Government of The People's Republic of Bangladesh
Ministry of Shipping

Bangladesh Inland Water Transport Authority (BIWTA)

MONTHLY PROGRESS REPORT

MAY 2023

Consultancy Services for Supervision & Monitoring of Performance-Based Dredging Contracts with Maintenance Dredging and Installation & Maintenance of Navigational Aids along the Navigational Routes under the Contract

Bangladesh Regional Waterway Transport Project 1

BRWTP-S1A

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Abbreviation

ASAP	As Soon As Possible
ASCII	American Standard Code for Information Interchange
BDT	Bangladeshi Taka
BELA	Bangladesh Environment Lawyer Association
BIWTA	Bangladesh Inland Water Transportation Authority
BIWTC	Bangladesh Inland Water Transportation Corporation
BIWTMAS	Bangladesh Inland Water Transport Master Plan
BM	Bench Mark
BRAC	Bangladesh Rural Advancement Committee
BRWTP	Bangladesh Regional Waterway Transport Project I
BWDB	Bangladesh Water Development Board
CD	Chart Datum
CEAP	Conservation Effects Assessment Project
CSD	Cutter Section Dredger
DCC	Dhaka Chittagong Corridor
DPD	Deputy Project Director
EIA	Environmental Impact Assessment
EMP	Environment Management Plan
ESHS	Environment, Social, Health and Safety
ESMP	Environment and Social Management Plan
GBM	Ganges, Brahmaputra (Jamuna) And Meghna
GBV	Gender-Based Violence
GIS	Geographic Information System
GPS	Global Positioning System
GRC	Governance, Risk, And Compliance
GRM	Grievance Redress Mechanism
HSE	Health and Safety Expert
IALA	International Association of Marine Aids and Lighthouse Authorities
IBC	Idle Berthing Centre
ID	Identity
IHO	International Hydrographic Organisation
IWT	Inland Water Transport
JPZ	Jurutera Perunding Zaaba
JV	Joint Venture
LAD	Least Available Depth
LLW	Lowest Low Water
MCD	Meters Above Chart Datum
MOEF	Ministry of Environment, Forest and Climate Change.
MSL	Mean Sea Level
NID	National Identity
OPBC	Output and Performance-Based Contract
PD	Project Director
PIU	Project Implementation Unit
RAP	Resettlement Action Plan
RCC	Reinforced Cement Concrete

RTK-GPS	Real-Time Kinematic- Global Positioning System
SE	Senior Engineer
SOB	Survey of Bangladesh
TBM	Temporary Bench Mark
US	United States
UTM	Universal Transverse Mercator
VSS	Vessel Storm Shelter
WB	World Bank
WGS	World Geodetic System

EXECUTIVE SUMMARY

River dredging is an essential part of development activities. Maintaining the navigability of Bangladesh's rivers is very important for the country's economic development. As a part of these development activities, JPZ-DEMAS-JCL, the consulting firm herein referred to as S1A has started the work of supervision of the project 'OPBC Works of Development Dredging with Maintenance and Aids to Navigational Installation Along Inland Waterways' in December 2022 financed by the World Bank (WB) and implemented by Bangladesh Inland Water Transport Authority (BIWTA), under the Ministry of Shipping (MoS).

The works package on dredging shall operate for 66 (Sixty-six) months on the river routes presented in Routes 12,13,13a,15,16,17and 21 Contractor DHARTI-BANGLA JOINT VENTURE herein referred to as Lot 3, Route 3,4,5,6,7,8,9,10 & 11 Contractor GULF-COBLA KARNAFULY JV herein referred to as Lot 2 under Bangladesh Regional Waterway Transport Project -1(BRWTP-1), Contract Number BRWTP-W1A-03&02.

Bangladesh's Inland Water Transport sector is indeed a significant part of the country's transportation system. The country has an extensive network of rivers, including the Brahmaputra, Ganges, and Meghna rivers, which provide a natural transportation network throughout the country. According to the BIWTA, approximately 50% of the country's cargo is transported via waterways. In addition, about 25% of passengers travel by waterways, including ferries and other vessels. The total length of riverways in Bangladesh is estimated to be around 24,000 km. However, only a portion of this is navigable year-round. During the monsoon season (June-September), approximately 5,923 km of the country's riverways are navigable. However, during the dry season (October-May), the navigable length of the rivers shrinks to around 3,865 km. Despite these challenges, the water transport sector in Bangladesh continues to play a crucial role in the country's economy and transportation system.

The project area is centered on the main Dhaka- Chattogram IWT route with branches to Ashuganj, Ghorashal and Barishal. This Monthly Progress Report (MPR) compiles construction and quality control activities of the Development, Improvement, Maintenance & Emergency dredging and interrelated services of Navigational Aids, Environmental & Social, Health & Safety, GRM, and Gender issues following contractual standards, specifications, guidelines, rules and policy. At present dredging along Route 21 (Class I, length 8.5km, Tentulia River), Route 9 (Class III, length 80km, Titas River) & Route 16 (Mehendiganj to Bheduria, Tentulia River) is in

progress with hydrographic surveys and development dredging works by cutter suction dredger for the routes to maintain LAD according to the route classification all the year round.

During this month, Route 21& Route 16 under Lot 3 and Route 9 under Lot 2 were included in the execution plan. According to the contract, the S1A team provided their services to the contractors to commence works, i.e., mobilization, public consultation, environmental data collection, dredging alignment, dredging section design, pre-dredged survey, dredging quality control and dredged material management and the team visited the sites to monitor the dredging operations.

During this month, air quality, noise level, surface water quality, and dredge material quality assessments were conducted by both Lot 2 and Lot 3 contractors' sites at the places of dredging work. Mainly Route 09, route 07 of Lot 2, and Route 16 of Lot 3 contractors are ready for starting dredging work.

During the site visit by the S1A team, no significant environmental pollution issues were observed. All the air pollution and noise pollution indices were found to be as per standards after the initial activity of the dredging work. In addition to the progress report of this month, S1A included ESHS and GRM part where the information from the contractor's report and from the monitoring visits are included

S1A submitted the 1st quarterly report and previous monthly reports to the PIU. The team is vigilant towards documenting all their performances regularly and hopefully will be able to submit monthly reports timely from this month and onward.

CHAPTER 01: INTRODUCTION

1.1 Overview

The rivers of Bangladesh mark both the physiography of the nation and the life of the people. About 700 in number, these rivers generally flow south. The larger rivers serve as the main source of water for cultivation and as the principal arteries of commercial transportation. Rivers also provide fish, an important source of protein. Flooding of the rivers during the monsoon season causes enormous hardship and hinders development, but fresh deposits of rich silt replenish the fertile but overworked soil. The rivers also drain excess monsoon rainfall into the Bay of Bengal. Thus, the great river system is at the same time the country's principal resource and its greatest hazard.

Most rivers in Bangladesh are facing a serious navigability problem, hampering the movement of boats and vessels as repeated requests for dredging fell on deaf ears. Over the decades the navigability during dry season in many rivers of the country has been deteriorating because of morphological processes and for withdrawal of water from the rivers beyond the border and within the country. The navigability has been further aggravated by poor or no maintenance of inland waterways. The navigability of inland waterways is intensely influenced by river morphology and hydraulics. Inland waterways, once the prime mode of transportation in Bangladesh, have declined fast as many rivers, canals, and other water bodies have disappeared in riverine Bangladesh over the past decades. The waterways were lost for decades due to the thin flow of waters from the upper Himalayan ranges, natural sedimentation, encroachments, and erosion of the embankment. A study by Bangladesh Water Development Board (BWDB) found that 80 percent of the 300 major rivers in Bangladesh lack navigability. Trade utilizing inland water transport (IWT) services can serve as one of the key factors for economic recovery in Bangladesh, as well as in South Asia. But lower navigability and inadequate infrastructure at river ports are now the biggest challenges faced by the country.

Navigable rivers are important for commerce and most of the commercial centers of Bangladesh are located on the banks of the rivers beside river ports. Optimum utilization of these inland water ports would result in a large traffic flow carrying passengers and cargo, sharing much of the burden of the total transportation. Navigability has been an important factor causing hindrance to the development of Inland Water Transport. Most of the urban centers and industrial belts are located close to the river network, but Bangladesh is yet to fully utilize the massive potential of waterways. However, the government has recently prioritized improving the IWT sector and taken

infrastructure projects in this regard. In a country like Bangladesh where capital and maintenance dredging are required for a number of reasons besides navigability, there is a need for introducing modern technology to gear up performance levels. The government has undertaken a mega project to excavate 178 rivers of the country to make around 10,500 kilometers of waterways, which have either dried up or disappeared, navigable by 2025.

In this reporting month the apparent view of environmental and social management during dredging operations and other construction periods which is being followed by the Contractor for sustainable management of different environmental and social issues mentioned in the CEAP. It is mandatory to perform different environmental and social issues, as prescribed by EIA and the Contract Document.

This Monthly Monitoring report covers the Environmental and Social aspects of the GULF COBLA-KARNAFULY JV's and DHARTI-BANGLA JV's activities for Bangladesh Regional Waterway Transport Project -1 (LOT-2 and Lot3 respectively).

This report is prepared to encompass the following approach to ensure all measures necessary to be included in this report are addressed in a comprehensive manner:

a) Field Visit
b) Checklist and form
c) Training and meeting
d) Consultation
e) Review of environmental safeguard specifications.
f) Review of the proposed dredging/dike layout on the site.
g) Review of Project implementation schedules.

The desk-based review of the secondary information and the primary information from the site visit has been incorporated into the monthly report.

1.2 ES Staffing status

The ES staff of BRWTP-1 has sound experience of both national and international projects. BRWTP-1 recruited the most efficient and experienced professionals who are determined to make an impact into the ES sector by providing premium services that can be evaluated against measurable outcomes. A group of Environmental and Social Specialists are working on the BRWTP-1 project at PIU, DSC, S1A and 3rd party is monitoring other packages and contractors. The details of ES staffing status for the contractors are given below.

1.2.1 Recruitment status in Contractor's part:

Contractors of Lot 2 and Lot 3 engaged personnel who manage, perform, and verify work affecting environmental matters.

Table 1: Personnel of the Dharti-Banga JV (Lot3)

Sl. No.	Name	Designation	Contact Number	Email
1.	Captain A. Razzak Bhuyian	Team Leader	01730029850	capt.razzak@bangadredgers.com
2.	Md. Aftabuzzaman	Social-Communication Officer	01719031938	aftabbdl2019@gmail.com
3.	Md. Shafiqul Islam	EHS Officer	01715156143	shafiqul.islamlot3@gmail.com
4.	K.M Shakik Ahmed Walid	Environmental Inspector	01303719776	shakik.ahmedlot3@gmail.com
5.	Tanvir Hossain	Safety Officer	01712163187	thossain7746@yahoo.com
6.	Ashraful Hauqe	Ecologist	01844584988	ashraful.hoquelot3@gmail.com

Source: Report March 2023

Table 2: Key ES Personnel of the Gulf Cobla-Karnafuly JV (Lot2)

Sl. No.	Name	Designation	Contact Number	Email
1.	Dr. Engr. Mrinal Kanti Saha	EHS Manager	01715-091090	
2.	Amit Kumar Saha	Ecologist/ Environmental Officer	01303-429207	
3.	Aminur Rahman	Social/ Communication Manager	01723-042360	

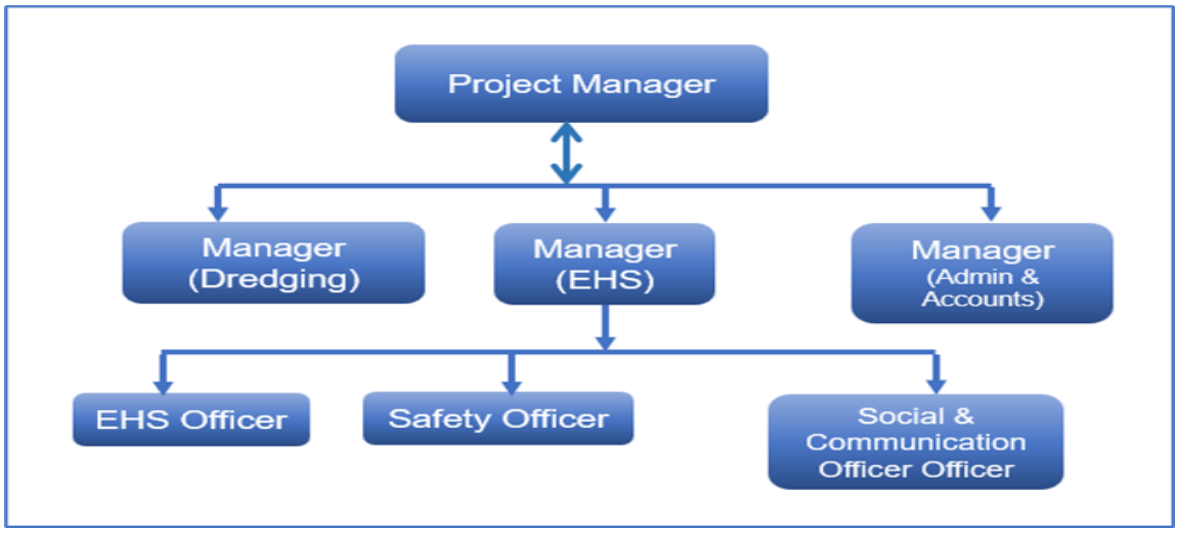


Figure1: Environmental Management Organization Chart (Source: Banga Dredgers Limited, 2022

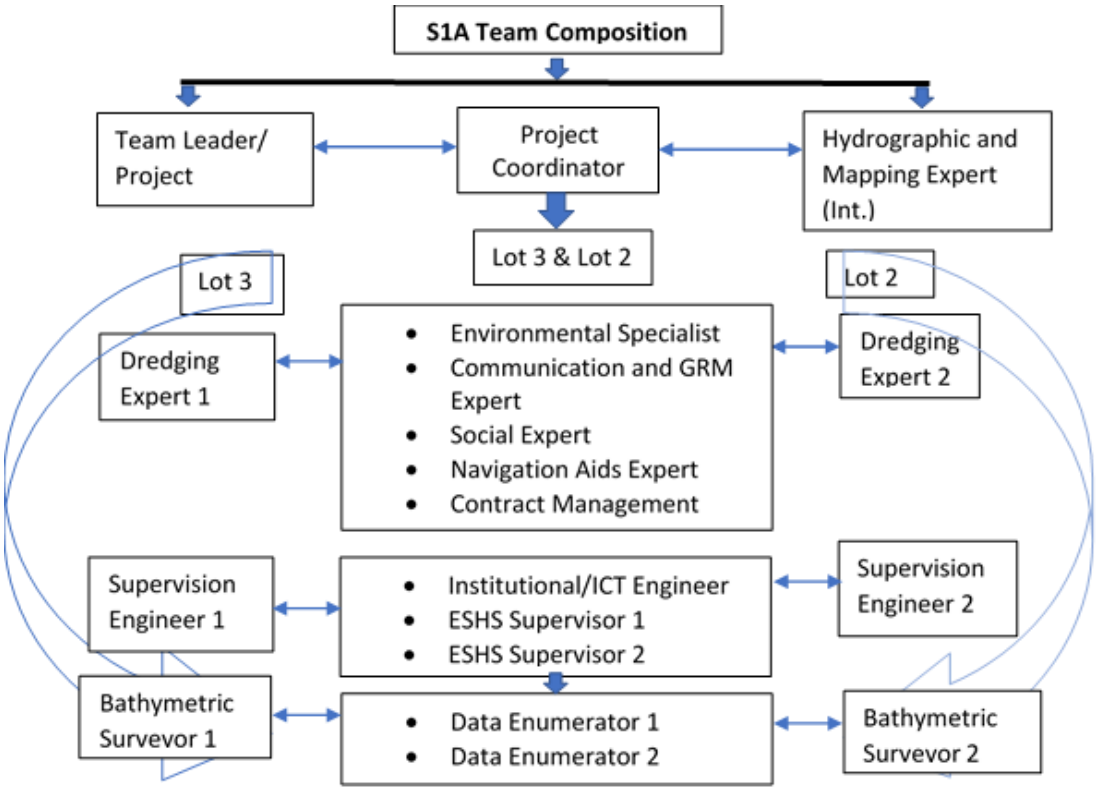


Figure 2: S1A Team Composition

1.2.2 Recruitment status in the S1A:

Consultant S1A has recruited necessary and sufficient experts and manpower during this reporting period, to carry out the project works efficiently and smoothly. Project work is progressing well with the overall responsibility, sound communication skills and experienced

working ability of the project personnel and staff. The team (Fig 2) work is improving day by day.

CHAPTER02: PROJECT DESCRIPTION IN A BRIEF

2.1 Background:

Bangladesh lies predominately within the Bengal basin, the world's largest delta formed by the Ganges, Brahmaputra (Jamuna), and Meghna (GBM) river system and its tributaries and distributaries. Bangladesh is a riverine country with some 700 rivers, streams, and canals with a total length of about 24,000 km. Approximately 6,000 km are navigable during the monsoon (wet) period for different-sized vessels, shrinking to about 3,900 km in the dry periods. While the larger rivers are up to 50 meters (m) in depth in places and the Lower Meghna (the main trafficked route on the Dhaka Chittagong Corridor or DCC) is generally 10-25m deep. Navigation is hindered by very shallow depths on bars, especially in the delta area, at the confluences of the major rivers and their tributaries, river bends, and estuaries. Navigation is further complicated by the braided nature of the main rivers. In total, the GBM System annually carries up to one billion tons of sediment and drains into the Bay of Bengal principally through the Shahbazpur and Hatiya estuaries in the Mouths of the Ganges - feeding the Bengal Fan, the largest depositional system in the world.

Inland Water Transport (IWT) carries over 50 percent of all Bangladesh's cargo traffic and one-quarter of all passenger traffic. There are over 22,300 registered vessels engaged in this trade, mainly transporting dry and liquid cargo in bulk or break-bulk form. Investment by the vibrant shipping and inland water transport industry in Bangladesh totals approximately US$ 4 billion. The Government has identified 65 main river navigation routes that are essential to passenger and freight transport within Bangladesh. The routes are categorized as Classes I through IV depending on their advertised depths as given below (Table 3).

Table 3: Main River navigation routes that are Essential to Passenger and freight transport within Bangladesh

Class	Max Vessel Draft/Least Advertised Depth	Length	%
I	3.65m/3.96m	683 km	11
II	2.13 m/2.43 m	1000 km	17
III	1.52 m/ 1.82 m	1886 km	32
IV	<1.52 m	2400 km	40

The development and control of Inland Water Transport is the responsibility of the Bangladesh Inland Water Transport Authority (BIWTA), under the Ministry of Shipping (MoS). Among its functions for passenger traffic, BIWTA is responsible to:

- Develop, maintain, and operate inland river routes to maintain the advertised Least Available Depth (LAD) and width by necessary surveys and dredging works including maintaining the necessary navigation measures to operate the vessels effectively;
- Develop, maintain, and operate inland river ports, landing ghats, and terminal facilities in such ports or ghats; and,
- Develop the most economical facilities for passenger traffic to ensure comfort, safety, and speed on mechanized craft.

In order to improve key multi-modal transport corridors and networks that would address current transport bottlenecks in Bangladesh, the World Bank is financing the Bangladesh Regional Waterway Transport Project I (BRWTP-1). It is centered on the main Dhaka-Chattogram IWT route, with branches to Ashuganj, Ghorashal and Barishal. Major components of BRWTP-1 include the following:

- Capital and maintenance dredging, installation, and operation of aids to navigation and construction and maintenance of Vessel Storm Shelters (VSS) / Idle Berthing Centers (IBC);
- Development of Cargo Terminals;
- Development of Passenger Terminals; and,
- Development of Landing Ghats.

The above-mentioned works are to be undertaken under an output and performance-based method of contracting. Output and Performance-Based Contracting for Inland Water Navigation (OPBC-IWN) is a results-oriented contracting method that focuses on the outputs, quality, or outcomes and ties at least a portion of a contractor's payment, contract extensions, or contract renewals to the achievement of specific, measurable performance standards and requirements. Supervision of OPBC-IWN contracts is to be done with due care and diligence following the highest professional practices and International Hydrographic Organization (IHO) S-44 5th edition standards and surveys.

This Monthly Report includes Commencement of Work, Mobilization, Document Review and Inception, Workshop and Training Program, Managing, Supervision and Monitoring of the OPBC-

IWN Contract, Technical and Management Support to Client, Monitoring, and Supervision of Environmental and Social Outputs, etc., from 1st May to 31st May 2023.

2.2 Objectives:

The main objective of this consultancy service is to monitor, supervise, and administer the contracts for performance-based dredging works, installation and operation of aids to navigation along the navigational routes under the BRWTP-WIA package (Lot-2 & Lot 3).

2.3 Scope of Works:

2.3.1 Approaches for the Assignment

The Consultant must be aware that the Output and Performance-Based Contract for Inland Water Navigation has its own characteristics. The performance 'Statement of Objectives are:

2.3.2 Purpose

To guarantee advertised depths and widths on all river routes except some routes in the delta area for at least 95%, i.e., 347 days/year, whilst, the dredging availability target will be 85% for the routes in the delta area (Route 21 under Lot-3) and to guarantee a 95% availability of aids to navigation.

2.3.3 Scope and Period of Performance

The scope of the OPBC-IWN (Works Package No. W1A, comprises two (2) Lots, under two (2) separate Contracts including:

2.3.3.1 Mobilization, Setup, and Establishment:

Mobilization/Demobilization, Rental of Major Plant and Equipment, Site Set-up and Establishment (including ESHS) which will include mobilization of all necessary survey, dredging and other vessels and attendant plant to Bangladesh, retention of the all plant and equipment in Bangladesh for the duration of the Works, site establishment, setting up and eventual demobilization.

2.3.3.2 Development of Dredging Works:

The activity of restoring advertised navigation channel depths and widths on the various Inland Waterways under Package No. W1A contract(s) is to be conducted over the first 30 (thirty) months period of the contract.

2.3.3.3 Improvement Works:

Consisting of a set of specific interventions indicated in the Specifications to add new

characteristics, including the provision of new aids to navigation to the Inland Waterways under Package No. WIA contracts, which shall be conducted over the first 18 (eighteen) months period of the contract.

2.3.3.4 Maintenance Services:

Consisting of all interventions on the inland waterways, which are to be carried out by the Contractors in order to keep the Inland Waterways to specific performance standards, including all activities related to management and evaluation of the Inland Waterways network under the contracts. Inter-alia, Maintenance Services include: (i) Maintenance Dredging Works starting from the 31st (Thirty-one) month of the contract and continuing up to 66 (Sixty-six) months of the contract, and (ii) Maintenance of Aids to Navigation starting once installed and continuing up to 66 (Sixty-six) months of the contract.

2.3.3.5 Support on Environmental and Social Safeguards:

To prepare site-specific Dredge Disposal Management Plan and Resettlement Action Plans (RAPs) as required for on-land disposal of dredge materials and support the PIU in the ES management under the W1A package including implementation of the Dredge Disposal Management Plan, RAPs, GBV Action Plans and project's GRMs.

2.3.3.6 Emergency Works:

Consisting of activities needed to reinstate the Inland Waterways and reconstruct their structure or their right-of-way which has been damaged as a result of natural phenomena such as cyclones and earthquakes with imponderable consequences, or severe accidents blocking the passage of vessels, which may be required at any time during the contract, up to 66 (Sixty-six) months from the Starting Date.

2.3.4 Place of Performance

The works package on dredging shall operate for 66 (Sixty-six) months on the river routes presented in the box below.

LOT 2: Route 3&4, Route 5, Route 6, Route 7&8, Route 9, Route 10, and Route 11

Route 3&4:	Shitalakshya (Munshiganj to Ghorashal)
Route 5:	Meghna (Munshiganj to Ashuganj)
Route 6:	Meghna (Loop joining Route 5)
Route 7&8:	Meghna (Narshingdi Northern and Southern Approaches)
Route 9:	Meghna (Bancharampur/Homna Loop)
Route 10:	Meghna (Homna to Daudkandi)
Route 11:	Gumti (Meghna to Daudkandi)

LOT 3: Route 12, Route 13, Route 13a, Route 15&16, Route 17, Route 21

Route 12:	Meghna (Chandpur to R140 Bridge)
Route 13:	Meghna Arial Khan Route (Approach from Alubazar North of Batamara up to Hat Hazar)
Route 13a:	Meghna (Looping Route inside Char Hijla)
Route 15 &16:	Meghna (Mehendiganj to Bheduria)
Route 17:	Meghna Tentulia (Bheduria to Route 14)
Route 21:	Tentulia (Bheduria to Laharhat)

2.3.4.1 The Scope During Dredging Operations:

- Joint hydrographic survey by the Contractor, S1A, BIWTA
- Supervise and certify dredging performance, review achieved depth, compare with targets and identify shortfalls;
- Supervise, witness, and certify pre, post, and monitoring surveys, environmental monitoring, and monitoring of hydraulic and morphological parameters performed by the Contractor;
- Check dredged volumes based on pre- and post-survey hydrographic data;
- Calibrate and update of available water model with data from surveys and monitoring;
- Assess backfilling rate and maintenance dredging requirements based on survey data;
- Update dredged material management plan;
- Verify and certify contractor's invoices;
- Organize progress meetings with the contractor, the client and the donor on a regular basis;
- Organize stakeholder meetings, RAPs, and GRM action plan/workshops to disseminate project schedule and progress.

2.3.4.2 Scope of Environmental Assessment and Monitoring:

- Environmental assessment and mitigation measures
- Investigation of baseline information of physical, biological, and social environment;
- Assessment of anticipated impacts of the project activities on the physical, biological, and social environment;
- To ensure that the Environmental Management Plan (EMP) and monitoring plan are followed strictly in order to minimize the adverse effects due to project interventions.
- Monitoring water availability, irrigation, fisheries and livelihood, and flooding through field surveys and consultation with multi-stakeholders
- Prepare environmental monitoring report
- Review and comments on W1A contract environmental reports

2.3.4.3 The Scope of Social Services:

- Resettlement Action Plans-
- Good faith agreements
- Organize stakeholder meetings

2.3.4.4 The Scope of Hydrographic Survey Services:

- Joint survey by S1A, PIU & Lot 2 & Lot 3 to identify and select the dredging area
- Joint pre-work survey (in survey) by S1A, PIU & Lot 2&3 in the dredging-required area
- Monitoring survey before post-work (out the survey) in the dredged area
- Joint post-work survey (out survey) by S1A, PIU & Lot 2 & Lot 3 in the dredged area
- Periodic monitoring survey after post-work (out the survey) in the dredged area
- Monitoring Survey after the monsoon in full route length and covering the full width

2.4 Outputs:

- Baseline hydrological, morphological, and environmental conditions of the project rivers routes
- Prepared hydrological data and hydrographic charts for the project rivers routes
- Best-suited dredging alignments for dredging different navigational routes;
- Dredged material disposal plan
- Development and maintenance of dredging volumes for different river stretches of project rivers routes
- Benefit of dredging maintaining LAD on physical and socio-economic conditions
- Monitoring results on dredging, water availability, navigability, irrigation, erosion, and flood improvement
- Monitoring results on agriculture, fisheries, livelihood, and environmental conditions
- Reports: All work performed by the consultancy team of engineering services shall be documented in written reports submitted to the PIU
- Preliminary charts for delineating dredging alignments and computation of dredging volume
- Different reports that shall highlight the output of survey works through a preliminary estimate of dredging requirement, Volume of dredging needed as per Joint Pre-work Survey and design, Progress of dredging work, the actual volume of dredging performed as per Joint post-work Survey
- Report mentioning the status of the dredged channel after the completion of dredging work. All work performed by the survey team services shall be documented in written reports submitted to the PIU.

In light of the basic information of this project, the S1A consultant arranged the monitoring and supervision program. From the beginning, the supervision was divided into three major parts- dredging works, environmental monitoring, monitoring on social aspects and ESHS. This month's (May 2023) administrative and recruitment process as well as the documentation process has been updated a lot. Site visits were average due to budget shortage.

CHAPTER 03: PERFORMANCE OF THE CONSULTANTS ON DREDGING WORK, ENVIRONMENTAL AND SOCIAL ISSUES

Since the commencement of the project, the contractors of Lot 2 and Lot 3 have been submitting their performance reports as per their contract. The S1A team prepared this chapter based on their own observation and supervision considering the information submitted by the contractors and the projected output of the project.

This chapter covers hydrological survey data and hydrographic charts for the project river routes. Also, the most suitable dredging alignment for dredging selected navigation routes and dredged material disposal plan.

Development and maintenance of dredging volume of various rivers of the project river routes and benefits of dredging while maintaining LAD on physical and socio-economic conditions are included in this chapter.

Monitoring results of dredging, water availability, navigability, irrigation, erosion, and flood improvements; and

Monitoring results on agriculture, fisheries, and ecological aspects, livelihoods of the riverside people, environmental quality measurement, and other environmental conditions, etc. are illustrated in this chapter. The chapter is mainly divided into three main parts:

3.1 Environmental Assessment/ Environmental Issues;
3.2 Social and Resettlement Issues; and
3.3 Development and Maintenance of Dredging Works.

3.1 Environmental Assessment/ Environmental Issues

3.1.1: Introduction

Monitoring the environmental impact is one of the main tasks of this project. However, social and other issues are closely related to the environment. The issues specifically related to the environment that were observed at the commencement period of the project are included in this part. The S1A team hopes that gradually it will be possible to do more specific and clear documentation. During this month environmental supervision is mostly done on the site visit and by collecting data from the reviewed reports provided by the contractors.

The main objective of this section is to understand the current environmental condition of the project area, and how the project needs to be implemented considering these conditions. This part also provides a standard guideline and approach to preserving key environmental aspects by preventing and controlling environmental pollution and the management of challenges and difficulties, resulting from the Improvement/dredging work of Inland Waterway routes under Bangladesh Regional Water Transport Project-1 (Lot 2 and Lot 3), in accordance with the conditions of contract and clients' requirements. The main objectives of this part are as follows:

- To present the records of monitoring and its mitigation measures, taken thereafter, of the environmental parameters, including noise, air, riverbed sediment, and water quality, for identifying the deviation of environmental quality if any due to construction-related activities.
- To evaluate and confirm whether the Contractor has met the environmental compliance requirement, as was committed in the CEAP to protect the surrounding environment of the construction site.

In this part of the report, we have illustrated the monthly quality measurement of different environmental parameters which may be affected by the dredging work according to the environmental management plan (EMP) of the project.

The monitoring includes air, surface water, groundwater quality, dredge material, and noise level testing according to standard procedures.

3.1.2 Summary of environmental protection and pollution control/mitigation measures, as recommended in the site-specific EMP and SMP

Table 4: Summary of the Major Findings in the Reporting Month (May 2023) of Lot 2

Issues	Present Status (Lot 2)	Mitigation Measures	S1A Comments
Aquatic Fauna (Fish)	•During the field visit of May 2023, fishing activities were not observed in Imam Nagar Dredging Site (Route 9) and Narsingdi Dredging Site (Route 7). •Local people informed that a very small number of fish are found at Imam Nagar Dredging Site. Common fishes include Punti, Tengra, Koi, etc. •There is no visible fish mortality within and around the dredging site location.	No mitigation measure is required	No evidence that proves that on-site fish catch was done, which is important to evaluate the dredging impacts and seasonal variation
Aquatic Fauna (Dolphin)	•During the monthly visit of May 2023, the study team did not observe any Ganges River Dolphin. However, consultation with local people confirmed that Ganges River Dolphins are not found in River Routes 9 and 7. •No direct observation of freshwater turtles in the dredging site, dike area, and adjacent local area. In addition, the study team did not observe any visible sign of turtle habitat.	No mitigation measure is required	Needs further observation during the monsoon months since the dolphins spread out with the increase of water levels. The statement that "the study team did not observe any visible sign of turtle habitat" is not a valid statement. To collect information on the turtles members of fisher communities need to be thoroughly interviewed. Recommended TO BE DONE for the following months.
Air quality	In this month, monitoring of Air quality at nine locations was conducted. All the testing parameters were found within the standard limit.	No mitigation measure is required.	Variations among the sampling sites need to be described
Noise level	Monthly monitoring of noise level has been conducted in this reporting month. Results were found within the standard limit.	No mitigation measure is required.	See the comment for air quality
Riverbank Erosion	During the reporting month, there was no issue was observed regarding riverbank erosion or flooding.	No mitigation measure is required.	Dykes constructed along the river bank for disposal of dredged materials are not maintained properly which caused breaches of the dykes and affecting the river bank to collapse and erode. **See inserted pictures** (Fig 3).
Drainage congestion	The dredging work in May 2023 is being carried out in Solimganj Ghat (Route-9) area. During site observation, the outline for water passing from the dredge material was found to be functional. The picture is attached in the Annex.	No mitigation measure is required.	Outlets of the dykes face the river, and seepage water from the dredged materials directly accumulates in the foreshore of the river bank, which may obstruct drainage and flow.
River transport	River traffic related sign boards have been observed during this reporting month to ensure a safe river traffic movement.	No mitigation measure is required.	Signages are not enough need more signages. Desings and contents to be approved by PIU
Blasting	No such activities have been conducted during the reporting month.	No mitigation measure is required.	No such activity
Spills from chemical storage	No spills either at land or river section were noticed during the reporting period.	No mitigation measure is required.	-
Sediment leakages from pipes	During this reporting month no leakage was found in the dredge pipe.	No mitigation measure is required.	-
Waste	During the reporting month, waste bins have	Oil cleaning cloths	-

Issues	Present Status (Lot 2)	Mitigation Measures	S1A Comments
Management	been placed on the houseboat as well as in dredger. Different color-coded dustbins (The picture is attached in the Annex.) with specific waste category levels on the waste bins have been installed in the dredging site. No wastewater and solid waste are discharged into the rivers.	need to be disposed of in hazardous waste bins.	
Water and Swamp Protection	Equipment is inspected and maintained regularly in order to prevent leaks. To check the water quality at the dredging points, five water samples were collected and tested in the laboratory. Adequate toilet facilities have been provided in houseboats and dredgers as well.	No mitigation measure is required.	-
Drinking water and sanitation	Safe drinking water is being supplied for the site workers also toilets were found clean during this reporting month. The picture is attached in the Annex.	Toilet checklists need to be maintained on a regular basis.	-

Table 5: Summary of the Major Findings in the Reporting Month of Lot 3

Issues	Present Status	Mitigation Measures	S1A Comments
Aquatic Fauna (Fish) observed items: Fishing Activities, Observed Fish Species, Fish Mortality	• During the field visit of May 2023, fishing activity with small mechanized and non-mechanized boats were observed. • Four species of fish and one species of crustaceans were observed to catch in the Tentulia River namely, Hilsha (Tenualosa ilisha), Poa (Otolithoides pama), Tengra (Mystus tengara), Bele (Glossogobius giuris), and Fresh water prawn/ Golda Chingri (Macrobrachium rosenbergii). • There is no visible fish mortality within and around the dredging site location.	No mitigation measure is required	No evidence that proves that on-site fish catch was done, which is important to evaluate the dredging impacts and seasonal variation
Aquatic Fauna (Dolphin and turtle observation)	• During the monthly visit of May 2023, the study team did not observe any Ganges River Dolphin. However, consultation with fishermen confirms the presence of Ganges River Dolphin in River route-16. • No direct observation of freshwater turtles in the dredging site, dike area and adjacent local area. In addition, the study team did not observe any visible sign of turtle habitat.	Regular monitoring was conducted during the dredging operation. No mitigation measure is required	Needs further observation during the monsoon months since the dolphins spread out with the increase of water levels. The statement that "the study team did not observe any visible sign of turtle habitat" is not a valid statement. To collect information on the turtle's members of fisher communities need to thoroughly interviewed. Recommended TO BE DONE for the following months.
Air quality	In this month, Air quality has been conducted at 4 sample areas of route 16. All the testing parameters were found within the standard limit. The results indicate that the levels of PM10, PM2.5, and SPM (Suspended Particulate Matter) were within the permissible limits at all monitoring locations. Additionally, the concentrations of gaseous pollutants such as CO (Carbon Monoxide), NO2 (Nitrogen Dioxide), and SO2 (Sulfur Dioxide) were below the	No mitigation measure is required.	See comments for Lot 2

Issues	Present Status	Mitigation Measures	S1A Comments
	standard levels in both monitoring locations		
Noise level	Noise level monitoring were also conducted at Route-16 due to the ongoing work activities at these locations. The objective of these assessments was to measure and evaluate the levels of noise generated during these activities. The results of the noise level monitoring indicate that the noise levels at all of the monitoring locations are in compliance with the International Finance Corporation's Environmental, Health, and Safety guidelines. However, it is noted that the levels are slightly higher than the standards set by Bangladesh .	No mitigation measure is required.	See comments for Lot 2
Underwater Noise	Underwater Noise level monitoring was conducted at due to the ongoing work activities at Patarhat launch ghat (R-16). The highest noise level recorded was 68.3 dBA, while the lowest level measured was 61.5 dBA at near Char Mithuya (R-16).	Pingers to be used prior to starting dredging	Contractors were asked to follow the protocols
Riverbank Erosion	During the reporting month, there were no issue was observed regarding riverbank erosion or flooding.	No mitigation measure is required.	-
Drainage congestion	The dredging work in May 2023 is being carried out in Solimganj Ghat (Route-9) area. During site observation, the outline for water passing from the dredge material was found to be functional. The picture is attached in the Annex.	No mitigation measure is required.	-
Quarries, borrow areas, spoil areas, asphalt plants, batch plants	No such activities and issues were observed during this reporting month.	No mitigation measure is required.	-
River transport	River traffic-related sign boards have been observed in this reporting month to ensure a safe river traffic movement. The picture is attached in the Annex.	No mitigation measure is required.	-
Blasting	No such activities have been conducted during the reporting month.	No mitigation measure is required.	-
Spills from chemical storage	No spills either at the land or river section were noticed during the reporting period.	No mitigation measure is required.	-
Sediment leakages from pipes	During this reporting month, no leakage was found in the dredge pipe.	No mitigation measure is required.	-
Waste Management	In the reporting month, waste bins were positioned on the vessels and the dredge material placement site. However, color-coded wastebins at the dredging site, along with written labels attached to facilitate clear identification. No wastewater or solid waste is released into the rivers	No mitigation measure is required.	-
Water and Swamp Protection	Equipment is inspected and maintained regularly in order to prevent leaks. To check the water quality at the dredging points, five water samples have been collected and tested in the laboratory. Adequate toilet facilities have been provided in houseboats and dredgers as well.	No mitigation measure is required.	-
Drinking water and sanitation	Safe drinking water is being supplied for the site workers also toilets were found clean during this reporting month.	Toilet checklists need to be maintained on a regular basis.	-
Surface Water	In the month of May 2023, surface water sampling was conducted at 4 locations, specifically in the Tentulia River near Patarhat launch ghat (R-16), due to the ongoing dredging works at this site		-

Issues	Present Status	Mitigation Measures	S1A Comments
Dredged Material	According to the analysis of the samples, there was 8.31 mg/kg of lead (Pb) and 0.010 mg/kg of cadmium (Cd) in the dredge material samples. In this study, the amounts of chrome (Cr), zinc (Zn), and arsenic (As) were found to be 9.05 mg/kg, 24.52 mg/kg, and 0.81 mg/kg, respectively. These results indicate the composition of the dredge material and provide valuable information regarding the presence of these specific contaminants.		-

Figure 3: Dykes constructed along the river bank. Disposal of dredged materials are not maintained properly which caused breaches of the dykes and affecting the river bank

3.1.3 Environmental Quality Measurement:

The main objective of this monitoring program is to assess the basic environmental variables in and around the dredging sites considering the possible exposures. Specific environmental and biodiversity conservation clauses are measured for understanding the probable impacts. The monitoring includes air, surface water, groundwater quality, dredge material, waste management, and noise level testing according to standard procedures.

The S1A team documented the quality of current environmental parameters according to the quality measurement results provided by the contractors of lot 2 and lot 3. Communicating with the field staff and from the site visits the team illustrated the environmental part of this reporting period.

3.1.3.1 LOT 2: GULF COBLA KARNAFULY JV

Air Quality

Dredging work can pollute ambient air in several ways. Considering this issue, the CEAP has suggested many mitigation approaches to lower air pollution. The GULF COBLA- KARNAFULY JV is maintaining these management plans to control the air pollution. As frequent monitoring is required to ensure the implementation of CEAP, the contractor measures suggested parameters of ambient air quality in and around the dredging site on a monthly basis.

According the lot2 monthly report the ambient status of major air pollutants viz. Particulate Matter (SPM, PM_{10} and $PM_{2.5}$), Gaseous substance (NO_2, SO_2 and CO) has been assessed. All the parameters have been sampling for 2 hours. Haz-Scanner TM (HIM 6000) has been used to monitor ambient air quality.

During this month (May 2023), air quality assessments were conducted at two routes, namely Solimganj ghat (R-9) and Narsingdi launch terminal (Route-7). The aim of this monitoring was to gather information on the air quality at these locations.

Table 6: Air quality results comparing with base line.

Lot 2: GULF COBLA KARNAFULY JV												
Monitoring Code	Baseline	May-23	Baseline	May-23	Baseline	May-23	Baseline	May-23	Baseline	May-23	Baseline	May-23
	SPM	SPM	PM10	PM10	PM2.5	PM2.5	SO2	SO2	NO2	NO2	CO	CO
	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(mg/m3)	(mg/m3)
AQ1	197.52	172.87	87.42	81.36	61.83	61.83	47.83	32.21	28.15	26.72	2.1	1.1
AQ2	149.82	180.34	69.63	84.67	49.41	49.41	27.71	35.77	19.34	29.31	1.8	1.2
AQ3	153.67	178.22	75.42	80.57	51.33	51.33	27.46	32.64	15.21	25.33	1.4	1
AQ4	145.34	175.83	71.34	77.39	32.21	32.21	20.98	26.94	16.53	31.64	1.6	1.2
AQ5	164.21	141.11	79.46	53.82	41.29	41.29	28.05	20.31	21.23	17.38	2	0.9
AQ6	133.52	147.33	67.59	55.74	29.64	29.64	19.45	19.45	14.64	16.79	1.1	1.1
AQ7	140.34	149.66	58.34	59.41	31.43	31.43	15.29	22.18	12.75	18.15	1.3	1
AQ8	127.76	151.71	50.91	58.18	34.21	34.21	12.45	24.78	18.47	19.83	1.8	1.3
AQ9	157.82	159.62	72.37	61.43	41.35	41.35	18.25	28.37	15.89	21.55	1.3	1.3
Duration (Hours)	8		24		24		24		24		8	
Weather	Sunny											
BD Standard, PCR 2022	-		150		65		80		80		5	
Note: Baseline Data on January 2023												

Table shows the summary findings of the ambient air quality results. The results show that the concentration of PM10, P2.5 and SPM were found within the standard limits in all locations. Also, the concentration of gaseous substances like CO, NO2, and SO2 are found to be below-standard in both river route monitoring locations. However, most of the data in May 2023 have increased from the baseline data.

Noise Level

Noise level was monitored in five locations. The noise level has been analyzed and compared with the Environment Conservation Rules (ECR), 1997. Noise level monitoring was conducted at

Solimganj ghat (R-9) and Narsingdi Launch Terminal (Route-7).

The table below summarizes the findings of noise level monitoring in May 2023. However, it is noted that the level was within the standards set by Bangladesh and did not vary noticeable level comparing with the baseline.

Table 7: Noise Level Monitoring Results

Location	Noise level (dB(A))[2]				Bangladesh Standard (dB(A))[3]		IFC EHS Guideline (2007)[4]		Location setting
	Leqday	Leqnight	Lmax	Lmin	Day	Night	Day	Night	
NL1	57.7	44.8	77.5	39.3	60	50	70	70	Mixed Area
NL2	55.3	41.5	78.4	38.7	60	50	70	70	
NL3	59.7	39.4	76.2	35.1	60	50	70	70	
NL4	58.9	41.2	73.6	37.4	60	50	70	70	
NL5	61.3	43.5	77.8	40.7	60	50	70	70	

Underwater Noise Level

Monitoring of underwater noise levels was conducted in the areas of Narsingdi Launch Terminal (Route-7) and near Solimganj ghat (Route-9) due to ongoing work activities in those areas.

The table (**Error! Reference source not found.**7) present the results of monitoring underwater oise levels in May 2023. Based on the findings, it was determined that the noise levels at the monitoring locations met the Environmental, Health, and Safety guidelines of the International Finance Corporation (IFC). It is important to note that there are currently no standard regulations in Bangladesh regarding underwater noise level monitoring.

During the monitoring period, the highest noise levels recorded were 68.7 dBA. On the other hand, the lowest level measured were 48.8 dBA. These findings suggest that the underwater noise levels at the monitoring locations were within acceptable limits and did not pose any significant risks to the environment or marine life.

Table 8: Underwater Noise Level Monitoring Results for May

Code	Location	L_{Avg} [dB (A)]	*Standard [dB (A)]

		May	
UWNL1	Near old Narsingdi Launch Terminal (Route- 7)	51.6	**No standard of GoB**
UWNL2	Near Narsingdi Launch Terminal (Route- 7)	48.8	
UWNL3	Bancharampur-Solimganj Now Path	68.7	
UWNL4	Bancharampur-Solimganj Now Path	54.7	
UWNL5	Bancharampur-Solimganj Now Path	65.9	

Surface Water Quality

The status of surface water quality is measured by testing some physic-chemical parameters to determine the impact of dredging activities on adjacent water bodies.

In the month of May 2023, surface water sampling was conducted at 10 locations in Solimganj ghat (Route-9) and Narsingdi Launch Terminal (Route-7).

Analytical results from the surface water sampling test are presented in Error! Reference ource not found**..**

Table 9: Surface water quality testing result.

Parameters	Unit	Concentration Present (Route -9)										Bangladesh Standard
		SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	
Temperature	°C	29.5	29.2	29.4	28.2	29.0	30.2	30.1	30.4	30.2	30.1	-
EC	µS/cm	590	594	588	591	593	327	319	300	310	305	-
Turbidity	NTU	3.8	4.1	4	3.9	4.2	5.8	6.1	6.7	7	6.8	-
pH	-	7.33	7.39	7.31	7.42	7.40	7.61	7.67	7.62	7.69	7.63	6 - 9
TDS	ppm	345	360	350	352	356	182	190	178	180	185	1000
DO	mg/L	5.7	5.9	6	5.4	5.8	5.9	6.2	6	6.3	6.4	5 of more
Potassium	mg/L	44	48	42	40	39	27	30	22	20	24	-
Calcium	mg/L	41	39	38	40	36	47	38	32	26	30	-
Magnesium	mg/L	22	18	16	20	19	9	7	7	8	9	-
Phosphate	mg/L	1.2	1.4	1.6	1.5	1.4	1.0	1.3	1.2	1.0	1.1	-
Chloride	mg/L	18	21	19	20	16	9	8	9	10	8	-
Fluoride	ppm	0.6	0.8	0.5	0.7	0.8	0.2	0.3	0.3	0.4	0.6	-
Nitrate	mg/L	0.8	0.7	0.8	0.9	0.6	0.5	0.2	0.3	0.2	0.5	7.0
BOD5 (at 20°C)	mg/L	5.8	5.6	5.9	5.7	5.5	5.2	4.9	5	4.7	4.6	6 of less
Sulfate	mg/L	14	21	19	16	18	20	17	19	16	15	-
TSS	mg/L	207	193	202	200	205	94	81	96	100	92	-

Note: Bangladesh Environment Conservation Rules, 2023- Schedule 2 (Standards for Inland Surface Water). DO: Dissolved Oxygen; BOD: Biological Oxygen Demand; EC: Electric Conductivity, TDS: Total Dissolved Solids; TSS: Total Suspended Solids.

Biological Oxygen Demand (BOD)

BOD values in the sampling points were found within the standard level as per ECR'23. Higher BOD indicates more oxygen was required, which is less for oxygen-demanding species to feed on and signifies lower water quality. Inversely, low BOD means less oxygen is being removed from the water. Runoff carrying waste from streets and sidewalks; nutrients from fertilizers; leaves, grass, and paper from residential areas, are all contributors to increase oxygen demand.

Dissolved Oxygen (DO)

Dissolved oxygen (DO) is one of the most important indicators of water quality. It is essential for the survival of fish and other aquatic organisms. Oxygen is also introduced into the water as a byproduct of aquatic plant photosynthesis. When dissolved oxygen becomes too low, fish and other aquatic organisms cannot survive. DO value in all samples also met the standard level of Bangladesh.

pH

The acceptable range of pH set by the DoE is between 6 to 9. This is the range, which indicates adequate protection to the life of freshwater fish and bottom dwelling invertebrates. The pH value ranged from 7.31 – 7.69. The pH value follows both Bangladesh standards (ECR, 2023).

Total Dissolved Solid (TDS)

The concentration of Total Dissolved Solid (TDS) of surface water was between 178 – 360 ppm. Test results showed that the TDS value for all the locations was found within the national standard.

Total Suspended Solid (TSS)

The concentration of Total Suspended Solid (TSS) of surface water was between 81 – 207 mg/L. There is no stipulated standard in Bangladesh for TS

Dredge Material

The dredge material sampling strategy was designed to assess the dredge material quality in the ongoing project area. Each location used a composite sampling technique for dredge sampling. There is no stipulated standard value for sediment or dredge in Bangladesh, as well as in IFC EHS general guideline. Dredge samples were collected from the disposal location. At each location, dredge samples were collected from one spot and homogenized. The homogenized sample was then packed in polyethylene plastic bags, sealed, and sent to the laboratory for analysis.

To assess the dredge material quality of the project area two samples were collected from two dredging disposal site following the USEPA technical manual. Sampling locations has been given in Table 10.

Table 10: Details of Dredge material sampling locations

SI. No.	Sampling Station	Station Code	Sampling Date	GPS Coordinates
1.	Solimganj Ghat (Route-9)	DM-1	28/05/2023	23°50'38.04"N 90°50'43.12"E
2.		DM-2	28/05/2023	23°50'38.06"N 90°50'42.68"E
3.		DM-3	28/05/2023	23°50'30.62"N 90°50'38.19"E
4.		DM-4	28/05/2023	23°50'30.76"N 90°50'37.45"E

Figure 4: Dredge Material Sampling from Dykes

Table 11: Dredge Materials Analysis Results

Parameter	Unit	Dredge Material – Route 9				Methodology/Instrument
		DM1	DM2	DM3	DM4	
Lead (Pb)	mg/kg	13.26	14.35	15.37	14.96	Atomic Absorption Spectrophotometer
Cadmium (Cd)	mg/kg	0.07	0.08	0.06	0.09	Atomic Absorption Spectrophotometer
Chromium (Cr)	mg/kg	23	21.85	20.65	22.04	Atomic Absorption Spectrophotometer
Zinc (Zn)	mg/kg	31.65	35.72	30.28	32.54	Atomic Absorption Spectrophotometer
Arsenic (As)	mg/kg	1.32	1.64	1.53	1.58	Atomic Absorption Spectrophotometer

This monthly report focuses on determining the levels of various contaminants in dredged material. Lead, an element with a concentration ranging from 13.26 to 15.37 mg/kg, was found in the samples. Cadmium, another contaminant, was detected within the range at 0.006 to 0.09 mg/kg. The presence of chrome, zinc, and arsenic was also identified. Chromium concentrations varied from 20.65 to 23 mg/kg, while zinc content ranged from 30.28 to 35.72 mg/kg. Arsenic, on the other hand, was found at levels of 1.32 to 1.64 mg/kg in the samples. These results indicate the composition of the dredge material and provide valuable information regarding the presence of these specific contaminants.

Aquatic Fauna (Fish, Dolphin and Turtle)

Fish and Fishing Activity

During the monthly visit of May 2023, dredging activities were only ongoing at Imamnagar Dredging Site along Route 9 (23°50'11.4"N 90°50'43.9"E). The site is situated in Imamnagar

Village under Darikandi Union, Bancharampur Upazila, Brahmanbaria. Another new dredging site at Narsingdi Sadar along Route 7 has been selected (23°55'03.1"N 90°43'56.9"E). But no dredging activities have been started yet.

During the monitoring period, fishing activities were not observed in the dredging sites. However, local people informed that very small number of fishes are found in Imamnagar Dredging Site along Route 9 and common fishes found here include Punti, Tengra, Koi, etc. The team also did not observe any kind of visible fish mortality within and around the dredging sites.

Dolphin

During the monthly visit of May 2023, the study team did not observe any Ganges River Dolphin (*Platanista gangetica*) near the dredging site and adjacent areas. However, discussion with local people and fisherman in the study area confirmed that Ganges River Dolphin (*Platanista gangetica*) are not found in River Route 9 and 7.

Turtle

Freshwater turtles were not observed in the dredging site, dike area and adjacent local area. In addition, the study team did not observe any visible sign of turtle habitat in the dredging and disposal areas.

3.1.3.2 LOT 3: DHARTI-BANGA JV

Air Quality

This month considering CEAP-suggested mitigation approaches contractors have measured the parameters of ambient air quality in and around the dredging sites. The following table shows the results comparing previous months.

The ambient status of major air pollutants viz. Particulate Matter (SPM, PM_{10} and $PM_{2.5}$), Gaseous substance (NO_2, SO_2 and CO) has been assessed.

Location of the Lot3 sites

During this month, air quality assessments were conducted at four locations on Route 16. The aim of this monitoring was to gather information on the air quality at these locations.

Table 12: Sampling locations of air quality

SI. No.	Sampling Station	Station Code	GPS Coordinates	Sampling Date
1.	Route 16	AQ-1	22°47'20.19"N 90°31'30.64"E	23/05/2023
2.	Route 16	AQ-2	22°47'13.64"N 90°31'35.78"E	23/05/2023
3.	Route 16	AQ-3	22°47'27.24"N	24/05/2023

			90°31'19.09"E	
4.	Route 16	AQ-4	22°47'58.71"N 90°31'23.78"E	24/05/2023

Source: Field Visit, 2023

Result

The summary findings of the ambient air quality results are presented in **Error! Reference source ot found.**13. The results indicate that the levels of PM10, P2.5, and SPM (Suspended Particulate Matter) were within the permissible limits at all monitoring locations. Additionally, the concentrations of gaseous pollutants such as CO (Carbon Monoxide), NO2 (Nitrogen Dioxide), and SO2 (Sulfur Dioxide) were below the standard levels in both monitoring locations.

Table 13: Summary findings of in-house air quality monitoring

Location	Sampling Date	Ambient Air Pollutants' Concentration in µg/m^3					CO mg/m3
		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	
AQ1 -Route 16	23/05/2023	86.34	43.10	20.45	12.56	15.11	0.8
AQ 2- Route 16	23/05/2023	89.77	45.89	23.51	14.15	16.71	0.7
AQ-3 Route 16	24/05/2023	81.71	43.32	20.45	12.23	13.54	0.7
AQ-4 Route 16	24/05/2023	143.14	71.18	42.62	13.58	21.43	1.0
Air Pollution (control) rules, 2022*		**-**	**150**	**65**	**80**	**80**	**5**
Method of Analysis Instrument Use: Haz-Scanner TM (HIM, 6000)		Particulates Sensor Light Scattering Nephelometer			High Sensitivity Electrochemical		

*Note: *Air Pollution (Control) Rules, 2022.*
Legend: *PM_{10}-Particulate Matter of a diameter of 10 microns or less. $PM_{2.5}$-Particulate Matter of a diameter of 2.5 microns or less, SO_2 –Sulphur Dioxide; NO_2 –Nitrogen-Dioxide; CO –Carbon Monoxide*

Noise Level

Construction-related environmental impacts on sensitive areas include noise, which is a significant aspect to consider. Various sources such as machinery and traffic contribute to noise levels. The following sections outline the methodologies, locations, and outcomes of noise level measurements.

Noise level monitoring were also conducted at Route-16 due to the ongoing work activities at these locations. The objective of these assessments was to measure and evaluate the levels of noise generated during these activities.

Table 14: Noise quality sampling locations

SI. No.	Route	Station Code	Geographic location	Monitoring date	Location setting (DOE/IFC)
1.	Route 16	NL-1	22°47'19.11"N 90°31'31.64"E	23/05/2023	-

2.	Route 16	NL2	22°47'11.50"N 90°31'36.03"E	23/05/2023	-
3.	Route 16	NL-3	22°47'28.20"N 90°31'17.67"E	24/05/2023	-
4.	Route 16	NL4	22°47'58.27"N 90°31'24.87"E	24/05/2023	Mixed area

Source: Field Visit, 2023

The table below summarizes the findings of noise level monitoring in May 2023. The results of the noise level monitoring indicate that the noise levels at all of the monitoring locations are in compliance with the International Finance Corporation's Environmental, Health, and Safety guidelines. However, it is noted that the levels are slightly higher than the standards set by Bangladesh. The highest noise level recorded was 67.44 dBA near Patarhat Launch Ghat, while the lowest level measured was 49.78 dBA at near Char mithuya.

Table 15: Noise Level Monitoring Results

Location	Noise level (dB(A))				Bangladesh Standard (dB(A))[1]		IFC EHS Guideline (2007)[2]		Location setting
	Leq_{day}	Leq_{night}	L_{max}	L_{min}	Day	Night	Day	Night	
NL1	54.66	36.32	68.42	31.44	-	-	-	-	-
NL2	51.34	37.65	69.75	32.36	-	-	-	-	-
NL3	49.78	35.45	66.89	32.75	-	-	-	-	-
NL4	67.44	42.36	82.22	35.88	60	50	70	70	Mixed area

Underwater Noise Level

Measuring underwater noise is crucial due to the potential adverse effects it can have on aquatic life in rivers. Excessive noise can disrupt communication and feeding behaviors, cause stress, and even physically harm certain species. Given the presence of communities residing near the dredging site, regular monitoring of noise levels is vital to ensure compliance with environmental construction standards.

Underwater Noise level monitoring was conducted at due to the ongoing work activities at Patarhat launch ghate (R-16). The objective of these assessments was to measure and evaluate the levels of noise generated during these activities.

The Table 1616 summarizes the findings of noise level monitoring in May 2023. The highest

[1]Ministry of Environment, Forest, and Climate Change. (2006). Noise Pollution (Control) Rules, 2006 (S.R.O. No. 212-Law/2006). The People's Republic of Bangladesh.

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

noise level recorded was 68.3 dBA, while the lowest level measured was 61.5 dBA at near Char Mithuya (R-16).

Table 16: Underwater Noise Level Monitoring Results

Code	Location	L_{Avg} [dB (A)]	*Standard
		[dB (A)]	
UWNL1	**Route 16**	61.5	**No standard of GoB**
UWNL2		68.3	
UWNL3		62.7	
UWNL4		65.8	

Surface Water Quality

The status of surface water quality is measured by testing some physic-chemical parameters to determine the impact of dredging activities on adjacent water bodies.

In the month of May 2023, surface water sampling was conducted at 4 locations, specifically in the Tentulia River near Patarhat launch ghat (R-16), due to the ongoing dredging works at this site.

Table 17: Surface water quality Sampling locations

SI. No.	Sampling Station	Station Code	Geographical Location	Sampling Date	Type of Source
1.	Near Char Mithuya (Route-16)	SW-1	22°47'41.34"N 90°31'11.48"E	23/05/2023	River
2.	Near Char Mithuya (Route-16)	SW-2	22°47'39.06"N 90°31'30.92"E	23/05/2023	River
3.	Near Char Mithuya (Route-16)	SW-3	22°47'29.25"N 90°31'48.16"E	23/05/2023	River
4.	Near Char Mithuya (Route-16)	SW-4	22°47'17.33"N 90°31'51.09"E	23/05/2023	River

Source: Field Visit, 2023

Table 18: Surface water quality Testing Results

Parameters	Unit	Concentration Present (Route -16)				Bangladesh Standard*
		SW-1	SW-2	SW-3	SW-4	
Temperature	°C	22.6	22.8	22.7	22.7	-
EC	µS/cm	170	180	170	160	-
Turbidity	NTU	11.2	9.3	8.1	8.1	-
pH	-	7.90	7.38	7.28	7.34	6 - 9
TDS	ppm	90	90	80	80	1000
DO	mg/L	6.2	6.1	6.2	6.4	5 or more
Potassium	mg/L	21	18	21	26	-
Calcium	mg/L	68	31	29	31	-
Magnesium	mg/L	21	11.6	10.7	8.1	-
Phosphate	mg/L	<0.01	<0.01	<0.01	<0.01	0.05
Chloride	mg/L	1.5	1.7	1.6	1.7	-
Fluoride	ppm	0.4	0.8	0.6	0.6	-
Nitrate	mg/L	<0.01	<0.01	<0.01	<0.01	7.0

BOD5 (at 20°C)	mg/L	2.1	1.8	1.9	2.2	6 or less
Sulfate	mg/L	5	8	5	7	-
TSS	mg/L	48	28	21	28	-

Note: * Bangladesh Environment Conservation Rules-2023, Schedule 2(A) (Water Usable for Fisheries). DO: Dissolved Oxygen; BOD: Biological Oxygen Demand; EC: Electric Conductivity, TDS: Total Dissolved Solids; TSS: Total Suspended Solids

Biological Oxygen Demand (BOD)

The BOD values at all sampling points were found to be within the standard levels specified by ECR'23. Higher BOD levels indicate a greater demand for oxygen, which is detrimental to oxygen-dependent species' feeding and signifies lower water quality. Conversely, lower BOD levels indicate less oxygen being depleted from the water. Factors contributing to increased oxygen demand include runoff carrying waste from streets and sidewalks, nutrients from fertilizers, and organic matter from residential areas such as leaves, grass, and paper.

Dissolved Oxygen (DO)

Dissolved oxygen (DO) is a critical indicator of water quality, vital for the survival of fish and other aquatic organisms. Oxygen is introduced into the water through aquatic plant photosynthesis. Insufficient dissolved oxygen levels can lead to the inability of fish and other organisms to survive. When DO levels drop below the critical threshold of $\geq$ 5 mg/L, most fish and aerobic aquatic organisms perish. The DO values in all samples met the standards set by Bangladesh.

pH

The acceptable pH range, as determined by the Department of Environment (DoE), is between 6 and 9. This range provides adequate protection for the life of freshwater fish and bottom-dwelling invertebrates. The pH values recorded ranged from 7.28 to 7.90, adhering to Bangladesh standards (ECR, 2023).

Total Dissolved Solids (TDS):

The standard for inland surface water regarding Total Dissolved Solids is set at 1000 mg/L. The concentration of Total Dissolved Solids (TDS) in the surface water samples ranged from 80 to 90 ppm. The test results indicated that the TDS levels at all locations complied with the national standard.

Total Suspended Solids (TSS):

The concentration of Total Suspended Solids (TSS) in the surface water samples ranged from 21 to 48 mg/L. There is no specific standard stipulated for TSS in Bangladesh.

Dredge Material

The dredge sampling strategy were designed to assess the dredge material quality in the ongoing project area. Each location used a composite sampling technique for dredge sampling.

There is no stipulated standard value dredge in Bangladesh, as well as in IFC EHS general guideline. Dredge samples were collected from the disposal location. At each location, dredge samples were collected from two spots and homogenized. Homogenized samples were then packed in polyethylene plastic bags, sealed, and sent to the laboratory for analysis.

To assess the dredge material quality of the project area one sample was collected from the dredging disposal site following the USEPA technical manual. Sampling locations has been given in Table 19.

Table 19: Details of Dredge material sampling locations

SI. No.	Sampling Station	Station Code	Sampling Date	GPS Coordinates
1.	Near Char Mithuya (Route-16)	DM-9	23/05/2023	22°47'11.16"N 90°31'40.44"E

Table 20: Dredge Materials Analysis Results

Parameter	Unit	Dredge Material Route 16	Methodology/Instrument
		DM9	
Lead (Pb)	mg/kg	8.31	Atomic Absorption Spectrophotometer
Cadmium (Cd)	mg/kg	0.010	Atomic Absorption Spectrophotometer
Chromium (Cr)	mg/kg	9.05	Atomic Absorption Spectrophotometer
Zinc (Zn)	mg/kg	24.52	Atomic Absorption Spectrophotometer
Arsenic (As)	mg/kg	0.81	Atomic Absorption Spectrophotometer

According to the analysis of the samples, there was 8.31 mg/kg of lead (Pb) and 0.010 mg/kg of cadmium (Cd) in the dredge material samples. In this study, the amounts of chrome (Cr), zinc (Zn), and arsenic (As) were found to be 9.05 mg/kg, 24.52 mg/kg, and 0.81 mg/kg, respectively. These results indicate the composition of the dredge material and provide valuable information regarding the presence of these specific contaminants. Riverbed Sediment

There is no stipulated standard value for riverbed sediment in Bangladesh, as well as in IFC EHS general guideline. The areas had been selected based on the dredging activities and the disposal sites.

To assess the riverbed sediment quality of the project area, four sediment samples were collected from the dredging sites. Sampling locations of riverbed sediment have been given in Table 21.

Table 21: Details of riverbed sampling locations

SI. No.	Sampling	Station	Sampling	GPS

	Station	Code	Date	Coordinates
1.	Near Char Mithuya (Route-16)	SedQ1	23/05/2023	22°47'22.20"N 90°31'45.05"E
2.	Near Char Mithuya (Route-16)	SedQ2	23/05/2023	22°47'26.42"N 90°31'33.10"E
3.	Near Char Mithuya (Route-16)	SedQ3	23/05/2023	22°47'35.24"N 90°31'22.70"E
4.	Near Patarhat ferry ghat (R-16)	SedQ4	23/05/2023	22°47'46.50"N 90°31'13.87"E

The analysis results of physicochemical parameters of riverbed sediment samples are presented in Table 222.

Table 22: Riverbed sediment Analysis Results

Parameter	Unit	Riverbed sediment – Lot 3				Methodology/Instrument
		SedQ1	SedQ2	SedQ3	SedQ4	
Lead (Pb)	mg/kg	9.32	9.81	9.06	9.54	ICPMS
Cadmium (Cd)	mg/kg	0.057	0.056	0.054	0.056	ICPMS
Chromium (Cr)	mg/kg	10.02	10.83	10.02	10.21	ICPMS
Zinc (Zn)	mg/kg	29.23	32.45	27.53	29.62	ICPMS
Arsenic (As)	mg/kg	0.76	0.86	1.06	1.10	ICPMS

Note: ICPMS – Inductively coupled plasma mass spectrometry.

The analysis of the samples showed that the concentrations of Lead (Pb) ranged from 9.06 mg/kg to 9.81 mg/kg, and the values for Chromium (Cr) varied from 10.02 mg/kg to 10.83 mg/kg. The highest content of Zinc (Zn) was detected in the SedQ2 sample, with a value of 32.45 mg/kg, while the lowest content was recorded in the SedQ3 sample, with a value of 27.53 mg/kg. Regarding Cadmium (Cd) and Arsenic (As), the data revealed concentrations ranging from 0.054 to 0.057 mg/kg and 0.76 to 1.10 mg/kg, respectively. As part of the evaluation of the potential impact of these contaminants on the project and the environment, it is important to take these findings into account.

3.1.3.3 Comments, Suggestions and Recommendations:

In comparison with the baseline period (January 2023) before the beginning of the dredging work and with the information collected in May 2023, we found no significant changes in the environmental parameter's quality in River Routes of Lot 2 and Lot3.

The results of the riverbed material, surface water, groundwater, air, and noise were included in the Contractor's Environment Action Plan (CEAP) which was submitted and has been reviewed by S1A and submitted to the PIU for their comments prior to the finalization and subsequent submission to the WB.

Based on the observations and monitoring results, it can be concluded that the project has not had any significant negative impact on the environment in terms of ambient air, ambient noise, water quality, and other health and safety factors during the reporting period.

Monitoring the environmental impact is one of the main tasks of this project. However, social and other issues are closely related to the environment. The issues specifically related to environment that were observed at the commencement period of the project are included in this part. The S1A team hopes that gradually it will be possible to do more specific and clear documentation. If sample was collected before middle (Date 15-16) of the month, it would have been easier to analyze timely and the results will help to take necessary action or to take mitigation measure during S1A visit.

3.2 Social and Resettlement Aspects:

The Resettlement and Social Expert monitors the compliance in respect to Social Safeguard issues of this project and gives feedback to the project director and also the World Bank. Evaluation of mitigation measures have been carried out for the project affected persons with special attention to women, tribal & indigenous peoples and other vulnerable groups. In addition, overall project performance, issues related to land acquisition and resettlement with a focus on social inclusion has been evaluated. Socio-economic risks and impacts are identified and suggested adequate mitigation measures following the project Social Impact Management Framework (SIMF). The updated SIMF provides guidance for management of community engagement, land acquisition and involuntary resettlement, indigenous peoples, risks of gender and gender-based violence (GBV) in the project.

The scope of this task is to monitor and supervise all relevant environmental and social management activities including those specified in the Project's ESIA, RPF and EMP, and any additional ESHS provisions in the contract. The Social and Resettlement Expert is responsible for ensuring that the Contractor complies with all checking and reporting, especially in respect to the Contract Dredge Disposal Management Plan, and the quality of dredged materials. The Consultant has done social screening for identification of safeguards issues likely to be associated with the subprojects, to verify the adequacy as per requirement of the SIMF. Identify the strengths and weaknesses of social screening, Land Acquisition/ Resettlement, Good Faith Agreement with land owners, Compensation, Approaches and Implementation strategies. The Consultant has monitored the working conditions according to the safeguard rules of the World Bank, monitored gender sensitive actions and objectives that include gender analysis for gender inclusive design,

implementation and operation have been achieved or in progress to be achieved. The Consultant has monitored the compliance of GAP including agreed actions necessary to address risks of labor influx and Gender Based Violence (GBV) due to the prevalence of high levels of poverty, including sexual exploitation and abuse (SEA), violence during project implementation.

3.2.1 Survey of land lease value:

S1A team conducted a survey for land lease value of Bancharampur and Salimgonj Upazila of Brahmanbaria and Mehendiganj Upazila, Barisal in April-May 2023. The land lease profile has already been made. It will submit to PIU as soon as possible.

3.2.2 Progress of Land Lease:

Land has not been acquisitioned in the present working areas. The rivers are dredged and the dredge material has been dumped on land on some government and some private lands who willingly provided the land on a good faith agreement. So, no compensation rules were applied and involuntary resettlement of individuals or families, compensation for unemployment, re-employment of affected people were not required and no harassment occured to collect the compensation. Progress on the land lease process is almost complete for Route 21 and Route 9. Land lease process is ongoing for route 16 and route 07

3.2.3 Good Faith Agreement:

At present 18 agreements have already been completed and some are ongoing. Most of the places people have willingly done these. A little part of areas some influential people are leading about this matter. General people of the project sites can know the news of river dredging, dredged materials dumping and good faith agreements for several consultation meetings with local people in local Bazars, Union Council, villages and the local Schools.

Table 23: Recently two good faith agreements have done in Solimgonj and Bancharampur, B. Baria.

Dyke No.	Rout No	Land Owner		Land			Good Faith Agreement
		Name and NID	Address	Description	Quantity (Decimal)	Quality of Land	
10	9	Md. Alamgir Kabir. NID: 1218575059084	Village: Nil1ukhy Upazila: Nabinagar District: B. Baria	Plot no. 455. Mouja: borail	52	Agricultural land (Two Crops)	Done
11	9	Md. Kabir hossain. NID: 10488088336	Village: Aka Nagar Upazilla: Bancharampur District: B. Baria	Plot no. 5972/ 5380/5984 Mouja: Aka Nagar	139	Agricultural land (Two Crops)	Done

Table 24: Previous Good Faith Agreements: Area: Bancharampur and Nabinagar, B. Baria.

Dyke No.	Route No	Land Owner		Landted			Good Faith Agre ement
		Name and NID	Address	Description	Quantity (Decimal)	Quality of Land	
1	9	Md. Monir Hossain NID: 6447046241	Village: Joy Nagar Upazilla: Bancharampur District: B. Baria	Plot No: 1117.1118, 10, 65, 1016 , Mouja: Jay Nagar Upazila: Bancharampur, , Dist: B. Baria	95	Agricultural land (Two Crops)	Done
2	9	Siblu Mia NID: 1210488091772	Village: Imam Nagar Upazilla: Bancharampur District: B. Baria	Plot No:. 158, 155, 166, 147. Mouja: Imam Nagar Upazila: Bancharampur, ,Dist: B. Baria	270	Agricultural land (Two Crops)	Done
3	9	Md. Afzal Hossain NID:1210488092232 (Chairman of the School committee)	Village: Joy Nagar Upazilla: Bancharampur District: B. Baria	Plot No: 461, 711, 712, 713, 714, 715 1016. Mouja: Jay Nagar Upazila: Bancharampur, Dist: B. Baria	150	School and School Field	Done
4	9	Md. Monzur Mahabub NID: 1210488092428	Village: Imam Nagar Upazilla: Bancharampur District: B. Baria	Plot No:. 3473, 3474 Mouja: Imam Nagar Upazila: Bancharam Dist: B. Baria	55	Agricultural land (One crop)	Done
5	9	Jharna Begum NID:5546582981	Village: Barail Upazila: Nabinagar District: B. Baria	Village: Imam Nagar Upazilla: Bancharampur District: B. Baria	132	Agricultural land (Two Crops)	Done
6	9	Md. Dostogir NID:7813941536	Village: Barail Upazila: Nabinagar District: B. Baria	Plot No: 326, 353,314, 622, 312, 126, 319, 320, 321, 334	141	Agricultural land (Two Crops)	Done
7		Monir Hossain NID: 12104880921009	Village: Imam Nagar Upazilla: Bancharampur District: B. Baria	Plot No.127	40	Agricultural land (Two Crops)	Done
8	9	Abdus Salam NID: 1210488089240	Village: Aka Nagar Upazilla:	Plot No.6021, 5622, 5627, 6620, 3277	90	Agricultural land (Two Crops)	Done

			Bancharampur District: B. Baria				
9	9	Md. Zakir Hossain NID: 2693016135957	Village: Aka Nagar Upazilla: Bancharampur District: B. Baria	Plot No. 2611, 2612, 6036	139	Agricultural land (Two Crops)	Done

Table 25: Area: Mehendiganj, Barisal and Bhola sadar.

Dyke No.	Rout No	Land Owner		Land			Good Faith Agreement
		Name and NID	Address	Description	Quantity (Decimal)	Quality of Land	
1	21	Salam Fakir NID:8223014047	Village Ghagoria. Upazila: Mehendigonj Dist: Barishal. (Near Bheduria Ferryghat)	Plot No: 1901/56	200	Agricultural and (Two Crops)	Done
2	21	Mizanur Rahman *NID: 6850475422*	Village & Char Veduria. Upazila and District: Bhola	Plot No: 1901/28	121	Agricultural land (Two Crops)	Done
3	21	Salam Fakir NID:8223014047	Village: Ghagoria. Bheduria Upazila: Mehendigonj Dist: Barishal.	Plot No: 1901/56	224	Agricultural land (Two Crops)	Done
4	21	Jahingir Hossain 0616213052704	Village:Sripur, Upazila: Mehendigonj Dist: Barishal.	Plot No: 1501	80	Fallow land	Done
5	21	Mizanur Rahaman Harun 6860475422	Char Veduria. Upazila and District: Bhola	Plot No: 1107. 1181, 1182, 2123, 2124, 2119, 2125	300	Agricultural land (Two Crops)	Done
6	21	Nur Nabi Vhuya NID: 0616213050970	Village: Seripur Upazilla: Mahandigong, District: Barishal	Plot No: 1468, , Mouja: Ghaguria Upazila: Mahandigong District: Barishal,	365	Agricultural land. (Two Crops) (Watermelon, , Bitter Gourd)	Done
7	21	Nur Nabi Vhuya NID No: 0616213050970	Village: Seripur Upazilla: Mahandigong, District: Barishal	Plot No: 1468, , Mouja: Ghaguria Upazila: Mahandigong District: Barishal,	120	Agricultural land (Two Crops) (Watermelon, Bitter Gourd)	Done

Problem: The dredging progress of Karnophuli consortium at Salimgonj, B. Baria is very low. Within these five months they have completed only 04 dykes. Most of the time their "Dredgers" does not work.

3.2.3 Grievance Redressal Mechanism (GRM):

The BRWTP-1 project has its own GRM system with three stages of mechanism (Field site level, River port level and Project level) and the compensation system follows the World Bank rules. The Consultant assists the Client in monitoring the functioning of the GRM that have been set up by the Client to receive and process project-related feedback, suggestions, concerns and complaints, especially in relation to the dredging activity carried out under the OPBC-IWN contracts and the Vessel Storm Shelters construction contract. This includes the following: (i) continuously checking in the field to ensure that the information on GRM remains publicized in an appropriate manner at the relevant sites and any complaints received by the Contractors and the Consultant himself is forwarded to the Client. (ii) Assisting the Client to prepare and disseminate brochures and signboards containing information of interest to people living close to the project sites.

The dredging consultant 'DHARTI–BANGA JV' (Lot 3) has formed two Grievance Redressal Committees (GRC), but no grievance complaints/incidents have yet been reported to be resolved. The GRM Expert will start work soon on behalf of S1A. The GRC committees of 'DHARTI–BANGA JV' are as follows:

Table 26: The Local Level Complaint Resolve Committee

Name	Designation	Organization	Position in GRC	Mobile No.
Capt. Abdur Razzak Bhuiyan	Team Leader	DHARTI–BANGA JV	Chairman	
Md Aftabuzzaman	Social and Communication Officer	DHARTI–BANGA JV	Member	
Mizanur Rahman	Environmental Specialist of Engineer	BRWTP-1	Executive Member	
Tanvir Hossain	HSE Manager	DHARTI–BANGA JV	Executive Member	
Walid Hossain	Environmental Health Safety Officer	DHARTI–BANGA JV	Member	
Robiul Islam	Site In charge	DHARTI–BANGA JV	Member	

Table 27: The Project Level Committee

Name	Designation	Organization	Position in GRC
-	Project Director		Chairman
Md. Khandekar Mahbub	GRM Expert	BRWTP-1	Executive Member
Mizanur Rahman	Environmental Specialist	BRWTP-1	Executive Member
-	Project Manager	BRWTP-1	Executive Member

-	Project Manager	DHARTI–BANGA JV	Member
Mr. Shahid Ali	Team Leader, Social	RDM – EQMS JV	Member
Dr. Rezaul Karin	Team Leader	S12/3	Member
-	Environmental Expert	S1A	Member

3.2.4 ESHS Status and OHS Related Incident:

Labor/Worker's employment status, health, safety, and security such as accommodation facilities, working condition, sanitation, safety, and security, drinking water supply, reporting accidents, dust control, noise control, waste management, emergency response facilities, and grievance mechanism were observed through direct visual observation, site visit, consultation with workers and respective officers of the project.

An accident record/register book is kept to record any accidents. Designated personnel have been assigned to maintain the safety book and datasheet with collaborating checklists. A dedicated first aid box is also available at the project site office for ensuring emergency response to any accidents/incidents and first aid requirement by workers and other staff.

If any health safety issues raised or an accident occurred, first aid is ensured immediately. If further medical support is required or in case of any major accident, the immediate medical treatment is ensured at nearby hospital. Safety signboards are also installed in the project site area for workers' and community people's awareness.

Labour and Working Condition: Data has been collected directly consult with the working laborers and directly observe their working condition. No female labors are available in the project sites. Data are collected about working situation, presence of male and female laborers, working environment, wage, first aid, labor shed etc. First-aid medical boxes, safe drinking water, toilet facilities are available in the project areas. No child laborer and no forced laborer have been engaged in the project work. Laborers have received wage in proper time and no harassment / no time lengthening happened. They are satisfied with their work and wages

Impact of Labor Influx: For the dredging works, some male laborers have arrived in the subproject sites. These subprojects are not mega projects and do not work continuously for long time (5-6 years) in one place/village and the laborers are the inhabitants of Bangladesh who share the same socio-cultural and religious values. So, the occurrence like conflict with local people,

shouting or group singing with loud voice at night, teasing, robbing, sexual harassment, HIV transmission, drug addicting, etc. have not happened in the subproject areas.

Indigenous People: No indigenous people inhabit the present project sites. So, there is no comment on that issue.

Cultural Properties / Heritage: The project sites have not used any cultural land or inflicted any damage to the cultural properties or values. So, no comments are available on that issue.

Gender Issues: No female laborers are available together with male laborers in the project site. On the other hand, the local people have reported that the dredging workers/ laborers have no congenial or free mixing relationship with the local female. No data have found about the violence against women. Everybody reported that no sexual exploitation, sexual violence, or gender-based violence happened in work sites.

Communication and Public Consultation: The social and safeguard team have communicated with local people and conducted consultation meeting on a regular basis. On the other hand the team also have communicated with UNOs, ADC and DC, B. Baria.

3.3 Development and Maintenance Dredging Works:

3.3.1 Introduction

The activity of restoring advertised navigation channel depths and widths on the various Inland Waterways under Package No. W1A contract(s) is to be conducted over the first 30 (thirty) months period of the contract. Class-wise River Routes under the dredging work is shown in Table 28 below.

Since the commencement of the project, various preparatory works have been carried out. Dredging work under Lot 3, Route 21 was carried out due to the urgent need as a national emergency. During this reporting period dredging work mostly covered the necessary progress meetings with the contractor, client and the donor, conduct baseline survey, joint hydrographic survey, check dredged volumes based on pre- and post-survey hydrographic data, disposal area selection and preparation, calibrate and updating available water model with data from surveys and monitoring, preparation to develop dredged material management plan, etc. Following are the major River Routes that will be carried out during this project period with the highlighted in red River Routes (09,16 and 21) where the dredging work is ongoing up to April 2023.

Table 28: Class-wise River Routes under the dredging work.

Dredging Routes			
Class I			
Lot No.	**Route No.**	**Intersecting River**	**Length (km)**
2	Route 3&4	Shitalakshya	56
2	Route 5	Meghna	82
2	Route 6	Meghna	25
ClassII			
Lot No.	**Route No.**	**Intersecting River**	**Length (km)**
2	Route 7&8	Meghna	30
3	Route 12	Chandpur	10
3	Route 13	Meghna and Arial Kha	84
3	Route 13a	Meghna	10
3	Route 21	Tentulia	7
Class III			
Lot No.	**Route No.**	**Intersecting River**	**Length (km)**
2	Route 9	Meghna	58
2	Route 10	Meghna	48
2	Route 11	Gumti	16
3	Route 15&16	Meghna and Tentulia	46
3	Route 17	Tentulia	10

3.3.2 Progress of Hydrographic Survey and Dredging Activities:

Description of Dredging Work: The dredging depth and dredging volume may be changed from time to time based on the hydrographic survey. The dredge volumes depend on route centerline, quality of MB/SB data, spacing of survey lines and interpolation between these. The dredge volume up to the month of May 2023 is shown below

Table 29: Progress of Dredging work at Route 09 up to May 2023

Progress of Dredging Work at Route 09 under Lot-02 up to May 2023					
Sl.	**Location/ Section**	**Dredger**	**Month**	**Chainage**	**Remarks**
1	**Route-09** Bancharampur - Homna loop,	Karnafuly-03	March	3845 to 3892	Dredging Start 23 March 2023 and Continuing
			April	3892 to 4055	
			May	4055 to 4140	
		Karnafuly-07	March	2770 to 2824	Dredging Start 23 March 2023 and Continuing
			April	2824 to 2970	
			May	2970 to 3283	
	TOTAL (Route -09 of Lot-02)				

Table 30: Progress of Dredging Work up to May2023 at Route -21 (Laharhat-Bheduria) and Route- 16 (Patarhat-Bheduria)under Lot3

Progress of Dredging Work up to May2023 at Route -21 (Laharhat-Bheduria) under Lot3						
SL	**Location/ Section**	**Dredger**	**Month**	**Chainage**	**Cutting Length (m)**	**Remarks**
1	Route 21 Laharhat-Bheduria	Banga Jamuna & Banga Padma	12th Dec 2022 to 12 March 2023	6400 to 8500	**2,100**	Dredging Started 12th Dec 2022 & started 12thMarch 2023
	TOTAL (Route-21)				**2,100**	
Progress of Dredging Work up to May2023 at Route -16 (Patarhat-Bheduria) under Lot3						
SL	**Location/ Section**	**Dredger**	**Month**	**Chainage**	**Cutting Length (m)**	**Remarks**
1	Route 16 Patarhat-Bheduria	Banga Shitolakkha	Apr-23	600 to 750	150	Dredging Started 14th April 2023
			May-23	1250 to 1600	350	
		Banga Jamuna	Apr-23	750 to 850	100	Dredging Started 14th April 2023
			May-23	850 to 1250	400	
	TOTAL (Route 16)				**1,000**	
	GRAND TOTAL (Route 21 & 16 of Lot-03)				**3,100 m**	Up to May 2023

3.3.3 Status on Navigation Aids Management:

Safety of river traffic during and after dredging work is the most important issue of the project. During this time period Navigational Aids Expert observed th……\\\e navigation condition of the currently finished dredging operation area of Laharhat-Bheduria, Route 21. He suggested few actions to be implemented for safe navigation.

The contractor (Lot3) has already completed primarily with dredging operations and post survey works. Completed dredging length measured 2.1 kilometers, width 65 meters and draft 2.8 meters.

It has been reported on 20 April 2023 that the installation with buoys as per IALA Marine Buoyage system for dredged route 21 (Bheduria-Laharhat, Lot 03) in the river Tentulia are in progress by the contractor DHART-BANGA-JOINT VENTURE which was recommended by JPZ-DEMAS-JCL expert earlier. In may it was yet to installation.

To mark the dredging area, special markings are essential to be installed for safe & trouble-free maneuvering/navigation for ferry ship. As per IALA (International Association of Marine Aids and Lighthouse Authorities) Buoyage system, all the River Route to be covered by required yellow buoys with yellow light flashing at night in every km of dredged distance.

IALA encourages its members to work together to utilize all the aids to navigation and to ensure the movements of vessels are safe.

So, few recommendations were sent to the contractor (Lot-03) DHARTI - BANGLA JOINT VENTURE in a letter form on dated 08 May 2023 and dated 21 May 2023 to install necessary buoys & to display cautionary boards as soon as possible in the routes 16 & 21 from the Navigational Aids Expert. (Details are in annexure 03)

Letters also sent to the contractor Lot-02 GULF-COBLA KARNAFULY JV as on dated 16 May 2023 & dated 30 May 2023 contain a few pictures of IALA buoys & standard marks, notices etc. to be installed as per necessity/ requirement in dredge routes.

However, it has been known from the contractors end of Lot 2 & Lot 3 and from other sources about the development of installation with buoys as per IALA marine buoyage system and standard cautionary notices in dredge route 16,21 & 09 which are expected to be in progress.

CHAPTER 04:
PROJECT MANAGEMENT AND PROGRAMME SUPPORT ACTIVITIES

To monitor dredging operation progress, resolve Environmental Health and Safety (EHS) concerns, and discuss other pertinent subjects as needed, monthly progress meetings were usually held at Lot 2 and Lot3 field offices. Other than the meetings with the contractors, several meetings with PIU were held throughout the reporting period to assess progress and discuss the updated dredging activities and environmental-ESHS-related issues. These team sessions enable efficient and safe job development by fostering teamwork and good communication.

4.1a. Coordination Meeting with the Representatives of Lot 3 Contractor DHART-BANGA-JOINT VENTURE

Figure 5: Coordination Meeting S1A and Lot3 Representatives on 30th May 2023

4.1b. Progress Meetings with PIU:

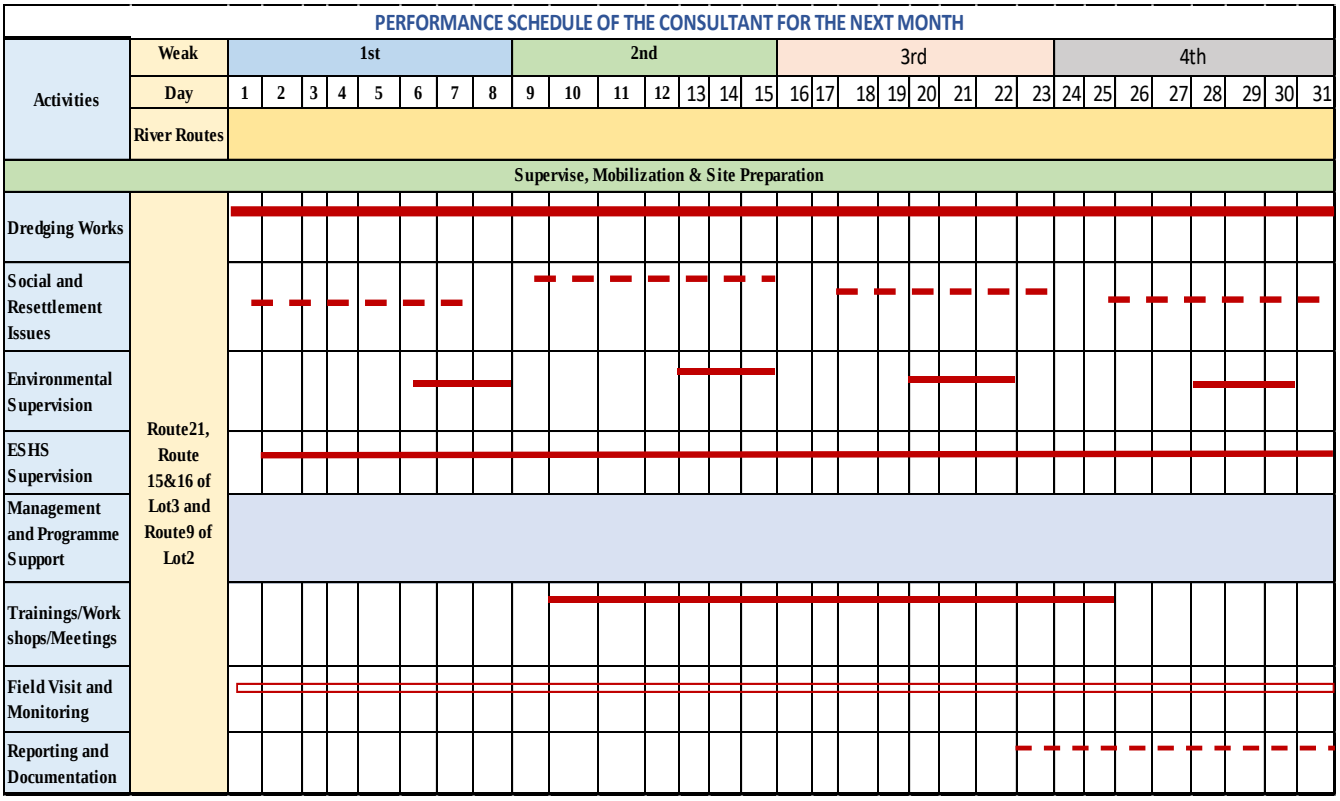
Several informal meetings were held with the PIU members on the progress of the project. The meetings highlighted environmental and safeguard issues. In addition, necessary decisions regarding good faith agreements and dyke preparation, and surveys of both dredging and social resettlements were important issues in these meetings.

4.2 Performance Schedule of the Consultant for the Next Month:

A tentative monitoring and supervision plan for the next month is shown in the table below. The contractor did not provide any plans in their reports. So, it is very difficult to make a monitoring plan without information. S1A asked the Contractors of both Lot 2 and Lot 3 to provide a monthly plan. Hopefully, the team will be able to include the monthly plan in the right way.

The schedule for the next month is organized based on last month's work as well as considering the activities going on at the field level. This plan will be updated or changed depending on the pace of field activities and immediate needs.

Table 31: Performance Schedule of the Consultant for the Next Month



CHAPTER 05: OPPORTUNITIES, ISSUES AND SOLUTIONS

5.1 Convenience

The project is a team work between PIU, Consultant (S1A) and Contractor (Lot 2 & Lot 3) which is noticeable from the beginning. Employer is always cooperating with necessary instructions. Their constant support has created great opportunities for the smooth implementation of this project. Easy coordination among all concerned parties has simplified the implementation of project activities. All relevant parties are sincere in discussing and assisting each other to find ways to improve and solve out the outstanding clauses.

5.2 Difficulties

Overall, the project implementation is well, but the dredging progress of Gulf Cobla-Karnaphuli JV at Solimganj, Brahmanbaria is very little. Within time period they completed only one dyke (full), other two are 70% at present. Most of the time their "Dredger" does not work. In Bheduria (Barisal), Dharti-Bango JV has not dumped dredged material properly on dykes. In Brahmanbaria, some influential people have created influence on the local people to provide their land for good faith agreement. The land lease and good faith agreement activities are going slow due to lack of budget.

Major difficulties faced during the monitoring and supervision of this Month (May 2023) are listed down as following:

- Difficult to implement EMP as prescribed because the absence of required technical staff.
- Contractor do not provide any work plan or notification before starting any new work.
- Contractor's site engineer never follows the design and specifications for dyke/disposal area construction.
- Contractor's site engineer does not provide daily progress report to the consultant supervision team.
- Contractor is not concerned about leakage and/or spillage from the pipelines.
- Contractor does not maintain record properly of all sand or sediment extraction.
- Contractor not concerned to identify the channel using navigation aids such as buoys, beacon, lights signal and sign board, etc.

- It is observed that sometimes contractor disposes dredge material outside of disposal area or on shore.
- The bunds or the dykes are not well maintained for examination/assessment after disposal of dredged material.
- Health and safety issue such as PPE, vest, helmet, hand gloves, safety shoes and life savings equipment are not maintained/utilized properly.
- The contractor is not controlling the discharge of site runoff including excess dredge water by the installation and correct use of containment walls, bunds and weirs.
- Lack of proper drainage for rain water/liquid waste and solid waste management system.
- Contractor environmental action plan (CEAP) is not followed properly.
- Environmental monitoring activities and quality measurement is not maintained regularly.
- Internal monitoring of the contractors needs improvement.

5.3 Solving out Difficulty

- The contractor should mobilize all qualified professionals to the project site and take necessary measures in order to solve the above-mentioned issues.
- The Contractors Manager must be a person with enough experience, who can lead the team to carry out the work comprehensively.
- To pay attention to perform the works according to the contract standards and specifications.
- Prior information and permission from S1A to commence any major activities is necessary.

CHAPTER 06:
CONCLUSION AND/OR RECOMMENDATIONS

This is the monthly report for the month of May 2023. At this stage of the project, the pace of dredging work is increasing gradually. However, S1A Consultants are not able to speed up the supervision work due to poor financial flow. This makes it difficult to take necessary mitigation measures at the field level on time. Significant progress has been made in office setup, recruitment etc. and regular efforts are being made to manage the project smoothly.

With few exceptions, most of the S1A professionals are on board and they give effort to speed up the information collection process, especially field data collection equipment such as environmental sampling equipment, speed boats, survey boats, and survey instruments that have not yet been collected. Field offices should be set up with necessary facilities so that field level manpower, especially non-key surveyors and environmental workers can work actively and diligently.

Dialogue and consultation with contractors and PIUs are important for the implementation of project activities. Documentation of meetings held with contractors or PIU members, in-house, or with any other stakeholders should be properly documented and circulated among stakeholders/participants. S1A is already maintaining these activities in a structured process. The S1A team is preparing a regular meeting schedule with contractors and other stakeholders that will be publicized and adhered to.

Overdue inception workshops and other necessary training programs will be held by S1A shortly. Further, the field enumerators as well as the contractor's staff will be briefed at regular intervals about the progress and defects, if any. Field workers should be convinced that discussions/conversations with local people (not just local elites) should be extended in determining the location for disposal of dredged materials.

Attendance of regular meetings at upazila and district level with representatives of contractors will be determined by S1A. Any non-compliance of contractors should be discussed with the contractor and should be reported to the client - PIU.

A brochure, to be produced by S1A, details project activities for awareness and communication with stakeholders. Field inspections along the total length of the river between Lot 2 and Lot 3 will be organized by S1A.

CHAPTER 07: ANNEXURE

ANNEX 01: PROJECT LOCATION AND RIVER BOUNDARY

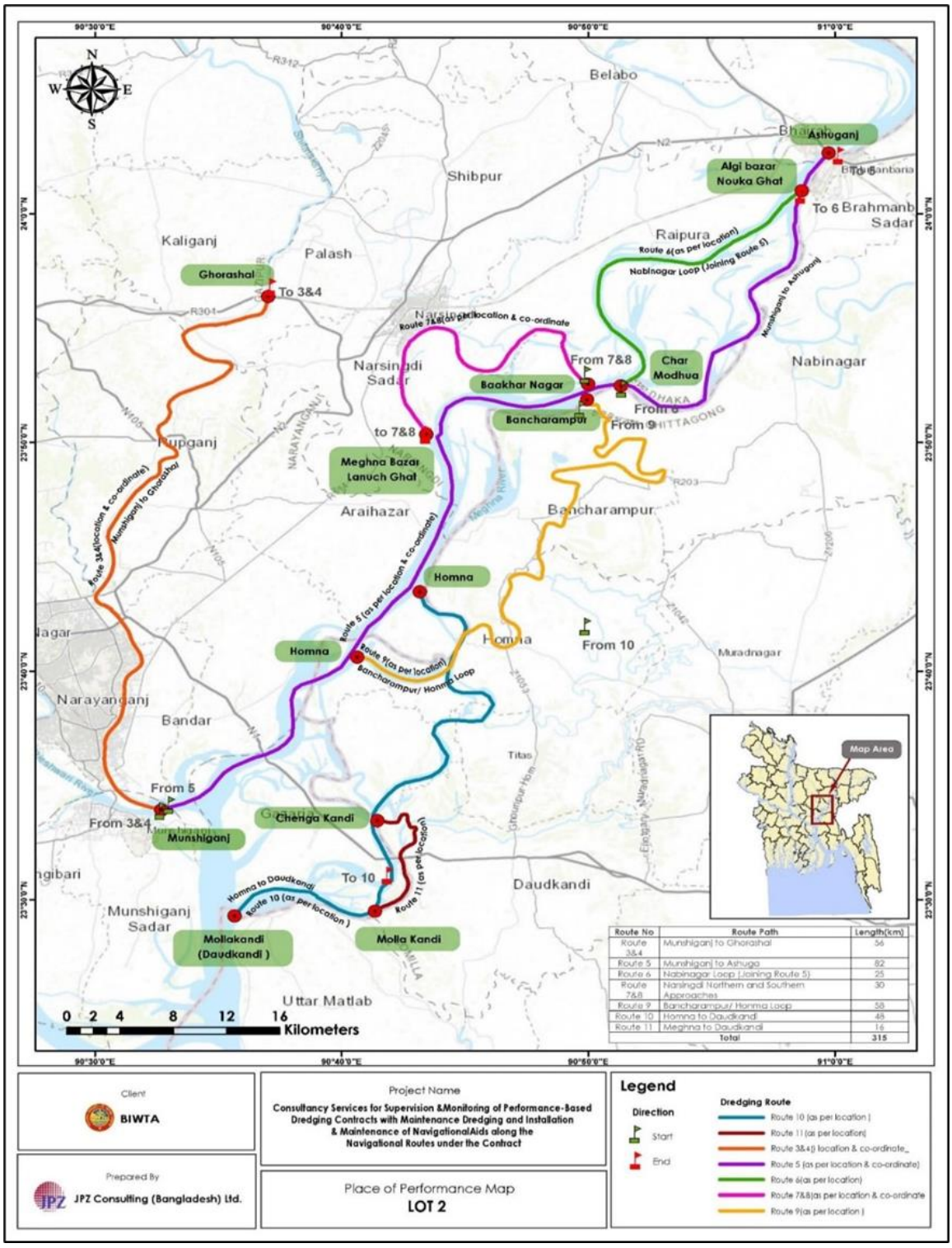


Figure 6: Project Location (with route) of BRWTP-1 Project, LOT-2

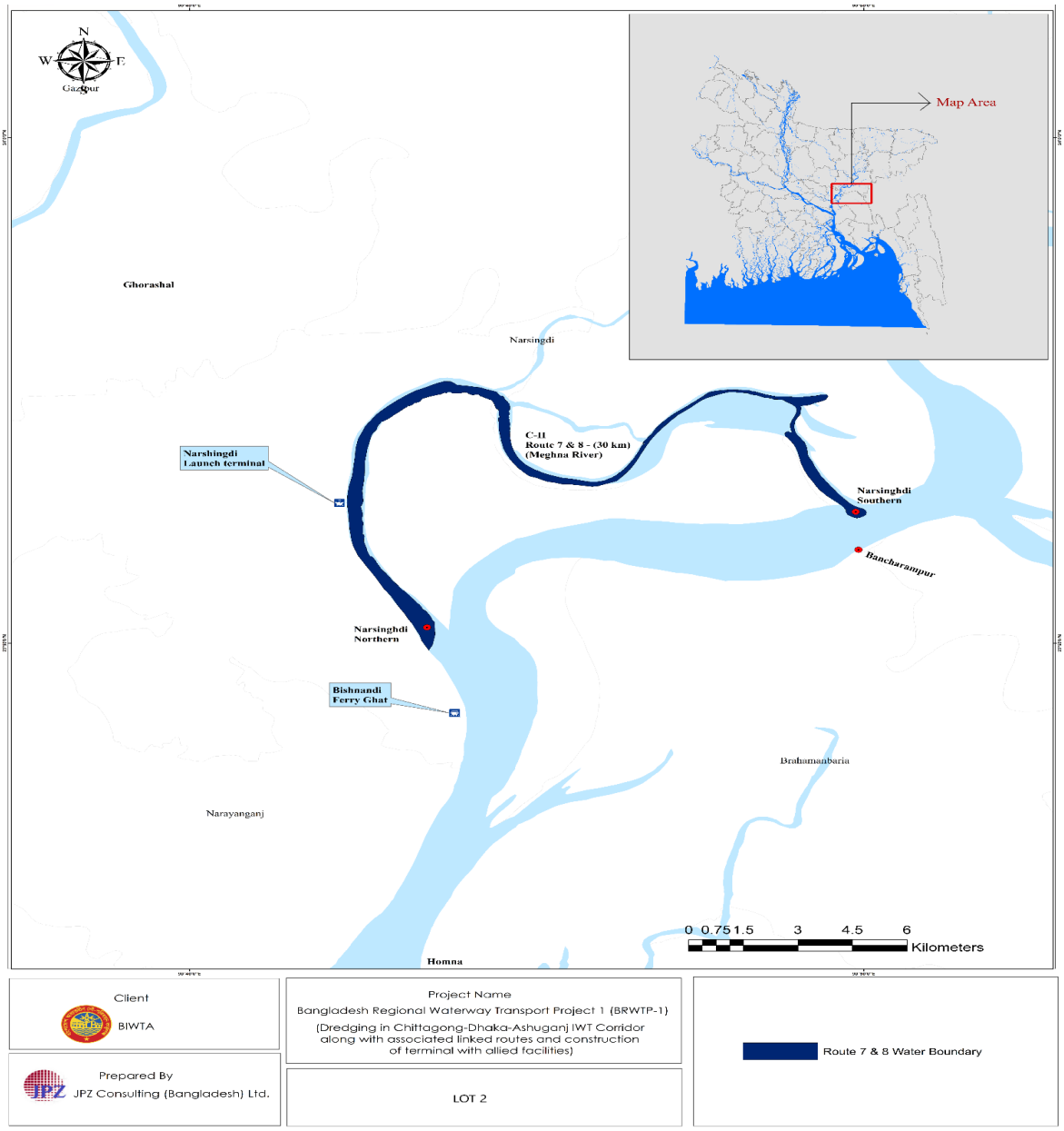


Figure 7: Route 07 Water Boundary

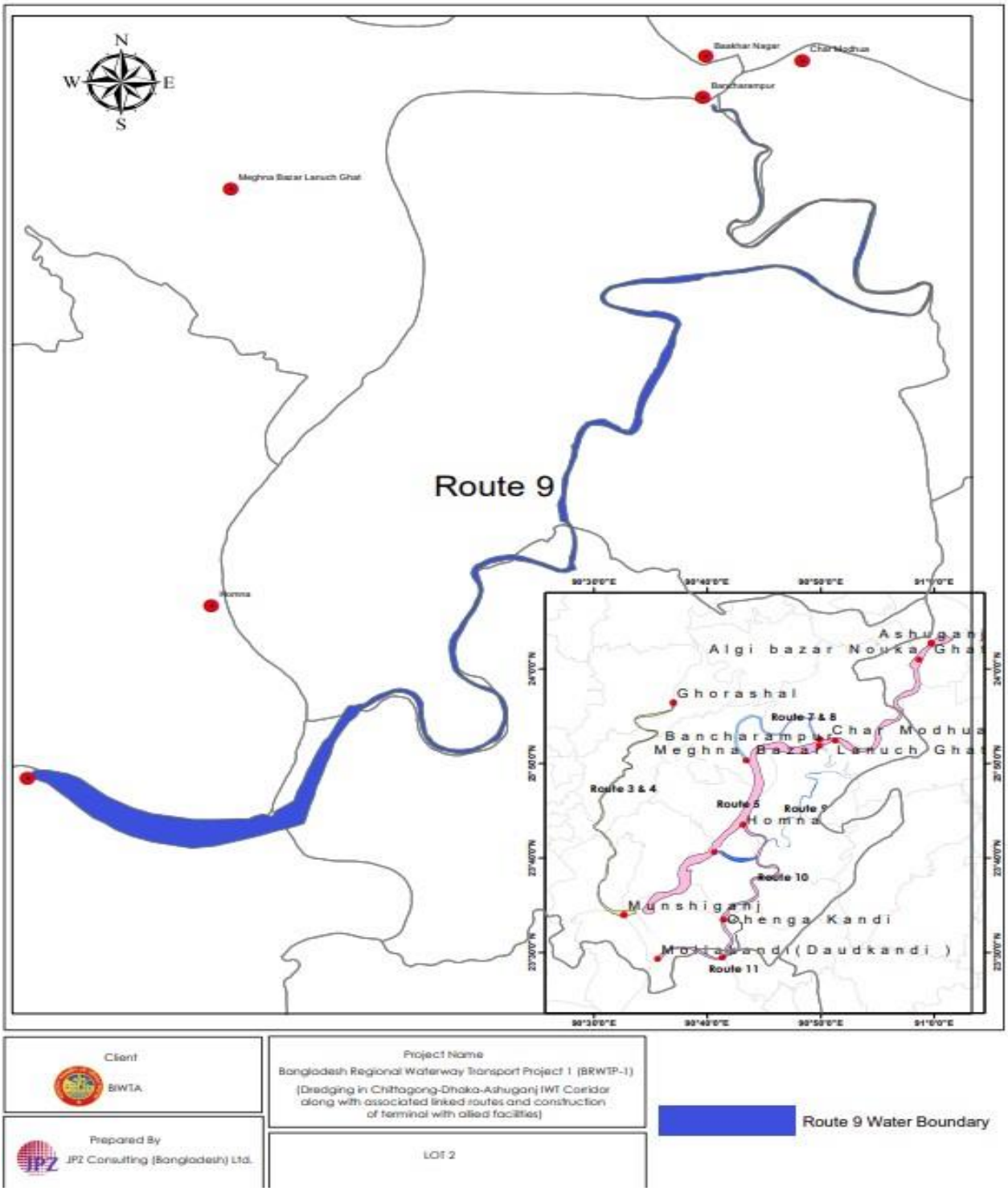


Figure 8: Route 09 Water Boundary

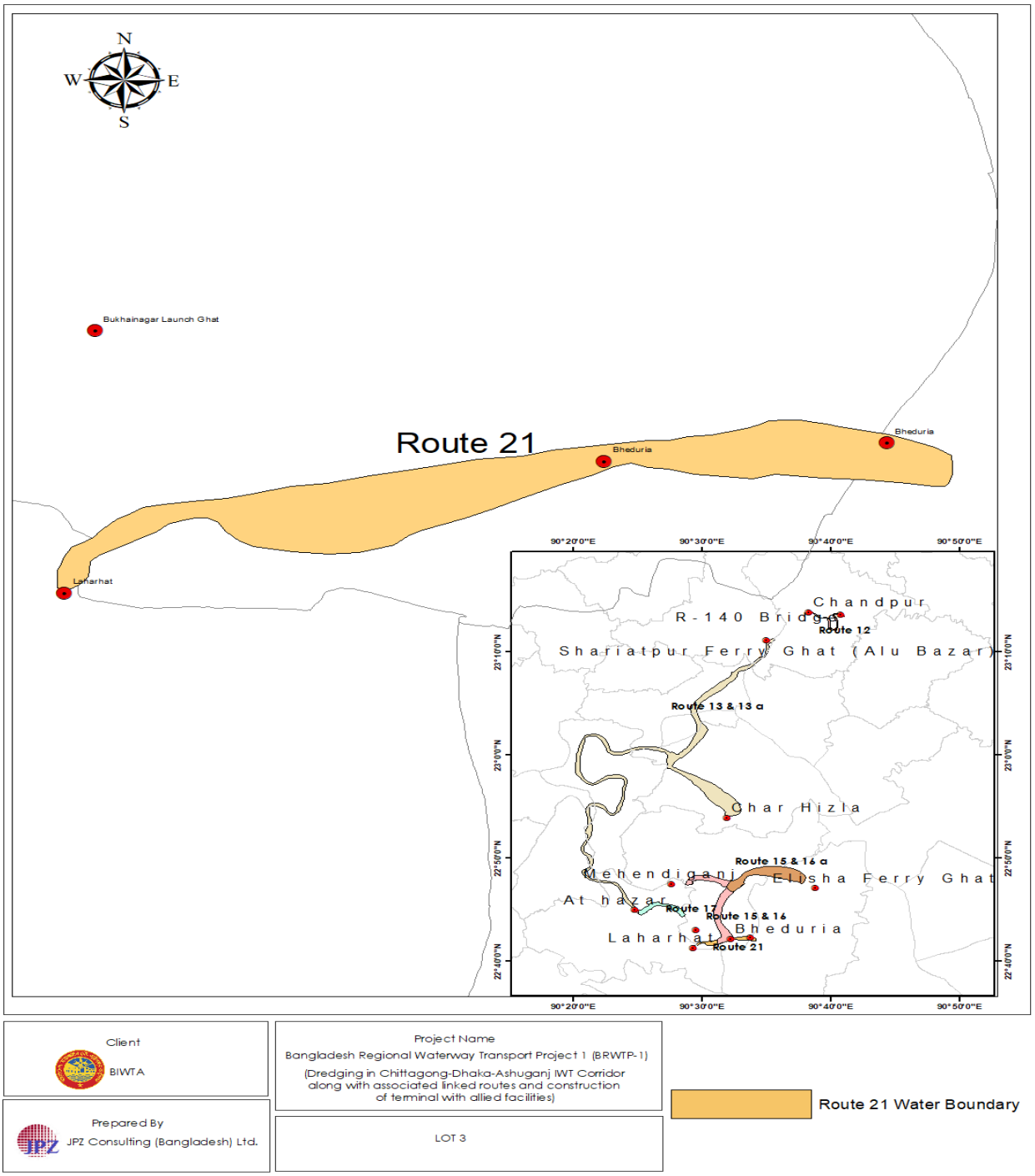


Figure 9: Route 21 River Water Boundary

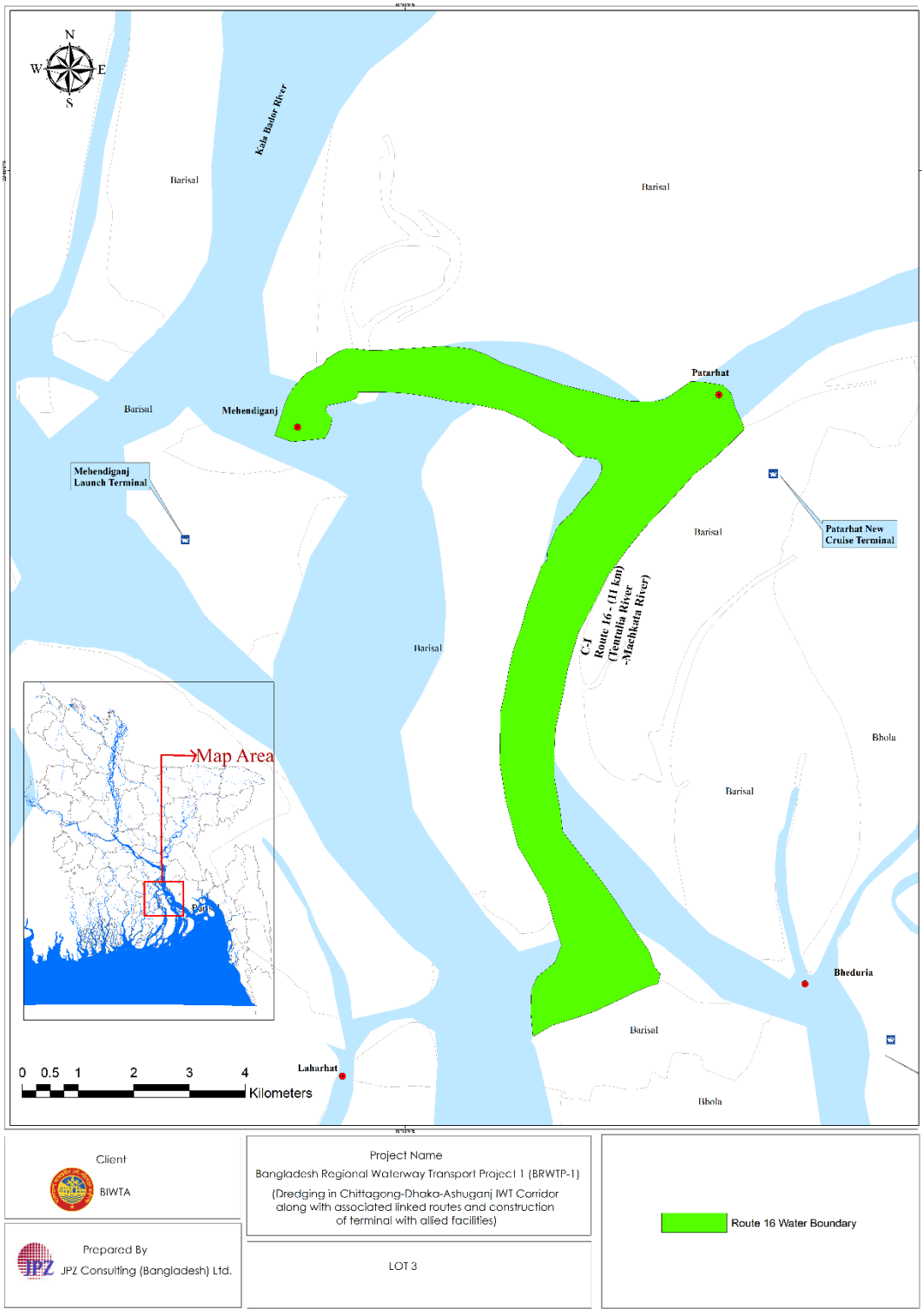


Figure 10: Route 16 Water Boundary

ANNEX 02: RECOMMENDATION FOR PLACING NOTICE BOARD AS THE PART OF NAVIGATION AIDS

Team Leader & Project Manager
BRWTP-S1A
JPZ-Demas-JCL
Level 20, BSC Tower
2-3 RAJUK Avenue
Dhaka-1000

21 May 2023

Subject: Recommendations for placing notice boards containing various cautionary /Warning signs along route 16
(Mehendigonj-Bheduria) being dredged. In the river Megna,Tentulia ,contract Number BRWTP-W1A-03.

Dear Sir

Kindly arrange to advice the contractor "DHARTI-BANGA JOINT VENTURE" to fix notice board which would be self-explanatory at the soonest. i,e as under in order to avoid any endanger during dredging operations with (route 16) Mehendigonj-Bheduria in the River Meghna, Tentulia

CAUTION!

DREADGING OPERATIONS IN PROGRESS

WARNING	WARNING
DREDGE SUBMERGED PIPELINE **DO NOT CROSS**!	DREDGE WORK KEEP DISTANCE OF 150 FT. FROM DREDGE EQUIPMENT

In addition to above cautionary sign boards, persisted underwater High voltage live 11 KV cable in route 16 also to be deliberated by putting orange color buoys in every 1000 ft of the cable length. However, if the high voltage live cable removed, no orange buoys are required, A few more samples of notice boards are pasted herein as below for your kind notice & perusal.
Thanking you with best regards.
Faithfully yours,
MOHAMMAD SHAH ALAM,

Navigational Aids Expert, JPZ-DEMAS-JCL, Phone +8801819313898

Team Leader & Project Manager 30 May, 2023
BRWTP-S1A
JPZ-DEMAS-JCL JV
BSC Tower, Level 20
2-3 RAJUK Avenue
Dhaka - 1000

Subject I: Installation of Buoys as par Maritime IALA Buoyage System along dredge route 09(Bancharampur-Homna)
in the river Meghna Distributary under Lot 02, Contract number BRWTP--W1A-02

Dear Sir
It has been observed & also known from various sources that a good number of Launch and Engine driven Country boat carrying huge number of passengers plying regularly in route 09, being dredged by contractor GULF-COBLA KARNAFULY JV

Figure 11: Different types of River Transport at Route 9 (Titus River), Solimganj Brahmanbaria.

Figure 12: Lot 2, Route-09. (Bancharampur-Homna Loop), Solimganj, being dredged by Cutter suction Dredger Karnafuly-07

Kindly arrange to advice the contractor GULF-COBLA-KARNAFULY JV to install adequate buoys as per IALA Marine
Buoyage System, sample of buoys might be as follows .

buoys with red light will be at port side while entering the river & are even numbered. On the other hand, green buoys with green light will be are odd numbered at Starboard side.

Buoys to be fitted in every Nautical Mile (1 nautical mile is equal to 1.852 kelom eters) along the route 09.

Buoys should be no more than 200 ft from the shore.

However, in order to ensure the save navigation in the river route and to avoid the endanger, installation of the recommended buoys are found to be essential.

Trust above all is in order.
Have good days ahead.
Thanks, with best regards.

Faithfully Yours
MOHAMMAD SHAH ALAM
Navigational Aids Expert
JPZ-DEMAS-JCL JV
Phone . 01818313898.

ANNEX 03: UPDATED DREDGING WORK

Route 21:

Laharhat-Bheduria Route 21 is located in the Tentulia river and its length is about 8.50km (Ch0+000 to Ch8+500).

Laherhat ferry ghat situated at Ch0+000 in union Tungibaria under sadar upozilla, Barisal district and Bheduria ferry ghat at Ch8+500 in union Bheduria under sadar upozilla, Bhola district.

In Laharhat-Bheduria route 21 dredging work done by two numbers of CSD dredgers named Banga Jamuna (20") and Banga Padma(20").

Banga Jamuna (20") mobilized at Patharhat on dated 26.10.2022 and after that mobilized in Bheduria on dated 10.12.2022

Banga Padma (20") mobilized at Laharhat on dated 17.10.2022 and after that mobilized in Bheduria on dated 27.11.2022

Dredging works:

Laharhat-Bheduria route 21 dredging work started in on dated 12thDecember 2022 and work finished on dated 12thMarch 2023.

Dredging works done Chainage/km from Ch8+500 to Ch6+400. Total dredging length of first stage development dredging is 2.10km, cutting width 65m and cutting depth on avg. 2.5m and dredged by two swings. This is class I type route and LAD is 4.0m.

Dredging carried out from Ch8+500 at location Bheduria ferry ghat, union Bheduria under sadar upozilla in Bhola district and ended at chainage Ch6+400 at location near Sreepur launch ghat, Sreepur union under Mehandiganj upozilla in Barisal district.

Hydrographic survey:

- Hydrographic Pre survey done on dated from 25th November 2022 to 28th November 2022. Pre survey Chainage from Ch0+000 to Ch8+500.
- Hydrographic Post survey done on dated from 16thMarch to 17th March 2023. Post survey Chainage from Ch8+500 to Ch6+400.

Disposal area:

Laharhat-Bheduria Route 21 dredges material suspending into seven (7) numbers of individual disposal areas. Following disposal details shows capacity, activity record and Locations, details:

(1) R21-D1: Area is 12729sqm, Height is 1.8m and estimated capacity containing 22912.2 cum spoils. Its Located at Left bank of Tentulia River in Mehandigonj Union under Mehandiganj Upozilla in Barisal district. (Used from 12thDecember 2022 to 1st February 2023)

(2) R21-D2: Area is 4899 sqm, Height is 0.974m and estimated capacity containing 4772 cum spoils. Its Located at Left bank of Tentulia River in Bheduria Union under Bheduria Upozilla in Bhola district. (Used from 12thDecember 2022 to 1st February 2023)
(3) R21-D3: Area is 9069 sqm; Height is 1.62m and estimated capacity containing 14692 cum spoils. Its Located at Left bank of Tentulia River in Mehandigonj Union under Mehandiganj Upozilla in Barisal district. (Used from 12thDecember 2022 to 1st February 2023)
(4) R21-D4 (Gucho-gram): Area is 3358 sqm; Height is 1.1m and estimated capacity containing 3391.58 cum spoils. Its Located at Right bank of Tentulia River in Sreepur Union under Mehandiganj Upozilla in Barisal district. (Used from 28th February 2023 to 11th March 2023)
(5) R21-D5: Area is 16,062 sqm; Height is 1.7m and Estimated capacity containing 27,305 cum spoils. Its Located at right bank of Tentulia River in Ghagoria Union under Mehandiganj Upozilla in Barisal district. (Used from 28th February 2023 to 11th March 2023)
(6) R21-D6: Area is 18571.5 sqm; Height is 1.5m and estimated capacity containing 27857.25 cum spoils. Its Located at left bank of Tentulia River in Ghagoria Union under Mehandiganj Upozilla in Barisal district. (Used from 1st February 2023 to 28th February 2023)
(7) R21-D7: Area is 7900 sqm; Height is 1.2m and Estimated capacity containing 9480 cum spoils. Its Located at left bank of Tentulia River in Ghagoria Union under Mehandiganj Upozilla in Barisal district. (Used from 1st February 2023to 28th February 2023)

Route 16:

Patarhat-Bheduria Route 16 dredging alignment is situated between two rivers. The name of the river at the north side is Maskata River (adjacent of Patarhat ghat) and connected with eastern one called Tentulia River.

Currently dredging work alignment situated on Maskata River and dredging Chainage from k0+000 to K3+500.

Starting Chainage from Ch0+000 located at patarhat-ghat (launch ghat) on Maskata river, union Mehandiganj under Mehandiganj upozilla in Barisal district and end part of Chainage Ch3+500 is located at eastern side of Tentulia River, union Alimabad under Mehandiganj upozilla, Barisal district.

In Patarhat-Bheduria Route 16 dredging work is in progress using two CSD dredgers named Banga Shitalakhya (20”) and BangaJamuna (20”).

Banga Shitalakhya (20”) mobilized at Alubazaron dated 18th October 2022 after that mobilized in Patarhat on dated 30th March 2023

Banga Jamuna (20”) mobilization at Patarhat on dated 13th April 2023.

Survey work upto 31th May 2023:

1. Hydrographic survey/Pre-work:
   Location: Laharhat-Bheduria Route 21
   Chainage: Ch0+000 to Ch8+500
   Line survey done on dated 25.11.2022

2. Hydrographic survey/Pre-work:
   Location: Laharhat-Bheduria Route 21
   Chainage: Ch0+000 to Ch8+500
   Line survey done on dated 26.11.2022 to 28.11.2022
3. Hydrographic survey/Pre-work:
   Location: Alur-bazar to At Hazar/ Route 13
   Chainage: Ch0+000 to Ch95+000
   Line survey done on dated 08.01.2023 to 18.01.2023
4. Hydrographic survey/Pre-work:
   Location: Patharhat to Bheduria/ Route 15 & 16
   Chainage: Ch0+000 to Ch3+500
   Line survey done on dated 19.01.2023 to 21.01.2023
5. Hydrographic survey/Pre-work:
   Location: Patharhat to Bheduria/ Route 15 & 16
   Chainage: Ch0+000 to Ch3+500
   Line survey done on dated 22.01.2023 to 24.01.2023
6. Hydrographic survey/Pre-work:
   Location: Bheduria to At Hazar(north)/ Route 17
   Chainage: Ch0+000 to Ch11+000
   Line survey done on dated 29.01.2023
7. Hydrographic survey/post-work:
   Location: Laharhat to Bheduria Route 21
   Chainage: Ch8+500 to Ch7+500
   Survey done on dated 08.02.2023
8. Hydrographic survey/post-work:
   Location: Laharhat to Bheduria Route 21
   Chainage: Ch8+500 to Ch6+400
   Survey done on dated 16.03.2023 to 17.03.2023

Dredging work upto 31th May 2023:

Location: Patarhat-Bheduria Route 16
Date: From 14th April, 2023 to 31th May 2023
Dredger name: Banga Sitalakhya & Banga Jamuna
Number of swings is 2 (two)
Chainage: Ch1+600 to Ch0+600
Total Length: 1000m
Width: 65m

Disposal Area: Disposal area R16-D1 & R16-D2 used up-to 31th May 2023.

(1) **R16-D1:** Area is 17,633sqm, Height is 3.5m (approx.) and estimated capacity containing 61,715.5cum spoils.

(2) **R16-D2:** Area is 11,596sqm, Height is 3m (approx.) and estimated capacity containing 34,788cum spoils.

Figure 13: Dredge Material Disposal Area R 16D1 and D2

Difficulties at site:

The dredgers sometime cannot be operated by the effect of high tide and low tide.

Disposal area or dyke selection is difficult for the political leader such as MP, Chairman and local peoples and their improper direction and talk outside rules.

Contractor never provide any work plan or notification before starting any new task and don't follow the design and specifications for dyke or disposal area construction**.**

The contractor does not control the discharge of site runoff including excess dredge water by the installation and correct use of containment walls, bunds and weirs or Torza.

Contractor less concern about leakage and spillage from the pipelines and don't maintain sand or sediment extraction record properly.

Contractor does not concern to identify the channel using navigation aids such as buoys; beacon, lights signal and sign board etc.

Contractor environmental action plan (CEAP) is not maintained properly and Health and safety issue such as PPE, vest, helmet, hand gloves, safety shoes and life savings equipment are not maintained properly. Also, it is hard to found any liquid waste and solid waste management system at house boat, barges and dredgers.

IHO standard survey boat and multi beam echo sounder, software etc. instrument that is not available in site

Route 09:

Bancharampur-Homna route 09 is located on Titas River (upper Titas) and its length about 58km (Ch0+000 to Ch58+000)

Currently dredging work alignment situated on Titas River and dredging Chainage from Ch0+000 to Ch8+860.

In Bancharampur-Homna route 09 dredging work done by two CSD dredgers named Karnophuly-03(18") and Karnophuly-07(18").

Karnophuly-07 (18") mobilization at Solimgonj site on 25.01.2023

Karnophuly -03 (18") mobilized at Solimgonj on 12.02.2023.

Bancharampur-Homna route 09 is class III type and current progress dredging depth is avg.1.125m

Starting chainage from Ch2+770 located on Titas River near Solimgonj bridge, union Tejkhali under Bancharampur upozilla in Brahmanbaria district.

Survey works up to 31th May:

- Topographic survey/Pre-work:
  Location: Solimgonj-Homna Route 09
  Chainage: K0+000 to K8+860
  Survey done on dated: 16.01.2023 to 27.01.2023
- Bathymetric survey/Pre-work:
  Location: Solimgonj -Homna Route 09
  Chainage: K0+000 to K8+860
  Survey done on dated: 16.01.2023 to 22.01.2023

Dredging work up to May 2023:

Location: Solimgonj -Homna Route 09
Date: From 3rdMay, 2023 to 28th May, 2023
Dredger name: Kornophuly-07
Number of swings is 1 (one)
Chainage: K2+970 to K3+283
Total Length: 313m
Width: 30m

- Location: Solimgonj -Homna Route 09
  Date: From 7thMay, 2023 to 28th May, 2023
  Dredger name: Kornophuly-03
  Number of swings is 1 (one)
  Chainage: K4+055 to K4+140
  Total Length: 85m
  Width: 30m

Disposal Area: Solimgonj-Homna Route 09**,** Disposal area R09-D2, R09-D5, R09-D6 and R-09-D10 used up-to 28th May 2023.

(1) R09-D2: Area is 17,493 sqm; Height is 3.0m and estimated capacity containing 52,479cum spoils. It is completed.

(2) R09-D5: Area is 5,888 sqm, Height is 3.0m and estimated capacity containing 17,664cum spoils. It is completed.

(3) R09-D6: Area is 5707 sqm; Height is 2.5 m and Estimated capacity containing 14,267cum spoils. It is completed.

(4) R09-D10: Area is 1,250 sqm; Height is 5 m and Estimated capacity containing 6,250 cum spoils. It is completed.

Figure 1: Photo of dredge material disposal area R09-D2

Figure 2: Photo of dredge material disposal area R09-D5

Figure 3: Photo of dredge material disposal area R09-D6

Figure 4: Photo of dredge material disposal area R09-D10