of Environment, Dhaka Metropolitan Office, Dhaka.
3) Deputy Director, Department of Environment, Dhaka District Office, Dhaka.
4) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

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Annex B: Applicable Standard

Table 1: Bangladesh Standard for Inland Surface Water

Best practice based classification	Parameter			
	pH	BOD mg/l	DO mg/l	Total Coliform Number/100
Source of drinking water for supply only after disinfecting	6.5-8.5	2 or less	6 or above	50 or less
Water usable for recreational activity	6.5-8.5	3 or less	5 or more	200 or less
Source of drinking water for supply after conventional treatment	6.5-8.5	6 or less	6 or more	5000or less
Water usable by fisheries	6.5-8.5	6 or less	5 or more	-
Water usable by various process and cooling industries	6.5-8.5	10 or less	5 or more	5000 or less
Water usable for irrigation	6.5-8.5	10 or less	5or more	1000 or less

Source: Rule 12, Schedule-3, ECR. 1997, Bangladesh

Table 2: Bangladesh Standards for Drinking Water

Parameters	Units	Bangladesh Standards
Aluminum	mg/l	0.2
Ammonia (NH3)	mg/l	0.5
Arsenic	mg/l	0.05
Balium	mg/l	0.01
Benzene	mg/l	0.01
BOD5 20°C	mg/l	0.2
Boron	mg/l	1.0
Cadmium	mg/l	0.005
Calcium	mg/l	75
Chloride	mg/l	150- 600
Chlorinated alkanes	mg/l	0.01
1,1 dichloroethylene	mg/l	0.01
1,2 dichloroethylene	mg/l	0.03
Tetrachloroethylene	mg/l	0.03
Trichloroethylene	mg/l	0.09
Chlorinatedphenols pentachlorophenol	mg/l	0.03
2.4.6 trichlorophenol	mg/l	0.03
Chlorine (residual)	mg/l	0.2
Chloroform	mg/l	0.09
Chromium (hexavalent)	mg/l	0.05

Parameters	Units	Bangladesh Standards
Chromium (total)	mg/l	0.05
COD	mg/l	4
Coliform (fecal)	n/100 ml	0
Coliform (total)	n/100 ml	0
Color	Hazen unit	15
Copper mg/l	mg/l	1
Cyanide	mg/l	0.1
Detergents	mg/l	0.2
DO	mg/l	6
Fluoride	mg/l	1
Hardness (as CaCO3)	mg/l	200-500
Iron	mg/l	0.3-1.0
Kjeldahl Nitrogen (total)	mg/l	1
Lead	mg/l	0.05
Magnesium	mg/l	30-35
Manganese	mg/l	0.1
Mercury	mg/l	0.001
Nickel	mg/l	0.1
Nitrate	mg/l	10
Nitrite	mg/l	<1
Odor	mg/l	Odorless
Oil and grease	mg/l	0.01
pH	mg/l	6.5-8.5
Phenolic compounds	mg/l	0.002
Phosphate	mg/l	6
Phosphorus	mg/l	0
Potassium	mg/l	12
Radioactive materials (gross alpha activity)	Bq/l	0.01
Radioactive materials (gross beta activity)	Bq/l	0.1
Selenium	mg/l	0.01
Silver	mg/l	0.02
Sodium	mg/l	200
Suspended particulate matters	mg/l	10

Parameters	Units	Bangladesh Standards
Sulfide	mg/l	0
Sulfate	mg/l	400
Total dissolved solids	mg/l	1000
Temperature	°C	20-30
Tin	mg/l	2
Turbidity	JTU	10
Zinc	mg/l	5

Source: Rule 12, Schedule-3, ECR.1997, Bangladesh

Table 3: Bangladesh Standards for Waste from Industrial Units or Project Waste

Parameters	Units	Inland Surface Water
Ammonical Nitrogen (as elementary N)	mg/l	50
Ammonia (as free ammonia)	mg/l	5
Arsenic	mg/l	0.2
BOD5 20°C	mg/l	50
Boron	mg/l	2
Cadmium	mg/l	0.50
Chloride	mg/l	600
Chromium (as total Cr)	mg/l	0.5
COD	mg/l	200
Chromium (as hexavalent Cr)	mg/l	0.5
Copper	mg/l	0.5
Dissolved Oxygen (DO)	mg/l	4.5-8
Electrical Conductivity (EC)	micro mho/cm	1200
Total Dissolved Solids	mg/l	2100
Fluoride (as F)	mg/l	2
Sulfide (as S)	mg/l	1
Iron (as Fe)	mg/l	2
Total Kjeldahl Nitrogen (as N)	mg/l	100
Lead (as Pb)	mg/l	0.1
Manganese (as Mn)	mg/l	5
Mercury (as Hg)	mg/l	0.1
Nickel (as Ni)	mg/l	1.0
Nitrate (as elementary N)	mg/l	10
Oil and Grease	mg/l	10
Phenolic Compounds (as C6H5OH)	mg/l	1.0
Dissolved Phosphorus (as P)	mg/l	8
pH	mg/l	6-9

Parameters	Units	Inland Surface Water
Selenium (as Se)	mg/l	0.05
Zinc (as Zn)	mg/l	5
Temperature	°C	Summer-40, Winter-45
Suspended Solids (SS)	mg/l	150
Cyanide (as Cn)	mg/l	0.1

Source: Rule- 13, Schedule-10, ECR.1997, Bangladesh

Table 4: IFC Indicative Values for Treated Sanitary Sewage Discharges

Pollutants	Units	Guideline values
pH	-	6-9
BOD	mg/l	30
COD	mg/l	125
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Oil and grease	mg/l	10
Total suspended solids	mg/l	50
Total coliform bacteria	MPN/ 100ml	400

Source: IFC EHS General Guidelines 30 April, 2007

Table 5: Bangladesh Standards for Sewage Discharge

Pollutants	Units	Standard limit for discharge into surface and inland water bodies
BOD	mg/l	40
Nitrate	mg/l	250
Phosphate	mg/l	35
Suspended Solids (SS)	mg/l	100
Temperature	°C	30
Coliform number	Per 100 ml	1000

Source: Rule- 12, Schedule-9, E.C.R.1997, Bangladesh

Table 6: WHO* Ambient Air Quality Guidelines

Parameters	Guideline value	Averaging period
PM 10 (µg/m^3)	20	Annual
	50	24 hour
PM 2.5 (µg/m^3)	10	Annual
	25	24 hour
NOx	40	Annual
	200	1 hour

Parameters	Guideline value	Averaging period
SOx	20	24 hour

Source: WHO guideline available at www.who.int/en

*World Health Organization (WHO) Ambient Air Quality Guideline Values (2005 and 2000), which are also being referred in the World Bank and IFC's General EHS Guidelines (2007)

Table 7: Ambient Air Quality Standards of Bangladesh

Pollutant	Standard	Average Time
SPM	200µg/m^3	8 hours
CO	10 mg/m^3 (9 ppm)	8 hours
	40 mg/m^3 (35 ppm)	1 hours
Pb	0.5 µg/m^3	Annual
NO_2	100 µg/m^3 (0.053 ppm)	Annual
PM10	50 µg/m^3	Annual
	150 µg/m^3	24 hours
PM2.5	15 µg/m^3	Annual
	65 µg/m^3	24 hours
O_3	235 µg/m^3 (0.12 ppm)	1 hours
	157 µg/m^3 (0.08 ppm)	8 hours
SO_2	80 µg/m^3 (0.03 ppm)	Annual
	365 µg/m^3 (0.14 ppm)	24 hours

Source: Bangladesh Gazette 19th July, 2005 under ECR 1997

Table 8: Bangladesh standards for ambient sound level

Category area	Day (dB)	Night (dB)
Silent Zone*	50	40
Residential Area	55	45
Mixed Area**	60	50
Commercial Area	70	60
Industrial Area	75	70

Source: Bangladesh Gazette 7th September, 2006 under ECR, 1997

* Area up to radius of 100 m around hospitals or educational institutions or special institutions/establishments identified/to be identified by the government designated as silent zone where use of horns of vehicles or other audio signals, and loudspeakers are prohibited)

** Mainly residential area, and also simultaneously used for commercial and industrial purposes.

Table 9: The WB/IFC Noise Level Guidelines*

Receptor	One hour LAeq (dB)	
	Daytime (07:00 –22:00)	Night time (22:00 –07:00)
Residential, institutional, educational**	55	45
Industrial, commercial	70	70

Source: IFC EHS General Guidelines 30 April, 2007

* Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

** For acceptable indoor noise levels for residential, institutional, and educational settings refer to WHO (1999).

Annex C: 1st Round Stakeholder Consultation Meeting

1st ROUND STAKEHOLDER CONSULTATION RECORD FOR MRT LINE 5

STAKEHOLDER CONSULTATION MEETING NO: 1 (MRT Line 5)

Location: Hemayetpur High School, Hemayetpur Bus Stand, Savar

Date: March 15, 2017 Time: 3.00 pm

Stakeholder Consultation Record

The 1st Stakeholder Consultation meeting of MRT line-5 was held on March 15, 2017 at Hemayetpur High School (First Floor) near to the Hemayetpur bus stand, Savar. The proceedings commenced at 04:00 pm and were presided by the honorable Mr. Fakrul Alam Samar, Union Parishad Chairman, Tetuljhora Union, Savar (Acting Upazila Parishad Chairman, Savar Upazila Parishad). The meeting was attended by a total of 53 people, which represent the government officials, non-government officials, doctor, local people including senior citizen, local school teachers, Businessmen. The attendance sheet of participants from these groups has been provided as follows**.**

Mr. Rofiul Karim, Consultant (EQMS) welcomed all the government officials and local people in the stakeholder consultation meeting. Mr. Karim (EQMS) invited Tauhidul Hasan, Consultant (EQMS) to precede the consultation. Mr. Hasan gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5. He also highlighted the need of Mass Transit in Dhaka city.

After the presentation, the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 1**.

After that, Mr. Rofiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, Mr. Fakrul Alam Samar, Union Parishad Chairman, Tetuljhora Union, Savar gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city.

Table 1: Stakeholder Consultation Meeting Outcome

Sl.	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
1.	Yeakub Ali Palash	Business	• Is there any possibility to acquire the land except the depot area? • Want will be the depth of underground tunnel of metro rail.	• No, there is no possibility of land acquisition except the depot area. • Feasibility study is going on and the depth of tunnel construction will decide after the study completion
2.	Ansar Ali	Business	• What will be the underground metro rail depth and its viaduct height? • How much land will be acquired for this project?	• It will be decided after completion of the feasibility Study • Land acquisition team will clarify this issue.
3.	Mr. Kamal	Business	• What will be the compensation rate of land	• Land acquisition will be carried out based on the national as well international regulation
4.	Mr. Nitish Chandra Sarkar	Doctor	• What will be the major environmental pollution due to the metro rail construction	• As the MRT 1 Line will be mostly underground so minimum environmental impact will be taken place. During construction, main environmental impacts will be dust pollution, noise pollution & vibration, traffic congestion. A comprehensive mitigation plan will be recommended in the EIA report to minimize the environmental impact.
5.	Abdul Mannan	Service	• Is there any possibility of acquisition of the nearer filling stations which are located along the road side?	• MRT 1 will be underground so there is no possibility of acquisition of the filling station. RAP study team will cover this issue.
6.	Md Robiul Hasan	School Teacher	• If someone having business in a rental place and the place will be acquired for this project then what will be the compensation package for the tenant?	• Land acquisition team will clarify this issue.

Photo Documentation of Stakeholder Consultation Meeting No. 1

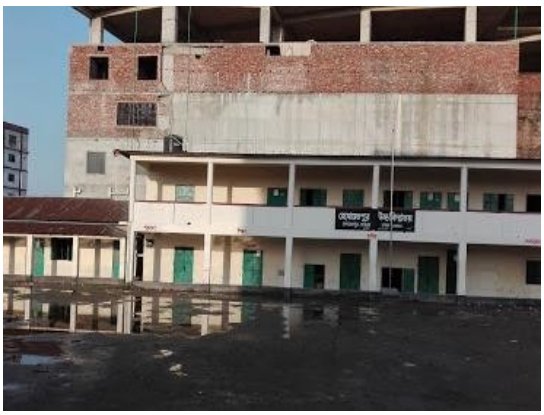


Photo 1: SCM 1 Location

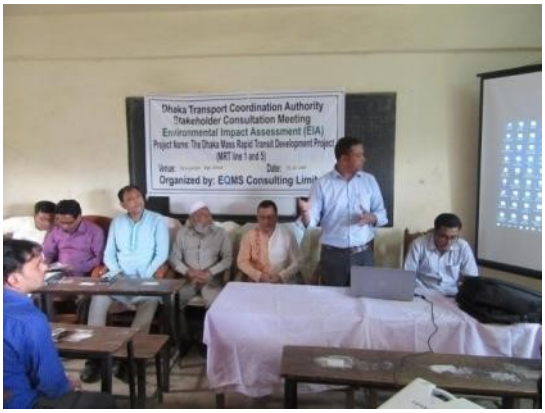


Photo 2: Participants in the Meeting

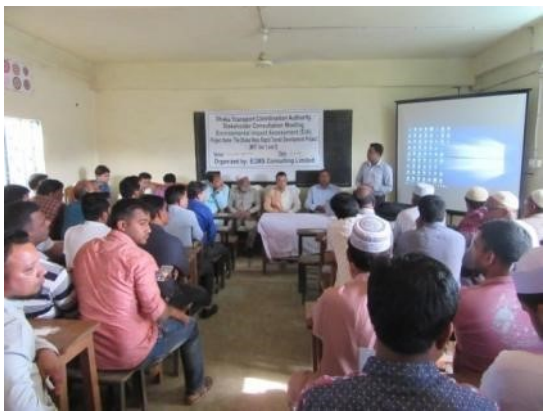


Photo 3: Participants in the Meeting

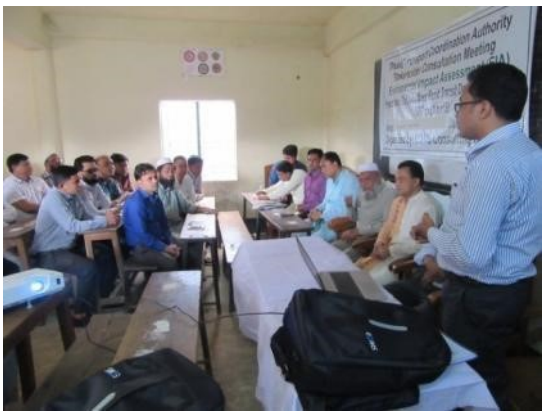


Photo 4: Participants in the Meeting

Photo 5: Participants in the Meeting

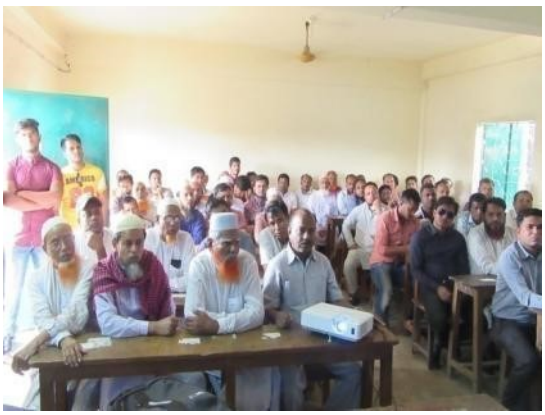


Photo 6: Participants in the Meeting

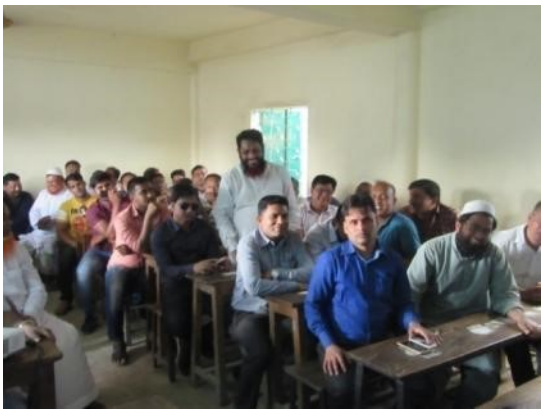


Photo 7: Participant is giving opinion

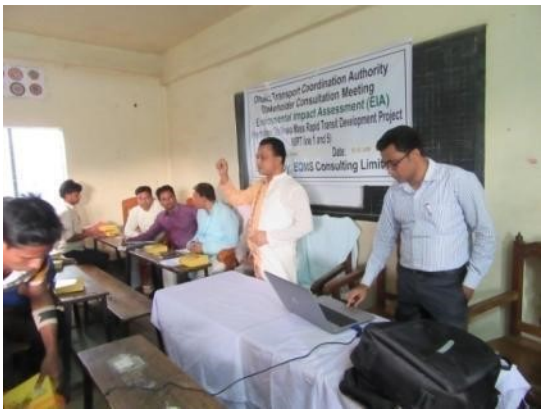


Photo 8: Participants is giving opinion

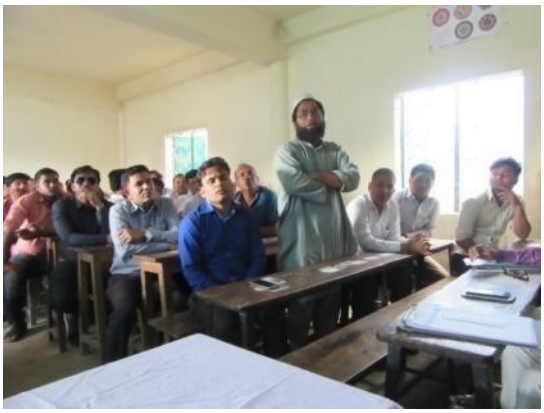


Photo 9: Participant is giving opinion

Photo 10: Participants is giving opinion

Photo 11: Participants is giving opinion

Photo 12: Participants is giving opinion

STAKEHOLDER CONSULTATION MEETING NO: 2 (MRT Line 5)

Location: Location: Rozina Filling Station, Mazar Road, Gabtoli.

Date: March 16, 2017 Time: 11.00 am

Stakeholder Consultation Record

The 2nd Stakeholder Consultation meeting of MRT line-5 was held on March 16, 2017 at Rozina Filling Station near to Mazar Road, Gabtoli. The proceedings commenced at 11:00 am and were presided by the Honorable Mr. Abu Taher, councilor, Ward No. 10, Dhaka North City Corporation. The meeting was attended by a total of 45 people, which represent local politician, non-government officials, and local people including senior citizen, Businessmen, Transport Workers and staffs. The attendance sheet of participants from these groups has been provided as follows.

Mr. Rofiul Karim, Consultant (EQMS) welcomed all the people in the stakeholder consultation meeting. Mr. Karim (EQMS) invited Tauhidul Hasan, Consultant (EQMS) to precede the consultation. Mr. Hasan gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5 (Metro Rail) development Project.

Hereafter the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 2.**

After that, Mr. Rofiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, Mr. Abu Taher, councilor gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city. He praised the government of the People's Republic of Bangladesh as well as JICA for taking the initiative.

Table 2: Stakeholder Consultation Meeting Outcome

Sl.	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
1.	Md. Masudul	Business	• The metro rail line should be extended to sadar ghat or a new line is required from Gabtoli to Jatrabari or Sadarghat via Shymoli, Asadgate and Science laboratory.	• Design team will consider this issue.
2.	Md. Eshaque	Driver	• What will be the width of underground tunnel of the Metro Rail?	• Feasibility study is going on so the exact width of the underground tunnel is not fixed yet.
3.	Manik	Transport Workers/staff	• Is there any possibility of damage to surface infrastructure during underground tunnel construction?	• No, latest TBM technology will be used. So there is no chance of damage to the surface infrastructure during underground tunnel construction.
4.	Nazrul Islam Mollik	Business	• What about the viaduct height and tunnel depth? • How many days will it take to complete?	• Feasibility study is going on. The exact height and tunnel depth are not finalized yet.
5.	Khorshed Alam	Bus Engine Mechanic	• Is the project design final?	• No, the project design is not final. The feasibility study is going on. After completion of the study detail design will come up.

Photo Documentation of Stakeholder Consultation Meeting 2

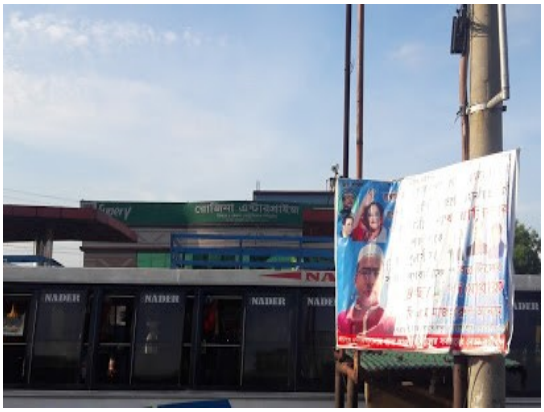


Photo 1: SCM 2 Location

Photo 3:Participants in the Meeting

Photo 4:Participants in the Meeting

Photo 6:Participants in the Meeting

Photo 5:Participants in the Meeting

Photo 8:Participants in the Meeting

Photo 9:Participant is giving opinion

Photo 10:Participant is giving opinion

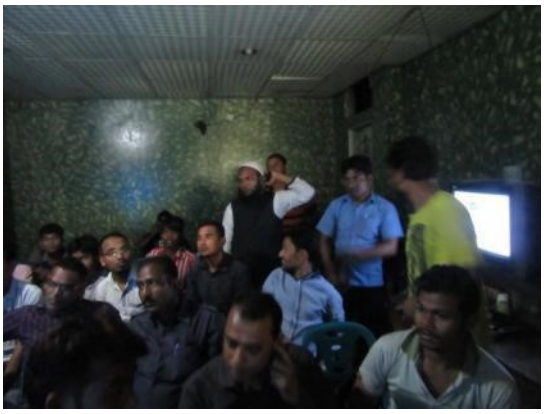


Photo 11: Participant is giving opinion

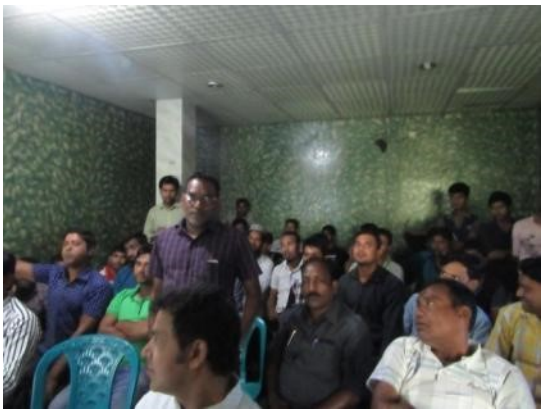


Photo 12: Participant is giving opinion

Photo 13: Participant is giving opinion

Photo 14: Participant is giving opinion

STAKEHOLDER CONSULTATION MEETING NO: 3 (MRT Line 5)

Location: Mirpur 10, Office of Zonal Executive Officer, Dhaka North City Corporation, Zone-4

Date: March 18, 2017 Time: 11.00 am

Stakeholder Consultation Record

The 3rd Stakeholder Consultation meeting of MRT line-5 was held on March 18, 2017 at Office of Zonal Executive Officer, Dhaka North City Corporation, Zone-4 near to Mirpur-10. The proceedings commenced at 11:00 am and were presided by the honorable Mr. Gullah Singha, Zonal Executive Officer and Executive Magistrate, Dhaka North City Corporation-Zone-4. The meeting was attended by a total of 52 people, which represent the government officials, non-government officials, engineer, City corporation staffs and local people including senior citizen, Businessmen. The attendance sheet of participants from these groups has been provided as follows.

Mr. Rofiul Karim, Consultant (EQMS) welcomed all the people in the stakeholder consultation meeting. Mr. Karim (EQMS) invited Mr. Mirza Shamim Ahsan Habib, Senior Consultant (EQMS) and Tauhidul Hasan, Consultant (EQMS) to precede the consultation. Mr. Mirza Habib gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5 (Metro Rail) development Project. He also highlighted the need of Mass Transit in Dhaka city.

Here after the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 3**.

After that, Mr. Rofiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, Mr. Gullah Singha gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city. Mr. Singha also shared his metro rail traveling experience in different countries and described its positive aspects to the participants. He praised the government of the Peoples Republic of Bangladesh as well as JICA for taking the initiative.

Table 3: Stakeholder Consultation Meeting Outcome

Sl	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
1.	Md. Delowar	Engineer DNCC	• Dhaka is a densely populated city. So how to manage the entire project related construction and preconstruction works?	• As the metro rail 1 will be undergound so no traffic congestion will occur during construction period. • Alternative traffic management plan will be developed for the viaduct section.
2.	MD Nasir Khan	TS DNCC	• After completion of this project people should be trained up to travel and maintain metro rail appropriately as it is new in our transportation system.	• Authority will provide awareness program through media. • Authority will also provide awareness program on all station through sign.
3.	Md RobiulAlam	SAE DNCC	• All types of direction label/sign/signal should be in Bengali along with English so that people can easily understand what they should do or not and how to travel.	• It will be recommended in the EIA report.
4.	Zorul Amin	Private Job	• The soil type of Dhaka city is Deep-Red brown or alluvial soil. Is the soil appropriate for such kind of underground project? Do the soil been tested? Earthquake should also be a major concerning issue for such mega project. Is there any technology to mitigate the vibration during construction and how?	• JICA is doing geological survey to understand the feasibility of underground metro rail project. • Proper mitigation measures will be taken for the vibration control. • Design consultant will consider earthquake impact during detailed design stage. It will be recommended in the EIA report.
5.	MD Abdur Razzak	Government Job	• Is there any evacuation plan for fire and earthquake hazard	• Proper disaster management and evacuation provision will be kept. Design team will consider this during detail design stage.
6.	Md Masud Khondokar	Business	• As far I understood this is a mega project and a lot of materials will be used. Where the pre-construction fabrication	• It is not yet selected. Feasibility study team will finalize the construction yard.

Sl	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
			work will be held?	
7.	MD Monir Hossen	Business	• What will be depth of underground tunnel?	• Feasibility study is in progress. Exact depth is not yet completed. After completion of the feasibility study it will be decided.
8.	Mr. Gullah Singha	Zonal Executive Officer and Executive Magistrate DNCC	• I hope the metro rail project will be a sustainable project. I think the major issue will be disaster e.g. earthquake and fire hazard during operation. Soil management will be big challenge for this project during construction. Hope authority will take proper step to mitigate the soil management related problems. Adequate sign both in Bangla and English need to be highlighted in the station area that will help local people to understand.	• It will be recommended in the EIA report.

Photo Documentation of Stakeholder Consultation Meeting 3

Photo 1:Participants in the Meeting

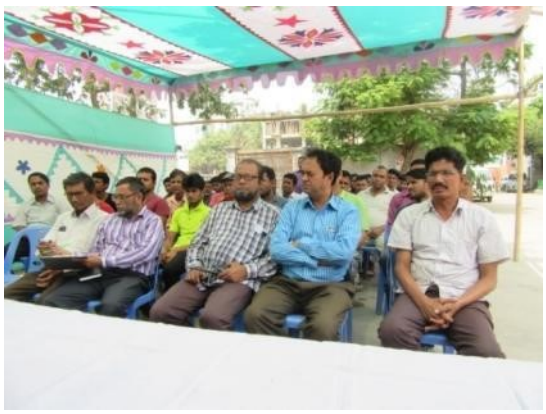


Photo 2:Participants in the Meeting

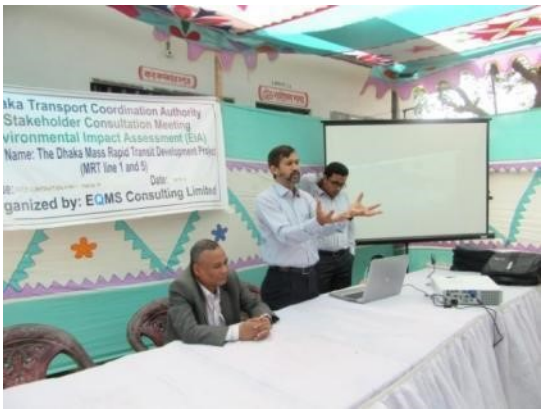


Photo 3:Participants in the Meeting

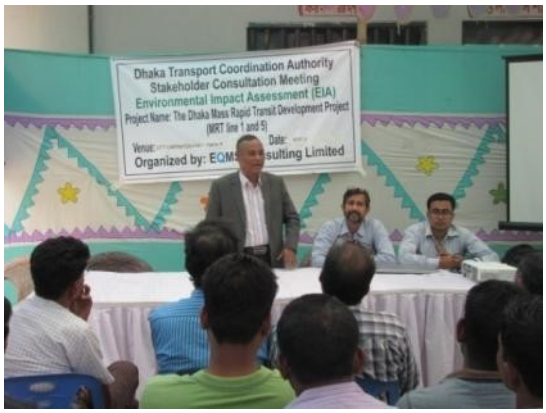


Photo 4: Participant is giving opinion

Photo 11: Participant is giving opinion

Photo 12: Participant is giving opinion

STAKEHOLDER CONSULTATION MEETING NO: 4 (MRT Line 5)

Location: Kisholoy Kinder Garten, Notun Bazar, Vatara.

Date: March 19, 2017 Time: 03.45 pm

Stakeholder Consultation Record

The 4th Stakeholder Consultation meeting of MRT line-5 was held on March 19, 2017 at Kisholoy Kinder Garten, Notun Bazar near to Vatara Thana. The proceedings commenced at 03:45 am and were presided by Mrs Rabeya Aktar, Secretary Vatara Union Parishad on behalf of honorable Mr. Ataur Rahman, Chairman, Vatara Union Parishad. The meeting was attended by a total of 22 people, which represent the government officials, non-government officials, politicians and local people including women, senior citizen, Businessmen. The attendance sheet of participants from these groups has been provided as follows.

Mr. Rofiul Karim, Consultant (EQMS) welcomed all the people in the stakeholder consultation meeting. Mr. Karim (EQMS) invited Mr. Jahidul Islam, Assistant Consultant (EQMS) to precede the consultation. Mr. Isalm gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5 (Metro Rail).

Hereafter the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 4**.

After that, Mr. Rofiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, Mr. Barkat Khan, senior citizen and local leader of vatara thana gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city.

Table 4: Stakeholder Consultation Meeting Outcome

Sl.	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
1.	Mahfuja Islam	Homemaker	• I always support all kinds of development works. Metro rail will make our life easier so I strongly support the project.	• Thank you for your complements.
2.	Nurunnahar Sonia	Homemaker	• Please keep provision of separate compartment or reserve seat for the women in the metro rail.	• Design team will consider this issue. It will recommend in the EIA report as well.
3.	Arif Ahmed	Service	• Is there any technology or any other system to mitigate dust pollution during the construction period?	• Yes, authority will take step to mitigate all types of pollution and advanced technology will be used. Proper mitigation plan will be incorporated in the EIA report to mitigate the environmental impact
4.	Md. Amir Hossen	Business	• Authority should compensate to the land looser perfectly as we already lost lots of land	• Yes it will be compensated if there will any damages or loss. Proper compensation will be provided in accordance with the national and international regulation
5.	Borkot Khan	Local Leader	• We always appreciate the development work in our country. Design team should consider the minimum damage and land acquisition as much as possible	• Study team will consider the issue.

Photo Documentation of Stakeholder Consultation Meeting 4

Photo 1: SCM 4 Location

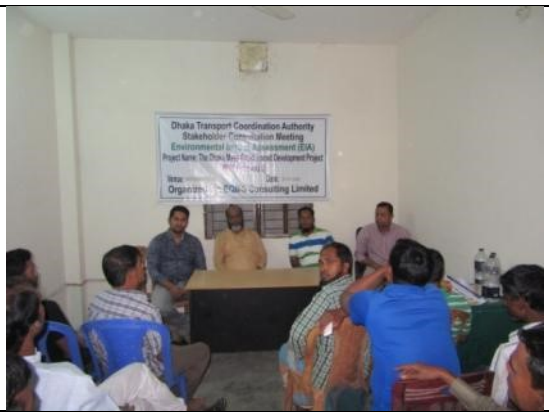


Photo 2: Participants in the Meeting

Photo 3: Participants in the Meeting

Photo 4: Participants in the Meeting

Photo 5: Participant is giving opinion

Photo 6: Participants in the Meeting

Photo 7: Participant is giving opinion

Photo 8: Participant is giving opinion

Annex D: 2nd Round Stakeholder Consultation Meeting

2nd ROUND STAKEHOLDER CONSULTATION RECORD FOR MRT LINE 5

STAKEHOLDER CONSULTATION MEETING NO: 1 (MRT Line 5)

Location: DNCC Zonal Office, Mirpur 10

Date: July 25, 2017 Time: 11.00 am

Stakeholder Consultation Record

The 1st Stakeholder Consultation meeting of MRT line-5 was held on July 25, 2017 at DNCC Zonal Office, Mirpur 10. The proceedings commenced at 04:00 pm and were presided by the honorable Gullal Singha, Zonal Executive Officer and Executive Magistrate Zone-4, Dhaka North City Corporation. The meeting was attended by a total of 40 people, which represent the government officials, non-government officials, local people including senior citizen, local school teachers, Businessmen. The attendance sheet of participants from these groups has been provided as follows**.**

Mr. Rafiul Karim, Consultant (EQMS) welcomed all the government officials and local people in the stakeholder consultation meeting. Mr. Karim (EQMS) invited Mr. S.K. Salahuddin Ahammad, Senior Consultant (EQMS) to precede the consultation. Mr. Ashraful Alam gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5. He also highlighted the need of Mass Transit in Dhaka city.

After the presentation, the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 1**.

After that, Mr. Rafiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, Gullal Singha, Zonal Executive Officer and Executive Magistrate Zone-4, Dhaka North City Corporation, gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city.

Table 1: Stakeholder Consultation Meeting Outcome

Sl.	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
7.	Gullal Singha	Zonal Executive Officer	• Authority should be informed to the local people before the project start. Procedure of the Land acquisition and compensation for the affected people must be clarified before construction phase.	• Thank you for your valuable comments and it will consider by the authority.
8.	Md Abu Taher	Govt. Employee	• If there any accident occurs at the operation phase in the underground how it will be managed?	• An emergency management plan will be prepared for the operation phase. This plan will be followed to manage any emergency situation both in construction and operation phases.
9.	Mr. Sukumar	Businessman	• Is there any possibility to damage the river system due to the underground metro operation?	• No, there is no possibility to damage the river system due to the underground construction of the project as it will pass several meter below the river.
10.	Ashik Siddiqui	Business	• What will be the compensation rate of land	• Land acquisition will be carried out based on the national as well international rules and regulation
11.	Md. Shah Alam	Business	• What will be the major environmental pollution due to the metro rail construction	• For every construction activities there have some environmental pollution. Air, sound pollution will be major concern for the metro rail construction.
12.	Nahid Akter Lucky	NGO Worker	• How the excavation materials will be managed?	• Authorities will talk with the responsible organization to use the excavation materials in different purposes as well as dump in the designated site. All the possible option will consider during the detail design stage.

Photo Documentation of Stakeholder Consultation Meeting No. 1

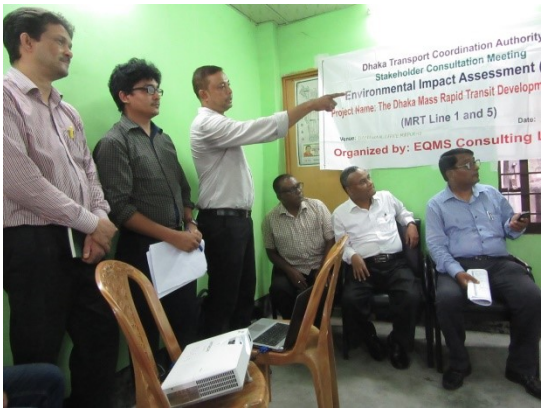


Photo 1: SCM 1 Location

Photo 2: Participants in the Meeting

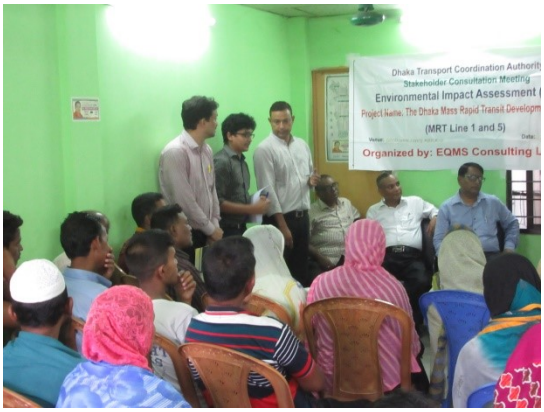


Photo 3: Participants in the Meeting

Photo 4: Participants in the Meeting

Photo 5: Participants in the Meeting

Photo 6: Participants in the Meeting

STAKEHOLDER CONSULTATION MEETING NO: 2 (MRT Line 5)

Location: 9 No Ward, DNCC, Darus Salam, Dhaka

Date: July 26, 2017 Time: 11.00 am

Stakeholder Consultation Record

The 2nd Stakeholder Consultation meeting of MRT line-5 was held on July 26, 2017 at 9 No ward councilor office, Darus Salam, Mirpur. The proceedings commenced at 11:00 am and were presided by the honorable T L Rabi Das, Secretary, 9 no ward, Darus Salam, Dhaka North City Corporation. The meeting was attended by a total of 23 people, which represent the government officials, non-government officials, local people including senior citizen, Businessmen. The attendance sheet of participants from these groups has been provided as follows**.**

Mr. Rafiul Karim, Consultant (EQMS) welcomed all the government officials and local people in the stakeholder consultation meeting. Mr. Karim (EQMS) invited Mr. S.K. Salahuddin Ahammad, Senior Consultant (EQMS) to precede the consultation. Mr. Ashraful Alam gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5. He highlighted the need of Mass Transit in Dhaka city. He also gave a presentation on impact and mitigation of MRT line 5 due to both construction and operation phases.

After the presentation, the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 2**.

After that, Mr. Rafiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, T L Rabi Das, Secretary, 9 No ward Councilor, Darus Salam, Dhaka North City Corporation, gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city.

Table 2: Stakeholder Consultation Meeting Outcome

Sl.	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
1.	Md. Golap Nabi	Business Man	• If there any private land at the underground station or alignment and do the land owner get compensation?	• If there any property damage of the land owner obviously he/she will get the compensation.
2.	Md. Javed	Businessman	• What will be the ticket price? • Is it bearable for all users?	• Authority will try to keep the ticket price within the capacity for every types of citizen and ticket price will be finalize during detail design stage.
3.	Md. Mamun	Business	• What will be the compensation rate of land	• Land acquisition will be carried out based on the national as well international regulation
4.	Monir Hossain	Business	• What will be the major environmental pollution due to the metro rail construction	• As the MRT 1 Line will be mostly underground so minimum environmental impact will be taken place. During construction, main environmental impacts will be dust pollution, noise pollution & vibration, traffic congestion. A comprehensive mitigation plan will be recommended in the EIA report to minimize the environmental impact.
5.	Md. Hasib	Businessman	• How the excavation materials will be managed?	• Authorities will talk with the responsible organization to use the excavation materials in different purposes as well as dump in the designated site. All the possible option will consider during the detail design stage.

Photo Documentation of Stakeholder Consultation Meeting No. 2

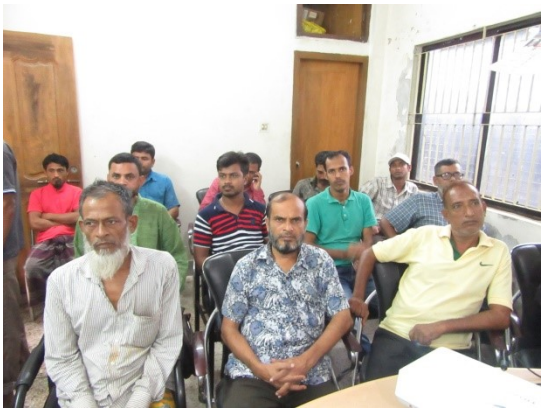


Photo 1: Participants in the Meeting

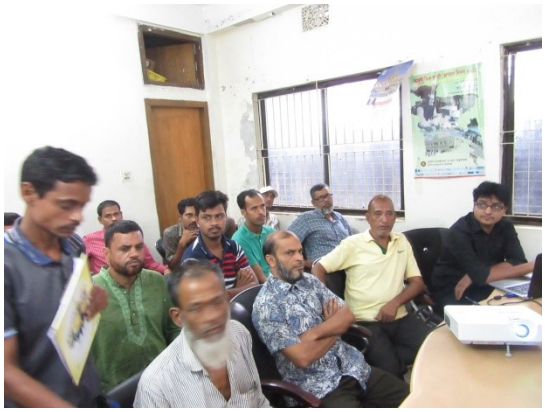


Photo 2: Participants in the Meeting

Photo 3: Participants in the Meeting

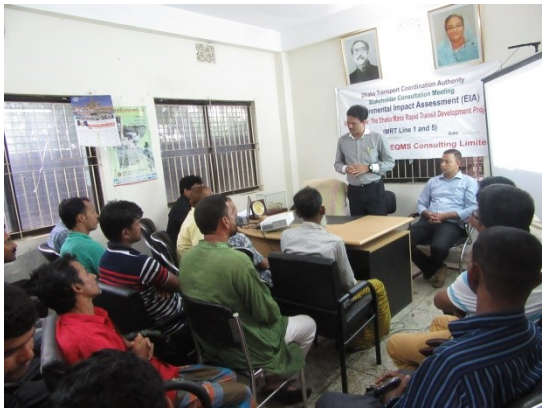


Photo 4: Participants in the Meeting

Photo 5: Participants in the Meeting

Photo 6: Participants in the Meeting

STAKEHOLDER CONSULTATION MEETING NO: 3 (MRT Line 5)

Location: Holy Touch Model School, Hemayetpur

Date: July 26, 2017 Time: 04.00 pm

Stakeholder Consultation Record

The 3rd Stakeholder Consultation meeting of MRT line-5 was held on July 26, 2017 at Holy Touch Model School, Hemayetpur. The proceedings commenced at 04:00 pm and were presided by the honorable Fakhrul Alam Samar, Chairman, Tetuljhora Union Parisad, Hemayetpur, Savar. The meeting was attended by a total of 53 people, which represent the government officials, non-government officials, local people including senior citizen, Businessmen, Farmer. The attendance sheet of participants from these groups has been provided as follows**.**

Mr. Rafiul Karim, Consultant (EQMS) welcomed all the government officials and local people in the stakeholder consultation meeting. Mr. Rafiul (EQMS) invited Mr. S.K. Salahuddin Ahammad, Senior Consultant (EQMS) to precede the consultation. Mr. Ashraful Alam gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5. He highlighted the need of Mass Transit in Dhaka city. He also gave a presentation on impact and mitigation of MRT line 5 due to both construction and operation phases.

After the presentation, the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 3**.

After that, Mr. Rafiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, Fakhrul Alam Samar, Chairman, Tetuljhora Union Parisod, Hemayetpur, Savar Upazila, gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city.

Table 3: Stakeholder Consultation Meeting Outcome

Sl.	Name	Occupation	Comment/Question	Answer and Policy of Counter-measure
1.	Ahsan Habib	Local Leader	• Station should be pollution free(mainly air pollution); • Compensation should not time consuming process.	• Thank you for your suggestions.
2.	Monir Hossain	Teacher	• Is there any discount in the ticketing system for students?	• It will be decided by the DTCA authority.
3.	Md. Shariful Hasan	Non-govt. employee	• Construction activities will cause huge traffic congestion in the project area. How it will be managed?	• Most of the alignment of MRT line-5 will be underground. So, very minimum traffic congestion will be taken place. However, a traffic management plan will be prepared and followed accordingly to minimize the traffic congestion.
4.	Nijam Uddin	Local Leader	• How major environmental pollution will be managed during the metro rail construction	• As the MRT 5 Line will be mostly underground so minimum environmental impact will be taken place. During construction, main environmental impacts will be dust pollution, noise pollution & vibration, traffic congestion. A comprehensive mitigation plan will be recommended in the EIA report to minimize the environmental impact.
5.	Fokhrul Alam Samar	Chairman	• Govt. takes a great step to minimize the traffic congestion in Dhaka city. Thanks to the JICA team to come forward for construction of MRT line-5 project.	• Thank you for your complement.
6.	Md. Ajijul Haque	Teacher	• What step will be taken to keep clean the underground station?	• Station will clean periodically. A designated cleaning team will work to keep clean the station.

Photo Documentation of Stakeholder Consultation Meeting No. 3

Photo 1: Welcomed Speech

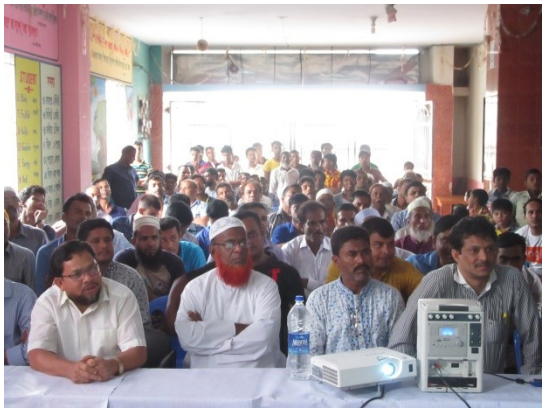


Photo 2: Participants in the Meeting

Photo 3: Question by the participants

Photo 4: Participants in the Meeting

Photo 5: Participants highly Agreed for the project

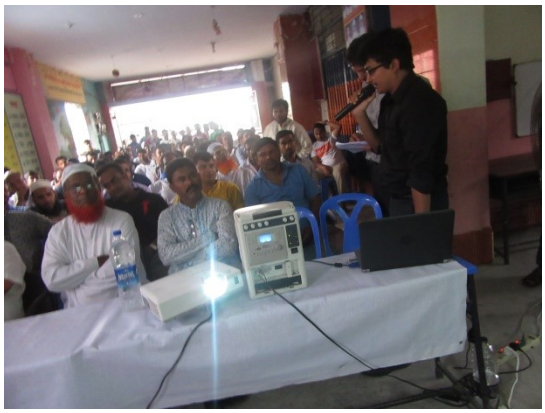


Photo 6: Presentation on the Project Overview, impact and mitigation

STAKEHOLDER CONSULTATION MEETING NO: 4 (MRT Line 5)

Location: Notun Bazar, Vatara

Date: July 30, 2017 Time: 04.00 pm

Stakeholder Consultation Record

The 4th Stakeholder Consultation meeting of MRT line-5 was held on July 30, 2017 at Holy Touch Model School, Hemayetpur. The proceedings commenced at 04:00 pm and were presided by the honorable Billal Shikdar, Public Representative, Notunbazar, Vatara. The meeting was attended by a total of 24 people, which represent the government officials, non-government officials, local people including senior citizen, Businessmen. The attendance sheet of participants from these groups has been provided as follows**.**

Mr. Rafiul Karim, Consultant (EQMS) welcomed all the government officials and local people in the stakeholder consultation meeting. Mr. Rafiul (EQMS) invited Mr. S.K. Salahuddin Ahammad, Senior Consultant (EQMS) to precede the consultation. Mr. Ashraful Alam gave a presentation on the route alignment and overview of proposed Dhaka MRT Line-5. He highlighted the need of Mass Transit in Dhaka city. He also gave a presentation on impact and mitigation of MRT line 5 due to both construction and operation phases.

After the presentation, the floor was opened for questions and suggestions from the attendees. The key points raised by the stakeholders with responses provided by the project proponent and consultant are summarized in **Table 4**.

After that, Mr. Rafiul Karim, Consultant (EQMS) gave the vote of thanks to all the participants. At the end of the meeting, Billal Shikdar, Public Representative, Notunbazar, Vatara, gave his concluding remarks and asked the people to support the project as Metro Rail is one of the key requirements for the development of the country as well as resolve the traffic jam of the Dhaka city.

Photo Documentation of Stakeholder Consultation Meeting No. 4

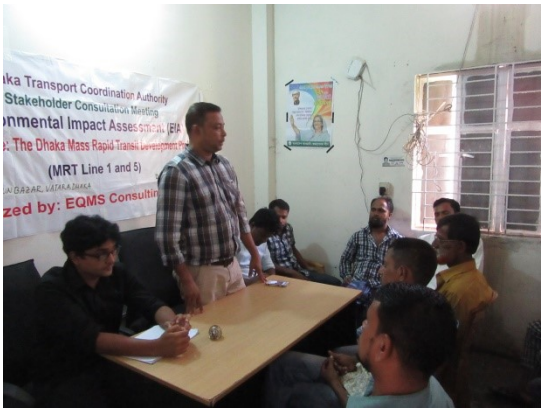


Photo 1: Welcomed Speech

Photo 2: Participants in the Meeting

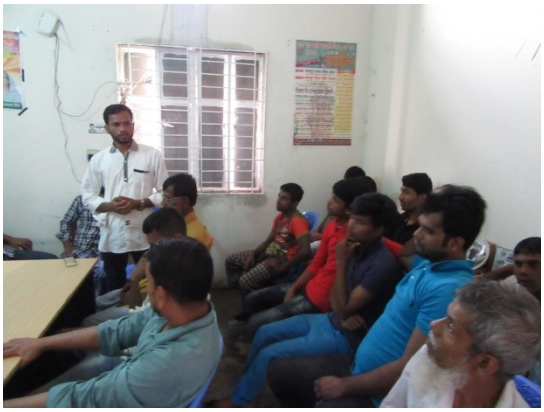


Photo 3: Question by the participants

Photo 4: Participants in the Meeting

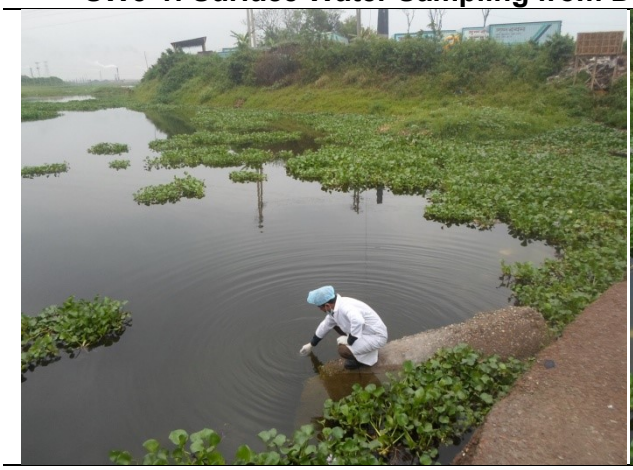
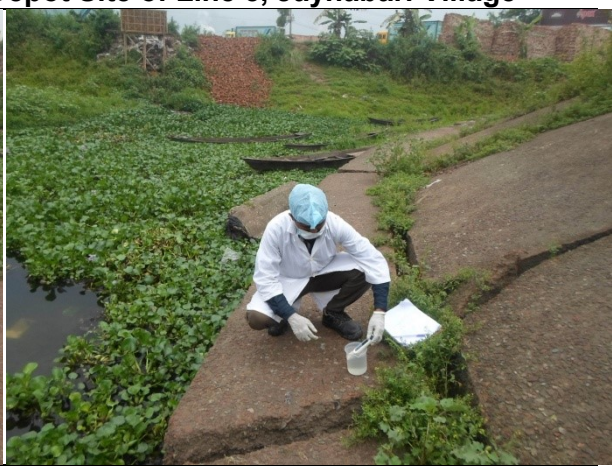
Photo 5: Participants highly Agreed for the project

Photo 6: Presentation on the Project Overview, impact and mitigation

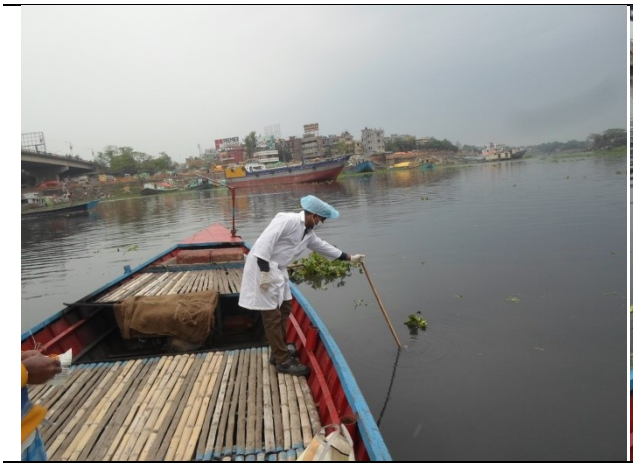
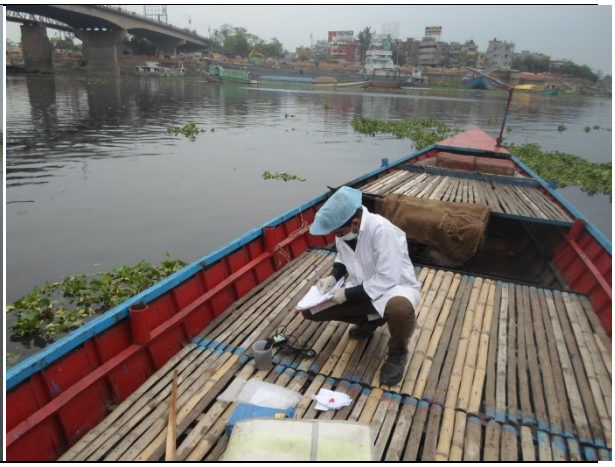
Annex E: Environmental Baseline Monitoring Picture

Surface Water Sampling Picture (MRT Line 5)

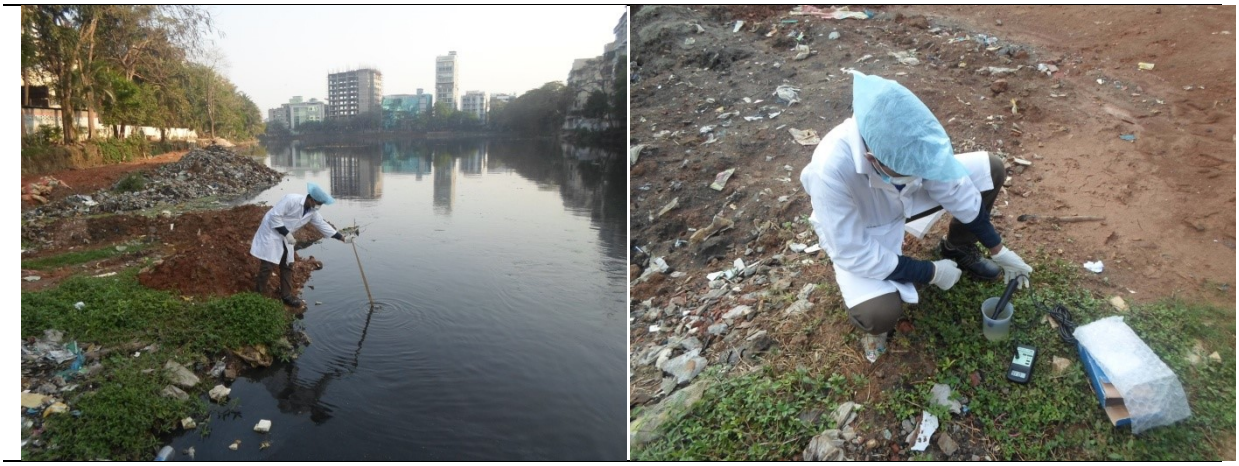

SW5-1: Surface Water Sampling from Depot Site of Line 5, Jaynabari Village

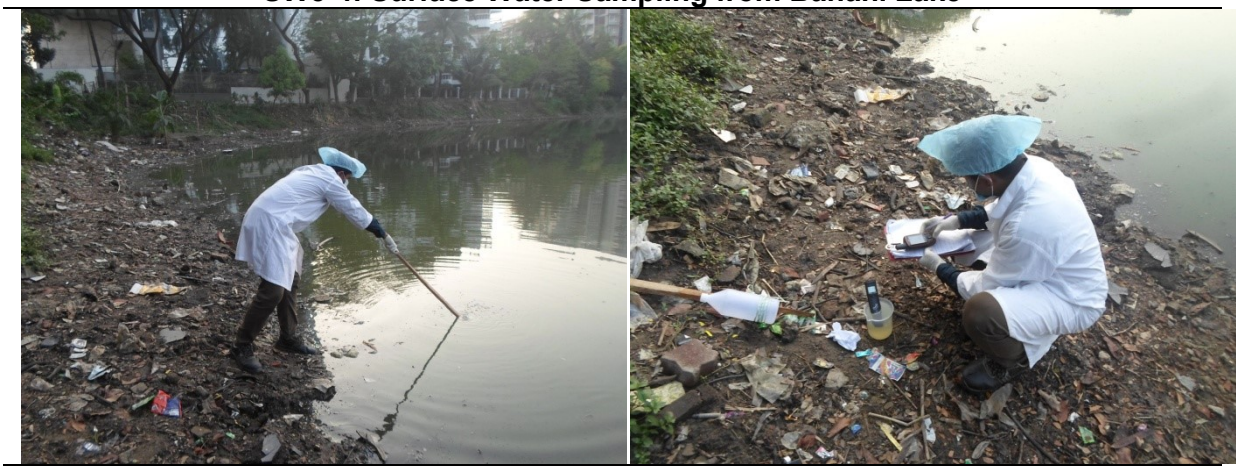
SW5-2: Surface Water Sampling from Wetland between Modhunmoti Station and Amin Bazar

SW5-3: Surface Water Sampling from Turag River

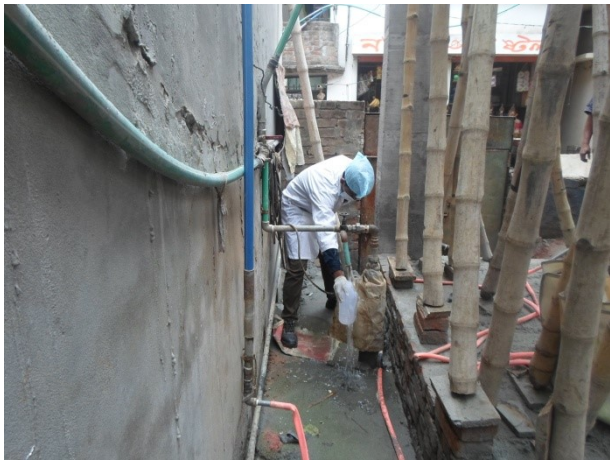


SW5-4: Surface Water Sampling from Banani Lake

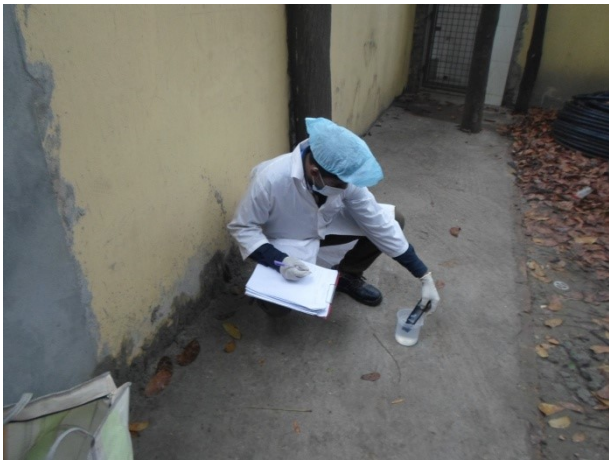


SW5-5: Surface Water Sampling from Gulshan Lake

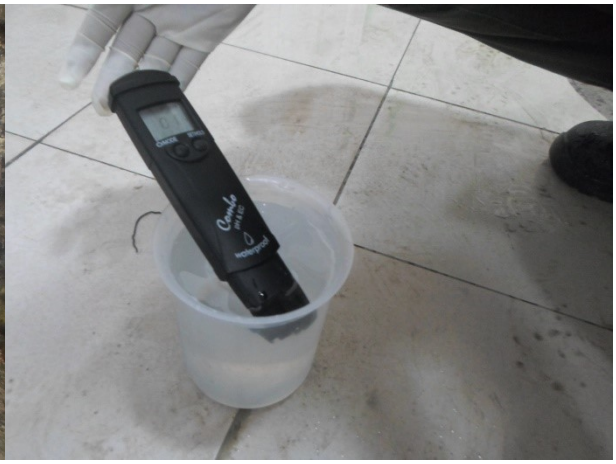
Ground Water Sampling Picture (MRT Line 5)



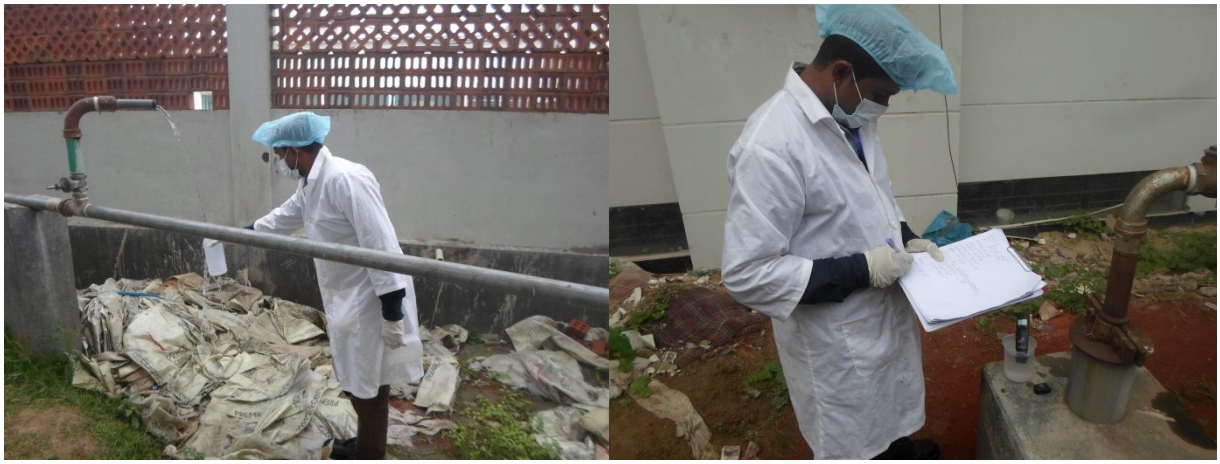

GW5-1: Ground Water Sampling from Abdul Malek Huse, Guydar Tak, Gabtoli

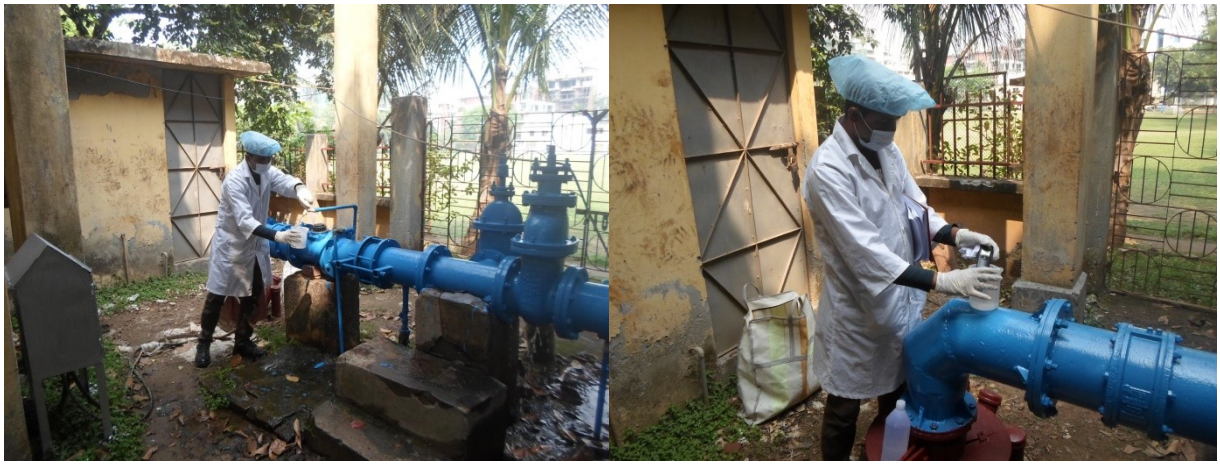
GW5-2: Ground Water Sampling from Mirpur Bangla College WASA Pump House

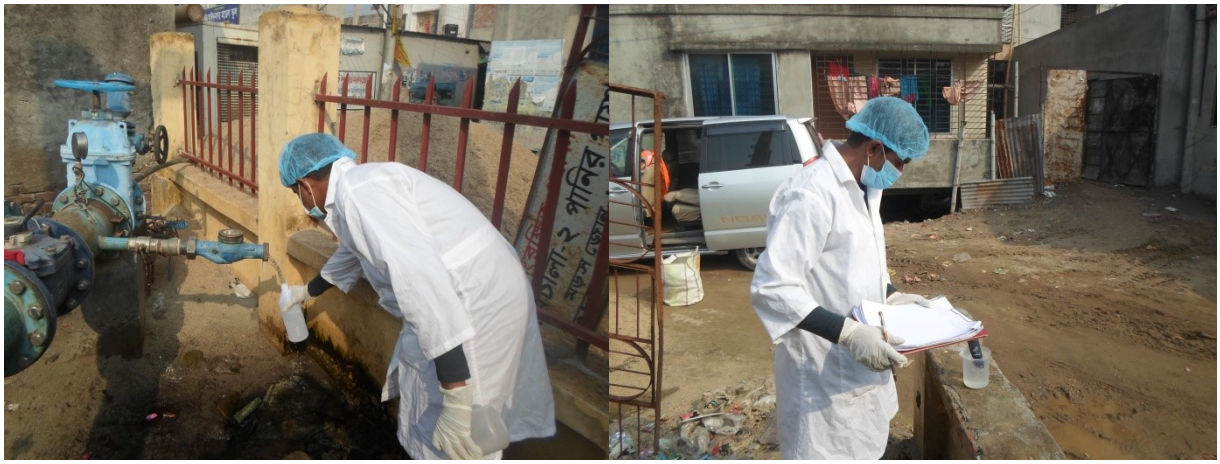
GW5-3: Ground Water Collection at Pump house Mirpur 10



GW5-4: Ground Water Sampling from Police Staff Collage Pump House, Mirpur 14

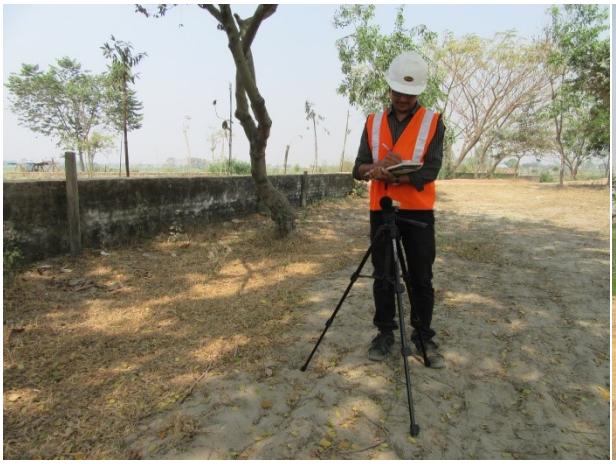


GW5-5: Ground Water Sampling from Banani DOHS Pump House

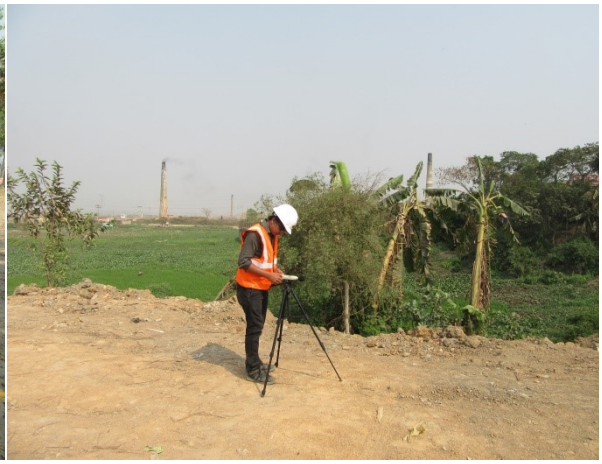


GW5-6: Ground Water Sampling from Vatara Pump House

Noise Level Monitoring Picture (MRT Line 5)



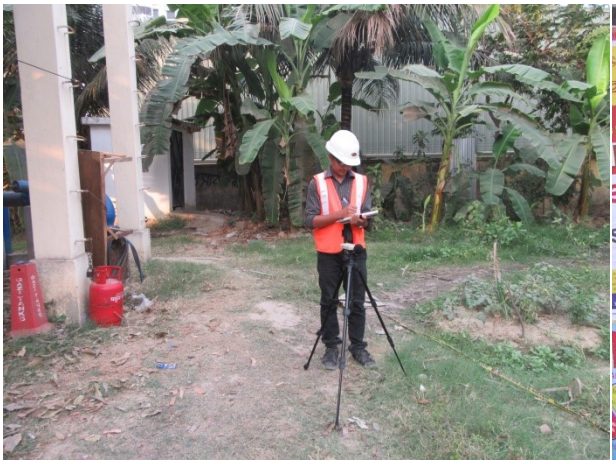
NL5-1: Monitoring at Depot Site



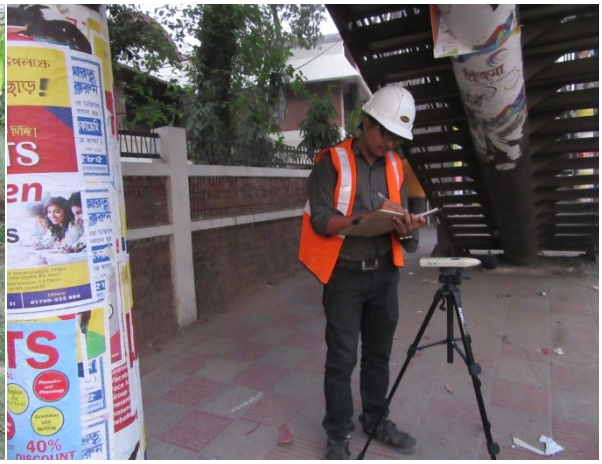
NL5-2: Monitoring at Modhumoti Station

NL5-3: Monitoring at Gabtoli Station

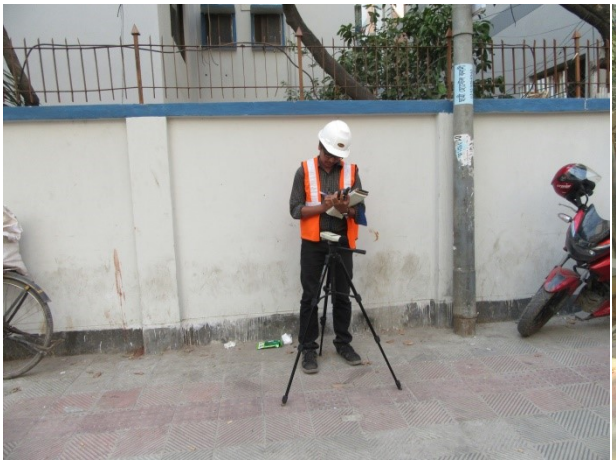
NL5-4: Monitoring at Dar-Us-Salam Station



NL5-5: Monitoring at Mirpur 10 Station



NL5-6: Monitoring at Mirpur-14 Station



NL5-7: Monitoring at Banani Station

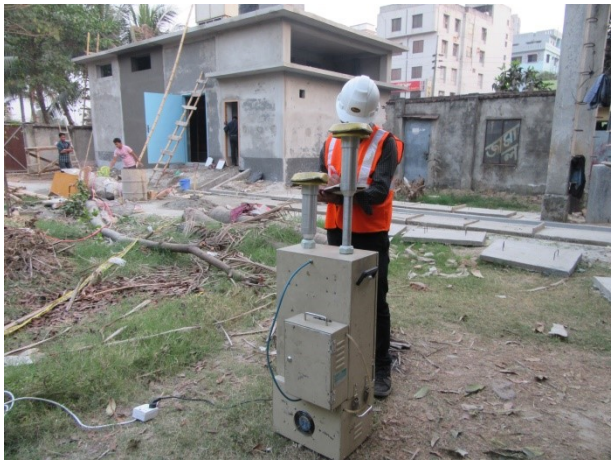
NL5-8: Monitoring at Gulshan-2 Station

NL5-9: Monitoring at Vatara Station

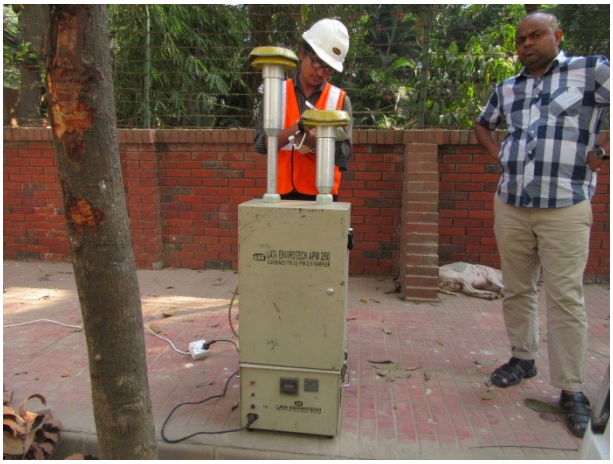
Air Quality Monitoring Picture (MRT Line 5)

AQ5-1: Air Quality Monitoring at Depot Site

AQ5-2: Air Quality Monitoring at Gabtoli Station



AQ5-3: Air Quality Monitoring at Mirpur 10 Station



AQ5-4: Air Quality Monitoring at Gulshan 2 Station

AQ5-5: Air QualityMonitoring at Vatara Station

Annex F: Laboratory Analysis Data Sheet

EQMSL/Ambient Air/10088/2017

EQMS Laboratory

Test Results of Ambient Air Quality Analysis

Description of Sample: Samples were collected from different Station Locations of Preparatory Study on the Dhaka Mass Rapid Transit Project (Line 5 from Vatara to Hemayetpur)

Sample Collector : Collected by EQMS Personnel

Sampling Location:

AQ1-1 : Depot Site of Line 5
AQ1-2 : Gabtoli Station
AQ1-3 : Mirpur 10 Station
AQ1-4 : Gulshan 2 Station
AQ1-5 : Vatara Station

Sampling Date : 28th February, 2017 to 5th March, 2017

Date of Analysis : 1st -15th March, 2017

Description of Analysis:

Location	Present Concentration in µg/m³						CO (ppm)
	PM10	PM2.5	NO_2	SO_2	O_3	Pb	
Depot Site of Line 5	68.2	33.8	33.6	5.5	2.4	BDL	0.2
Gabtoli Station	345.5	145.6	120.5	24.6	23.2	0.1	5.1
Mirpur 10 Station	318.4	134.9	101.7	13.7	15	0.07	1.6
Gulshan 2 Station	268.5	88.4	87.9	12.0	12.8	BDL	0.5
Vatara Station	72.4	36.8	46.7	6.4	3.2	BDL	0.1
Duration	24 hours	24 hours	Annual	24 hours	8 hours	Annual	8 hours
Standard ECR1997	**150**	**65**	**100**	**365**	**157**	**0.5**	**9**
Method of Analysis	Gravimetric	Gravimetric	Jacob & Hochheiser	West-Geake	UV Photometric	ED-XRF using Teflon Filter	Digital CO meter (HTC ™)

Note:

*Regular Checkup and calibration of the equipment's are done by the manufacturers and EQMS personnel to avoid any error

Legend:

PM_{10}: Particulate Matter of a diameter of 10 micron or less; $PM_{2.5}$: Particulate Matter of a diameter of 2.5 micron or less; SO_2: Sulphur Di-Oxide; NO_2: Nitrogen Oxide; O_3: Ozone; CO: Carbon Monoxide

Collected by:	Analyzed by:	Checked by:
Jahidul 15.03.17	Karimul	
Jahidul Islam	**Karimul Islam**	**Kazi Farhad Iqubal**
Sample Collector	Senior Chemist	Executive Director
EQMS Consulting Limited	EQMS Consulting Limited	EQMS Consulting Limited

EQMS Consulting Limited
Flat # C1, House # 76, Road # 5, Block # F, Banani, Dhaka-1213, Bangladesh.
Phone: +88-029873282, Mobile: +88-01911702074, E-mail: info@eqmsbd.com, eqmsbd@gmail.com, Web: www.eqmsbd.com

Project Name : Environmental Impact Assessment of the Preparatory Study on the Dhaka Mass Rapid Transit Development Project (Line 5 from Vatara to Hemayetpur)
Project Address: RAJUK Area
Monitored by: EQMS Consulting Limited (EQMS Team)
Description of Monitoring: Noise Level Monitoring
Monitoring Date: 28th February, 2017 – 10th March, 2017
Reporting Date: 13th March 2017 – 20th March 2017
Monitoring Location:

NL1-1	:	Depot Site of Line 5	NL 1-6	:	Mirpur 14 Station
NL 1-2	:	Modhunmoti Station	NL 1-7	:	Banani Station
NL 1-3	:	Gabtoli Station	NL 1-8	:	Gulshan 2 Station
NL 1-4	:	Dar-Us-Salam Station	NL 1-9	:	Vatara Station
NL 1-5	:	Mirpur 10 Station			

Description of Analysis

Location	L_{max}	L_{min}	Leq_{day}	Leq_{night}	L90	L50	L10	Area Setting*
NL1-1	65.6	43.7	54.3	50.1	47.6	50.4	56.3	Residential
NL1-2	84.2	58.8	69.2	63.5	60.1	64.3	70.5	Commercial
NL1-3	95.5	56.2	74.8	68.0	62.1	64.9	71.9	Commercial
NL1-4	82.7	55.1	69.3	65.7	60.7	63.7	70.1	Mixed
NL1-5	87.5	57.8	68.2	63.9	61.3	63.8	66.2	Commercial
NL1-6	84.8	53.4	67.3	62.3	59.1	61.9	69.5	Commercial
NL1-7	82.2	56.5	71.0	68.1	62.8	64.4	71.5	Commercial
NL1-8	90.3	52.7	65.9	59.7	56.1	60.5	67.3	Commercial
NL1-9	74.9	46.7	64.5	57.1	55.1	59.6	66.5	Commercial
Standard (ECR'1997)								
Silent area			50	40	-		-	-
Residential area			55	45	-		-	-
Mixed area			60	50	-		-	-
Commercial			70	60	-		-	-
Industrial area			75	70	-		-	-
World Bank/IFC Standard								
Residential; Institutional; Educational			70	70	-		-	-
Industrial			55	45	-		-	-

* Area setting (according to the ECR, 1997)

Collected by:	Analyzed by:	Checked by:
20.03.17		
Toffazzal Hossain	**Salahuddin Ahmad**	**Kazi Farhed Iqubal**
Sample Collector	Lab In-charge	Executive Director
EQMS Consulting Limited	EQMS Consulting Limited	EQMS Consulting Limited

EQMS Consulting Limited
Flat # C1, House # 76, Road # 5, Block # F, Banani, Dhaka-1213, Bangladesh.
Phone: +88-029873282, Mobile: +88-01911702074, E-mail: info@eqmsbd.com, eqmsbd@gmail.com, Web: www.eqmsbd.com

Project Name: Environmental Impact Assessment of the Preparatory Study on the Dhaka Mass Rapid Transit Development Project (Line 5 from Vatara to Hemayetpur)
Project Address: RAJUK Area
Monitored by: EQMS Consulting Limited (EQMS Team)
Description of Monitoring: Noise Level Monitoring
Monitoring Date: 28th February, 2017 – 10th March, 2017
Reporting Date: 13th March 2017 – 20th March 2017
Monitoring Location:

NL1-1	:	Depot Site of Line 5	NL 1-6	:	Mirpur 14 Station
NL 1-2	:	Modhunmoti Station	NL 1-7	:	Banani Station
NL 1-3	:	Gabtoli Station	NL 1-8	:	Gulshan 2 Station
NL 1-4	:	Dar-Us-Salam Station	NL 1-9	:	Vatara Station
NL 1-5	:	Mirpur 10 Station			

Description of Analysis

Hour	NL5-1	NL5-2	NL5-3	NL5-4	NL5-5	NL5-6	NL5-7	NL5-8	NL5-9
1:00-1:59 AM	49.9	61.5	71.8	67.6	62.6	60.6	65.8	60.7	54.7
2:00-2:59 AM	48.4	59.2	67.4	63.4	60.6	58.1	67.7	56.5	52.0
3:00-3:59 AM	48.5	58.3	65.6	60.5	58.7	57.4	65.0	53.6	53.1
4:00-4:59 AM	49.6	58.3	67.2	59.4	60.9	56.9	67.4	55.1	50.8
5:00-5:59 AM	51.6	60.2	65.7	65.8	59.7	57.9	68.2	54.9	52.6
6:00-6:59 AM	52.1	64.1	67.2	68.1	65.2	59.7	70.4	59.6	53.5
7:00-7:59 AM	54.9	66.1	68.3	69.9	69.9	65.3	71.9	61.3	57.2
8:00-8:59 AM	53.0	68.0	69.0	68.0	70.8	69.4	70.3	63.8	60.7
9:00-9:59 AM	54.8	71.2	71.6	68.4	69.4	68.8	69.2	64.2	63.2
10:00-10:59 AM	55.5	70.3	66.7	67.0	67.5	69.6	67.5	66.3	62.8
11:00-11:59 AM	53.6	72.1	68.8	66.2	65.5	64.5	69.6	65.6	65.8
12:00-12:59 PM	52.8	70.3	70.2	69.2	67.8	65.3	67.0	67.4	64.0
13:00-13:59 PM	51.4	69.4	69.9	70.9	65.2	63.4	68.9	68.2	67.5
14:00-14:59 PM	55.2	67.2	71.0	67.2	68.6	63.9	67.2	65.2	68.0
15:00-15:59 PM	53.3	68.1	72.6	66.3	65.7	64.4	65.0	64.6	66.0
16:00-16:59 PM	55.4	66.9	68.3	67.5	66.5	63.6	67.1	63.7	65.9
17:00-17:59 PM	52.8	70.7	70.5	69.3	64.3	67.5	70.3	65.0	64.9
18:00-18:59 PM	51.6	72.6	72.4	70.9	65.0	71.6	68.6	63.6	65.3
19:00-19:59 PM	50.6	69.3	71.1	68.5	67.2	70.1	69.5	66.6	63.3
20:00-20:59 PM	51.2	67.8	69.0	66.4	68.7	67.4	71.9	67.4	63.5
21:00-21:59 PM	50.5	68.8	68.2	68.1	69.8	65.1	69.3	64.1	65.1
22:00-22:59 PM	50.2	67.3	67.7	65.5	65.8	64.9	68.3	63.3	62.9
23:00-23:59 PM	51.3	61.3	68.5	66.9	64.9	66.0	70.5	62.9	59.2
00:00-00:59 AM	50.8	58.6	66.2	64.8	63.1	64.7	67.4	63.4	59.9

Collected by:	Analyzed by:	Checked by:
20.03.17		
Toffazzal Hossain	**Salahuddin Ahmad**	**Kazi Farhed Iqubal**
Field Enumerator	Lab In-charge	Executive Director
EQMS Consulting Limited	EQMS Consulting Limited	EQMS Consulting Limited

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Flat # C1, House # 76, Road # 5, Block # F, Banani, Dhaka-1213, Bangladesh.
Phone: +88-029873282, Mobile: +88-01911702074, E-mail: info@eqmsbd.com, eqmsbd@gmail.com, Web: www.eqmsbd.com

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Department of Public Health Engineering
Central Lab, 38-39, Mohakhali C/A, Dhaka-1212
Phone: 88-02-9881927, Fax: 88-02-9882003 , Email: wqmsc_central_lab@yahoo.com

Lab Memo: 520/ CC, DPHE, CL, Dhaka. Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040226	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Suface Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (SW-01)	Union:, Vill.:Jatrabari
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Biochemical Oxygen Demand (BOD)	0.2	13	mg/L	5 days Incubation	0.20
2	Chemical Oxygen Demand (COD)	4.0	48	mg/L	CRM	-
3	Colour	15	2.1	Hazen	UVS	-
4	Total Suspended Solid (TSS)	10	24	mg/L	Gravity Multimeter	-

Comments: Sample was collected & Supplied by client.
N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Method, LOQ - Limit of Quantitation.

Test Performed by: Signature

1.) Name: Mahabuba Sabina Motin
Designation: Sample Analyzer
03-05-17

2.) Name: Taslima Akhter
Designation: Sample Analyzer
03.05.2017
নমুনা বিশ্লেষক
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার
মহাখালী, ঢাকা

Countersigned/Approved by: Signature

1.) Name: Md. Biplab Hossain
Designation: Chief Chemist
03/05/2017
মোঃ বিপ্লব হোসেন
চীফ কেমিস্ট
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।

2.) Name:
Designation:

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Central Lab, 38-39, Mohakhali C/A, Dhaka-1212
Phone: 88-02-9881927, Fax: 88-02-9882003 , Email: wqmsc_central_lab@yahoo.com

Lab Memo: 520/ CC, DPHE, CL, Dhaka. Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040227	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Suface Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (SW-02)	Union:, Vill.:Turag bridge (Amin Bazar)
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Biochemical Oxygen Demand (BOD)	0.2	08	mg/L	5 days Incubation	0.20
2	Chemical Oxygen Demand (COD)	4.0	32	mg/L	CRM	-
3	Colour	15	1.8	Hazen	UVS	-
4	Total Suspended Solid (TSS)	10	15	mg/L	Gravity Multimeter	-

Comments: Sample was collected & Supplied by client.
N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	Mamotin 03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	B Hossain 03/05/2017 মোঃ বিপ্লব হোসেন চীফ কেমিস্ট জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।
2.) Name: Taslima Akhter Designation: Sample Analyzer	Taslima 03.05.2017 নমুনা বিশ্লেষক জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা	2.) Name: Designation:	

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Central Lab, 38-39, Mohakhali C/A, Dhaka-1212
Phone: 88-02-9881927, Fax: 88-02-9882003 , Email: wqmsc_central_lab@yahoo.com

Lab Memo: 520/ CC, DPHE, CL, Dhaka. Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040228	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Suface Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (SW-03)	Union:, Vill.:Gabtoli
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Biochemical Oxygen Demand (BOD)	0.2	12	mg/L	5 days Incubation	0.20
2	Chemical Oxygen Demand (COD)	4.0	44	mg/L	CRM	-
3	Colour	15	2.0	Hazen	UVS	-
4	Total Suspended Solid (TSS)	10	42	mg/L	Gravity Multimeter	-

Comments: Sample was collected & Supplied by client.
N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	Mamotin 03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	Bhossain 03/05/2017 মোঃ বিপ্লব হোসেন চীফ কেমিস্ট জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।
2.) Name: Taslima Akhter Designation: Sample Analyzer	Taslima 03.05.2017 নমুনা বিশ্লেষক জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা	2.) Name: Designation:	

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Phone: 88-02-9881927, Fax: 88-02-9882003 , Email: wqmsc_central_lab@yahoo.com

Lab Memo: 520/ CC, DPHE, CL, Dhaka. Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040229	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Suface Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (SW-04)	Union:, Vill.:Banani Lake
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Biochemical Oxygen Demand (BOD)	0.2	13	mg/L	5 days Incubation	0.20
2	Chemical Oxygen Demand (COD)	4.0	48	mg/L	CRM	-
3	Colour	15	1.3	Hazen	UVS	-
4	Total Suspended Solid (TSS)	10	28	mg/L	Gravity Multimeter	-

Comments: Sample was collected & Supplied by client.
N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	Mamotin 03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	BHossain 03/05/2017 মোঃ বিপ্লব হোসেন চীফ কেমিস্ট জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।
2.) Name: Taslima Akhter Designation: Sample Analyzer	Taslima 03.05.2017 নমুনা বিশ্লেষক জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা	2.) Name: Designation:	

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Lab Memo: 520/ CC, DPHE, CL, Dhaka.

Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040230	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Suface Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (SW-05)	Union:, Vill.:Gulshan Lake
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Biochemical Oxygen Demand (BOD)	0.2	10	mg/L	5 days Incubation	0.20
2	Chemical Oxygen Demand (COD)	4.0	36	mg/L	CRM	-
3	Colour	15	1.7	Hazen	UVS	-
4	Total Suspended Solid (TSS)	10	21	mg/L	Gravity Multimeter	-

Comments: Sample was collected & Supplied by client.
N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	03/05/2017 মোঃ বিপ্লব হোসেন চীফ কেমিস্ট জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।
2.) Name: Taslima Akhter Designation: Sample Analyzer	03.05.2017 সুমনা বিশ্লেষক জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা	2.) Name: Designation:	

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Lab Memo: 520/ CC, DPHE, CL, Dhaka.

Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040231	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Ground Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (GW-01)	Union:, Vill.:Gabtoli
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Alkalinity	-	170	mg/L	Titrimetic	-
2	Arsenic (As)	0.05	0.002	mg/L	AAS	0.001
3	Calcium (Ca)	75	10	mg/L	AAS	0.17
4	Chloride	150-600	12	mg/L	Titrimetic	-
5	Coliform (Faecal)	0	0	N/100ml	MFM	-
6	Colour	15	0.9	Hazen	UVS	-
7	Magnesium (Mg)	30-35	12	mg/L	AAS	0.05
8	Nitrogen (Nitrate)	10.0	0.10	mg/L	UVS	0.10
9	Nitrogen (Nitrite)	<1.0	<LOQ	mg/L	UVS	0.02
10	Potassium (K)	12.0	04	mg/L	AAS	-
11	Sodium (Na)	200	28	mg/L	AAS	0.34
12	Sulphate	400	02	mg/L	UVS	1.0

Comments: Sample was collected & Supplied by client.
N.B: AAS- Atomic Absorption Spectrophotometer, UVS- UV-Visible Spectrophotometer, MFM= Membrane Filtration Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	Motin 03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	B Hossain 03/05/2017 মোঃ বিপ্লব হোসেন চীফ কেমিস্ট জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।
2.) Name: Taslima Akhter Designation: Sample Analyzer	Taslima 03.05.2017 ফয়সুলা বিশ্লেষক জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা	2.) Name: Designation:	

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Lab Memo: 520/ CC, DPHE, CL, Dhaka.

Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040232	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Ground Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (GW-02)	Union:, Vill.:Mirpur Bangla College Wasa Pump
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Alkalinity	-	205	mg/L	Titrimetic	-
2	Arsenic (As)	0.05	0.001	mg/L	AAS	0.001
3	Calcium (Ca)	75	15	mg/L	AAS	0.17
4	Chloride	150-600	16	mg/L	Titrimetic	-
5	Coliform (Faecal)	0	0	N/100ml	MFM	-
6	Colour	15	1.3	Hazen	UVS	-
7	Magnesium (Mg)	30-35	09	mg/L	AAS	0.05
8	Nitrogen (Nitrate)	10.0	<LOQ	mg/L	UVS	0.10
9	Nitrogen (Nitrite)	<1.0	<LOQ	mg/L	UVS	0.02
10	Potassium (K)	12.0	04	mg/L	AAS	-
11	Sodium (Na)	200	29	mg/L	AAS	0.34
12	Sulphate	400	1.0	mg/L	UVS	1.0

Comments: Sample was collected & Supplied by client.
N.B: AAS- Atomic Absorption Spectrophotometer, UVS- UV-Visible Spectrophotometer, MFM= Membrane Filtration Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	Motin 03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	Biplab 03/05/2017 মোঃ বিপ্লব হোসেন চীফ কেমিস্ট জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।
2.) Name: Taslima Akhter Designation: Sample Analyzer	Taslima 03.05.17	2.) Name: Designation:	

নমুনা বিশ্লেষক
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার
মহাখালী, ঢাকা

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Lab Memo: 520/ CC, DPHE, CL, Dhaka. Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040233	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Ground Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (GW-03)	Union:, Vill.:Mirpur-10 Wasa Pump
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Alkalinity	-	135	mg/L	Titrimetic	-
2	Arsenic (As)	0.05	0.001	mg/L	AAS	0.001
3	Calcium (Ca)	75	07	mg/L	AAS	0.17
4	Chloride	150-600	13	mg/L	Titrimetic	-
5	Coliform (Faecal)	0	0	N/100ml	MFM	-
6	Colour	15	1.0	Hazen	UVS	-
7	Magnesium (Mg)	30-35	11	mg/L	AAS	0.05
8	Nitrogen (Nitrate)	10.0	<LOQ	mg/L	UVS	0.10
9	Nitrogen (Nitrite)	<1.0	0.017	mg/L	UVS	0.02
10	Potassium (K)	12.0	03	mg/L	AAS	-
11	Sodium (Na)	200	24	mg/L	AAS	0.34
12	Sulphate	400	02	mg/L	UVS	1.0

Comments: Sample was collected & Supplied by client.
N.B: AAS- Atomic Absorption Spectrophotometer, UVS- UV-Visible Spectrophotometer, MFM= Membrane Filtration Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	Mamotin 03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	BHossain 03/05/2017
2.) Name: Taslima Akhter Designation: Sample Analyzer	Taslima 03.05.2017 নমুনা বিশ্লেষক জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা	2.) Name: Designation:	মোঃ বিপ্লব হোসেন চীফ কেমিস্ট জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।

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Lab Memo: 520/ CC, DPHE, CL, Dhaka. Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040234	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Ground Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (GW-04)	Union:, Vill.:Mirpur-14,Police Line
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Alkalinity	-	160	mg/L	Titrimetic	-
2	Arsenic (As)	0.05	0.003	mg/L	AAS	0.001
3	Calcium (Ca)	75	07	mg/L	AAS	0.17
4	Chloride	150-600	15	mg/L	Titrimetic	-
5	Coliform (Faecal)	0	04	N/100ml	MFM	-
6	Colour	15	1.7	Hazen	UVS	-
7	Magnesium (Mg)	30-35	11	mg/L	AAS	0.05
8	Nitrogen (Nitrate)	10.0	2.38	mg/L	UVS	0.10
9	Nitrogen (Nitrite)	<1.0	<LOQ	mg/L	UVS	0.02
10	Potassium (K)	12.0	03	mg/L	AAS	-
11	Sodium (Na)	200	28	mg/L	AAS	0.34
12	Sulphate	400	1.0	mg/L	UVS	1.0

Comments: Sample was collected & Supplied by client.
N.B: AAS- Atomic Absorption Spectrophotometer, UVS- UV-Visible Spectrophotometer, MFM= Membrane Filtration Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	03/05/2017
2.) Name: Taslima Akhter Designation: Sample Analyzer	03.05.17	2.) Name: Designation:	

নমুনা বিশ্লেষক
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার
মহাখালী, ঢাকা

মোঃ বিপ্লব হোসেন
চীফ কেমিস্ট
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।

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Lab Memo: 520/ CC, DPHE, CL, Dhaka.

Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040235	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Ground Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (GW-05)	Union:, Vill.:Banani, DOHS
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Alkalinity	-	165	mg/L	Titrimetic	-
2	Arsenic (As)	0.05	0.002	mg/L	AAS	0.001
3	Calcium (Ca)	75	09	mg/L	AAS	0.17
4	Chloride	150-600	14	mg/L	Titrimetic	-
5	Coliform (Faecal)	0	0	N/100ml	MFM	-
6	Colour	15	0.8	Hazen	UVS	-
7	Magnesium (Mg)	30-35	12	mg/L	AAS	0.05
8	Nitrogen (Nitrate)	10.0	<LOQ	mg/L	UVS	0.10
9	Nitrogen (Nitrite)	<1.0	<LOQ	mg/L	UVS	0.02
10	Potassium (K)	12.0	03	mg/L	AAS	-
11	Sodium (Na)	200	23	mg/L	AAS	0.34
12	Sulphate	400	1.0	mg/L	UVS	1.0

Comments: Sample was collected & Supplied by client.
N.B: AAS- Atomic Absorption Spectrophotometer, UVS- UV-Visible Spectrophotometer, MFM= Membrane Filtration Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	Mamotin 03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	BHossain 03/05/2017
2.) Name: Taslima Akhter Designation: Sample Analyzer	Taslima 03.05.17	2.) Name: Designation:	

নমুনা বিশ্লেষক
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার
মহাখালী, ঢাকা

মোঃ বিপ্লব হোসেন
চীফ কেমিস্ট
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।

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Lab Memo: 520/ CC, DPHE, CL, Dhaka. Date: 03-05-2017

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2017040236	Sample Receiving date: 22-03-2017
Ref. Memo No: EQMS/2017/Nill & Dated: 22-03-2017	Sample Source: Ground Water
Sent by:Kazi Forhad Iqbal ,Executive Director , EQMS Consulting Ltd., Banani, Dhaka-1213.	Dist:Dhaka, Upa:
Care Taker: EQMS (GW-06)	Union:, Vill.:Wasa Pump House
Sample Collection date: 22-03-2017	Date of Testing: 22/03/2017-30/04/2017

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Alkalinity	-	90	mg/L	Titrimetic	-
2	Arsenic (As)	0.05	0.001	mg/L	AAS	0.001
3	Calcium (Ca)	75	05	mg/L	AAS	0.17
4	Chloride	150-600	12	mg/L	Titrimetic	-
5	Coliform (Faecal)	0	0	N/100ml	MFM	-
6	Colour	15	1.0	Hazen	UVS	-
7	Magnesium (Mg)	30-35	08	mg/L	AAS	0.05
8	Nitrogen (Nitrate)	10.0	0.28	mg/L	UVS	0.10
9	Nitrogen (Nitrite)	<1.0	<LOQ	mg/L	UVS	0.02
10	Potassium (K)	12.0	03	mg/L	AAS	-
11	Sodium (Na)	200	17	mg/L	AAS	0.34
12	Sulphate	400	1.0	mg/L	UVS	1.0

Comments: Sample was collected & Supplied by client.
N.B: AAS- Atomic Absorption Spectrophotometer, UVS- UV-Visible Spectrophotometer, MFM= Membrane Filtration Method, LOQ - Limit of Quantitation.

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Mahabuba Sabina Motin Designation: Sample Analyzer	03-05-17	1.) Name: Md. Biplab Hossain Designation: Chief Chemist	03/05/2017
2.) Name: Taslima Akhter Designation: Sample Analyzer	03.05.17	2.) Name: Designation:	

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জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার
মহাখালী, ঢাকা

মোঃ বিপ্লব হোসেন
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জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কেন্দ্রীয় পরীক্ষাগার মহাখালী, ঢাকা।

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