



INLAND WATERWAYS AUTHORITY OF INDIA, A-13, SECTOR-1, NOIDA  
DIST-GAUTAM BUDHA NAGAR, UTTAR PRADESH, PIN- 201 301(UP)

“FINAL FEASIBILITY REPORT ON HYDROGRAPHIC SURVEY

**DIKHU RIVER (NW-32) (63.205 km)**

FROM “CONFLUENCE OF DIKHU AND BRAHMAPUTRA RIVER TO BRIDGE AT NAZIRA”

Survey Period from 21.09.15 to 22.10.15



**FINAL REPORT ON HYDROGRAPHICAL SURVEY OF DIKHU  
RIVER, ASSAM**

**REPORT SUBMISSION DATE-05.11.2018**

SUBMITTED BY:

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FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)



**Acknowledgement**

Precision Survey Consultancy (PSC), Salap, Howrah express its sincere gratitude to **IWAI** for awarding the work and guidance for completing this Project of detailed Hydrographic Survey and the Feasibility Report in **Region-II (Dikhu River) from Confluence of Dikhu and Brahmaputra River to Bridge at Nazira (63.205 Km)**.

We would like to use this opportunity to pen down our profound gratitude and appreciations to **Ms. Nutan Guha Biswas, IAS, Chairperson, IWAI** for spending their valuable time and guidance for completing this project of “ Detailed Hydrography and Topography survey in Dikhu River.” PSC would also like to thanks **Shri Pravir Pandey, Vice Chairman, IA&AS., Shri Alok Ranjan, Member (Finance) and Shri S.K.Gangwar, Member (Technical)**.

PSC wishes to express their gratitude to **Cdr. Ashish Arya, Hydrographic Chief, IWAI, Cdr. P.K. Srivastava, Ex. Hydrographic Chief, Shri S.V.K. Reddy, Chief Engineer-I, IWAI** for his guidance and inspiration for this project. PSC would also like to thank **Shri Rajiv Singhal, A.H.S., IWAI** for invaluable support and suggestions provided throughout the survey period. PSC is pleased to place on record our sincere thanks to other staff and officers of **IWAI** for their excellent support and co-operation throughout the survey period.

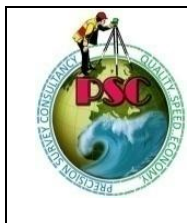


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**List of Abbreviations**

CD	Chart Datum
DGPS	Differential Global Positioning Systems
ETS	Electronic Total Station
GPS	Global Positioning Systems
LBM	Local Bench Mark
MSL	Mean Sea Level
RL	Reference Level
SD	Sounding Datum
SBAS	Satellite-Based Augmentation System
TBC	Trimble Business Centre
FRP	Fiber Reinforced Plastic

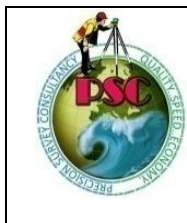


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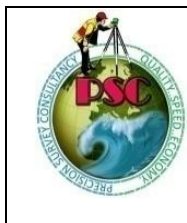
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**FINAL FEASIBILITY REPORT ON  
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**Salient Features of Dikhu River**

Sl.	Particulars	Details																																																	
1.	Name of Consultant	Precision Survey consultancy																																																	
2.	Region number & State(s)	Region II, Assam																																																	
3.	a) Waterway name b) NW # c) Total Stretch and length of declared NW (from.... To....; total length) d) Survey Period (... to ...)	a) Dikhu River b) NW-32 c) From Confluence of Dikhu and Brahmaputra River to Bridge at Nazira (63.205 km) d) 21st September to 22nd October, 2015																																																	
4.	Tidal & non tidal portions (from... to, length, average tidal variation)	There are no Tidal influence or portions found in this zone of River.																																																	
5.	LAD status (Least Available Depth)  i) < 1.2 m ii) 1.2 m to 1.4 m iii) 1.5 m to 1.7 m iv) 1.8 m to 2.0 m v) > 2.0 m    i) < 1.2 m ii) 1.2 m to 1.4 m iii) 1.5 m to 1.7 m iv) 1.8 m to 2.0 m v) > 2.0 m	<p><b><u>Observed Depth</u></b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d2b48c;"> <th style="text-align: center;">Sub Stretch-1 (0.00-10.00 km)</th> <th style="text-align: center;">Sub Stretch-2 (10.00-20.00 km)</th> <th style="text-align: center;">Sub Stretch-3 (20.00 – 30.00 km)</th> <th style="text-align: center;">Sub Stretch-4 (30.00-40.00 km)</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">3.5</td><td style="text-align: center;">3.5</td><td style="text-align: center;">3.75</td><td style="text-align: center;">3.75</td></tr> <tr><td style="text-align: center;">2.75</td><td style="text-align: center;">2.75</td><td style="text-align: center;">2.8</td><td style="text-align: center;">2.8</td></tr> <tr><td style="text-align: center;">0.85</td><td style="text-align: center;">0.85</td><td style="text-align: center;">0.9</td><td style="text-align: center;">0.9</td></tr> <tr><td style="text-align: center;">1.00</td><td style="text-align: center;">1.00</td><td style="text-align: center;">1.3</td><td style="text-align: center;">1.3</td></tr> <tr><td style="text-align: center;">1.9</td><td style="text-align: center;">1.9</td><td style="text-align: center;">1.25</td><td style="text-align: center;">1.25</td></tr> <tr><td style="text-align: center;">Total-10.0</td><td style="text-align: center;">Total-10.0</td><td style="text-align: center;">Total- 10.0</td><td style="text-align: center;">Total- 10.0</td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d2b48c;"> <th style="text-align: center;">Sub Stretch-5 (40.00-50.00 km)</th> <th style="text-align: center;">Sub Stretch-6 (50.00-63.205 km)</th> <th style="text-align: center;">Total (km)</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">3.25</td><td style="text-align: center;">3.25</td><td style="text-align: center;">21.0</td></tr> <tr><td style="text-align: center;">2.5</td><td style="text-align: center;">2.5</td><td style="text-align: center;">16.1</td></tr> <tr><td style="text-align: center;">2.2</td><td style="text-align: center;">3.1</td><td style="text-align: center;">8.8</td></tr> <tr><td style="text-align: center;">1.1</td><td style="text-align: center;">1.1</td><td style="text-align: center;">6.8</td></tr> <tr><td style="text-align: center;">0.95</td><td style="text-align: center;">3.255</td><td style="text-align: center;">10.505</td></tr> <tr><td style="text-align: center;">Total- 10.0</td><td style="text-align: center;">Total- 13.205</td><td style="text-align: center;">Total- 63.205 km</td></tr> </tbody> </table>	Sub Stretch-1 (0.00-10.00 km)	Sub Stretch-2 (10.00-20.00 km)	Sub Stretch-3 (20.00 – 30.00 km)	Sub Stretch-4 (30.00-40.00 km)	3.5	3.5	3.75	3.75	2.75	2.75	2.8	2.8	0.85	0.85	0.9	0.9	1.00	1.00	1.3	1.3	1.9	1.9	1.25	1.25	Total-10.0	Total-10.0	Total- 10.0	Total- 10.0	Sub Stretch-5 (40.00-50.00 km)	Sub Stretch-6 (50.00-63.205 km)	Total (km)	3.25	3.25	21.0	2.5	2.5	16.1	2.2	3.1	8.8	1.1	1.1	6.8	0.95	3.255	10.505	Total- 10.0	Total- 13.205	Total- 63.205 km
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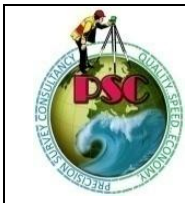
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6.	<p align="center">Cross structures</p> <p>i) Dams, weirs, barrages etc (total number; with navigation locks or not)</p> <p>ii) Bridges, Power cables etc [total number; range of horizontal and vertical clearances</p>	<p>i) There are no Dams, weirs or Barrages found in this zone of river.</p> <p>ii) Total number of RCC Bridges – Three (3), Wooden Bridge- one (1) Bamboo Bridge - Two (2), Steel Bridge- one (1)</p> <table border="1"> <thead> <tr> <th>Clearance w.r.t H.F.L</th> <th>Min (m)</th> <th>Max (m)</th> </tr> </thead> <tbody> <tr> <td>Horizontal Clearance (m)</td> <td align="center">26.020</td> <td align="center">41.810</td> </tr> <tr> <td>Vertical Clearance w.r.t. H.F.L (m)</td> <td align="center">4.529</td> <td align="center">6.254</td> </tr> </tbody> </table> <p>iii) Electric Lines-2 (Two)</p> <table border="1"> <thead> <tr> <th>Clearance w.r.t H.F.L</th> <th>Min (m)</th> <th>Max (m)</th> </tr> </thead> <tbody> <tr> <td>Horizontal Clearance (m)</td> <td align="center">116.06</td> <td align="center">124.006</td> </tr> <tr> <td>Vertical Clearance w.r.t. H.F.L (m)</td> <td align="center">1.495</td> <td align="center">2.946</td> </tr> </tbody> </table>	Clearance w.r.t H.F.L	Min (m)	Max (m)	Horizontal Clearance (m)	26.020	41.810	Vertical Clearance w.r.t. H.F.L (m)	4.529	6.254	Clearance w.r.t H.F.L	Min (m)	Max (m)	Horizontal Clearance (m)	116.06	124.006	Vertical Clearance w.r.t. H.F.L (m)	1.495	2.946										
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Sl.	Particulars	Details																																																												
7.	Slope	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #f4a460;"> <th colspan="2">Reach</th> <th>River / Canal Bed Level Change (m)</th> <th>Distance (km)</th> <th>Slope (m/km)</th> <th>Slope (cm/km)</th> </tr> <tr> <th style="text-align: center;">From</th> <th style="text-align: center;">To</th> <td></td> <td></td> <td></td> <td></td> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0.000</td> <td style="text-align: center;">2.000</td> <td style="text-align: center;">0.243</td> <td style="text-align: center;">2.000</td> <td style="text-align: center;">0.122</td> <td style="text-align: center;">12.15</td> </tr> <tr> <td style="text-align: center;">2.100</td> <td style="text-align: center;">9.616</td> <td style="text-align: center;">0.924</td> <td style="text-align: center;">7.516</td> <td style="text-align: center;">0.123</td> <td style="text-align: center;">12.29</td> </tr> <tr> <td style="text-align: center;">9.617</td> <td style="text-align: center;">24.517</td> <td style="text-align: center;">1.810</td> <td style="text-align: center;">14.90</td> <td style="text-align: center;">0.121</td> <td style="text-align: center;">12.15</td> </tr> <tr> <td style="text-align: center;">24.518</td> <td style="text-align: center;">34.180</td> <td style="text-align: center;">1.173</td> <td style="text-align: center;">9.662</td> <td style="text-align: center;">0.121</td> <td style="text-align: center;">12.14</td> </tr> <tr> <td style="text-align: center;">34.181</td> <td style="text-align: center;">42.566</td> <td style="text-align: center;">1.004</td> <td style="text-align: center;">8.385</td> <td style="text-align: center;">0.120</td> <td style="text-align: center;">11.97</td> </tr> <tr> <td style="text-align: center;">42.567</td> <td style="text-align: center;">50.746</td> <td style="text-align: center;">0.997</td> <td style="text-align: center;">8.179</td> <td style="text-align: center;">0.122</td> <td style="text-align: center;">12.19</td> </tr> <tr> <td style="text-align: center;">50.747</td> <td style="text-align: center;">63.115</td> <td style="text-align: center;">1.487</td> <td style="text-align: center;">12.368</td> <td style="text-align: center;">0.120</td> <td style="text-align: center;">12.02</td> </tr> <tr> <td colspan="3" style="text-align: center;">Total</td> <td style="text-align: center;">63.01</td> <td style="text-align: center;">Avg - 0.121</td> <td style="text-align: center;">Avg - 12.13</td> </tr> </tbody> </table>	Reach		River / Canal Bed Level Change (m)	Distance (km)	Slope (m/km)	Slope (cm/km)	From	To					0.000	2.000	0.243	2.000	0.122	12.15	2.100	9.616	0.924	7.516	0.123	12.29	9.617	24.517	1.810	14.90	0.121	12.15	24.518	34.180	1.173	9.662	0.121	12.14	34.181	42.566	1.004	8.385	0.120	11.97	42.567	50.746	0.997	8.179	0.122	12.19	50.747	63.115	1.487	12.368	0.120	12.02	Total			63.01	Avg - 0.121	Avg - 12.13
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8.	Discharge Report	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #f4a460;"> <th>Sl. No</th> <th>Chainage (km)</th> <th>Discharge (Cu.m/sec)</th> <th rowspan="6" style="text-align: center; vertical-align: middle;"><b>Dated 21.09.15 to 22.10.15</b></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">9.616</td> <td style="text-align: center;">117.046</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">34.180</td> <td style="text-align: center;">34.159</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">42.566</td> <td style="text-align: center;">25.941</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">63.115</td> <td style="text-align: center;">50.925</td> </tr> <tr> <td colspan="2" style="text-align: center;">Avg. Discharge</td> <td style="text-align: center;">57.02</td> </tr> </tbody> </table>	Sl. No	Chainage (km)	Discharge (Cu.m/sec)	<b>Dated 21.09.15 to 22.10.15</b>	1	9.616	117.046	2	34.180	34.159	3	42.566	25.941	4	63.115	50.925	Avg. Discharge		57.02																																									
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9.	i) Present IWT operations  ii) Ferry services, tourism, cargo, if any	i) As Follows  ii) There are two passenger ferry services named Dikhow mukh Ghat and Goshkota Ghat are available in this zone of river near at chainage of 0.750 km and 9.244 km respectively. There is no cargo available in this zone of river.																																																												
10.	Approx Distance of Rail & Road from Industry	Nearest Railway station- i) Simaluguri Junction Railway Station (0.65 km from riverside approx) ii) Sivasagar Town Railway Station (1.94 km from riverside approx)  Name of National highway close to the River-NH-37, NH-61  Name of SH- SH-1, SH-2, SH-702C																																																												
11.	Any other information/ comment																																																													



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## Section-1: Introductory Considerations

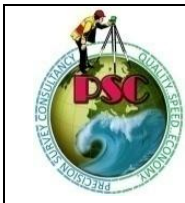
### 1.1 River Course: Background information, Historical Information, Origin, End

Dikhu River originates from Nuroto Hill area in Zunheboto district and the river traverses towards north along the border of Mokokchung and Tuensang districts. The main tributaries of river Dikhu are Yangyu in Tuensang district and Nanung in the Langpangkong range in Mokokchung district. The river flows further northward and leaves the hill near Naginimora and finally merges with the Brahmaputra River in the plains of Assam.

Dikhu River is one of the most prominent rivers of Nagaland. The river Dikhu flows across the Mokokchung and the Longleng districts. This river is one of the major tourist attractions of Longleng. The serene atmosphere and sandy edges make it a perfect picnic spot. During the winters the water levels come down. Every tourist must experience once in their lifetime sitting by the edge of the river and soaking in the beauty of the place. The rivers of Nagaland serve as an important source of water for the state of Nagaland. Fishes are available in this zone of rivers. Dikhu River is one of the tributaries of Brahmaputra. The river flows close to fields located in Mokokchung district. It is one of the mightiest rivers of India. The Dikhu River is one of the prime tourist attractions and also a significant source of livelihood for the people. The Water of this river makes the area around the river fertile. Longleng is primarily an agricultural district. Dikhu River serves as a lifeline to its people. Dikhu River does not dry during the harvest season. Dikhu River forms the boundary between Ungma and Longsa.



Figure 1-Site Map of Dikhu River



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### 1.2 Tributaries / Network of River/ Basin

The three streams create a river basin in this zone of river -

- i) Dikhu
- ii) Disang
- iii) Janji

### 1.3 State / District through which river passes

The river passes through the district of Mokokchung and Tuensang, Zunheboto of the state of Assam & Nagaland.

### 1.4 Project Site Location Map

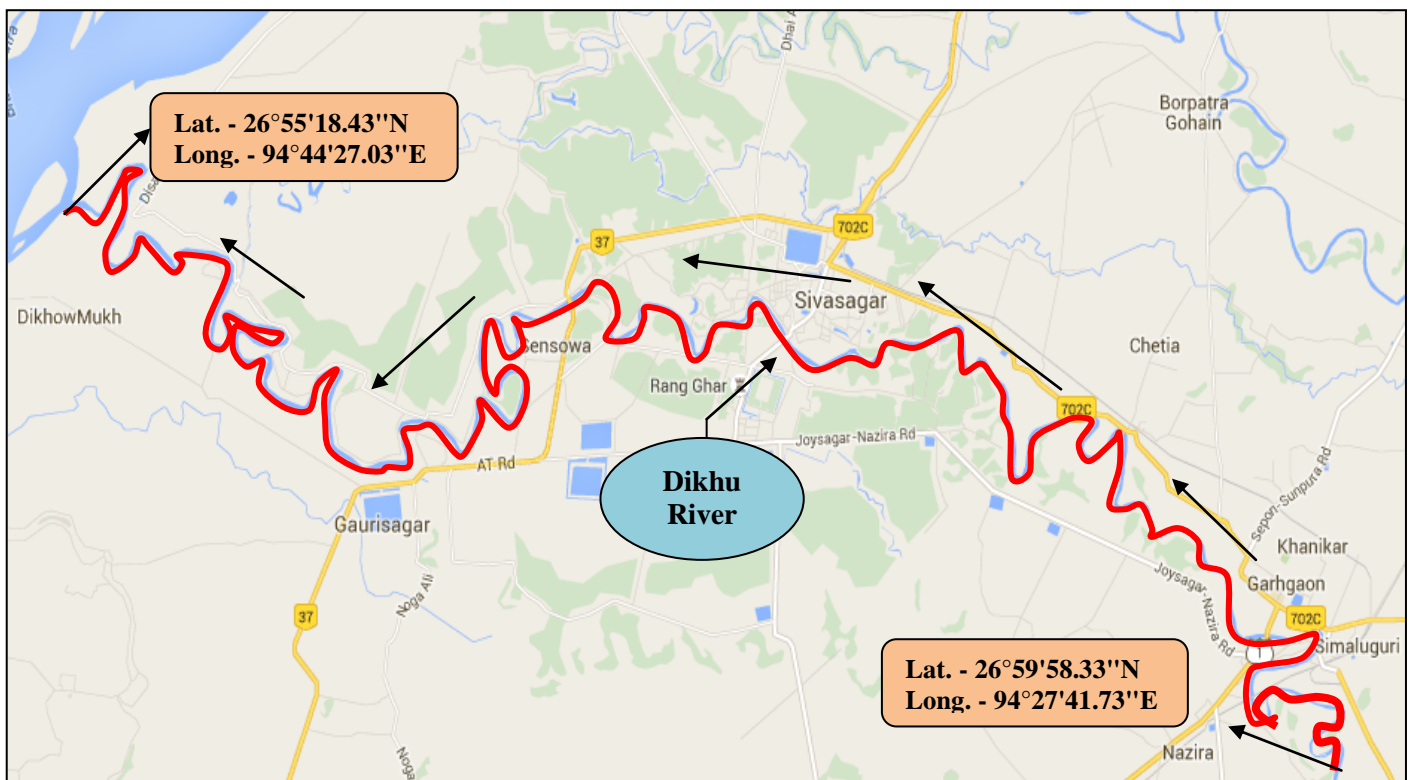


Figure 2 Project Site Location Map



### 1.5 River Key Map

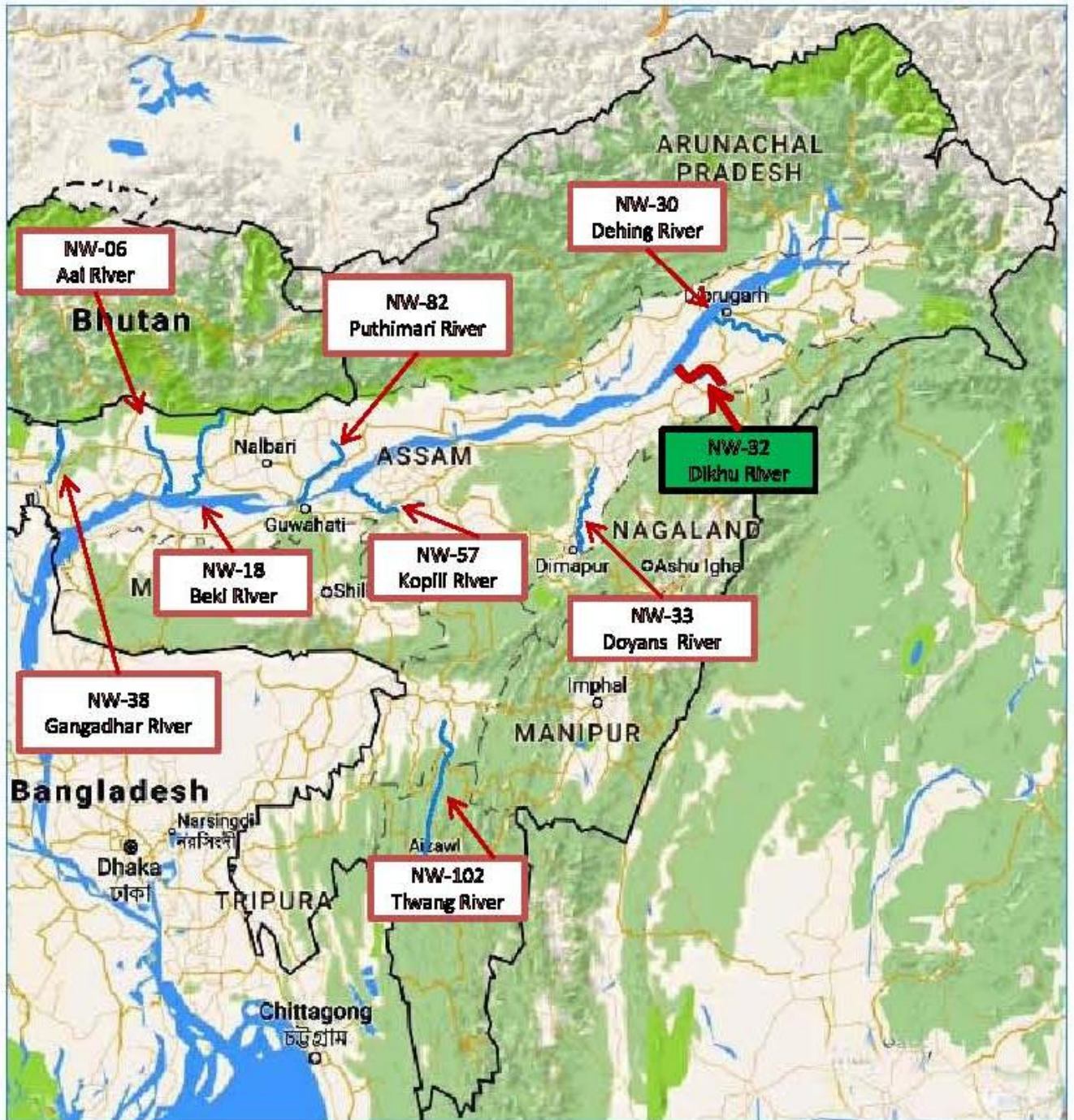
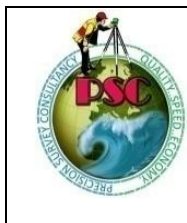


Figure 3- River Key Map



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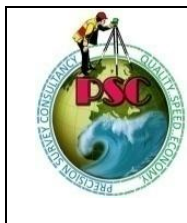


### **1.6 Scope of work**

The Scope of work shall cover all technical aspects of hydrographic survey at par with International Standards including the following for development of the river/canal for inland navigation.

The detailed hydrographic survey is to be carried out by using Automated Hydrographic Survey System (using digital Echo sounder for depth measurement, DGPS Beacons Receivers for position fixing and Hypackmax or equivalent software for data logging). The survey is to be conducted in WGS‘84 datum.

- Detailed Hydrographic Survey to assess the navigability of the waterway.
- To collect Water and bottom samples, current meter observation and discharge from the deepest route at every 10 km interval.
- To identify cross structures which are obstructing navigation.
- To identify the length of bank protection required.
- The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.
- The pillar extends 60.cms above ground level with inscription “IWAI”, “PSC” and BM No. can be seen on the face of the pillar.
- The main objective of the Study was to recommend the strategy and programs for the development of the Dikhu River waterway and to provide an appropriate economic and organizational framework for restoring trade and navigation (cargo and passengers) on the Dikhu River with an aim to do as follows:
  - Improve public and private investments into transport on the Dikhu River, in accordance with adequate economic and financial analysis;
  - Propose enhancement of coordination of activities regarding inland navigation and to set up priorities of public interests;
  - Obtain an integrated approach considering water management, energy production, flood control and environmental aspects in the Dikhu River basin and Propose improvement of the infrastructure.



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## **Section-2: Methodology Adopted to undertake Study**

### **2.1 Methodology Adopted including Resources and equipment used and calibration**

#### **➤ Equipment:-**

Followings equipments were employed for the Bathymetry and Topography survey:-

<b>Equipment</b>	<b>Make</b>	<b>Version</b>	<b>Qty Employed</b>
Echo sounder	Bathy MF 500	.....	1
Current Meter	AEM 213-D	.....	1
Tide Gauge	Manual (Pole type)	-	4
RTK	South S86T	-	3
GPS Sets	Trimble –Becon Rover SPS 361	-	1
Software	HYPACK data acquisition	Version 14	1
Software	AUTOCAD	2013	1
Software	Microsoft Office	2013	1

**Table 1 - Detail Equipment list**

- **Conduct of survey work**

- **Topographic Survey**

- Detailed survey has carried out from “Confluence of Dikhu and Brahmaputra River (Lat- 26° 59'58.33"N, Long- 94°27'41.73"E) to Bridge at Nazira on State High Way (Lat- 26°55'18.43"N, Long- 94°44'27.03"E). The Length of the topography survey is from chainage 0.00 km to Chainage 63.205 km.

The Topographic survey was conducted to ascertain following in the survey area:-

- Spot levels
- High bank Line
- Vegetation covered
- Bridges and permanent structures
- Road, culvert and other communication network

GPS RTK (Real Time Kinematic) satellite navigation is a technique used in land survey and in hydrographic survey based on the use of carrier phase measurements of the GPS, GLONASS and / or Galileo signals where a single reference station provides the real-time corrections, providing up to centimeter-level accuracy. When referring to GPS in particular, the system is also commonly referred to as Carrier-Phase Enhancement, CPGPS. RTK systems use a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier that it measured, and the mobile units compare their own phase measurements with the ones received from the base station. There are several ways to transmit a correction signal from base station to mobile station. The most popular way to achieve real-time, low-cost signal transmission is to use a radio



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modem, typically in the UHF band. This allows the units to calculate their relative position to millimeters, although their absolute position is accurate only to the same accuracy as the position of the base station.

**Bathymetry Survey:-**

The Length of the Bathymetry survey is from Chainage 0.00 km to Chainage 63.205 km. The water level is sufficient for the Bathymetry survey in this zone of river. Bathy 500 MF was used to obtain soundings onboard the survey boat. A working frequency of 210 KHz was used for sounding operations. The digital output from the echo sounder was automatically fed to the HYPACK data logging software on a real-time basis for the acquisition of survey data. No breakdown of equipment was reported and the performance of the equipment was found to be satisfactory during the entire duration of the survey.

The sound velocity was set to 1395 m/s on single beam echo sounder during acquisition. The Daily bar checks were done prior to the sounding operation and before the closing of the sounding operation for the day. Being very shallow depths, the echo sounder depths were also cross-checked in between by using demarcated sounding poles during the conduct of the survey. The sounding lines were run using Survey boat to identify the design line of the Dikhu River for the possible stretch. The cross lines were run perpendicular to the orientation of river flow (i.e. perpendicular to the orientation of depth contours) in respective stretches. The spot sounding was also carried out in the area where the survey boat cannot be operated due to low depth. The hemisphere DGPS and Sounding Pole were used for Spot sounding at shallow locations in the Dikhu River. The DGPS position along with water depths was recorded simultaneously and the tidal reduction was applied to the obtained depths.



**Figure 4-Bathymetry Survey work**





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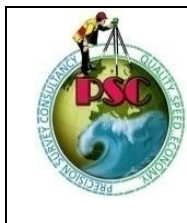
**2.2 Description of Bench Marks (B.M) / authentic Reference Level used:**

For the Topography Survey, The Horizontal control/Vertical control has been carried out from the Bench mark no- CP-D1. The Bench Mark has been established at Jagra Hati Village. The value of the Bench Mark at Jagra Hati Village is –

Location Name	Geographic position		UTM position		Elevation (m) w.r.t. M.S.L
	Latitude (N)	Longitude (E)	Northing	Easting	
Jagra Hati Village	26°59'1.09"	94°34'45.34"	2985602.97	656721.12	100.765 mtre



**Figure 5- G.T.S Bench Mark & C.W.C Gauge Position of Dikhu River**



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### **2.3 Tidal Influence Zone and tidal variation in different stretches:-**

There is no tidal influence found in this part of the region of Assam.

### **2.4 Methodology to fix Chart Datum / Sounding Datum-**

IWAI has provided the Sounding Datum at Bihubar, Sivsagar and at the confluence with Brahmaputra River. The same was used to arrive the sounding datum values at BM pillars and tide gauges.

Sl. No	Place	Sounding Datum w.r.t MSL (Provided by IWAI)
1	Bihubar (Chainage-86.712 km)	91.275 meter
2	Sivsagar (Chainage- 42.435 km)	85.952 meter
3	Brahmaputra Confluence (Chainage-0.000km)	85.311 meter

### **2.5 Six years minimum Water Levels to arrive at Chart Datum (CD) / Sounding Datum (SD).**

The CD levels of the Dikhu River are:-

Bihubar- 91.275 meter (Chainage-86.712 km)

Sivsagar- 85.952 meter (Chainage-42.435 km)

Brahmaputra Confluence- 85.311 meter (Chainage-0.000 km)

### **2.6 Transfer of Sounding Datum table for tidal rivers / canals**

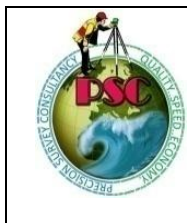
There is no Tidal influence or Tidal effects found in this zone of river.

### **2.7 Table Indicating tidal variation at different observation points (say at every 10 Km)**

There is no Tidal influence or Tidal effects found in this zone of river.

### **2.8 Salient Features of Dam, Barrages, Weirs, Anicut, Locks, Aqueducts etc**

There are no Dams, Barrage, Weirs, Anicut, Locks, Aqueducts found in this zone of river.



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**2.9 Description of erected Bench Mark Pillars:-**



BM No	Location	Chainage (km)	Latitude (N)	Longitude (E)	Easting	Northing	BM Height above M.S.L (m)	BM Height above SD (m)
BM 1	Nazira	63.115	26°55'20.787"	94° 44' 23.5314"	672755.565	2979032.849	99.250	14.289
BM 2	Singha Duwar Grant	50.746	26°57'18.2982"	94° 40' 49.8138"	666811.888	2982569.353	96.038	12.263
BM 3	Sivsagar	42.566	26°58'31.5834"	94° 37' 46.6026"	661730.247	2984758.456	95.270	11.925
BM 4	Kari Gaon	34.180	26°58'56.5314"	94° 34' 42.9888"	656658.021	2985461.853	93.750	11.779
BM 5	Koi Jan	24.517	26°57'33.8682"	94° 33' 6.2454"	654022.073	2982885.059	94.120	13.245
BM 6	Gosh Kota	9.616	26° 59' 5.013"	94° 30' 10.299"	649136.932	2985631.118	87.215	1.26
BM 7	Saraguri	2.000	27° 0' 17.9274"	94° 28' 10.1598"	645798.674	2987835.928	87.420	1.015

**Table 2 Bench Mark Details**

**2.10 Details of collected Water level of different gauge stations:-**

Chain age (km)	Gauge station	Location	Easting	Northing	Latitude (N)	Longitude (E)	W.L (m)	Period of Observation
34.273	GS -(TP)- 1	RCC bridge near Sivsagar Bypass	656788.096	2985447.039	26°58'55.996"	94° 34' 47.698"	86.293	24 hrs
24.500	GS -(TP)- 2	Bhatiapar village	653990.4	2982870.3	26°57'33.4038"	94° 33' 5.0898"	83.259	24 hrs
42.566	GS -(TP)- 3	Sripuria village	651606.5	2982390.8	26°57'18.7668"	94°31'38.4414"	82.111	24 hrs
9.646	GS -(TP)- 4	Goshkota village	649019.9	2985661.8	26° 59' 6.054"	94° 30' 6.0696"	80.921	24 hrs
0.616	GS -(TP)- 5	Confluence point	645413.8	2987360.2	27° 0' 2.6172"	94°27'55.9974"	80.349	24 hrs
42.643	GS -(TP)- 6	Sivsagar RCC bridge	661798.4	2984718.4	26°58'30.2514"	94°37'49.0542"	86.990	24 hrs
63.088	GS -(TP)- 7	Nazira	672732.3	2978987.6	26° 55' 19.329"	94°44'22.6638"	89.193	24 hrs
42.390	GS -(TP)- 8	Dikhu-Mathari road	661648.9	2984928.3	26°58'37.1346"	94°37'43.7304"	86.443	24 hrs
34.364	GS -(TP)- 9	Kari gaon village	656837.8	2985517.9	26° 58' 58.278"	94°34'49.50"	86.300	24 hrs



**Table 3 Water level data of different Gauge stations**

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**2.11 Chart Datum / Sounding Datum and Reductions details:-**

Sl no	CWC gauge / Dam / Barrage / Weir / Anicut / Bench Mark / tide gauges	Chainage (km)	Stretch for corrected soundings and topo levels (km)	Establish ed Sounding Datum w.r.t. MSL (m) at col. A.	Sounding Datum of Tide Gauge w.r.t. MSL (m)	Correction in WL data for Bathymetric survey (m)	Topo level data to be converted as depth for volume calculation w.r.t. SD (m)
	A	B	C (50% stretch is to be selected on both side of tide gauge)	D +ve indicates above MSL -ve indicates below MSL	E	F = (E- WL data in MSL)	G = (E- topo levels in MSL)
1	Bihubar	86.712		91.275			Dikhu Reduced Topo.xyz
2	Gauge Station- (TP)- 7	63.088	52.9-63.205		88.435	-0.758	
3	Gauge Station - (TP)- 6	42.643	42.5-52.9		85.955	-1.035	<b>Submitted in Soft Copy</b>
4	Sivasagar	42.435		85.952			
5	Gauge Station- (TP)- 8	42.390	38.4-42.5		85.947	-0.496	
6	Gauge Station- (TP)- 9	34.364	34.3-38.4		84.972	-1.328	
7	Gauge Station- (TP)- 1	34.273	29.4-34.3		84.961	-1.332	
8	Gauge Station - (TP)- 2	24.500	22.7-29.4		83.775	0.116	
9	Gauge Station - (TP)- 3	20.964	15.3-22.7		83.345	1.234	
10	Gauge Station - (TP)- 4	9.646	5.1-15.3		81.971	1.050	
11	Gauge Station- (TP)- 5	0.616	0.0-5.1		80.875	0.526	
12	Confluence (663.926)	0.000		80.800			

**Table 4-Chart Datum / Sounding Datum & Reduction Details**

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### 2.12 High Flood Level (H.F.L.) at known gauge stations and cross-structures:-

Sl no	Location and description of CWC gauge / Dam / Barrages / Weirs / Anicut / Locks / Aqueducts / BM	Cross-structure details	Chainage (km)	Established HFL / MHWS / FSL / MWL / FRL w.r.t. MSL (m)	Computed HFL at Cross-Structures w.r.t. MSL (m)
1	Bihubar		86.712	104.770	
2	Sivasagar		42.435	95.620	

Table 5 HFL Details

### 2.13 Average Bed Slope:-

Reach		River / Canal Bed Level Change (m)	Distance (km)	Slope (m/km)	Slope (cm/km)
From	To				
0.000	2.000	0.243	2.000	0.122	12.15
2.100	9.616	0.924	7.516	0.123	12.29
9.617	24.517	1.810	14.90	0.121	12.15
24.518	34.180	1.173	9.662	0.121	12.14
34.181	42.566	1.004	8.385	0.120	11.97
42.567	50.746	0.997	8.179	0.122	12.19
50.747	63.115	1.487	12.368	0.120	12.02
Total			63.01	Avg - 0.121	Avg - 12.13

Table 6-Average Bed Slope

### 2.14 Details of Dam/Barrage/Weirs/Anicut etc. w.r.t MSL:-

There are no Dams, Barrage, weirs, Anicut found in this river zone.

### 2.15 Details of Locks:-

There are no locks found in this river zone.

### 2.16 Details of Aqueducts:-

There are no aqueducts found in this zone of river.



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**2.17 Details of existing Bridge and Crossing over waterway:-**

There are three RCC Bridges, one steel bridge, one wooden bridge and two Bamboo bridges are situated in this zone of river. The Bamboo bridges and wooden bridges are not permanent. During the rainy season these bridges are collapsed and so these bridges are no clearances. The Details of the Bridges are tabulated below:-

Sl. No	Structure Name	Chainage (km)	Location	Position		Position		Length (m)	Width (m)	No. of Piers	Horizontal Clearance (m)	Vertical Clearance w.r.t H.F.L (m)	Present Condition
				Latitude (N)	Longitude (E)	Easting	Northing						
1	Bamboo Bridge	4.019	Goyal Goyan village	26°59'50.10"	94°28'39.59"	646620.8135	2986989.2205	37.40	1.23	-	-	-	Completed
2	wooden Bridge	17.277	Mitong village	26°57'49.68"	94°30'49.70"	650251.4798	2983326.3508	58.24	1.75	-	-	-	Completed
3	RCC Bridge	34.294	Kari Gaon village	26°58'56.94"	94°34'47.64"	656786.7162	2985476.3120	172.11	9.44	5	41.13	4.665	Completed
4	Dikhow Steel Bridge	42.544	Sivsagar village	26°58'33.86"	94°37'48.93"	661770.9513	2984829.0953	160.12	4.79	-	33.250	4.620	Completed
5	RCC Bridge	42.575	Sivsagar village	26°58'33.20"	94°37'49.15"	661800.7753	2984809.1765	170.68	11.35	3	41.81	6.254	Completed
6	Bambo Bridge	50.703	Meteka pathar village	26°57'20.02"	94°40'57.39"	667020.4585	2982625.3470	100.82	1.49	-	-	-	Completed
7	RCC Bridge	63.202	Nazira village	26°59'50.00"	94°28'39.99"	646631.4076	2986986.2384	118.52	6.27	2	26.02	4.529	Completed

**Table 7- Bridge Details**

**2.18 Details of other Cross structures, pipe-lines, under water cables:-**

A Pipeline is crossing near at chainage of 56.500 km.

Sl No	Structure Name	Chainage (km)	Location	Position		Position		Vertical Clearance w.r.t H.F.L (m)
				Latitude (N)	Longitude (E)	Easting	Northing	
1	Pipe line crossing	56.750	Bailungcheta village	26°57'8.47"	94°42'27.76"	669517.6448	2982303.4427	2.158

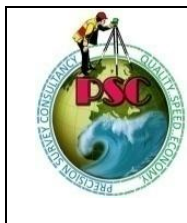
**Table 8- Details of Pipe line**

**2.19 High Tension Lines / Electric Lines/Tele-communication lines:-**

There are two electrical lines are located in this zone of river. The Details are tabulated below:-

Line	Chainage (km)	Location	Position				No. of Piers	Horizontal clearance (m)	Vertical clearance w.r.t H.F.L (m)	Remarks
			Latitude (N)	Longitude (E)	Easting (m)	Northing (m)				
Electrical Line	23.215	Simultapu No. II	26°57'28.64"	94°32'27.15"	652946.0070	2982711.1580	4	116.06	1.495	Complete
Electrical Line	33.273	Simultapu No. II	26°58'47.62"	94°34'15.26"	655897.7330	2985178.3370	4	124.006	2.946	Complete

**Table 9- Electric Lines**



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**2.20 Current Meter and Discharge Details:-**

Stretch No.	Chainage (km)	Position				Observed Depth (m) (D)	Velocity (m/sec.)	Average Velocity (m/sec.)	X-Sectional area (sq. m.)	Discharge (Cu.m/sec)
		Easting (m)	Northing (m)	Latitude (N)	Longitude (E)		0.5 D			
1	9.616	649035.415	2985731.398	26°59'08.31"	94°30'06.662"	2.4	0.282	0.282	415.06	117.046
2	34.180	656750.1368	2985424.5915	26°58'55.283"	94°34'46.311"	1.5	0.223	0.223	153.18	34.159
3	42.566	661789.509	2984772.859	26°58'32.027"	94°37'48.757"	1.6	0.203	0.203	127.79	25.94
4	63.115	672752.6369	2978964.855	26°55'18.581"	94°44'23.392"	0.800	0.500	0.500	101.85	50.925

**Table 10- Details Current Metre List**

**2.21-a. Soil Sample Locations:-**

Sample No.	Chainage (km)	Easting (m)	Northing (m)	Latitude (N)	Longitude (E)	Depth (m)
1	2.000	672754.839	2978972.18	26°55'18.818	26°55'18.818"	1.8
2	42.566	661789.509	2984772.859	26°58'32.027"	94°37'48.757"	2.4
3	63.115	672752.6369	2978964.855	26°55'18.581"	94°44'23.392"	0.8

**Table 11-Soil Sample Location**

**b. Water Sample Locations:-**

Sample No.	Chainage (km)	Easting (m)	Northing (m)	Latitude (N)	Longitude (E)	Total Depth (d) (m)	Mid-Depth (0.5d) (m)
1	2.000	672754.839	2978972.18	26°55'18.818	26°55'18.818"	1.8	0.9
2	42.566	661789.509	2984772.859	26°58'32.027"	94°37'48.757"	2.4	1.2
3	63.115	672752.6369	2978964.855	26°55'18.581"	94°44'23.392"	0.8	0.4

**Table 12- Water Sample Location**



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### Section-3: Description of Waterway- Stretch Wise

#### 3.1 From Chainage 0.00 Km to Chainage 10.00 Km (Brahmaputra confluence to Dikhow Mukh village)

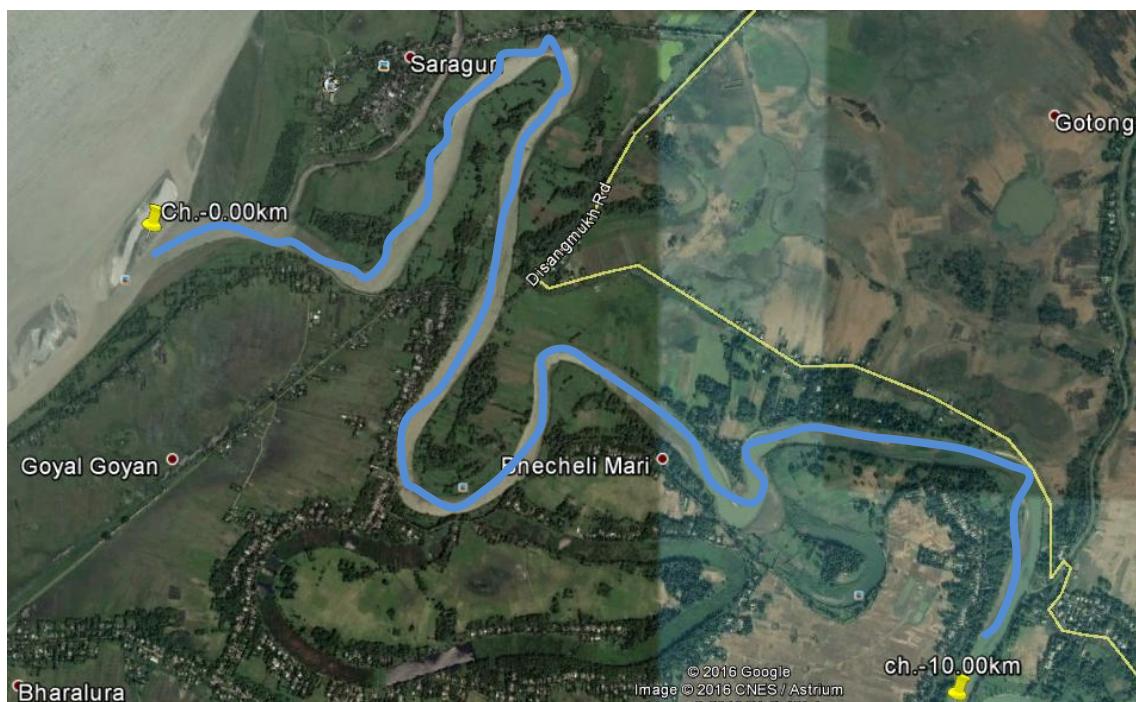


Figure 6 Chainage 0.00km to Chainage 10.00 km

The River width of Dikhu River from Chainage 0.00 km to Chainage 10.00 km is approximately 111m to 91m. Out of the total width, the average width portion of the river is 60m.

During the survey, it was noticed that Saraguri village, Gotonga Pather village are situated left bank side of the river and Goyal Goyan village, Kharadhara village, Dhane Khowa village, Dikhow Mukh village, Bharulura village, Na-Katani Kalu gaon village, Bhechelimari village are situated right bank side of the river. BM-7 has been situated near at chainage of 0.6 km. A Bamboo Bridge is situated near at chainage of 4.019km. The Bamboo Bridge location is (Lat-26°59'50.10"N, Long-94°28'39.59"E). Dikhu Mukh Ferry and Gosh Kota Ferry service are available near at chainage of 0.750 km and 9.244 km in this stretches of river respectively. An Irrigation canal is also found near at chainage of 9.616km where BM-6 has been situated.





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Class	Chainage (km)		Observed				Reduced w.r.t. Sounding Datum			
	From	To	Min. dept h (m)	Max. dept h (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Min. Dept h (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)
I	0.00	10.00	1.0	7.9	7650	43210.83	1.0	7.8	4250	10670.06
II	0.00	10.00	1.0	8.0	9500	85610.53	1.0	7.9	6300	29149.77
III	0.00	10.00	1.0	8.1	10000	167058.66	1.0	8.0	9000	78307.37
IV	0.00	10.00	1.0	8.1	10000	237101.69	1.0	8.1	10000	137699.26



**Figure 7-Bamboo Bridge (Chainage- 4.019 km)**



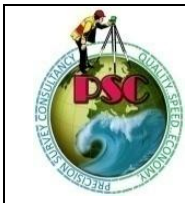
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Figure 8- Dikhumukh ferry Ghat (Chainage- 0.750 km)



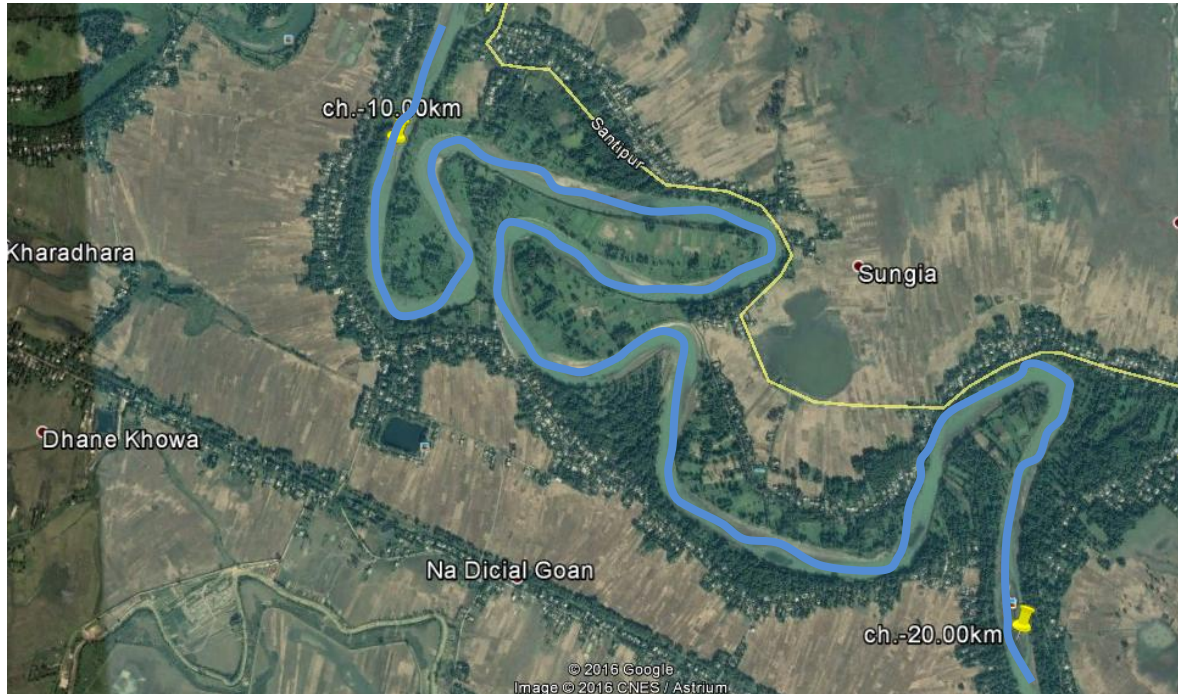
Figure 9- Goshkota Ferry Ghat (Chainage- 9.244 km)



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**3.2 From Chainage 10.000 Km to Chainage 20.000 Km (Goshkota village to Gaurisagar village)**



**Figure 10-Chainage 10.00 km to Chainage 20.00 km**

The River width of Dikhu River from Chainage 10.00 km to Chainage 20.00 km is approximately 91m to 108.72m. Out of the total width, the average width portion of the river is 50m.

During the survey it was noticed that Gosh kota village, Sungia village, Boka Bill village are situated left bank side of the river and Na-Dicial Gaon village, Mitong village are situated right bank side of the river. A wooden bridge has been found near at chainage of 17 km. The Wooden Bridge’s location is (Lat-26°57'49.68"N, Long-94°30'49.70"E). Both side plants have been also noticed during the survey.

Class	Chainage (km)		Observed				Reduced w.r.t. Sounding Datum			
	From	To	Min. dept h (m)	Max. dept h (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Min. Dept h (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)
I	10.00	20.00	1.1	11.0	8750	56056.95	1.0	10.9	4450	10048.83
II	10.00	20.00	1.1	11.1	10000	113188.12	1.0	11.0	7600	32939.1
III	10.00	20.00	1.1	11.2	10000	239545.59	1.0	11.1	10000	90574.47
IV	10.00	20.00	1.1	11.2	10000	340273.08	1.0	11.1	10000	127193.07



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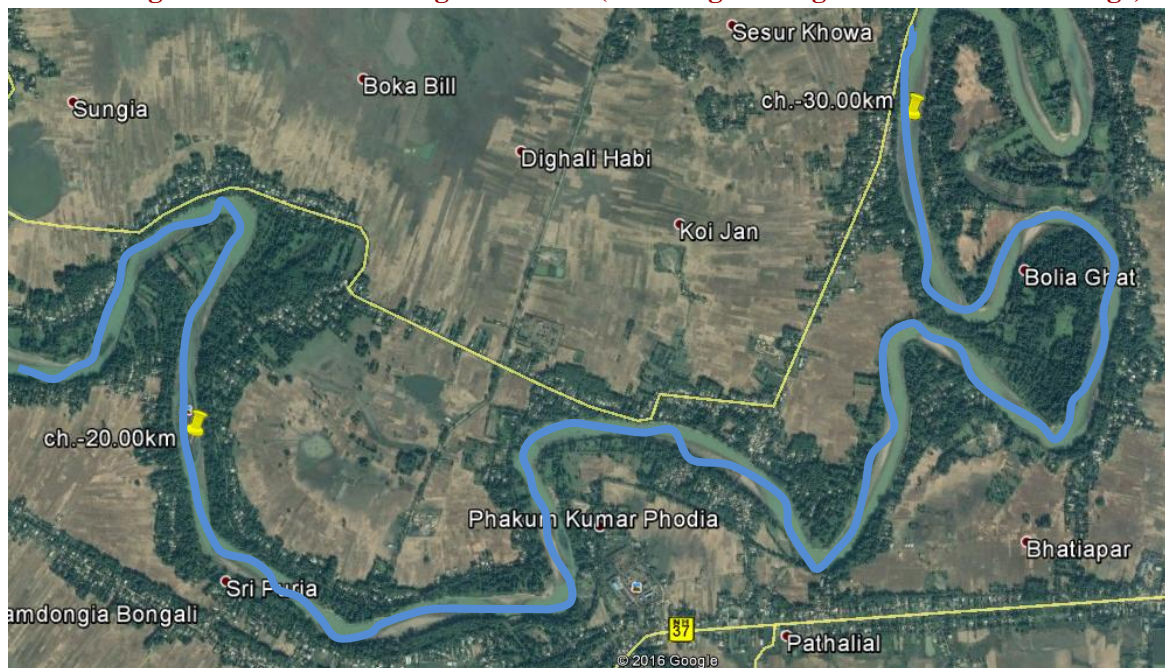
**Figure 11- Wooden Bridge (Chainage-17 km)**



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**3.3 From Chainage 20.00 Km to Chainage 30.00 Km (Gaurisagar village to Sesur Khowa village)**



**Figure 12 Chainage 20.00 km to Chainage 30.00 km**

The River width of Dikhu River from Chainage 20.00km to Chainage 30.00km is approximately 108 m to 95 m. Out of the total width, the average width portion of the river is 70m.

During the survey it was noticed that Sri Puria village, Phakum Kumar Phodia village, Bhatiapar village, Namdang Kumar village, Gaurisagar village, Aila Mukh Habi village, Namdongia village are situated right bank side of the river and Jagara Hati village, KoiJan village, Dighali Habi village, Sesur Khowa village are situated left bank side of the river. BM-5 is situated near at chainage of 24.517km. NH-37 is located in this stretch of river.

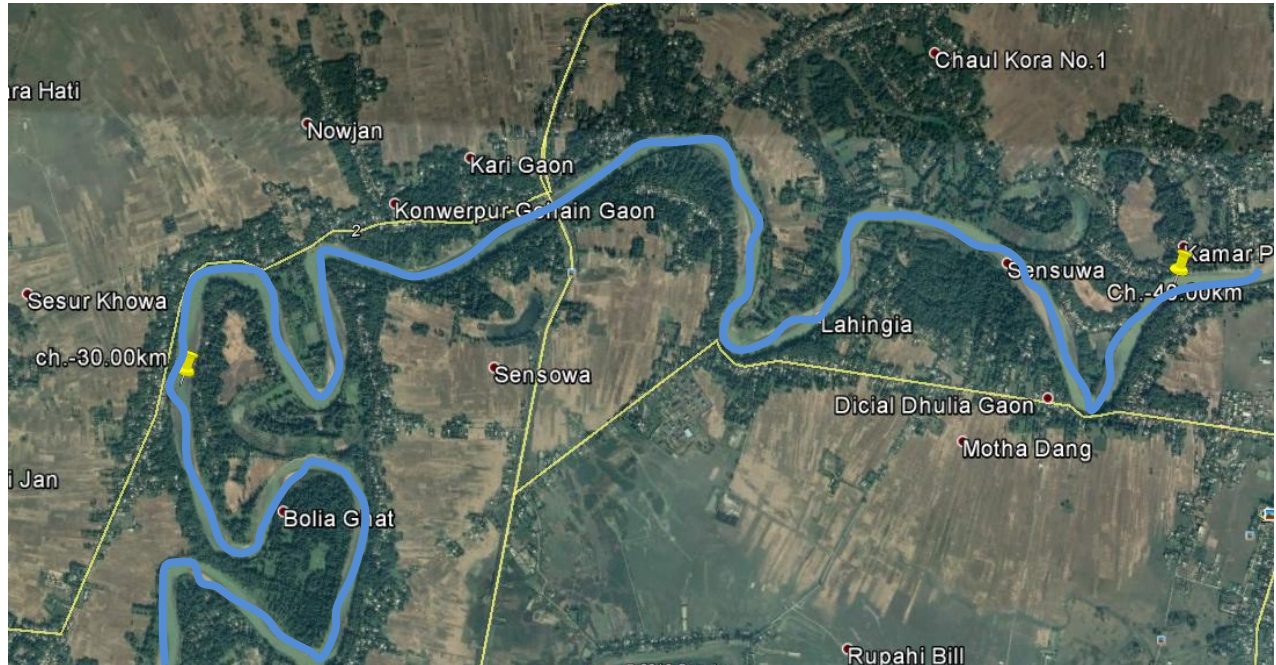
Class	Chainage (km)		Observed				Reduced w.r.t. Sounding Datum			
	From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)
I	20.00	30.00	0.51	9.5	10000	55390.06	-0.3	9.3	8100	65086.44
II	20.00	30.00	0.9	9.7	10000	131400.38	-0.3	9.5	8800	95036.89
III	20.00	30.00	0.6	9.9	10000	299291.35	-0.3	9.7	10000	286118.61
IV	20.00	30.00	0.6	9.9	10000	425746.31	-0.3	9.7	10000	607328.06



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**3.4 From Chainage 30.000 Km to Chainage 40.000 Km (Sesur Khowa village to Kamar Phodia village)**



**Figure 13 Chainage 30.00 km to Chainage 40.00 km**

The River width of Dikhu River from Chainage 30.00 km to Chainage 40.00km is approximately 95m to 100m. The average width portion of the river is 55m.

During the survey it was noticed that Konwerpur Gohain gaon village, Chaul Kora no-1 village, Nowjan village, Kari gaon village, kamar phodia village, Gara Kush village, Chaul kora no-1 village are situated left bank side of the river and Bolia ghat village, Sensowa village, Lahingia village, Dicial dhulia village, Motha dang village, Rupahi Bill village, Bon gaon village are situated right bank side of the river. A RCC Bridge has been situated near at chainage of 34.294km. The Bridge location is (Lat.-26°58'56.94"N, Long.-94°34'47.64"E). BM-4 is also situated near at chainage of 34.180km. NH-37 is located in this stretch of river.

Class	Chainage (km)		Observed				Reduced w.r.t. Sounding Datum			
	From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)
I	30.00	40.00	0.4	9.5	10000	87236.47	-0.3	9.5	10000	313949.75
II	30.00	40.00	0.3	9.5	10000	179323.7	-0.3	9.5	10000	492972.89
III	30.00	40.00	0.1	9.7	10000	363707.15	-0.3	9.6	10000	751640.87
IV	30.00	40.00	0.1	9.7	10000	502633.64	-0.3	9.6	10000	986521.84



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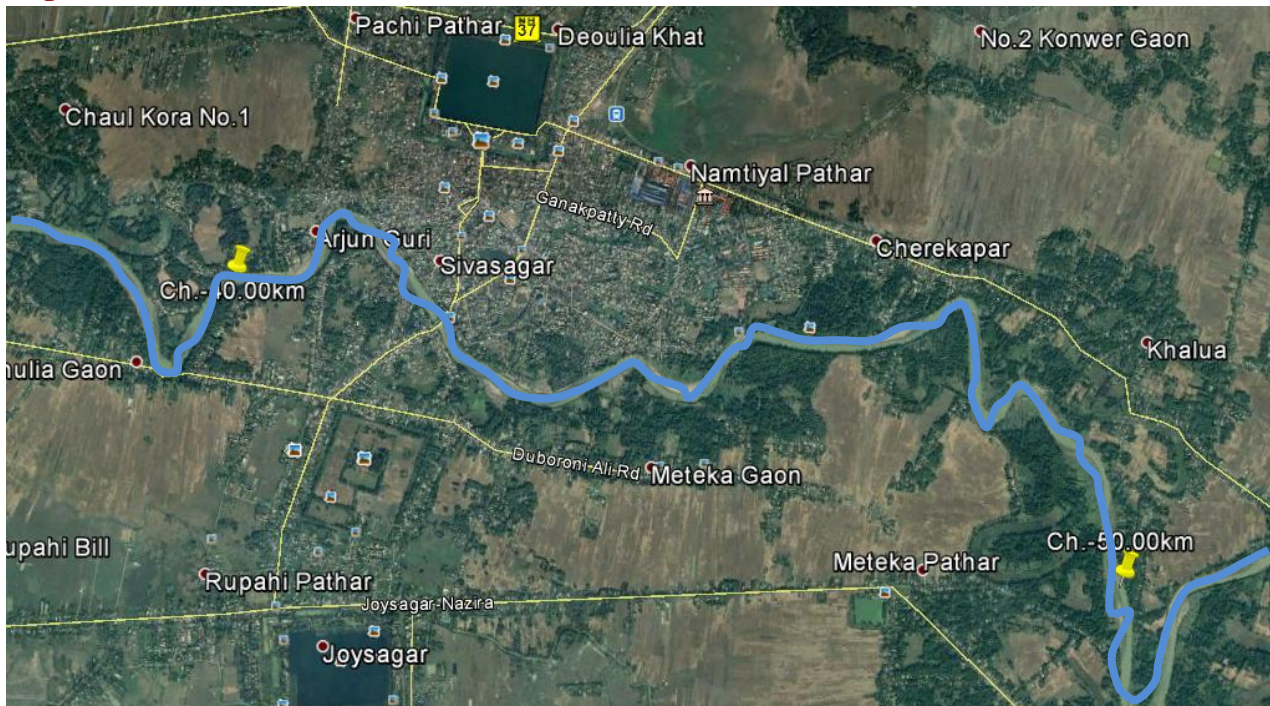
**Figure 14- RCC Bridge (Chainage-34.294 km)**



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**3.5 From Chainage 40.00 Km to Chainage 50.00 Km (Kamar Phodia village to Singha Duwar Grant village)**



**Figure 15- Chainage 40.00 km to Chainage 50.00 km**

The River width of Dikhu River from Chainage 40.00km to Chainage 50.00km is approximately 100m to 70m. The average width portion of the river is 55m.

During the survey it was noticed that Kamar Phodia village, Arjun Guri village, Pachy Pathar village, Sivasagar village, Phukan Nagar village, Cherekapar village, Khalua village are situated left bank side of the river and Hatikukh village, Meteka gaon village, Rupahi Pathar village, Sala Guria village, Kurula kotia village, Hatimuria village are situated right bank side of the river. Two RCC Bridge firstly named Dikhu steel Bridge has been situated near at chainage of 42.544km and the other RCC Bridge has been also situated near at chainage of 42.575km. The Steel Bridge’s location is (Lat.-26°58'33.86"N, Long.-94°37'48.93"E) and the RCC Bridge’s location is (Lat.-26°58'33.20"N, Long.-94°37'49.15"E). Both side plants have been also noticed during the survey.

Class	Chainage (km)		Observed				Reduced w.r.t. Sounding Datum			
	From	To	Min. dept h (m)	Max. dept h (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Min. Dept h (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)
I	40.00	50.00	0.21	5.91	10000	156392.11	-0.3	5.9	10000	359709.86
II	40.00	50.00	0.1	5.92	10000	292853.48	-0.3	5.91	10000	515786.27
III	40.00	50.00	0.1	5.93	10000	533405.44	-0.3	5.92	10000	860412.63
IV	40.00	50.00	0.1	5.93	10000	689682.03	-0.3	5.92	10000	992246.93





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**Figure 16- Dikhu Steel Bridge (Chainage-42.544 km)**



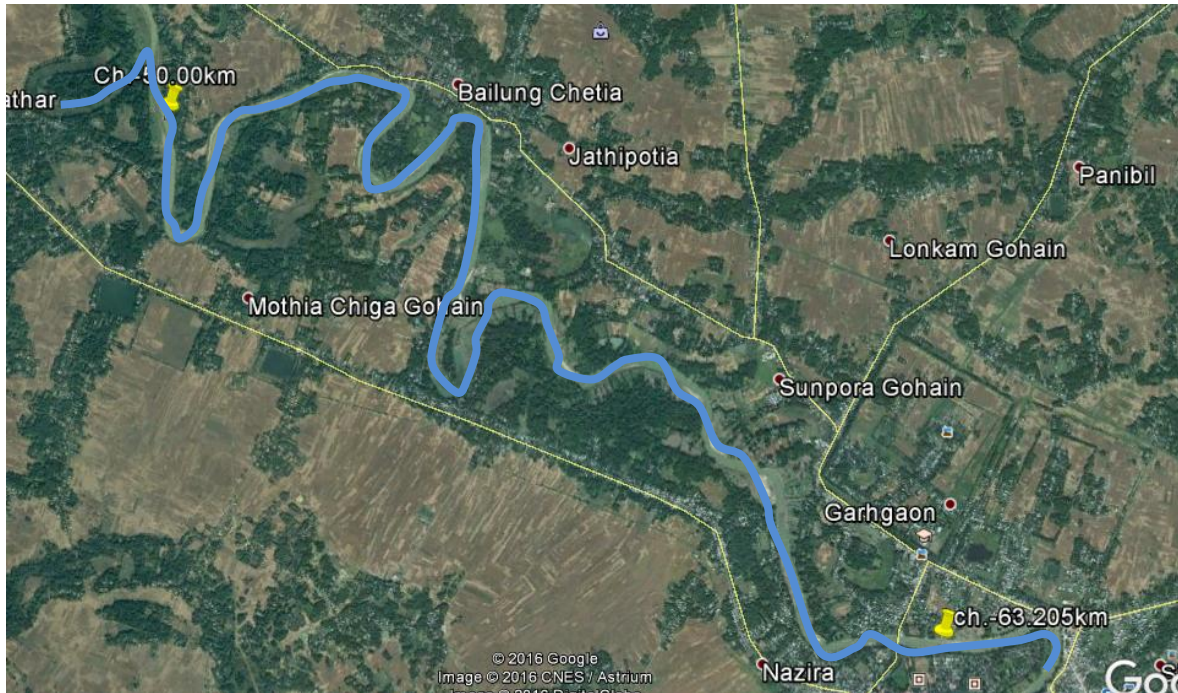
**Figure 17- RCC Bridge (Chainage- 42.575 km)**



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**3.6 From Chainage 50.00 Km to Chainage 63.205 Km (Singha Duwar Grant village to Nazira village)**



**Figure 18 Chainage 50.00 km to Chainage 63.205 km**

The River width of Dikhu River from Chainage 50.00km to Chainage 63.205 km is approximately 70m to 81m. Out of the total width, the average water portion of the river is 58m.

During the survey, it was noticed that BM-2 has been situated near at chainage of 50.746km right bank side of the river. BM-1 is also situated near at chainage of 63.115km left bank side of the river. Bailing Chetia village, Sunpora Gohain village, Jathipotia village, Labang village, Chetia village, garhgaon village, Khanikar village, Lonkam gohain village, Panibil village, Jathipotia village, Upper Namchai village are situated left bank side of the river and Haluwa Bhakot village, Bura Gohain village, Mothia Chiga Gohain village, Kujibali Habi village, Mola Gaon village, Mechagorh Gohain village, Nawholia village, Dihingia village, Na-Mati Gaon village, Borduwar Mukh village, Nazira village, Joykham-dang Khat gaon village are situated right bank side of the river. A RCC Bridge has been found near at chainage of 63.202km. The Bridge Position is (Lat-26°57'20.02"N, Long-94°40'57.39"E). A Bamboo Bridge has been also situated near at chainage of 50.703km. The Bamboo Bridge's location is - (Lat.-26°59'50.00"N, Long.-94°28'39.99"E).

Class	Chainage (km)		Observed				Reduced w.r.t. Sounding Datum			
	From	To	Min. dept h (m)	Max. dept h (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)	Min. Dept h (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cu.m.)
I	50.00	63.205	0.2	4.4	13000	174981.45	-0.3	4.2	13000	403676.28
II	50.00	63.205	0.01	4.6	13000	343263.34	-0.3	4.4	13000	658667.21
III	50.00	63.205	0.1	5.93	13000	646598.85	-0.3	4.6	13000	1004255.9
IV	50.00	63.205	0.01	4.8	13000	858273.16	-0.3	4.6	13000	622528.51



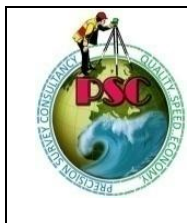
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**Figure 19 RCC Bridge (Chainage-63.202 km)**



**Figure 20-Bamboo Bridge (Chainage-50.703 km)**



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### 3.1 Hydrographic Survey

- **Bathymetry Survey**

**a) Length of the stretch for which the Bathymetric Survey has been carried out:-**

The layer of water in the river Dikhu is sufficient for carrying out the Bathymetric survey. The Stretch of the river has been carried out from the Chainage of 0.00 km to Chainage 63.205 km.

Date of Survey	Type of survey	Chainage	
		From (km)	To (km)
25.09.15	Bathymetry Survey	0.00	6.00
27.09.15	Bathymetry Survey	6.00	14.00
30.09.15	Bathymetry Survey	14.00	24.500
02.10.15	Bathymetry Survey	24.500	34.800
03.10.15	Bathymetry Survey	34.800	42.135
08.10.15	Bathymetry Survey	42.135	48.300
10.10.15	Bathymetry Survey	48.300	56.205
14.10.15	Bathymetry Survey	56.205	63.205

- **Topographic Survey**

**a) Length of the stretch for which the Topographic survey has been carried out:-**

The Topographic survey has been carried out from Brahmaputra confluence to Nazira Bridge. The length of the Topography Survey is near at Chainage of 0.00 km to Chainage 63.205km.

**a) Prominent Dams / Barrage:-**

There are no Dams, Barrage found in this zone of River.

**b) Tidal stretch, tidal range. Pondage stretch / length of Dam, Barrages, Weirs, Anicut, Locks:-**

There are no Dams, Barrages, weirs, Anicut; Locks are found in this zone of river.

**c) Conditions of banks (protected, un-protected):-**

Dikhu River annually bears the brunt of floods and where embankment construction and repairing seems like permanent affair. Displacement of people living on the banks of rivers due to river bank erosion is another major issue here. The tributaries continue to erode the banks rapidly. The River banks are constantly being changed by means of flood of very high magnitude, channel widening, and change in channel pattern and of river bank erosion. To protect the shore and its properties various methods are in use like, geobags filling with sand, porcupine (triangle shaped concrete structure), sand bags and boulder bags called Gabions are in use to strengthen the embankments. From near Dikhowmukh village at chainage 5 km to Goshkota village at chainage 9.00 km are protected by embankment and the RCC Bridges area are also be protected by Bolder Pitching. The Embankment and the Bolder pitching are needful some places for protecting the banks of the river and also prevent the soil erosion.



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**d) Hindrances - Hyacinth, rocks, rapid waterfalls, steep gradient, forest, wild-life sanctuary, security issues. Obstruction (if any) for navigation, e.g. fishing stakes:-**

Gibbon wild life sanctuary and the Panidehing Bird Sanctuary are situated near the riverside of Dikhu. In this portion of the river, the high Security has been declared due to dense Forest area and also for the wildlife animals.

**e) Details of Protected Area- Wildlife, Defence, Atomic Power Plants and any other issue attached to it:-**

Near the bank side of the river, the wild life like Gibon wild life sanctuary and the Panidehing Bird Sanctuary are situated. So forest side and Wildlife area have become Unapproachable and also defence its own states from another states or country.

**f) NH/SH/MDR along and/or within 5 km from the waterways:-**

NH-37, NH-61 is two major communications way near the river side. Besides, SH -1 is also communicative way for the local villagers.

**g) Railway Line and Stations in the vicinity:-**

No Railway lines are found in this zone of river. Sivsagar town Railway station is located far from the river side.

**h) Land Use Pattern along Waterway on visual assessment:-**

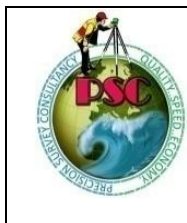
The major portion of the right bank of the river is occupied by agriculture. Major crops are rice, tea, mustard, sugarcane, black dhal, vegetables like, radish, cabbage, cauliflower, etc. The left bank mostly occupied with scattered forest area and agriculture. The most important forest products are timber, bamboo and firewood.

**i) Crops / Agriculture in the region on visual assessment:-**

The Major crops along the river is Paddy, jute, Tea, Rice, Wheat, Maize, Sorghum, gram, Millets, Sugarcane and Spices are cultivated here.

**j) Availability of Bulk / Construction Material:-**

The cement factories and the brick fields are located in this stretch of river. Besides, sand is available from the river. These materials are useful for the Building construction.



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**k) Existing Industries along Waterway with their types and details:-**

The state of Assam is not an industrially developed state and the position of Sivsagar district in industrial scenario of the state is insignificant. The district has four handloom training centres, three weavers' extension services units and three handloom production centres. ONGC Transport section is situated near Sivsagar area. The position of the ONGC is (Lat: - 26°59'4.68"N, Long: - 94°39'0.10"E). GGS-1, RDS is also situated in this zone of river and its position is-(Lat: - 26°57'13.02"N, Long:- 94°32'46.10"E).

**l) Existing Ghats, Jetties and Terminals (with conditions and facilities). Existing navigation facilities (if any):-**

The Jetty Services are available near at chainage of 0.750 km and 9.244 km. Dikho Mukh Ghat co-operates as a Ferry service which is helped to the native villagers and also for the tourist.

Sl no	Chainage (km)	Name of Ferry ghat	Easting	Northing	Latitude (N)	Longitude (E)	Remarks
1	0.750	Dikhumukh ferry ghat	645552.551	2987274.942	26°59'59.76"	94°28'0.98"	Temporary Jetty
2	9.244	Goshkota ferry ghat	649037.362	2986064.476	26°59'19.12"	94°30'6.86"	

**m) Existing Cargo Movement:-**

The Cargo movement is processed through waterways system. There are two passenger ferry services available in this zone of river near at chainage of 0.750 km and 9.244 km. There is no cargo available in this zone of river.

**n) Prominent City / Town / Places of Worship / Historical places for Tourism:-**

Gaurisagar, Sivsagar, Catholic Church in Kohima and Shiva Temple in Dimapur are the famous tourist worship place. Angling, Camping are also the tourist spot of Dikhu River.

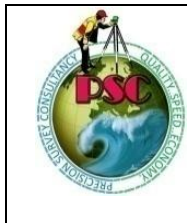
**o) Village / colonies along the sub-stretch and approx. Population:-**

Bihubar Village, Dikhowmukh Ghat Village, Goshkota Village, Mitong Village, Jagra Hati Village, Khalua Village, Meteka Pathar village etc. have been situated in this zone of river.

**p) Availability of Passenger Ferry Services and Recreational Facilities:-**

The Passenger Ferry Services are available near at chainage of 0.750 km and 9.244 km. Dikho Mukh Ghat and Goshkota ferry ghat co-operates as a Ferry service which is helped to the native villagers and also for the tourist.

Sl no	Chainage (km)	Name of Ferry ghat	Easting	Northing	Latitude (N)	Longitude (E)	Remarks
1	0.750	Dikhumukh ferry ghat	645552.551	2987274.942	26°59'59.76"	94°28'0.98"	Temporary Ferry
2	9.244	Goshkota ferry ghat	649037.362	2986064.476	26°59'19.12"	94°30'6.86"	



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**q) Available and probable Water Sport Recreational Facilities:-**

There are no water sport recreational facilities available in this zone of river.

**r) Fishing activities:-**

Dikhu River is the lifeline of the people of its important places for fishing culture. Dikhu provides diverse habitat in its downstream for living biota such as stream, riparian zones and wetlands etc. Dikhu has some of the richest riverine fisheries in India. Juliva Fishery is located near Sivsagar area. The river has over fish species and forms an important component of livelihood and nutritional security in the downstream stretches in Assam. The wetlands are ecologically and economically important for the local people. Fishing in Dikhu River is very famous among the people.

**s) Sand mining:-**

Illegal river sand mining across the country is on the rise for past many years in Indian, which results in adverse impact on river system and dependent communities. In Dikhu gravel mining was noticed during the survey period. Besides this, sand is also exported to other states as it becomes demandful for making Building or Industries.

**t) Tributaries:-**

The three streams create a river basin in this zone of river –

- i) Dikhu
- ii) Disang
- iii) Janji

**u) Details of Irrigation Canals and Outlets:-**

The Irrigation Canal and Outlets have been found near at chainage of 2km, 9.6km left bank side of the river.

**v) Details of Nalas. Polluted water discharge in to the rivers and treatment plants (if any):-**

No Nalas are found in this zone of river.

**w) Usage of water (drinking, irrigation, industries, navigation etc.) Water quality:-**

In Recent time's man avoid to drinking the water of the river but the water is essential for cultivation which is the main occupation for the villagers of this region. The water is also used in the industrial hubs. Ferry services are also navigable in this region of river. The water is used as irrigation purposes. With the help of the irrigation system, the cultivation can easily accessible. Irrigation Canals supply the sufficient water for the cultivation.



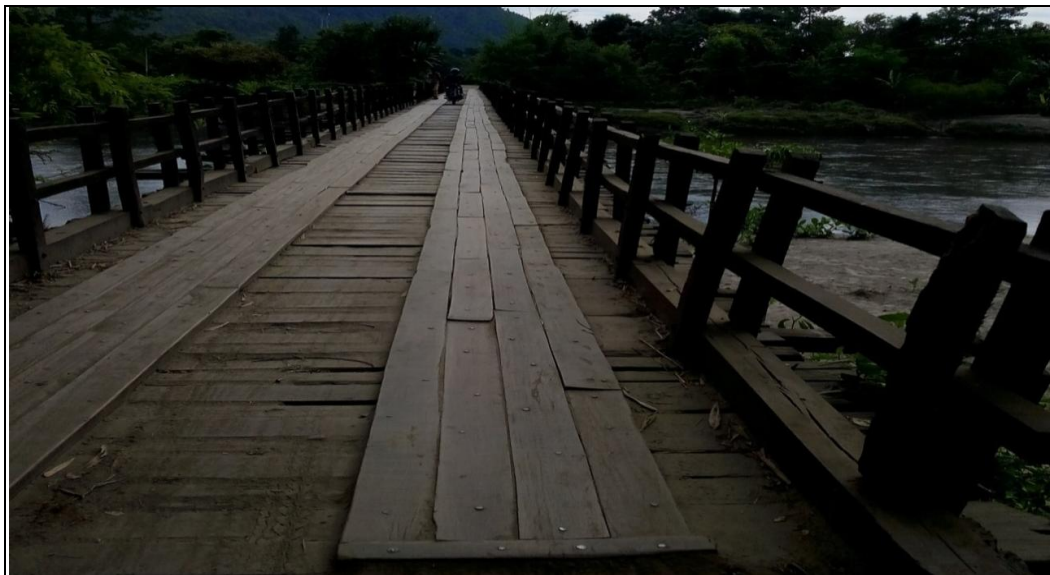
FINAL FEASIBILITY REPORT ON  
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**AA) Photographs of Cross structure in each stretch with description, location, Chainage, clearance and Conditions:-**



This Bamboo Bridge has been situated near at chainage of 4.019km at Goyal Goyan village. The Bridge position is (Lat.- 26°59'50.10"N, Long.-94°28'39.59"E).



This Wooden Bridge has been situated near at chainage of 17.277km at Mitong village. The Bridge position is (Lat.- 26°57'49.68"N, Long.-94°30'49.70"E).





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This RCC Bridge has been situated near at chainage of 34.294km at Kari Gaon village. The Bridge position is (Lat.- 26°58'56.94" N, Long.- 94°34'47.64"E). The bridge have a good horizontal and vertical clearance for the waterways development.



The Dikhu Steel Bridge has been situated near at chainage of 42.544km at Sivsagar Village. The Bridge position is- (Lat.-26°58'33.86"N, long.-94°37'48.93"E). The bridge have a good horizontal and vertical clearance for the waterways development.



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This RCC Bridge has been situated near at chainage of 42.575km at Sivsagar village. The Bridge position is (Lat.- 26°58'33.20"N, Long.- 94°37'49.15"E). The bridge has a good horizontal and vertical clearance for the waterways development.



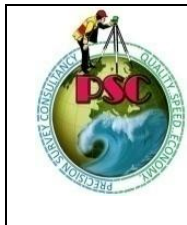
This Bamboo Bridge has been situated near at chainage of 50.703km at Metekapathar village. The Bridge position is (Lat.-26°57'20.02" N, Long.- 94°40'57.39"E).



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This RCC Bridge has been situated near at chainage of 63.202km at Nazira village. The Bridge position is (Lat.- 26°59'50.00"N, Long.- 94°28'39.99"E). The bridge has a good horizontal and vertical clearance for the waterways development.



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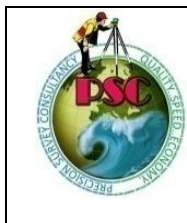


#### **Section 4: Terminals**

There is no existing terminal found in this zone of river.

##### **4.1 Details of Land use, owner etc.:-**

The both side banks of the River Dikhu used for cultivation. The bank of the river is also surrounded by small hills, dense forest etc. The Farmers are cultivated their crops with using this fertile land and grows a huge amount of crops every year. Besides, some portions of the land are surrounded by small industries and Forests. Though bolder pitching is found in some places, But in Recent times, the bank of the river has been worn away in some places for lack of trees. Sometimes, the land of the river has been changed into a heap of garbage. As a result, the river side becomes polluted land. In the Monsoon period, Flood and erosion has been affected both side of the river bank.



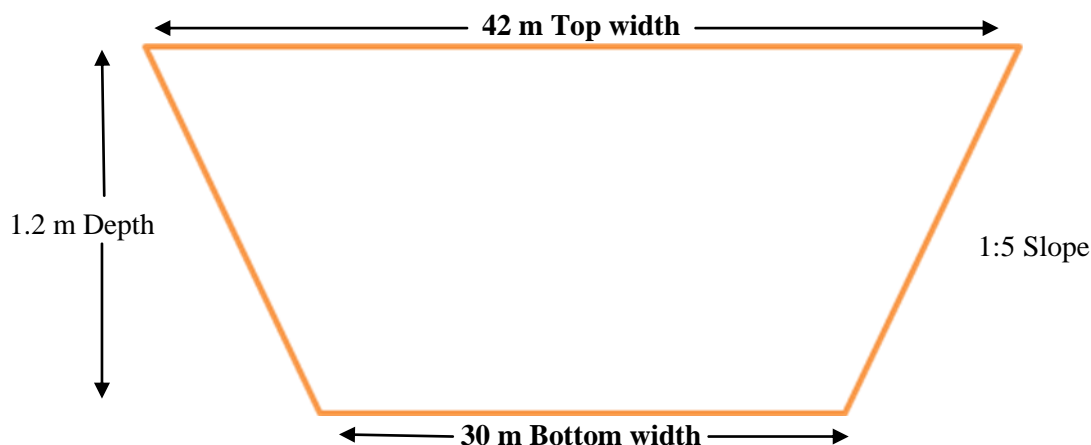
**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
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**Section 5: Fairway development:-**

**Dredging sections, summary of depths and dredging quantity for different classification of waterways (stretch-wise)**

**Class-I: - (Channel design: - Bottom width- 30 meter, Top width- 42 meter)**



**Class-I:-**

Location		Chainage (km)		As per Observed soundings						As per Reduced soundings					
From	To	From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)	Min. Depth (m)	Max Depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)
Brahmaputra Confluence	Dikhowmukh Village	0.00	10.00	1	7.9	7650	0.171	43210.83	43210.83	1.0	7.8	4250	0.07	10670.06	10670.06
Goshkota Village	Gaurisagar Village	10.00	20.00	1.1	11.0	8750	0.193	56056.95	99267.78	1	10.9	4450	0.06	10048.83	20718.89
Gaurisagar Village	Sesurkhowa Village	20.00	30.00	0.51	9.5	10000	0.167	55390.06	154657.84	-0.3	9.5	8100	0.243	65086.44	85805.33
Sesurkhowa Village	Kamarpodia Village	30.00	40.00	0.4	9.5	10000	0.264	87236.47	241894.31	-0.3	9.8	10000	0.950	313949.75	399755.08
Kamarpodia Village	Singhaduwar Grant	40.00	50.00	0.21	5.91	10000	0.473	156392.11	398286.42	-0.3	5.9	10000	1.08	359709.86	759464.94
Singhaduwar Grant	Nazira Village	50.00	63.205	0.2	4.4	13000	0.407	174981.45	573267.87	-0.3	4.2	13000	0.940	403676.26	1163141.20
Total						59400		573267.87		Total	49800			1163141.20	

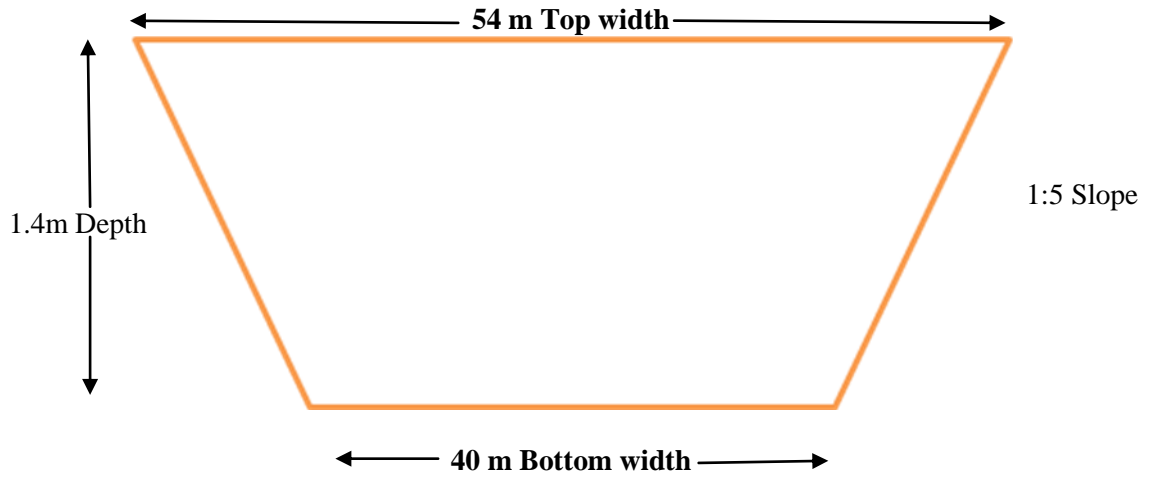
**Table 13- Minimum & Maximum depth of Class-I**



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**Class-II: - (Channel design: - Bottom width- 40 meter, Top width- 54 meter)**



Location		Chainage (km)		As per Observed soundings						As per Reduced soundings					
From	To	From	To	Min. depth (m)	Max depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)	Min Depth (m)	Max Depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)
Brahmaputra Confluence	Dikhomukh Village	0.00	10.00	1.0	8.0	9500	0.204	85610.53	85610.53	1.0	7.9	6300	0.105	29149.77	29149.77
Goshkota Village	Gaurisagar Village	10.00	20.00	1.1	11.1	10000	0.257	113188.12	198798.65	1.0	11.0	7600	0.098	32939.1	62088.87
Gaurisagar Village	Sesurkhowa Village	20.00	30.00	0.9	9.7	10000	0.298	131400.38	330199.03	-0.3	9.5	8800	0.245	95036.89	157125.76
Sesurkhowa Village	Kamarpodia Village	30.00	40.00	0.3	9.5	10000	0.407	179323.70	509522.73	-0.3	9.5	10000	1.120	492972.89	650098.65
Kamarpodia Village	Singhaduwar Grant	40.00	50.00	0.1	5.92	10000	0.665	292853.48	802376.21	-0.3	5.91	10000	1.172	515786.27	1165884.92
Singhaduwar Grant	Nazira Village	50.00	63.205	0.01	4.6	13000	0.599	343263.34	1145639.55	-0.3	4.4	13000	1.150	658667.21	1824552.13
Total						62500		1145639.55		Total		55700		1824552.13	

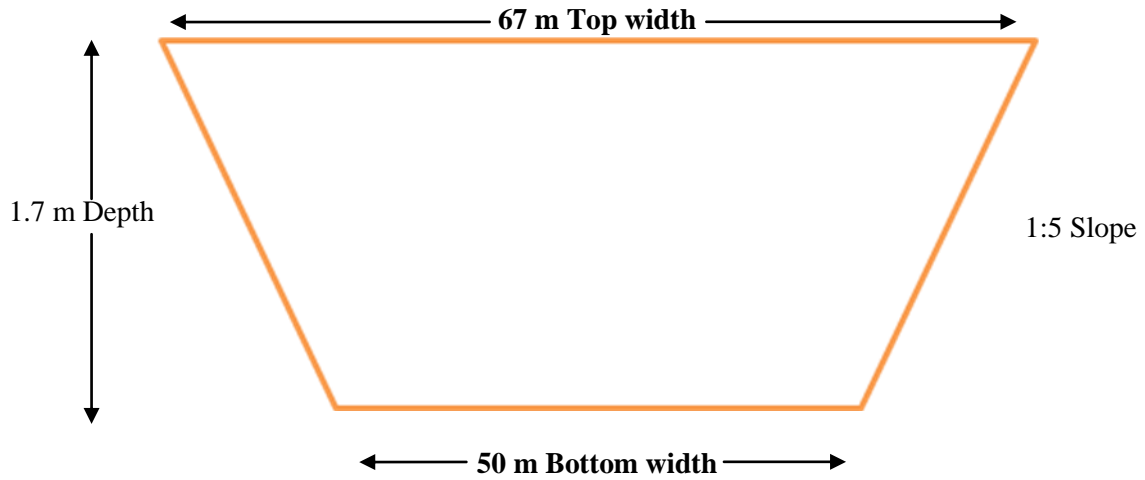
**Table 14- Minimum & Maximum depth of class-II**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**

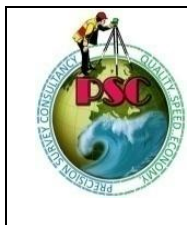


**Class-III: - (Channel design: - Bottom width- 50 meter, Top width- 67 meter)**



Location		Chainage (km)		As per Observed soundings						As per Reduced soundings					
From	To	From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)
Brahmaputra Confluence	Dikhow mukh Village	0.00	10.00	1.0	8.1	10000	0.304	167058.66	167058.66	1.0	8.0	9000	0.158	78307.37	78307.37
Goshkota Village	Gaurisagar Village	10.00	20.00	1.1	11.2	10000	0.435	239545.59	406604.25	1.0	11.1	10000	0.165	90574.47	168881.84
Gaurisagar Village	Sesurkhowa Village	20.00	30.00	0.6	9.9	10000	0.544	299291.35	705895.60	-0.3	9.7	10000	0.520	286118.61	455000.45
Sesurkhowa Village	Kamarpodia Village	30.00	40.00	0.1	9.7	10000	0.661	363707.20	1069602.80	-0.3	9.6	10000	1.366	751640.85	1206641.30
Kamarpodia Village	Singha Duwar Grant	40.00	50.00	0.1	5.93	10000	0.970	533405.40	1603008.20	-0.3	5.92	10000	1.564	860412.70	2067054.00
Singha Duwar Grant	Nazira Village	50.00	63.205	0.01	4.8	13000	0.904	646598.80	2249607.00	-0.3	4.6	13000	1.40	1004255.90	3071309.90
Total						63000		2249607.00		Total	62000		3071309.90		

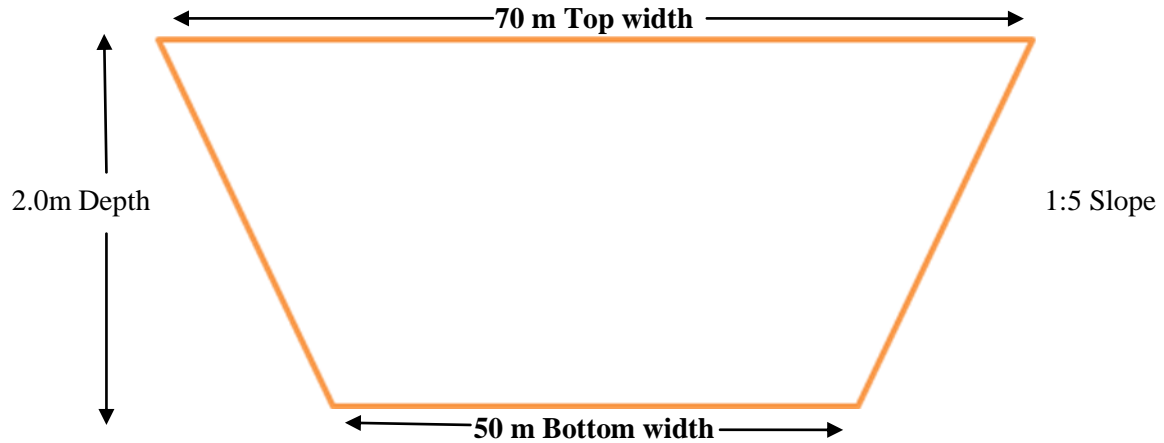
**Table 15- Minimum & Maximum depth of class-III**



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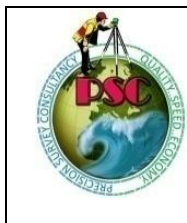
**Class-IV: - (Channel design: - Bottom width- 50 meter, Top width- 70 meter)**



Location		Chainage (km)		As per Observed soundings						As per Reduced soundings					
From	To	From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)	Min. Depth (m)	Max Depth (m)	Length of Shoal (m)	Avg Depth of Cut (m)	Dredging Qty. (cu.m.)	Accumulative Dredging Qty (cu.m)
Brahmaputra Confluence	Dikhow mukh Village	0.00	10.00	1.0	8.1	10000	0.431	237101.69	237101.69	1.0	8.1	10000	0.250	137699.26	137699.26
Goshkota Village	Gaurisagar Village	10.00	20.00	1.1	11.2	10000	0.619	340273.08	577374.77	1.0	11.1	10000	0.231	127193.07	264892.33
Gaurisagar Village	Sesurkhowa Village	20.00	30.00	0.6	9.9	10000	0.774	425746.33	1003121.10	-0.3	9.7	10000	1.104	607328.06	872220.39
Sesurkhowa Village	Kamarphodia Village	30.00	40.00	0.1	9.7	10000	0.914	502633.60	1505754.70	-0.3	9.6	10000	1.793	986521.81	1858742.20
Kamarphodia Village	Singha Duwar Grant	40.00	50.00	0.1	5.93	10000	1.254	689682.10	2195436.80	-0.3	5.92	10000	1.804	992247.00	2850989.20
Singha Duwar Grant	Nazira Village	50.00	63.205	0.01	4.8	13000	1.20	858273.10	3053709.90	-0.3	4.6	13000	0.870	622528.50	3473517.70
Total						63000		3053709.90		Total		63000		3473517.70	

**Table 16- Minimum & Maximum depth of class-IV**





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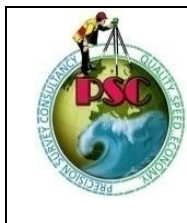
## Section 6: Conclusion

The surveyed stretch of Dikhu River is 63.205 km in length, originates from Nuroto hill area in zunheboto district. Longleng is the prime area near the bank side of this river where the agricultural field has been noticed. As much as 02 major and minor ferry services like Dikhow mukh Ferry service and Goshkota ferry service is being operated along the survey stretch by private concerns. Most of the rivers stretches are sometimes become bent curve which is shaped like-V. The bank of the river is well connected with roads and Railways. An RCC Bridge is located near at Kari Gaon which is linked with A.T.Road and Sivasagar Bypass. Dikhow steel Bridge is situated near at sivasagar town area. The communication system is easily moved in this zone through Dikhu steel bridge, RCC Bridges etc. Sivasagar town Railway station is also located in this zone of river. So Sivasagar area is always communicated very well by Railways and Roads. Another RCC Bridge is named as Dhodar Ali Road situated near at Nazira village which is linked with SH-1. Saraguri, Gosh kota, Sivasagar, Sungia, Boka Bill, Sri Puria, Koi Jan, Sensowa, Kari, gaon, Nazira, Arjunguri etc. villages are located in this zone of river.

NH-37, NH 61 is the major communication and transportation system in this zone of river. Sivasagar is one of the tourist places situated in this zone of river. Sivadol, Ajanpir Dargah, Garhgaon's Kareng ghar, Rang ghar etc. places are located near at Sivasagar. But there were lots of possibility to improve the cargo transportation by waterways and also by Railways.

### 6.1 Dredging Quantity:-

Class Details	Observed (cub.m)	Reduced (cub.m) w.r.t Sounding Datum
Class I	573267.87	1163141.22
Class II	1145639.55	1824552.13
Class III	2249607.00	3071309.90
Class IV	3053709.91	3473517.70



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**Annexure:-**

**Annexure-1 Source and type of data collected from various agencies:-**

The Chart Datum value and HFL values of Bihubar, Sivsagar and Confluence of Brahmaputra River have been provided by IWAI office.

**Annexure-2 Min. / max. depth, length of shoal per km-wise for different classification in the designed dredged channel:-**

**Class-I:**

Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)
0	1	1.1	5.71	1000	611.39	611.39	1.1	5.7	100	22.31	22.31
1	2	1.1	7.9	350	452.12	1063.51	1.1	7.8	100	6.88	29.19
2	3	1.01	5.2	500	634.06	1697.57	1	5.1	100	40.25	69.44
3	4	1	3.6	700	753.11	2450.68	1	3.5	100	60.00	129.44
4	5	1.1	7	1000	1294.69	3745.37	1	6.8	150	309.72	439.16
5	6	1.1	7	100	78.95	3824.32	1	6.8	100	26.93	466.09
6	7	1.1	5.1	1000	8645.07	12469.39	1	5	1000	2490.37	2956.46
7	8	1.1	6.21	1000	5430.86	17900.25	1	6.2	600	714.96	3671.42
8	9	1.1	3.4	1000	11946.48	29846.73	1	3.3	1000	1835.59	5507.01
9	10	1.1	3.4	1000	13364.10	43210.83	1	3.3	1000	5163.05	10670.06
10	11	1.1	7.9	1000	2014.85	45225.68	1	7.8	100	169.57	10839.63
11	12	1.1	8.3	1000	2634.54	47860.22	1	8.1	1000	1085.14	11924.77
12	13	1.1	8.3	1000	16575.06	64435.28	1	8.1	1000	6158.20	18082.97
13	14	1.1	6	150	283.28	64718.56	1.1	5.8	100	112.31	18195.28
14	15	1.1	9.5	1000	7069.32	71787.88	1.1	9.4	1000	1224.40	19419.68
15	16	1.1	8	600	716.55	72504.43	1	7.8	100	108.42	19528.10
16	17	1.1	11	1000	4838.43	77342.86	1	10.9	100	19.08	19547.18
17	18	1.1	5.9	1000	10829.67	88172.53	1	5.8	750	822.87	20370.05
18	19	1.1	6.8	1000	1804.21	89976.74	1.1	6.5	200	227.45	20597.50
19	20	1.1	6.3	1000	9291.04	99267.78	1	6.2	100	121.39	20718.89
20	21	1.1	6.6	1000	4286.60	103554.38	1.1	6.4	100	178.10	20896.99
21	22	1.1	8.9	1000	8000.01	111554.39	1	8.8	0	0.00	20896.99
22	23	1.1	7.1	1000	4754.84	116309.23	1	7	1000	4282.55	25179.54
23	24	1.1	9.5	1000	3944.46	120253.69	1	9.3	1000	3641.29	28820.83



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)
24	25	1	8.1	1000	3776.66	124030.35	1	8	1000	2920.87	31741.70
25	26	1	8.1	1000	3189.36	127219.71	1	8	1000	2448.87	34190.57
26	27	1	9.4	1000	5590.75	132810.46	1	9.2	1000	5059.42	39249.99
27	28	1	7.1	1000	10714.72	143525.18	1	6.9	1000	10264.02	49514.01
28	29	1	8.31	1000	2976.64	146501.82	1	8.3	1000	3142.97	52656.98
29	30	0.51	7.01	1000	8156.02	154657.84	-0.3	7	1000	33148.35	85805.33
30	31	0.6	5.7	1000	6037.82	160695.66	-0.3	5.5	1000	25609.01	111414.34
31	32	0.6	9.5	1000	4522.89	165218.55	-0.3	9.8	1000	25646.95	137061.29
32	33	0.6	9.5	1000	7390.83	172609.38	-0.3	9.4	1000	29044.91	166106.20
33	34	0.6	7	1000	15755.28	188364.66	-0.3	6.9	1000	43096.28	209202.48
34	35	0.41	4.8	1000	8344.12	196708.78	-0.3	4.7	1000	35932.90	245135.38
35	36	0.4	5.9	1000	5880.81	202589.59	-0.3	5.7	1000	37072.48	282207.86
36	37	0.6	6.21	1000	6062.73	208652.32	-0.3	6.2	1000	27198.91	309406.77
37	38	0.5	8.6	1000	7250.42	215902.74	-0.3	8.4	1000	41924.49	351331.26
38	39	0.51	2.2	1000	16341.26	232244.00	-0.3	1.8	1000	30933.49	382264.75
39	40	0.4	5.91	1000	9650.31	241894.31	-0.3	5.9	1000	17490.33	399755.08
40	41	0.3	5.91	1000	9776.99	251671.30	-0.3	5.9	1000	19232.11	418987.19
41	42	0.5	5.2	1000	23305.02	274976.32	-0.3	5.1	1000	35364.74	454351.93
42	43	0.8	2.3	1000	23509.66	298485.98	-0.3	0.6	1000	48007.13	502359.06
43	44	0.5	3.4	1000	16391.99	314877.97	-0.3	3.2	1000	38248.00	540607.06
44	45	0.4	3.9	1000	5251.16	320129.13	-0.3	3.8	1000	21329.42	561936.48
45	46	0.42	3.22	1000	22134.30	342263.43	-0.3	3.2	1000	50009.79	611946.27
46	47	0.5	1.2	1000	17723.73	359987.16	-0.3	0.6	1000	39975.58	651921.85
47	48	0.3	2.91	1000	15618.18	375605.34	-0.3	2.9	1000	39496.54	691418.39
48	49	0.4	3.4	1000	6482.66	382088.00	-0.3	3.2	1000	24443.05	715861.44
49	50	0.21	3.3	1000	16198.42	398286.42	-0.3	3.2	1000	43603.50	759464.94
50	51	0.3	1.3	1000	15032.69	413319.11	-0.3	0.7	1000	38073.51	797538.45
51	52	0.3	4.4	1000	18061.03	431380.14	-0.3	4.2	1000	43358.75	840897.20
52	53	0.2	1.2	1000	14559.77	445939.91	-0.3	0.8	1000	38145.20	879042.40
53	54	0.2	3.9	1000	6875.06	452814.97	-0.3	3.8	1000	21358.19	900400.59
54	55	0.2	3.9	1000	9954.62	462769.59	-0.3	3.8	1000	23911.12	924311.71
55	56	0.4	1.4	1000	12654.10	475423.69	-0.3	1.3	1000	27973.80	952285.51
56	57	0.3	1.5	1000	12386.80	487810.49	-0.3	1.3	1000	30373.14	982658.65
57	58	0.3	2.6	1000	8807.90	496618.39	-0.3	2.5	1000	23008.99	1005667.60



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)
58	59	0.3	3.91	1000	8376.90	504995.29	-0.3	3.9	1000	22090.52	1027758.20
59	60	0.2	3.91	1000	12075.42	517070.71	-0.3	3.9	1000	30481.71	1058239.90
60	61	0.2	0.9	1000	17849.15	534919.86	-0.3	0.5	1000	36588.40	1094828.30
61	62	0.2	0.9	1000	22087.48	557007.34	-0.3	0.7	1000	41959.05	1136787.30
62	63.205	0.2	1.4	1000	16260.53	573267.87	-0.3	1.2	1000	26353.90	1163141.20
Total				59400	573267.87		Total		49800	1163141.20	

**Table 17- Dredging Quantity for Class-I**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Class-II:**

Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)
0	1	1.1	5.71	1000	2009.96	2009.96	1.1	5.71	100	349.03	349.03
1	2	1.3	8	500	671.63	2681.59	1.4	7.9	0	0.00	349.03
2	3	1.01	5.3	1000	1052.98	3734.57	1	5.2	100	276.57	625.60
3	4	1	3.7	1000	1829.44	5564.01	1	3.6	100	208.91	834.51
4	5	1.1	7.2	1000	2920.47	8484.48	1	7	1000	1299.59	2134.10
5	6	1.1	7.2	1000	2301.21	10785.69	1	7	1000	1737.68	3871.78
6	7	1.1	5.2	1000	18395.32	29181.01	1	5.1	1000	7184.04	11055.82
7	8	1.1	6.22	1000	9760.61	38941.62	1	6.21	1000	1486.17	12541.99
8	9	1.1	3.5	1000	22926.42	61868.04	1	3.4	1000	8533.20	21075.19
9	10	1.1	3.5	1000	23742.49	85610.53	1	3.4	1000	8074.58	29149.77
10	11	1.1	8	1000	7546.65	93157.18	1	7.9	1000	5955.61	35105.38
11	12	1.1	8.5	1000	6918.94	100076.12	1	8.3	1000	3139.09	38244.47
12	13	1.1	8.5	1000	28681.40	128757.52	1	8.3	1000	8330.39	46574.86
13	14	1.1	6.2	1000	1605.40	130362.92	1.1	6	1000	4249.06	50823.92
14	15	1.1	9.6	1000	14297.28	144660.20	1.1	9.5	1000	4435.48	55259.40
15	16	1.1	8.2	1000	2388.56	147048.76	1	8	100	1580.88	56840.28
16	17	1.3	11.1	1000	9870.53	156919.29	1.4	11	0	0.00	56840.28
17	18	1.1	6	1000	19113.69	176032.98	1	5.9	1000	3207.47	60047.75
18	19	1.1	7.1	1000	4162.10	180195.08	1.1	6.8	1000	1259.91	61307.66
19	20	1.1	6.4	1000	18603.57	198798.65	1	6.3	500	781.21	62088.87
20	21	1.1	6.8	1000	10378.94	209177.59	1.1	6.6	1000	1544.79	63633.66
21	22	1.1	9	1000	17897.63	227075.22	1	8.9	250	524.96	64158.62
22	23	1.1	7.2	1000	9972.24	237047.46	1	7.1	550	804.07	64962.69
23	24	1.1	9.7	1000	11512.86	248560.32	1	9.5	1000	14160.24	79122.93
24	25	1	8.2	1000	10000.32	258560.64	1	8.1	1000	9914.29	89037.22
25	26	1	8.2	1000	10947.21	269507.85	1	8.1	1000	9952.19	98989.41
26	27	1	9.4	1000	13282.84	282790.69	1	9.4	1000	7598.07	106587.48
27	28	1	7.1	1000	23559.62	306350.31	1	7.1	1000	17763.42	124350.90
28	29	1	8.31	1000	7381.88	313732.19	1	8.3	1000	17187.83	141538.73
29	30	0.9	7.01	1000	16466.84	330199.03	-0.3	7.01	1000	15587.03	157125.76
30	31	0.6	5.7	1000	12422.48	342621.51	-0.3	5.7	1000	58775.64	215901.40
31	32	0.6	9.5	1000	10456.21	353077.72	-0.3	9.3	1000	33897.33	249798.73
32	33	0.6	9.5	1000	14729.65	367807.37	-0.3	9.5	1000	39087.97	288886.70
33	34	0.6	7	1000	28577.31	396384.68	-0.3	7	1000	29301.31	318188.01



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)
34	35	0.41	4.8	1000	16477.45	412862.13	-0.3	4.8	1000	72068.32	390256.33
35	36	0.4	5.9	1000	16312.88	429175.01	-0.3	5.9	1000	49966.79	440223.12
36	37	0.4	6.22	1000	13672.90	442847.91	-0.3	6.21	1000	56915.14	497138.26
37	38	0.3	8.8	1000	15986.85	458834.76	-0.3	8.6	1000	49767.86	546906.12
38	39	0.5	2.4	1000	31280.20	490114.96	-0.3	1.9	1000	57950.23	604856.35
39	40	0.3	5.92	1000	19407.77	509522.73	-0.3	5.91	1000	45242.30	650098.65
40	41	0.2	5.92	1000	20786.49	530309.22	-0.3	5.91	1000	30247.50	680346.15
41	42	0.3	5.3	1000	39114.95	569424.17	-0.3	5.2	1000	35427.61	715773.76
42	43	0.7	2.4	1000	42261.48	611685.65	-0.3	0.8	1000	53579.03	769352.79
43	44	0.3	3.6	1000	29663.37	641349.02	-0.3	3.4	1000	67318.93	836671.72
44	45	0.3	4	1000	12079.75	653428.77	-0.3	3.9	1000	60185.89	896857.61
45	46	0.4	3.24	1000	40429.55	693858.32	-0.3	3.22	1000	36793.23	933650.84
46	47	0.4	1.4	1000	32146.68	726005.00	-0.3	0.8	1000	63041.86	996692.70
47	48	0.29	2.92	1000	28504.98	754509.98	-0.3	2.91	1000	68615.51	1065308.21
48	49	0.3	3.6	1000	15644.86	770154.84	-0.3	3.4	1000	55708.48	1121016.69
49	50	0.1	3.4	1000	32221.37	802376.21	-0.3	3.3	1000	44868.23	1165884.92
50	51	0.1	1.4	1000	28228.01	830604.22	-0.3	0.9	1000	56103.22	1221988.14
51	52	0.2	4.6	1000	32558.78	863163.00	-0.3	4.4	1000	71104.91	1293093.05
52	53	0.1	1.3	1000	29283.93	892446.93	-0.3	0.9	1000	56336.44	1349429.49
53	54	0.1	4	1000	16698.65	909145.58	-0.3	3.9	1000	59220.22	1408649.71
54	55	0.1	4	1000	20309.70	929455.28	-0.3	3.9	1000	33581.47	1442231.18
55	56	0.3	1.5	1000	23198.38	952653.66	-0.3	1.4	1000	32162.90	1474394.08
56	57	0.3	1.7	1000	26143.15	978796.81	-0.3	1.5	1000	41028.43	1515422.51
57	58	0.3	2.7	1000	17985.65	996782.46	-0.3	2.6	1000	55978.63	1571401.14
58	59	0.01	3.92	1000	21222.10	1018004.60	-0.3	3.91	1000	39937.60	1611338.74
59	60	0.01	3.92	1000	27925.51	1045930.10	-0.3	3.91	1000	31583.87	1642922.61
60	61	0.2	1.1	1000	32614.35	1078544.40	-0.3	0.7	1000	51582.34	1694504.95
61	62	0.2	1.1	1000	38968.42	1117512.80	-0.3	0.9	1000	46547.97	1741052.92
62	63.205	0.2	1.6	1000	28126.71	1145639.60	-0.3	1.4	1000	83499.21	1824552.13
Total				62500	1145639.55		Total		55700	1824552.13	

**Table 18- Dredging Quantity for Class-II**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Class-III:**

Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)
0	1	1.1	5.73	1000	7102.95	7102.95	1.1	5.72	1000	1576.15	1576.15
1	2	1.1	8.1	1000	2122.21	9225.16	1.1	8	550	679.40	2255.55
2	3	1.01	5.4	1000	1723.84	10949.00	1	5.3	450	485.77	2741.32
3	4	1	3.8	1000	5466.87	16415.87	1	3.7	1000	1131.30	3872.62
4	5	1.1	7.4	1000	5490.93	21906.80	1	7.2	1000	3488.98	7361.60
5	6	1.1	7.4	1000	9550.98	31457.78	1	7.2	1000	5900.57	13262.17
6	7	1.1	5.3	1000	34138.40	65596.18	1	5.2	1000	17967.99	31230.16
7	8	1.1	6.23	1000	17905.74	83501.92	1	6.22	1000	7676.41	38906.57
8	9	1.1	3.6	1000	43521.08	127023.00	1	3.5	1000	19728.98	58635.55
9	10	1.1	3.6	1000	40035.66	167058.66	1	3.5	1000	19671.82	78307.37
10	11	1.1	8.1	1000	20906.77	187965.43	1	8	1000	11650.68	89958.05
11	12	1.1	8.7	1000	18085.80	206051.23	1	8.5	1000	11821.53	101779.58
12	13	1.1	8.7	1000	50116.15	256167.38	1	6.2	1000	23582.83	125362.41
13	14	1.1	6.4	1000	8721.90	264889.28	1.1	6.2	1000	6014.72	131377.13
14	15	1.1	9.7	1000	29245.18	294134.46	1.1	9.6	1000	15418.79	146795.92
15	16	1.1	8.4	1000	10432.74	304567.20	1	8.2	1000	3743.44	150539.36
16	17	1.1	11.2	1000	20785.77	325352.97	1	11.1	1000	4058.24	154597.60
17	18	1.1	6.1	1000	34512.04	359865.01	1	6	1000	8361.81	162959.41
18	19	1.1	7.4	1000	11760.00	371625.01	1.1	7.1	1000	2470.00	165429.41
19	20	1.1	6.5	1000	34979.24	406604.25	1	6.4	1000	3452.43	168881.84
20	21	1.1	7	1000	24778.74	431382.99	1.1	6.8	1000	5183.54	174065.38
21	22	1.1	9.1	1000	38033.51	469416.50	1	9	1000	6751.40	180816.78
22	23	1.1	7.3	1000	22425.38	491841.88	1	7.2	1000	18514.28	199331.06
23	24	1.1	9.9	1000	26497.88	518339.76	1	9.7	1000	26465.70	225796.76
24	25	1	8.3	1000	26071.71	544411.47	1	8.2	1000	25330.31	251127.07
25	26	1	8.3	1000	31390.51	575801.98	1	8.2	1000	32150.37	283277.44
26	27	1	9.8	1000	30534.78	606336.76	1	9.6	1000	31545.71	314823.15
27	28	1	7.5	1000	48344.72	654681.48	1	7.3	1000	51373.14	366196.29
28	29	0.66	8.33	1000	18975.46	673656.94	0.5	8.32	1000	21319.91	387516.20
29	30	0.6	7.03	1000	32238.66	705895.60	-0.3	7.02	1000	67484.25	455000.45
30	31	0.3	6.1	1000	24543.91	730439.51	-0.3	5.9	1000	60512.92	515513.37
31	32	0.3	9.7	1000	24674.30	755113.81	-0.3	9.5	1000	60424.56	575937.93
32	33	0.4	9.7	1000	27218.07	782331.88	-0.3	9.6	1000	61645.07	637583.00



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)
33	34	0.2	7.2	1000	52419.24	834751.12	-0.3	7.1	1000	92153.76	729736.76
34	35	0.2	5	1000	35938.32	870689.44	-0.3	4.9	1000	87287.56	817024.32
35	36	0.2	6.3	1000	39382.40	910071.84	-0.3	6.1	1000	96744.30	913768.62
36	37	0.2	6.23	1000	29150.00	939221.84	-0.3	6.22	1000	65120.52	978889.14
37	38	0.1	9	1000	36246.23	975468.07	-0.3	8.8	1000	93953.02	1072842.20
38	39	0.4	2.6	1000	56582.13	1032050.20	-0.3	2	1000	81192.96	1154035.10
39	40	0.2	5.93	1000	37552.55	1069602.80	-0.3	5.92	1000	52606.20	1206641.30
40	41	0.1	5.93	1000	44371.17	1113973.90	-0.3	5.92	1000	64572.23	1271213.60
41	42	0.1	5.4	1000	62028.00	1176001.90	-0.3	5.3	1000	78922.76	1350136.30
42	43	0.6	2.5	1000	72141.75	1248143.70	-0.3	1	1000	104055.53	1454191.80
43	44	0.1	3.8	1000	51062.43	1299206.10	-0.3	3.6	1000	83178.64	1537370.50
44	45	0.1	4.1	1000	30118.71	1329324.80	-0.3	4	1000	64832.76	1602203.20
45	46	0.38	3.26	1000	70532.70	1399857.50	-0.3	3.24	1000	109488.87	1711692.10
46	47	0.2	1.6	1000	55214.13	1455071.60	-0.3	1	1000	88713.70	1800405.80
47	48	0.1	3	1000	50764.37	1505836.00	-0.3	2.92	1000	89047.04	1889452.90
48	49	0.1	3.8	1000	35351.82	1541187.80	-0.3	3.6	1000	70493.40	1959946.30
49	50	0.1	3.5	1000	61820.36	1603008.20	-0.3	3.4	1000	107107.70	2067054.00
50	51	0.1	1.6	1000	50483.24	1653491.40	-0.3	1.1	1000	88435.80	2155489.80
51	52	0.1	4.8	1000	57386.15	1710877.60	-0.3	4.6	1000	98294.92	2253784.70
52	53	0.1	1.4	1000	56420.91	1767298.50	-0.3	1	1000	90101.34	2343886.00
53	54	0.1	4.1	1000	37942.66	1805241.20	-0.3	4	1000	62622.21	2406508.20
54	55	0.1	4.1	1000	40474.75	1845715.90	-0.3	4	1000	63559.57	2470067.80
55	56	0.2	1.6	1000	42390.00	1888105.90	-0.3	1.5	1000	68399.24	2538467.00
56	57	0.1	1.9	1000	50040.96	1938146.90	-0.3	1.7	1000	76776.10	2615243.10
57	58	0.3	2.8	1000	36083.34	1974230.20	-0.3	2.7	1000	58905.74	2674148.90
58	59	0.01	3.93	1000	46935.79	2021166.00	-0.3	3.92	1000	69697.18	2743846.10
59	60	0.01	3.93	1000	57295.84	2078461.80	-0.3	3.92	1000	86627.46	2830473.50
60	61	0.2	1.3	1000	59238.06	2137699.90	-0.3	0.9	1000	88131.11	2918604.60
61	62	0.2	1.3	1000	64909.02	2202608.90	-0.3	1.1	1000	91374.08	3009978.70
62	63.205	0.2	1.8	1000	46998.13	2249607.00	-0.3	1.6	1000	61331.16	3071309.90
Total				63000	2249607.00		Total		62000	3071309.90	

**Table 19- Dredging Quantity for class III**





**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Class-IV:**

Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty.(cubic meter)	Cumulative Dredging Qty. (cubic meter)
0	1	1.1	5.73	1000	12249.18	12249.18	1.1	5.72	1000	3817.64	3817.64
1	2	1.1	8.1	1000	2605.18	14854.36	1.1	8	1000	1080.70	4898.34
2	3	1.01	5.4	1000	3375.10	18229.46	1	5.3	1000	1149.34	6047.68
3	4	1	3.8	1000	9612.59	27842.05	1	3.7	1000	3071.83	9119.51
4	5	1.1	7.4	1000	8323.07	36165.12	1	7.2	1000	9074.69	18194.20
5	6	1.1	7.4	1000	16551.44	52716.56	1	7.2	1000	27972.48	46166.68
6	7	1.1	5.3	1000	47492.33	100208.89	1	5.2	1000	13048.26	59214.94
7	8	1.1	6.23	1000	24693.56	124902.45	1	6.22	1000	31608.17	90823.11
8	9	1.1	3.6	1000	58527.03	183429.48	1	3.5	1000	29927.79	120750.90
9	10	1.1	3.6	1000	53672.21	237101.69	1	3.5	1000	16948.36	137699.26
10	11	1.1	8.1	1000	31219.07	268320.76	1	8	1000	18080.73	155779.99
11	12	1.1	8.7	1000	27268.36	295589.12	1	8.5	1000	37178.40	192958.39
12	13	1.1	8.7	1000	67683.57	363272.69	1	6.2	1000	9123.37	202081.76
13	14	1.1	6.4	1000	14917.60	378190.29	1.1	6.2	1000	22912.65	224994.41
14	15	1.1	9.7	1000	39925.56	418115.85	1.1	9.6	1000	5931.86	230926.27
15	16	1.1	8.4	1000	17619.14	435734.99	1	8.2	1000	6258.03	237184.30
16	17	1.1	11.2	1000	30308.95	466043.94	1	11.1	1000	12356.96	249541.26
17	18	1.1	6.1	1000	46593.90	512637.84	1	6	1000	2997.02	252538.28
18	19	1.1	7.4	1000	17945.61	530583.45	1.1	7.1	1000	4854.84	257393.12
19	20	1.1	6.5	1000	46791.32	577374.77	1	6.4	1000	7499.21	264892.33
20	21	1.1	7	1000	36638.46	614013.23	1.1	6.8	1000	26238.94	291131.27
21	22	1.1	9.1	1000	52256.73	666269.96	1	9	1000	37767.39	328898.66
22	23	1.1	7.3	1000	32085.24	698355.20	1	7.2	1000	47843.10	376741.76
23	24	1.1	9.9	1000	38666.96	737022.16	1	9.7	1000	44557.58	421299.34
24	25	1	8.3	1000	38628.01	775650.17	1	8.2	1000	30093.26	451392.60
25	26	1	8.3	1000	46813.64	822463.81	1	8.2	1000	83054.66	534447.26
26	27	1	9.8	1000	43360.80	865824.61	1	9.6	1000	75523.35	609970.61
27	28	1	7.5	1000	63953.50	929778.11	1	7.3	1000	75618.29	685588.90
28	29	0.66	8.33	1000	27213.72	956991.83	0.5	8.32	1000	74589.29	760178.19
29	30	0.6	7.03	1000	46129.25	1003121.10	-0.3	7.02	1000	112042.20	872220.39
30	31	0.3	6.1	1000	35491.70	1038612.80	-0.3	5.9	1000	106146.30	978366.69
31	32	0.3	9.7	1000	37378.89	1075991.70	-0.3	9.5	1000	117814.00	1096180.70
32	33	0.4	9.7	1000	37514.56	1113506.20	-0.3	9.6	1000	80629.22	1176809.90
33	34	0.2	7.2	1000	69628.53	1183134.80	-0.3	7.1	1000	113477.60	1290287.50

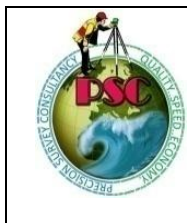


**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (km)		As per Observed Soundings					As per Reduced Soundings				
From	To	Min. depth (m)	Max. depth (m)	Length of Shoal (m)	Dredging Qty. (cubic meter)	Cumulative Dredging Qty. (cubic meter)	Min. Depth (m)	Max. Depth (m)	Length of Shoal (m)	Dredging Qty.(cubic meter)	Cumulative Dredging Qty. (cubic meter)
34	35	0.2	5	1000	50165.72	1233300.50	-0.3	4.9	1000	99368.31	1389655.80
35	36	0.2	6.3	1000	56983.79	1290284.30	-0.3	6.1	1000	66179.95	1455835.80
36	37	0.2	6.23	1000	40719.16	1331003.40	-0.3	6.22	1000	95232.47	1551068.20
37	38	0.1	9	1000	51636.65	1382640.10	-0.3	8.8	1000	98261.72	1649330.00
38	39	0.4	2.6	1000	73584.80	1456224.90	-0.3	2	1000	80700.77	1730030.70
39	40	0.2	5.93	1000	49529.84	1505754.70	-0.3	5.92	1000	128711.50	1858742.20
40	41	0.1	5.93	1000	59956.70	1565711.40	-0.3	5.92	1000	104340.70	1963082.90
41	42	0.1	5.4	1000	77578.79	1643290.20	-0.3	5.3	1000	106736.20	2069819.10
42	43	0.6	2.5	1000	91544.31	1734834.50	-0.3	1	1000	87880.49	2157699.60
43	44	0.1	3.8	1000	64277.88	1799112.40	-0.3	3.6	1000	129144.90	2286844.50
44	45	0.1	4.1	1000	42071.24	1841183.60	-0.3	4	1000	106123.90	2392968.40
45	46	0.38	3.26	1000	88656.20	1929839.80	-0.3	3.24	1000	117392.60	2510361.00
46	47	0.2	1.6	1000	69294.39	1999134.20	-0.3	1	1000	80713.89	2591074.90
47	48	0.1	3	1000	65754.90	2064889.10	-0.3	2.92	1000	80074.43	2671149.30
48	49	0.1	3.8	1000	49104.64	2113993.80	-0.3	3.6	1000	84886.55	2756035.90
49	50	0.1	3.5	1000	81442.98	2195436.80	-0.3	3.4	1000	94953.27	2850989.20
50	51	0.1	1.6	1000	65451.23	2260888.00	-0.3	1.1	1000	74426.76	2925415.90
51	52	0.1	4.8	1000	73861.01	2334749.00	-0.3	4.6	1000	89195.17	3014611.10
52	53	0.1	1.4	1000	75434.77	2410183.80	-0.3	1	1000	108131.30	3122742.40
53	54	0.1	4.1	1000	54131.09	2464314.90	-0.3	4	1000	107919.50	3230661.90
54	55	0.1	4.1	1000	54708.03	2519022.90	-0.3	4	1000	109948.30	3340610.20
55	56	0.2	1.6	1000	56783.20	2575806.10	-0.3	1.5	1000	73692.54	3414302.70
56	57	0.1	1.9	1000	67043.64	2642849.70	-0.3	1.7	1000	3817.64	3418120.40
57	58	0.3	2.8	1000	49795.34	2692645.10	-0.3	2.7	1000	1080.70	3419201.10
58	59	0.01	3.93	1000	64818.88	2757463.90	-0.3	3.92	1000	1149.34	3420350.40
59	60	0.01	3.93	1000	77112.38	2834576.30	-0.3	3.92	1000	3071.83	3423422.20
60	61	0.2	1.3	1000	77725.32	2912301.60	-0.3	0.9	1000	9074.69	3432496.90
61	62	0.2	1.3	1000	82515.20	2994816.80	-0.3	1.1	1000	27972.48	3460469.40
62	63.21	0.2	1.8	1000	58893.07	3053709.90	-0.3	1.6	1000	13048.26	3473517.70
Total				63000	3053709.90		Total		63000	3473517.70	

Table 20- Dredging Quantity for Class IV



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Annexure-3 Observed depth at 200 m interval:-**

Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
0	2.1	3.2	2	3.3	1.9	3.4	1.9	3.4
200	2.5	3	2.3	3.2	2.1	3.4	2.1	3.4
400	2.4	2.7	2.1	3	1.8	3.3	1.8	3.3
600	2.1	3	2	3.1	1.9	3.2	1.9	3.2
800	2.21	5.71	2.2	5.72	2.19	5.73	2.19	5.73
1000	1.1	1.9	1	2.1	1	2.3	1	2.3
1200	4.5	7.9	4.4	8	4.3	8.1	4.3	8.1
1400	3.1	7.2	3	7.3	2.9	7.4	2.9	7.4
1600	1.2	1.5	1.1	1.6	1	1.7	1	1.7
1800	1.1	1.51	1	1.52	1	1.53	0.89	1.53
2000	1.1	1.6	1.1	1.8	1.1	2	1.1	2
2200	1.4	5.2	1.3	5.3	1.2	5.4	1.2	5.4
2400	1.01	2.41	1	2.42	1	2.43	1	2.43
2600	2.1	3.4	2	3.5	1.9	3.6	1.9	3.6
2800	2.3	3.6	2.1	3.8	1.9	4	1.9	4
3000	1.3	2.6	1	2.9	1	3.2	1	3.2
3200	1.9	3.6	1.8	3.7	1.7	3.8	1.7	3.8
3400	1.8	2.9	1.7	3	1.6	3.1	1.6	3.1
3600	1	1.6	1	1.8	1	2	1	2
3800	1.2	2.2	1.1	2.3	1	2.4	1	2.4
4000	1.1	3	1	3.1	1	3.2	1	3.2
4200	1.2	2.3	1.1	2.3	1.1	2.3	1.1	2.3
4400	1.1	1.6	1.1	1.2	1	1.4	1	1.4
4600	3.21	4.41	3.2	4.42	3.19	4.43	3.19	4.43
4800	2.2	4.2	2.1	4.3	2	4.4	2	4.4
5000	5.5	7	5.3	7.2	5.1	7.4	5.1	7.4
5200	2.4	3	2.2	3.2	2	3.4	2	3.4
5400	3	3.5	2.8	3.7	2.6	3.9	2.6	3.9
5600	3.2	5	3.1	5.1	3	5.2	3	5.2
5800	2.11	3.21	2.1	3.22	2.09	3.23	2.09	3.23
6000	1.1	3.3	1	3.4	1	3.5	1	3.5
6200	2.8	5.1	2.7	5.2	2.6	5.3	2.6	5.3
6400	1.1	1.51	1	1.52	1	1.53	1	1.53
6600	1.1	1.1	1	1.3	1	1.5	1	1.5



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
6800	1.1	1.3	1.1	1.3	1.1	1.3	1.1	1.3
7000	1.1	1.5	1	1.5	1	1.5	1	1.5
7200	2	4.3	1.9	4.4	1.8	4.5	1.8	4.5
7400	5.4	5.7	5.2	5.9	5	6.1	5	6.1
7600	5.11	6.21	5.1	6.22	5.09	6.23	5.09	6.23
7800	1.21	5.21	1.2	5.22	1.19	5.23	1.19	5.23
8000	1.1	1.1	1	1.3	1	1.5	1	1.5
8200	1.1	1.21	1	1.22	1	1.23	1	1.23
8400	1.2	1	1.1	1.2	1	1.4	1	1.4
8600	1.1	1.21	1	1.22	1	1.23	1	1.23
8800	1.2	1.5	1.1	1.8	1	2.1	1	2.1
9000	1.8	3.4	1.7	3.5	1.6	3.6	1.6	3.6
9200	1.6	2.5	1.4	2.7	1.2	2.9	1.2	2.9
9400	1.1	3.3	1.1	3.4	1.1	3.5	1.1	3.5
9600	1.2	1.4	1.1	1.6	1	1.8	1	1.8
9800	1.41	2.11	1.4	2.12	1.39	2.13	1.39	2.13
10000	1.1	1.7	1	1.7	1	1.7	1	1.7
10200	1.7	2	1.5	2.2	1.3	2.4	1.3	2.4
10400	1.2	2	1.1	2.1	1	2.2	1	2.2
10600	1.1	2.3	1	2.4	1	2.5	1	2.5
10800	1.4	7.9	1.3	8	1.2	8.1	1.2	8.1
11000	1.41	2.21	1.4	2.22	1.39	2.23	1.39	2.23
11200	5	7	4.8	7.2	4.6	7.4	4.6	7.4
11400	4.6	7.2	4.5	7.3	4.4	7.4	4.4	7.4
11600	1.2	1.41	1.1	1.42	1	1.43	1	1.43
11800	1.1	2.5	1	2.6	1	2.7	0.4	2.7
12000	5.2	8.3	5	8.5	4.8	8.7	4.8	8.7
12200	1.21	1.51	1.2	1.52	1.19	1.53	1.19	1.53
12400	1.4	1.8	1.3	1.9	1.2	2	1.2	2
12600	1.2	1.5	1.1	1.7	1	1.9	1	1.9
12800	1.1	1.2	1	1.3	1	1.4	1	1.4
13000	1.2	1.6	1.1	1.6	1	1.6	1	1.6
13200	1.9	2.7	1.7	2.9	1.5	3.1	1.5	3.1
13400	1.5	5.2	1.4	5.3	1.3	5.4	1.3	5.4
13600	2.5	6	2.3	6.2	2.1	6.4	2.1	6.4
13800	1.3	2.5	1.2	2.6	1.1	2.7	1.1	2.7
14000	3	3.6	2.8	3.8	2.6	4	2.6	4
14200	1.01	2.91	1	2.92	1	2.93	1	2.93
14400	1.2	1.2	1.1	1.3	1	1.4	1	1.4



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
14600	1	2.1	1	2.3	1	2.5	1	2.5
14800	3.3	9.5	3.2	9.6	3.1	9.7	3.1	9.7
15000	1.1	1.8	1	1.9	1	2	1	2
15200	2.9	3.5	2.8	3.6	2.7	3.7	2.7	3.7
15400	3.01	3.21	3	3.22	2.99	3.23	2.99	3.23
15600	3	8	2.8	8.2	2.6	8.4	2.6	8.4
15800	1.1	1.3	1	1.4	1	1.5	1	1.5
16000	1.2	3.81	1.1	3.82	1	3.83	1	3.83
16200	3.1	4.4	3	4.5	2.9	4.6	2.9	4.6
16400	1.2	2	1	2.2	1	2.4	1	2.4
16600	1.81	3.11	1.8	3.12	1.79	3.13	1.79	3.13
16800	4	11	3.9	11.1	3.8	11.2	3.8	11.2
17000	2.1	2.6	1.9	2.8	1.7	3	1.7	3
17200	1.1	1.3	1	1	1	1.1	1	1.1
17400	1.2	1.1	1	1.2	1	1.3	1	1.3
17600	1.2	1.6	1.1	1.8	1.1	2	1	2
17800	1.3	5.3	1.2	5.4	1.1	5.5	1.1	5.5
18000	2.3	5.9	2.2	6	2.1	6.1	2.1	6.1
18200	1.1	1.7	1	1.9	1	2.1	1	2.1
18400	2.4	6.8	2.1	7.1	1.8	7.4	1.8	7.4
18600	1.3	1.5	1.2	1.6	1.1	1.7	1.1	1.7
18800	1.1	1.8	1	1.9	1	2	1	2
19000	2.8	6	2.6	6.2	2.4	6.4	2.4	6.4
19200	2.6	6.3	2.5	6.4	2.4	6.5	2.4	6.5
19400	1.8	2.6	1.7	2.7	1.6	2.8	1.6	2.8
19600	1.6	2.6	1.5	2.7	1.4	2.8	1.4	2.8
19800	1.1	1.5	1	1.7	1	1.9	1	1.9
20000	1.2	1.3	1.1	1.3	1	1.3	1	1.3
20200	1.1	1.3	1	1.3	1	1.3	1	1.3
20400	1.6	2.3	1.4	2.5	1.2	2.7	1.2	2.7
20600	2.2	6.6	2	6.8	1.8	7	1.8	7
20800	1	1.6	1	1.8	1	2	1	2
21000	1.2	2.2	1.1	2.3	1	2.4	1	2.4
21200	1.21	1.81	1.2	1.82	1.19	1.83	1.19	1.83
21400	2.6	8.9	2.5	9	2.4	9.1	2.4	9.1
21600	2.9	4.3	2.8	4.4	2.7	4.5	2.7	4.5
21800	1.1	2.11	1	2.12	1	2.13	1	2.13
22000	1	1.2	1	1.4	1	1.6	1	1.6
22200	1.1	7.1	1	7.2	1	7.3	1	7.3



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
22400	1.7	5.4	1.5	5.6	1.3	5.8	1.3	5.8
22600	1.1	1.3	1	1.4	1	1.5	1	1.5
22800	1.1	1.5	1	1.7	1	1.9	1	1.9
23000	1.2	1.51	1.1	1.52	1	1.53	1	1.53
23200	2.81	3.51	2.8	3.52	2.79	3.53	2.79	3.53
23400	2.7	9.5	2.5	9.7	2.3	9.9	2.3	9.9
23600	1	1.3	1	1.12	1	1.13	1	1.13
23800	1	1.6	1	1.7	1	1.8	1	1.8
24000	1	2.7	1	2.9	1	3.1	1	3.1
24200	1.1	2	1	2.2	1	2.4	1	2.4
24400	1	2	1	2.2	1	2.4	1	2.4
24600	1.1	1.3	1	1.4	1	1.5	1	1.5
24800	1.21	1.41	1.2	1.42	1.19	1.43	1.19	1.43
25000	2.1	8.1	2	8.2	1.9	8.3	1.9	8.3
25200	1	1.8	1	1.9	1	2	1	2
25400	1.31	1.81	1.3	1.82	1.29	1.83	1.29	1.83
25600	1.7	3	1.5	3.2	1.3	3.4	1.3	3.4
25800	2.9	3.4	2.8	3.5	2.7	3.6	2.7	3.6
26000	1.3	1.7	1.1	1.9	1	2.1	1	2.1
26200	3.2	4.3	3.1	4.4	3	4.5	3	4.5
26400	4.7	9.4	4.5	9.6	4.3	9.8	4.3	9.8
26600	1.1	2.11	1	2.12	1	2.13	1	2.13
26800	1	1.2	1	1.21	1	1.22	1	1.22
27000	1.3	2	1.1	2.2	1	2.4	1	2.4
27200	5.1	7.1	4.9	7.3	4.7	7.5	4.7	7.5
27400	1	1.1	1	1.11	1	1.12	1	1.12
27600	1	1.3	1	1.4	1	1.5	1	1.5
27800	1.1	1.5	1	1.7	1	1.9	1	1.9
28000	1.1	1.6	1	1.7	1	1.8	1	1.8
28200	1.5	4.9	1.4	5	1.3	5.1	1.3	5.1
28400	2	5.2	1.9	5.3	1.8	5.4	1.8	5.4
28600	2.71	8.31	2.7	8.32	2.69	8.33	2.69	8.33
28800	1.7	4.2	1.5	4.4	1.3	4.6	1.3	4.6
29000	1	2.9	1	3	0.6	3.1	1	3.1
29200	1.1	7.01	1	7.02	1	7.03	1	7.03
29400	3.6	4.6	3.5	4.7	3.4	4.8	3.4	4.8
29600	1	1.1	1	1.3	1	1.5	1	1.5
29800	1.21	2.11	1.2	2.12	1.19	2.13	1.19	2.13
30000	0.9	2.3	0.8	2.4	0.7	2.5	0.7	2.5



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
30200	0.7	2.1	0.5	2.3	0.3	2.5	0.3	2.5
30400	0.6	1.5	0.5	1.6	0.4	1.7	0.4	1.7
30600	0.9	1.9	0.8	2	0.7	2.1	0.7	2.1
30800	1.4	5.7	1.2	5.9	1	6.1	1	6.1
31000	0.6	2.9	0.5	3	0.4	3.1	0.4	3.1
31200	1.4	2.1	1.3	2.2	1.2	2.3	1.2	2.3
31400	0.7	1	0.5	1.2	0.3	1.4	0.3	1.4
31600	1.4	1.8	1.1	2.1	0.8	2.4	0.8	2.4
31800	2.2	2.9	2.1	3	2	3.1	2	3.1
32000	2.6	9.5	2.5	9.6	2.4	9.7	2.4	9.7
32200	0.9	2.3	0.7	2.5	0.5	2.7	0.5	2.7
32400	0.8	1.5	0.7	1.6	0.6	1.7	0.6	1.7
32600	0.6	1.4	0.5	1.5	0.4	1.6	0.4	1.6
32800	3	8.3	2.9	8.4	2.8	8.5	2.8	8.5
33000	1.3	1.7	1.1	1.9	0.9	2.1	0.9	2.1
33200	3.01	3.81	3	3.82	2.99	3.83	2.99	3.83
33400	2.4	7	2.3	7.1	2.2	7.2	2.2	7.2
33600	0.9	2.3	0.7	2.5	0.5	2.7	0.5	2.7
33800	0.7	2.3	0.5	2.5	0.3	2.7	0.3	2.7
34000	0.6	1.5	0.4	1.7	0.2	1.9	0.2	1.9
34200	0.5	1.5	0.4	1.6	0.3	1.7	0.3	1.7
34400	0.8	1.3	0.79	1.31	0.78	1.32	0.78	1.32
34600	0.7	1.2	0.6	1.3	0.5	1.4	0.5	1.4
34800	0.6	4.8	0.5	4.9	0.4	5	0.4	5
35000	0.41	2.31	0.4	2.32	0.39	2.33	0.39	2.33
35200	1	5.9	0.8	6.1	0.6	6.3	0.6	6.3
35400	1.1	3.3	1	3.4	0.9	3.5	0.9	3.5
35600	0.9	2	0.7	2.2	0.5	2.4	0.5	2.4
35800	0.4	1.8	0.3	1.9	0.2	2	0.2	2
36000	0.6	1.2	0.4	1.4	0.2	1.6	0.2	1.6
36200	0.8	1.01	0.79	1.02	0.78	1.03	0.78	1.03
36400	1.41	6.21	1.4	6.22	1.39	6.23	1.39	6.23
36600	0.7	0.9	0.5	1.1	0.3	1.3	0.3	1.3
36800	0.6	1.31	0.59	1.32	0.58	1.33	0.58	1.33
37000	0.9	4.9	0.8	5	0.7	5.1	0.7	5.1
37200	0.7	5.9	0.5	6.1	0.3	6.3	0.3	6.3
37400	0.5	2.2	0.3	2.4	0.1	2.6	0.1	2.6
37600	1.7	8.6	1.5	8.8	1.3	9	1.3	9
37800	1.1	2.3	1	2.4	0.9	2.5	0.9	2.5



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
38000	0.51	1.21	0.5	1.22	0.49	1.23	0.49	1.23
38200	0.6	1.3	0.5	1.4	0.4	1.5	0.4	1.5
38400	0.8	1.9	0.7	2	0.6	2.1	0.6	2.1
38600	1.1	1.7	1.09	1.71	1.08	1.72	1.08	1.72
38800	1	2.2	0.8	2.4	0.6	2.6	0.6	2.6
39000	0.9	2.1	0.8	2.2	0.7	2.3	0.7	2.3
39200	0.7	2.4	0.5	2.6	0.3	2.8	0.3	2.8
39400	0.4	4.3	0.3	4.4	0.2	4.5	0.2	4.5
39600	1.1	2.3	0.9	2.5	0.7	2.7	0.7	2.7
39800	0.7	0.61	0.69	0.62	0.68	0.63	0.68	0.63
40000	2.21	5.91	2.2	5.92	2.19	5.93	2.19	5.93
40200	1.1	3.2	0.9	3.4	0.7	3.6	0.7	3.6
40400	0.5	1.2	0.4	1.3	0.3	1.4	0.3	1.4
40600	0.5	3	0.3	3.2	0.1	3.4	0.1	3.4
40800	0.3	4.3	0.2	4.4	0.1	4.5	0.1	4.5
41000	0.6	1.1	0.4	1.3	0.2	1.5	0.2	1.5
41200	0.51	2.51	0.5	2.52	0.49	2.53	0.49	2.53
41400	0.8	5.2	0.7	5.3	0.6	5.4	0.6	5.4
41600	0.5	1.1	0.3	1.3	0.1	1.5	0.1	1.5
41800	0.7	1.2	0.6	1.3	0.5	1.4	0.5	1.4
42000	1	2.3	0.9	2.4	0.8	2.5	0.8	2.5
42200	1.1	1.5	1	1.6	0.9	1.7	0.9	1.7
42400	0.8	1.3	0.79	1.31	0.78	1.32	0.78	1.32
42600	1.1	2.1	0.9	2.3	0.7	2.5	0.7	2.5
42800	0.8	1.4	0.7	1.5	0.6	1.6	0.6	1.6
43000	1.1	1.3	1.09	1.31	1.08	1.32	1.08	1.32
43200	1	1.2	0.9	1.3	0.8	1.4	0.8	1.4
43400	0.9	3.4	0.7	3.6	0.5	3.8	0.5	3.8
43600	0.7	1.2	0.69	1.21	0.68	1.22	0.68	1.22
43800	0.6	0.7	0.5	0.8	0.4	0.9	0.4	0.9
44000	0.5	1	0.3	1.2	0.1	1.4	0.1	1.4
44200	0.4	3.3	0.3	3.4	0.2	3.5	0.2	3.5
44400	0.5	1.5	0.4	1.6	0.3	1.7	0.3	1.7
44600	0.7	2.6	0.5	2.8	0.3	3	0.3	3
44800	0.6	3.9	0.5	4	0.4	4.1	0.4	4.1
45000	0.7	1.1	0.69	1.11	0.68	1.12	0.68	1.12
45200	0.6	2.9	0.5	3	0.4	3.1	0.4	3.1
45400	0.42	3.22	0.4	3.24	0.38	3.26	0.38	3.26
45600	1.1	1.3	1	1.4	0.9	1.5	0.9	1.5





**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
45800	0.8	1.2	0.79	1.21	0.78	1.22	0.78	1.22
46000	0.9	1.2	0.7	1.4	0.5	1.6	0.5	1.6
46200	0.6	0.9	0.5	1	0.4	1.1	0.4	1.1
46400	0.7	1.2	0.5	1.4	0.3	1.6	0.3	1.6
46600	0.8	1.1	0.7	1.2	0.6	1.3	0.6	1.3
46800	0.6	0.7	0.4	0.9	0.2	1.1	0.2	1.1
47000	0.5	0.6	0.49	0.61	0.48	0.62	0.48	0.62
47200	0.6	2.91	0.59	2.92	0.58	2.93	0.58	2.93
47400	0.8	1.1	0.6	1.3	0.4	1.5	0.4	1.5
47600	0.3	0.5	0.29	0.51	0.28	0.52	0.28	0.52
47800	0.6	0.9	0.5	1	0.4	1.1	0.4	1.1
48000	0.5	2.6	0.3	2.8	0.1	3	0.1	3
48200	0.6	3.4	0.4	3.6	0.2	3.8	0.2	3.8
48400	0.5	2.3	0.3	2.5	0.1	2.7	0.1	2.7
48600	0.4	2.6	0.3	2.7	0.2	2.8	0.2	2.8
48800	0.41	1.31	0.4	1.32	0.39	1.33	0.39	1.33
49000	0.5	1.2	0.4	1.3	0.3	1.4	0.3	1.4
49200	0.3	3.3	0.2	3.4	0.1	3.5	0.1	3.5
49400	0.21	3.11	0.2	3.12	0.19	3.13	0.19	3.13
49600	0.5	1.6	0.3	1.8	0.1	2	0.1	2
49800	0.5	1.4	0.4	1.5	0.3	1.6	0.3	1.6
50000	0.3	0.7	0.1	0.9	0.1	1.1	0.1	1.1
50200	0.4	0.7	0.3	0.8	0.2	0.9	0.2	0.9
50400	1	1.2	0.8	1.4	0.6	1.6	0.6	1.6
50600	1.1	1.3	1.09	1.31	1.08	1.32	1.08	1.32
50800	0.5	0.61	0.49	0.62	0.48	0.63	0.48	0.63
51000	0.6	0.9	0.4	1.1	0.2	1.3	0.2	1.3
51200	0.4	2.2	0.3	2.3	0.2	2.4	0.2	2.4
51400	0.6	4.4	0.4	4.6	0.2	4.8	0.2	4.8
51600	0.3	0.6	0.2	0.7	0.1	0.8	0.1	0.8
51800	0.5	0.7	0.3	0.9	0.1	1.1	0.1	1.1
52000	0.3	0.5	0.29	0.51	0.28	0.52	0.28	0.52
52200	0.2	0.3	0.1	0.4	0.1	0.5	0.1	0.5
52400	0.3	0.7	0.1	0.9	0.1	1.1	0.1	1.1
52600	1	1.2	0.9	1.3	0.8	1.4	0.8	1.4
52800	0.4	0.9	0.3	1	0.2	1.1	0.2	1.1
53000	0.3	0.7	0.2	0.8	0.1	0.9	0.1	0.9
53200	0.2	0.51	0.19	0.52	0.18	0.53	0.18	0.53
53400	0.3	0.8	0.1	1	0.1	1.2	0.1	1.2



**FINAL FEASIBILITY REPORT ON  
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IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
53600	0.4	0.8	0.3	0.9	0.2	1	0.2	1
53800	0.5	0.61	0.49	0.62	0.48	0.63	0.48	0.63
54000	0.4	3.9	0.3	4	0.2	4.1	0.2	4.1
54200	0.3	0.7	0.1	0.9	0.1	1.1	0.1	1.1
54400	0.2	0.61	0.19	0.62	0.18	0.63	0.18	0.63
54600	0.4	0.9	0.3	1	0.2	1.1	0.2	1.1
54800	1	1.2	0.8	1.4	0.6	1.6	0.6	1.6
55000	1.1	1.3	1	1.4	0.9	1.5	0.9	1.5
55200	0.8	1.4	0.7	1.5	0.6	1.6	0.6	1.6
55400	0.7	1.1	0.5	1.3	0.3	1.5	0.3	1.5
55600	0.4	0.7	0.3	0.8	0.2	0.9	0.2	0.9
55800	0.5	0.71	0.49	0.72	0.48	0.73	0.48	0.73
56000	0.6	1.3	0.5	1.4	0.4	1.5	0.4	1.5
56200	0.5	1.5	0.3	1.7	0.1	1.9	0.1	1.9
56400	1	1.3	0.8	1.5	0.6	1.7	0.6	1.7
56600	0.5	0.7	0.5	0.9	0.5	1.1	0.5	1.1
56800	0.3	1.3	0.3	1.4	0.3	1.5	0.3	1.5
57000	0.3	1.31	0.3	1.32	0.3	1.33	0.3	1.33
57200	0.4	0.6	0.4	0.7	0.4	0.8	0.4	0.8
57400	0.6	2.6	0.6	2.7	0.6	2.8	0.6	2.8
57600	0.8	2.11	0.8	2.12	0.8	2.13	0.8	2.13
57800	0.5	0.7	0.5	0.9	0.5	1.1	0.5	1.1
58000	0.3	0.7	0.3	0.8	0.3	0.9	0.3	0.9
58200	0.5	2.5	0.2	2.7	0.2	2.9	0.2	2.9
58400	0.3	0.6	0.3	0.7	0.3	0.8	0.3	0.8
58600	0.3	0.8	0.3	1	0.3	1.2	0.3	1.2
58800	0.4	0.71	0.4	0.72	0.4	0.73	0.4	0.73
59000	0.41	3.91	0.01	3.92	0.01	3.93	0.01	3.93
59200	0.3	0.7	0.3	0.9	0.3	1.1	0.3	1.1
59400	0.2	0.8	0.2	1	0.2	1.2	0.2	1.2
59600	0.3	0.71	0.3	0.72	0.3	0.73	0.3	0.73
59800	0.2	0.7	0.2	0.8	0.2	0.9	0.2	0.9
60000	0.4	0.7	0.4	0.9	0.4	1.1	0.4	1.1
60200	0.3	0.6	0.3	0.7	0.3	0.8	0.3	0.8
60400	0.2	0.5	0.2	0.6	0.2	0.7	0.2	0.7
60600	0.4	0.6	0.4	0.7	0.4	0.8	0.4	0.8
60800	0.6	0.9	0.6	1.1	0.6	1.3	0.6	1.3
61000	0.5	0.8	0.5	0.81	0.5	0.82	0.5	0.82
61200	0.3	0.6	0.3	0.7	0.3	0.8	0.3	0.8

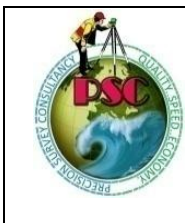


**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Observed		Observed		Observed		Observed	
	Min	Max	Min	Max	Min	Max	Min	Max
61400	0.4	0.7	0.4	0.8	0.4	0.9	0.4	0.9
61600	0.3	0.9	0.3	1.1	0.3	1.3	0.3	1.3
61800	0.2	0.5	0.2	0.6	0.2	0.7	0.2	0.7
62000	0.3	0.7	0.3	0.9	0.3	1.1	0.3	1.1
62200	0.2	0.8	0.2	1	0.2	1.2	0.2	1.2
62400	0.3	0.8	0.3	0.9	0.3	1	0.3	1
62600	0.4	1.4	0.4	1.6	0.4	1.8	0.4	1.8
62800	0.4	1.2	0.4	1.3	0.4	1.4	0.4	1.4
63000	0.3	1.3	0.3	1.5	0.3	1.7	0.3	1.7
63205	0.2	1.21	0.2	1.22	0.2	1.23	0.2	1.23

**Figure 21-Observed depth at 200 meter interval**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Annexure-4 Reduced depth at 200 meter interval:-**

Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
0	2	3.1	1.9	3.2	1.8	3.3	1.8	3.3
200	2.3	2.8	2.1	3	1.9	3.2	1.9	3.2
400	2.1	2.4	1.8	2.7	1.5	3	1.5	3
600	2	2.9	1.9	3	1.8	3.1	1.8	3.1
800	2.2	5.7	2.19	5.71	2.18	5.72	2.18	5.72
1000	1.1	1.7	1.1	1.9	1	2.1	1	2.1
1200	4.4	7.8	4.3	7.9	4.2	8	4.2	8
1400	3	7.1	2.9	7.2	2.8	7.3	2.8	7.3
1600	1.1	1.4	1	1.5	1	1.6	1	1.6
1800	1.1	1.5	1.09	1.51	1.08	1.52	1	1.52
2000	1.1	1.4	1	1.6	1	1.8	1	1.8
2200	1.3	5.1	1.2	5.2	1.1	5.3	1.1	5.3
2400	1	2.4	1	2.41	1	2.42	1	2.42
2600	2	3.3	1.9	3.4	1.8	3.5	1.8	3.5
2800	2.1	3.4	1.9	3.6	1.7	3.8	1.7	3.8
3000	1	2.3	1	2.6	1	2.9	1	2.9
3200	1.8	3.5	1.7	3.6	1.6	3.7	1.6	3.7
3400	1.7	2.8	1.6	2.9	1.5	3	1.5	3
3600	1.2	1.4	1	1.6	1	1.8	1	1.8
3800	1.1	2.1	1	2.2	1	2.3	1	2.3
4000	1	2.9	1	3	1	3.1	1	3.1
4200	1.2	0.8	1.1	0.9	1	1	1	1
4400	1.1	0.8	1	1	1	1.2	1	1.2
4600	3.2	4.4	3.19	4.41	3.18	4.42	3.18	4.42
4800	2.1	4.1	2	4.2	1.9	4.3	1.9	4.3
5000	5.3	6.8	5.1	7	4.9	7.2	4.9	7.2
5200	2.2	2.8	2	3	1.8	3.2	1.8	3.2
5400	2.8	3.3	2.6	3.5	2.4	3.7	2.4	3.7
5600	3.1	4.9	3	5	2.9	5.1	2.9	5.1
5800	2.1	3.2	2.09	3.21	2.08	3.22	2.08	3.22
6000	1	3.2	1	3.3	1	3.4	1	3.4
6200	2.7	5	2.6	5.1	2.5	5.2	2.5	5.2
6400	1.1	1.5	1	1.51	1	1.52	1	1.52
6600	1.2	1.7	1	1.9	1	2.1	1	2.1



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
6800	1.1	1.3	1	1.4	1	1.5	1	1.5
7000	1	1.3	1	1.5	1	1.7	1	1.7
7200	1.9	4.2	1.8	4.3	1.7	4.4	1.7	4.4
7400	5.2	5.5	5	5.7	4.8	5.9	4.8	5.9
7600	5.1	6.2	5.09	6.21	5.08	6.22	5.08	6.22
7800	1.2	5.2	1.19	5.21	1.18	5.22	1.18	5.22
8000	1	2.1	1	2.3	1	2.5	1	2.5
8200	1.2	1.2	1.19	1.21	1.18	1.22	1	1.22
8400	1	0.8	1	1	0.8	1.2	1	1.2
8600	1.2	1.2	1.19	1.21	1.18	1.22	1	1.22
8800	1	1.2	1	1.5	1	1.8	1	1.8
9000	1.7	3.3	1.6	3.4	1.5	3.5	1.5	3.5
9200	1.4	2.3	1.2	2.5	1	2.7	1	2.7
9400	1.3	3.2	1.2	3.3	1.1	3.4	1	3.4
9600	1.2	1.2	1	1.4	1	1.6	1	1.6
9800	1.4	2.1	1.39	2.11	1.38	2.12	1.38	2.12
10000	1	1.3	1	1.4	1	1.5	1	1.5
10200	1.5	1.8	1.3	2	1.1	2.2	1.1	2.2
10400	1.1	1.9	1	2	1	2.1	1	2.1
10600	1.2	2.2	1.1	2.3	1	2.4	1	2.4
10800	1.3	7.8	1.2	7.9	1.1	8	1.1	8
11000	1.4	2.2	1.39	2.21	1.38	2.22	1.38	2.22
11200	4.8	6.8	4.6	7	4.4	7.2	4.4	7.2
11400	4.5	7.1	4.4	7.2	4.3	7.3	4.3	7.3
11600	1	1.4	1	1.41	1	1.42	1	1.42
11800	1.1	2.4	1	2.5	1	2.6	1	2.6
12000	5	8.1	4.8	8.3	4.6	8.5	4.6	8.5
12200	1.2	1.5	1.19	1.51	1.18	1.52	1.18	1.52
12400	1.3	1.7	1.2	1.8	1.1	1.9	1.1	1.9
12600	1	1.3	1	1.5	1	1.7	1	1.7
12800	1.1	1.1	1	1.2	1	1.3	1	1.3
13000	1.2	1.6	1.1	1.6	1	1.7	1	1.7
13200	1.1	2.5	1.1	2.7	1.1	2.9	1.1	2.9
13400	1.4	5.1	1.3	5.2	1.2	5.3	1.2	5.3
13600	2.3	5.8	2.1	6	1.9	6.2	1.9	6.2
13800	1.2	2.4	1.1	2.5	1	2.6	1	2.6
14000	2.8	3.4	2.6	3.6	2.4	3.8	2.4	3.8
14200	1	2.9	1	2.91	1	2.92	1	2.92
14400	1.1	1.1	1	1.2	1	1.3	1	1.3



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
14600	1.2	1.9	1	2.1	1	2.3	1	2.3
14800	3.2	9.4	3.1	9.5	3	9.6	3	9.6
15000	1.1	1.7	1	1.8	1	1.9	1	1.9
15200	2.8	3.4	2.7	3.5	2.6	3.6	2.6	3.6
15400	3	3.2	2.99	3.21	2.98	3.22	2.98	3.22
15600	2.8	7.8	2.6	8	2.4	8.2	2.4	8.2
15800	1.5	1.2	1.4	1.3	1.3	1.4	1	1.4
16000	1.3	3.8	1.29	3.81	1.28	3.82	1	3.82
16200	3	4.3	2.9	4.4	2.8	4.5	2.8	4.5
16400	1	1.8	1	2	1	2.2	1	2.2
16600	1.8	3.1	1.79	3.11	1.78	3.12	1.78	3.12
16800	3.9	10.9	3.8	11	3.7	11.1	3.7	11.1
17000	1.9	2.4	1.7	2.6	1.5	2.8	1.5	2.8
17200	1	1.5	1	1.6	1	1.7	1	1.7
17400	1.4	1	1.3	1.1	1.2	1.2	1	1.2
17600	1.3	1.4	1.1	1.6	1	1.8	1	1.8
17800	1.2	5.2	1.1	5.3	1	5.4	1	5.4
18000	2.2	5.8	2.1	5.9	2	6	2	6
18200	1.1	1.5	1	1.7	1	1.9	1	1.9
18400	2.1	6.5	1.8	6.8	1.5	7.1	1.5	7.1
18600	1.2	1.4	1.1	1.5	1	1.6	1	1.6
18800	1	1.7	1	1.8	1	1.9	1	1.9
19000	2.6	5.8	2.4	6	2.2	6.2	2.2	6.2
19200	2.5	6.2	2.4	6.3	2.3	6.4	2.3	6.4
19400	1.7	2.5	1.6	2.6	1.5	2.7	1.5	2.7
19600	1.5	2.5	1.4	2.6	1.3	2.7	1.3	2.7
19800	1.1	1.3	1.1	1.5	1	1.7	1	1.7
20000	1.3	1.5	1.29	1.51	1.28	1.52	1	1.52
20200	1.3	1.7	1.2	1.8	1.1	1.9	1	1.9
20400	1.4	2.1	1.2	2.3	1	2.5	1	2.5
20600	2	6.4	1.8	6.6	1.6	6.8	1.6	6.8
20800	1.4	1.4	1.2	1.6	1	1.8	1	1.8
21000	1.1	2.1	1	2.2	1	2.3	1	2.3
21200	1.2	1.8	1.19	1.81	1.18	1.82	1.18	1.82
21400	2.5	8.8	2.4	8.9	2.3	9	2.3	9
21600	2.8	4.2	2.7	4.3	2.6	4.4	2.6	4.4
21800	1.5	2.1	1.49	2.11	1.48	2.12	0.78	2.12
22000	1.1	1.5	1	1.7	1	1.9	1	1.9
22200	1.1	7	1	7.1	1	7.2	1	7.2



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
22400	1.5	5.2	1.3	5.4	1.1	5.6	1.1	5.6
22600	1	1.2	1	1.3	0.9	1.4	1	1.4
22800	1.1	1.3	1	1.5	0.8	1.7	1	1.7
23000	1	1.5	1	1.51	0.99	1.52	1	1.52
23200	2.8	3.5	2.79	3.51	2.78	3.52	2.78	3.52
23400	2.5	9.3	2.3	9.5	2.1	9.7	2.1	9.7
23600	1.1	1.3	1.09	1.31	1.08	1.32	1	1.32
23800	1	1.5	1	1.6	1	1.7	1	1.7
24000	1.1	2.5	1	2.7	1	2.9	1	2.9
24200	1	1.8	1	2	1	2.2	1	2.2
24400	1.1	1.8	1	2	1	2.2	1	2.2
24600	1	1.2	1	1.3	1	1.4	1	1.4
24800	1.2	1.4	1.19	1.41	1.18	1.42	1.18	1.42
25000	2	8	1.9	8.1	1.8	8.2	1.8	8.2
25200	1.1	1.7	1	1.8	1	1.9	1	1.9
25400	1.3	1.8	1.29	1.81	1.28	1.82	1.28	1.82
25600	1.5	2.8	1.3	3	1.1	3.2	1.1	3.2
25800	2.8	3.3	2.7	3.4	2.6	3.5	2.6	3.5
26000	1.1	1.5	1	1.7	1	1.9	1	1.9
26200	3.1	4.2	3	4.3	2.9	4.4	2.9	4.4
26400	4.5	9.2	4.3	9.4	4.1	9.6	4.1	9.6
26600	1	2.1	1	2.11	1	2.12	1	2.12
26800	1.1	0.8	1.09	0.81	1.08	0.82	1	0.82
27000	1.1	1.8	1	2	0.8	2.2	1	2.2
27200	4.9	6.9	4.7	7.1	4.5	7.3	4.5	7.3
27400	1	0.8	1	0.81	1	0.82	1	0.82
27600	1.1	1.2	1	1.3	1	1.4	1	1.4
27800	1	1.3	1	1.5	1	1.7	1	1.7
28000	1	1.5	1	1.6	1	1.7	1	1.7
28200	1.4	4.8	1.3	4.9	1.2	5	1.2	5
28400	1.9	5.1	1.8	5.2	1.7	5.3	1.7	5.3
28600	2.7	8.3	2.69	8.31	2.68	8.32	2.68	8.32
28800	1.5	4	1.3	4.2	1.1	4.4	1.1	4.4
29000	0.7	2.8	0.6	2.9	0.5	3	0.5	3
29200	0.5	7	0.49	7.01	0.48	7.02	0.48	7.02
29400	3.5	4.5	3.4	4.6	3.3	4.7	3.3	4.7
29600	0.7	0.9	0.5	1.1	0.3	1.3	0.3	1.3
29800	1.2	2.1	1.19	2.11	1.18	2.12	1.18	2.12
30000	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
30200	-0.3	0.7	-0.3	0.9	-0.3	1.1	-0.3	1.1
30400	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
30600	0.8	1.8	0.7	1.9	0.6	2	0.6	2
30800	1.2	5.5	1	5.7	1	5.9	1	5.9
31000	0.5	2.8	0.4	2.9	0.4	3	0.4	3
31200	1.3	9.8	1.2	9.9	1.1	9.9	1.1	9.9
31400	-0.3	0.8	-0.3	1	-0.3	1.2	-0.3	1.2
31600	1.1	1.5	0.8	1.8	0.7	2.1	0.7	2.1
31800	2.1	2.8	2	2.9	1.9	3	1.9	3
32000	2.5	9.4	2.4	9.5	2.3	9.6	2.3	9.6
32200	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
32400	0.7	1.4	0.6	1.5	0.5	1.6	0.5	1.6
32600	-0.3	0.7	-0.3	0.8	-0.3	0.9	-0.3	0.9
32800	2.9	8.2	2.8	8.3	2.7	8.4	2.7	8.4
33000	1.1	1.5	0.9	1.7	0.7	1.9	0.7	1.9
33200	3	3.8	2.99	3.81	2.98	3.82	2.98	3.82
33400	2.3	6.9	2.2	7	2.1	7.1	2.1	7.1
33600	-0.3	0.8	-0.3	1	-0.3	1.2	-0.3	1.2
33800	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
34000	-0.3	0.6	-0.3	0.8	-0.3	1	-0.3	1
34200	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
34400	-0.3	0.5	-0.3	0.51	-0.3	0.52	-0.3	0.52
34600	-0.3	0.8	-0.3	0.9	-0.3	1	-0.3	1
34800	0.3	4.7	0.2	4.8	0.2	4.9	0.2	4.9
35000	0.4	2.3	0.39	2.31	0.39	2.32	0.39	2.32
35200	0.8	5.7	0.6	5.9	0.5	6.1	0.5	6.1
35400	-0.3	3.2	-0.3	3.3	-0.3	3.4	-0.3	3.4
35600	-0.2	1.8	-0.2	2	-0.2	2.2	-0.2	2.2
35800	0.3	1.7	0.3	1.8	0.3	1.9	0.3	1.9
36000	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
36200	-0.3	1	-0.3	1.01	-0.3	1.02	-0.3	1.02
36400	1.4	6.2	1.39	6.21	1.39	6.22	1.39	6.22
36600	-0.3	0.7	-0.3	0.9	-0.3	1.1	-0.3	1.1
36800	-0.3	1.3	-0.3	1.31	-0.3	1.32	-0.3	1.32
37000	0.8	4.8	0.7	4.9	0.6	5	0.6	5
37200	0.5	5.7	0.3	5.9	0.3	6.1	0.3	6.1
37400	0.3	2	0.3	2.2	0.3	2.4	0.3	2.4
37600	1.5	8.4	1.3	8.6	1.2	8.8	1.2	8.8
37800	-0.3	0.8	-0.3	0.9	-0.3	1	-0.3	1





**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
38000	0.5	1.2	0.49	1.21	0.46	1.22	0.46	1.22
38200	0.5	1.2	0.4	1.3	0.3	1.4	0.3	1.4
38400	0.7	1.8	0.6	1.9	0.5	2	0.5	2
38600	-0.3	0.7	-0.3	0.71	-0.3	0.72	-0.3	0.72
38800	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
39000	-0.3	0.8	-0.3	0.9	-0.3	1	-0.3	1
39200	0.5	2.2	0.3	2.4	0.3	2.6	0.3	2.6
39400	0.3	4.2	0.3	4.3	0.3	4.4	0.3	4.4
39600	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
39800	-0.3	0.6	-0.3	0.61	-0.3	0.62	-0.3	0.62
40000	2.2	5.9	2.19	5.91	2.18	5.92	2.18	5.92
40200	0.9	3.9	0.7	4.1	0.5	4.3	0.5	4.3
40400	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
40600	0.3	2.8	-0.3	3	-0.3	3.2	-0.3	3.2
40800	0.2	4.2	0.2	4.3	0.2	4.4	0.2	4.4
41000	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
41200	0.5	2.5	0.49	2.51	0.49	2.52	0.49	2.52
41400	0.7	5.1	0.6	5.2	0.5	5.3	0.5	5.3
41600	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
41800	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
42000	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
42200	-0.3	0.4	-0.3	0.5	-0.3	0.6	-0.3	0.6
42400	-0.3	0.5	-0.3	0.51	-0.3	0.52	-0.3	0.52
42600	-0.3	0.6	-0.3	0.8	-0.3	1	-0.3	1
42800	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
43000	-0.3	0.4	-0.3	0.41	-0.3	0.42	-0.3	0.42
43200	-0.3	0.3	-0.3	0.4	-0.3	0.5	-0.3	0.5
43400	-0.3	3.2	-0.3	3.4	-0.3	3.6	-0.3	3.6
43600	-0.3	0.5	-0.3	0.51	-0.3	0.52	-0.3	0.52
43800	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
44000	-0.3	0.8	-0.3	1	-0.3	1.2	-0.3	1.2
44200	0.3	3.2	0.3	3.3	0.3	3.4	0.3	3.4
44400	0.4	1.4	0.3	1.5	0.3	1.6	0.3	1.6
44600	0.5	2.4	0.3	2.6	0.3	2.8	0.3	2.8
44800	0.5	3.8	0.4	3.9	0.4	4	0.4	4
45000	-0.3	0.5	-0.3	0.51	-0.3	0.52	-0.3	0.52
45200	0.5	2.8	0.4	2.9	0.3	3	0.3	3
45400	0.4	3.2	0.38	3.22	0.35	3.24	0.35	3.24
45600	-0.3	0.7	-0.3	0.8	-0.3	0.9	-0.3	0.9



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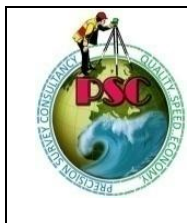
Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
45800	-0.3	0.5	-0.3	0.51	-0.3	0.52	-0.3	0.52
46000	-0.3	0.6	-0.3	0.8	-0.3	1	-0.3	1
46200	-0.3	0.3	-0.3	0.4	-0.3	0.5	-0.3	0.5
46400	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
46600	-0.3	0.4	-0.3	0.5	-0.3	0.6	-0.3	0.6
46800	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
47000	-0.3	0.4	-0.3	0.41	-0.3	0.42	-0.3	0.42
47200	0.2	2.9	0.2	2.91	0.2	2.92	0.2	2.92
47400	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
47600	-0.3	0.4	-0.3	0.41	-0.3	0.42	-0.3	0.42
47800	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
48000	0.3	2.4	0.3	2.6	0.3	2.8	0.3	2.8
48200	0.4	3.2	0.4	3.4	0.4	3.6	0.4	3.6
48400	0.3	2.1	0.3	2.3	0.3	2.5	0.3	2.5
48600	0.3	2.5	0.3	2.6	0.3	2.7	0.3	2.7
48800	0.4	1.3	0.39	1.31	0.37	1.32	0.37	1.32
49000	-0.3	1.1	-0.3	1.2	-0.3	1.3	-0.3	1.3
49200	0.2	3.2	0.2	3.3	0.2	3.4	0.2	3.4
49400	0.2	3.1	0.2	3.11	0.2	3.12	0.2	3.12
49600	0.3	1.4	0.3	1.6	0.3	1.8	0.3	1.8
49800	0.4	1.3	0.3	1.4	0.3	1.5	0.3	1.5
50000	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
50200	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
50400	-0.3	0.4	-0.3	0.6	-0.3	0.8	-0.3	0.8
50600	-0.3	0.5	-0.3	0.51	-0.3	0.52	-0.3	0.52
50800	-0.3	0.6	-0.3	0.61	-0.3	0.62	-0.3	0.62
51000	-0.3	0.7	-0.3	0.9	-0.3	1.1	-0.3	1.1
51200	0.3	2.1	0.3	2.2	0.3	2.3	0.3	2.3
51400	0.4	4.2	0.4	4.4	0.4	4.6	0.4	4.6
51600	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
51800	-0.3	0.4	-0.3	0.6	-0.3	0.8	-0.3	0.8
52000	-0.3	0.3	-0.3	0.31	-0.3	0.32	-0.3	0.32
52200	-0.3	0.2	-0.3	0.3	-0.3	0.4	-0.3	0.4
52400	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
52600	-0.3	0.7	-0.3	0.8	-0.3	0.9	-0.3	0.9
52800	-0.3	0.8	-0.3	0.9	-0.3	1	-0.3	1
53000	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
53200	-0.3	0.5	-0.3	0.51	-0.3	0.52	-0.3	0.52
53400	-0.3	0.6	-0.3	0.8	-0.3	1	-0.3	1



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Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
53600	-0.3	0.7	-0.3	0.8	-0.3	0.9	-0.3	0.9
53800	-0.3	0.6	-0.3	0.61	-0.3	0.62	-0.3	0.62
54000	0.3	3.8	-0.3	3.9	-0.3	4	-0.3	4
54200	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
54400	-0.3	0.6	-0.3	0.61	-0.3	0.62	-0.3	0.62
54600	-0.3	0.8	-0.3	0.9	-0.3	1	-0.3	1
54800	-0.3	0.7	-0.3	0.9	-0.3	1.1	-0.3	1.1
55000	-0.3	1.2	-0.3	1.3	-0.3	1.4	-0.3	1.4
55200	-0.3	1.3	-0.3	1.4	-0.3	1.5	-0.3	1.5
55400	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
55600	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
55800	-0.3	0.7	-0.3	0.71	-0.3	0.72	-0.3	0.72
56000	-0.3	1.2	-0.3	1.3	-0.3	1.4	-0.3	1.4
56200	-0.3	1.3	-0.3	1.5	-0.3	1.7	-0.3	1.7
56400	-0.3	0.7	-0.3	0.9	-0.3	1.1	-0.3	1.1
56600	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
56800	-0.3	1.2	-0.3	1.3	-0.3	1.4	-0.3	1.4
57000	-0.3	1.3	-0.3	1.31	-0.3	1.32	-0.3	1.32
57200	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
57400	0.5	2.5	-0.3	2.6	-0.3	2.7	-0.3	2.7
57600	0.5	2.1	-0.3	2.11	-0.3	2.12	-0.3	2.12
57800	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
58000	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
58200	0.3	2.3	-0.3	2.5	-0.3	2.7	-0.3	2.7
58400	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
58600	-0.3	0.6	-0.3	0.8	-0.3	1	-0.3	1
58800	-0.3	0.7	-0.3	0.71	-0.3	0.72	-0.3	0.72
59000	0.4	3.9	-0.3	3.91	-0.3	3.92	-0.3	3.92
59200	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
59400	-0.3	0.6	-0.3	0.8	-0.3	1	-0.3	1
59600	-0.3	0.7	-0.3	0.71	-0.3	0.72	-0.3	0.72
59800	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
60000	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
60200	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7
60400	-0.3	0.4	-0.3	0.5	-0.3	0.6	-0.3	0.6
60600	-0.3	0.3	-0.3	0.4	-0.3	0.5	-0.3	0.5
60800	-0.3	0.3	-0.3	0.5	-0.3	0.7	-0.3	0.7
61000	-0.3	0.4	-0.3	0.41	-0.3	0.42	-0.3	0.42
61200	-0.3	0.5	-0.3	0.6	-0.3	0.7	-0.3	0.7



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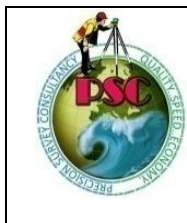
Chainage (in meter)	Class-I		Class-II		Class-III		Class-IV	
	Reduced		Reduced		Reduced		Reduced	
	Min	Max	Min	Max	Min	Max	Min	Max
61400	-0.3	0.6	-0.3	0.7	-0.3	0.8	-0.3	0.8
61600	-0.3	0.7	-0.3	0.9	-0.3	1.1	-0.3	1.1
61800	-0.3	0.4	-0.3	0.5	-0.3	0.6	-0.3	0.6
62000	-0.3	0.5	-0.3	0.7	-0.3	0.9	-0.3	0.9
62200	-0.3	0.6	-0.3	0.8	-0.3	1	-0.3	1
62400	-0.3	0.7	-0.3	0.8	-0.3	0.9	-0.3	0.9
62600	-0.3	1.2	-0.3	1.4	-0.3	1.6	-0.3	1.6
62800	-0.3	1.1	-0.3	1.2	-0.3	1.3	-0.3	1.3
63000	-0.3	1.1	-0.3	1.3	-0.3	1.5	-0.3	1.5
63205	-0.3	1.2	-0.3	1.21	-0.3	1.22	-0.3	1.22

**Figure 22- Reduced depth at 200 meter interval**

1. Details of collected Water level of different gauge stations w.r.t. MSL (CWC, Irrigation, Ports, Maritime Boards, Observed stations during survey etc.) – Table indicating Chainage (zero at downstream) and following:-

Date	Tide Pole name	Chainage (km)	Time	T. Reading (m)	Zero of TP w.r.t. MSL (m)	W.L w.r.t. MSL (m)	SD value w.r.t. MSL (m)	Corrected Tide (m)
				<b>A</b>	<b>B</b>	<b>C = A+B</b>	<b>D</b>	<b>E = D-C</b>
04.03.16	GS-(TP)-7	63.088	24 hrs	0.26	88.933	89.193	88.435	-0.758
04.03.16	GS-(TP)-6	42.643	24 hrs	0.35	86.64	86.990	85.955	-1.035
05.03.16	GS-(TP)-8	42.390	24 hrs	0.39	86.053	86.443	85.947	-0.496
05.03.16	GS-(TP)-9	34.364	24 hrs	0.45	85.85	86.300	84.972	-1.328
01.03.16	GS-(TP)-1	34.273	24 hrs	0.55	85.743	86.293	84.961	-1.332
02.03.16	GS-(TP)-2	24.500	24 hrs	0.58	83.079	83.659	83.775	0.116
01.03.16	GS-(TP)-3	20.964	24 hrs	0.62	81.491	82.111	83.345	1.234
02.03.16	GS-(TP)-4	9.646	24 hrs	0.65	80.271	80.921	81.971	1.050
03.03.16	GS-(TP)-5	0.616	24 hrs	0.69	79.659	80.349	80.875	0.526

**Table 21- Details of Collected water level of Different gauge stations**



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**Annexure-5 Details of Bathymetric surveys carried out:-**

Date of Survey	Type of survey	Chainage	
		From (km)	To (km)
25.09.15	Bathymetry Survey	0.00	6.00
27.09.15	Bathymetry Survey	6.00	14.00
30.09.15	Bathymetry Survey	14.00	24.500
02.10.15	Bathymetry Survey	24.500	34.800
03.10.15	Bathymetry Survey	34.800	42.135
08.10.15	Bathymetry Survey	42.135	48.300
10.10.15	Bathymetry Survey	48.300	56.205
14.10.15	Bathymetry Survey	56.205	63.205

**Table 22- Details of Bathymetry survey**

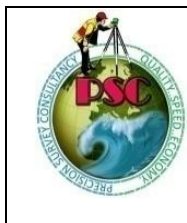
**Annexure-6 Bank Protection along the Bank:-**

The River had a tendency to break its boundary. So for this reason some short and as well as long embankments and Boulder pitching are needed in the both banks of the river. From chainage 55.00km to 56.600km, The Boulder pitching is noticed very well. From chainage 29.500km to 32.500km are highly protected by Bituminous Roadside. Though in the Rainy season the water level becomes very high and the both side river bank are flooded in some places.

**Annexure-7 Details of Features across the Bank:-**

The bank of the river includes with villages, Ferry Ghats, Irrigation canals and outlets, Rail Bridges, RCC Bridges and Forest etc. The both side river bank are highly protected by embankment and boulder pitching due to flood, erosion etc. The villagers are also situated near the bank side of the river. Recently different kinds of industries are also located near the bank side of the river.

-



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**Annexure-8 Detailed methodology adopted for carrying out survey. Horizontal Control and Vertical Details Control:-**

• **Establishment of Horizontal Control:-**

**The Horizontal control for Topography surveys:** - High precision RTK DGPS in fix mode is using UHF Radio Modem with IHO accuracy standards, with minimum 24 hours observations at some permanent platform/base.

**The Horizontal control for Bathymetry surveys:** - DGPS is receiving corrections from Beacons.

**Establishment of Vertical Control:-**

Vertical control from CP- D1, situated near the Jagra Hati Village is used for the entire Survey work. Its value is 100.765m w.r.t. M.S.L has been considered for calculating the vertical levels. Total 7 no. of BM have been established along the 63.205kms stretch of the Dikhu River with the reference of G.T.S level which was fixed near at CP-D-1.

**Topography Survey:-**

The survey was commenced on 21st September 2015 and completed on 22<sup>nd</sup> October 2015. Then the days autumn season and the climate become normal which reached about 20° C. Mostly day weather was sunny and was very favorable for the conduct of survey and the weather condition remains same for the entire duration of the survey.

The survey was undertaken as per the line plan provided and the spot level points in the cross line were spaced at 40 m interval. The plotting of the chart was done on UTM Projection at Zone 46R as directed in the contract specifications. The spot levels along the river were obtained by using Trimble DGPS. The data was post processed using Trimble Business Center to get the precise position and MSL height values of the rover locations. The topographic survey for the entire survey stretch was conducted to collect the following data:-

- Spot levels
- Delineation of Islands
- Fixing of bridges and marks
- Assess the type of river bank
- Extending the vertical and horizontal control throughout the survey area
- Collection of local information along the river Banks

Topographic survey Equipments: South (S86T) GNSS RTK, Total Station was used for conducting the topographic survey.



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**South RTK (S86T)** satellite navigation is a technique used in land survey and in hydrographic survey based on the use of carrier phase measurements of the GPS, GLONASS and / or Galileo signals where a single reference station provides the real-time corrections, providing up to centimeter-level accuracy. When referring to GPS in particular, the system is also commonly referred to as Carrier-Phase Enhancement, CPGPS. RTK systems use a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier that it measured, and the mobile units compare their own phase measurements with the ones received from the base station. There are several ways to transmit a correction signal from base station to mobile station. The most popular way to achieve real-time, low-cost signal transmission is to use a radio modem, typically in the UHF band. This allows the units to calculate their relative position to millimeters, although their absolute position is accurate only to the same accuracy as the position of the base station.

RTK systems are available in dual-frequency and single-frequency versions. Dual-frequency systems deliver greater precision, faster and over longer baselines than single-frequency systems. Leica GS09 & GS12 GNSS RTK that used for the survey contains dual-frequency requires antenna and controller to suit any surveying task with a wide range of functionality. Leica GS09 & GS12 GNSS RTK Rover is extremely light-weight and cable free rover is comfortable to use and withstand even for rough use and topple over. It uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier that it measured, and the mobile units compare their own phase measurements with the ones received from the base station. So, that centimeter level accuracy can be achieved from latitude, longitude and altitude. RTK technique in terms of general navigation, it is perfectly suited to roles like surveying. In this case, the base station is located at a known surveyed location, often a benchmark, and the mobile units can then produce a highly accurate map by taking fixes relative to that point. RTK has also found uses in auto drive/autopilot systems, precision farming and similar roles.



**Figure 23-Topography Survey Instrument**



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○ **Bathymetry Survey:-**

The bathymetry survey was carried out using Bathy 500 portable shallow water Echosounder supported by DGPS Beacon Receiver and HYPACK Data collection and processing software. The survey equipment was installed as per the standard procedure the survey vessel equipped with safety gears.

**Bathy- 500MF Echosounder:** The Bathy- 500MF echosounder is an electronic hydrographic survey instrument used for measuring depths with precision chart recordings and digital data output manufactured by Syqwest Incorporated, USA. The Bathy-500 echo sounding systems are based on the principle that when a sound signal is sent into the water it will be reflected back when it strikes an object. The Bathy-500 is technologically sophisticated, utilizing modern, micro processor based electronics and a thermal chart recorder mechanism. Digital processing enables the instrument to offer fully automatic digitizing capabilities. When interfaced to a NMEA 0183 compatible position sensor, it provides user with a complete, integrated hydrographic survey environment. The instrument front panel consists of a high contrast, backlit four line LCD displays and a fully sealed input keypad. The front panel encompassing system data, status and setup parameters with RS232/RS422 output format. All operating functions are set via the front panel interface. Setup selections are stored within internal, non-volatile memory for instant availability upon power-up. The instrument decodes and processes the NMEA 0183 formatted sentence GGA or GLL from GPS/DGPS using variable Baud rates for communication.



Figure 24- Bathymetry Survey Instrument





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**Annexure-9 Photographs of Equipment:-**

Following equipment was employed for the bathymetric and topographic survey:-

Equipment	Make	Version	Qty Employed
Echo sounder	Bathy MF 500	.....	1
Current Meter	AEM 213-D	.....	1
Tide Gauge	Manual (Pole type)	-	4
RTK	South S86T		3
GPS Sets	Trimble –Becon Rover SPS 361		1
Software	HYPACK data acquisition	Version 14	1
Software	AUTOCAD	2013	1
Software	Microsoft Office	2013	1

**Survey Vessel:-**

The bathymetric survey was conducted using one motorized boat. This boat was also used to collect water sample, current velocity, soil sample etc.



**Figure 25 Survey Boat**



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- **Positioning System:-**
- **1 no Trimble DGPS system (SPS361)**



Figure 26 DGPS System Instrument

- **Navigation & Data Logging System:-**

To provide on-line route guidance, log navigation data, provide QC of navigation data, etc. The system comprises the following equipment:

- **1 no. DELL Laptop**
  - **1 no. Hypack version 2014 Navigation & Data Logging Software**
  - **1 no. Positioning & sensor interfaces**
  - **Sufficient Paper Rolls**
- 
- **Single Beam Echo Sounder System:-**
  - **1 no. Bathy 500MF multi frequency Echo sounder**
  - **1 no. transducer 210 kHz + mounting bracket & base plate**



Figure 27 Echo Sounder Instrument



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○ **Current Meter:-**

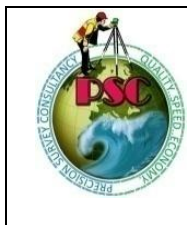
- **1 no. current meter (AEM 213-D) was used during water velocity**
- **observation**



**Figure 28 Current Meter**

● **Calibration**

The equipments used for the survey were calibrated by the equipment supplier. The equipment calibration certificates are placed at *Annexure* to this report.

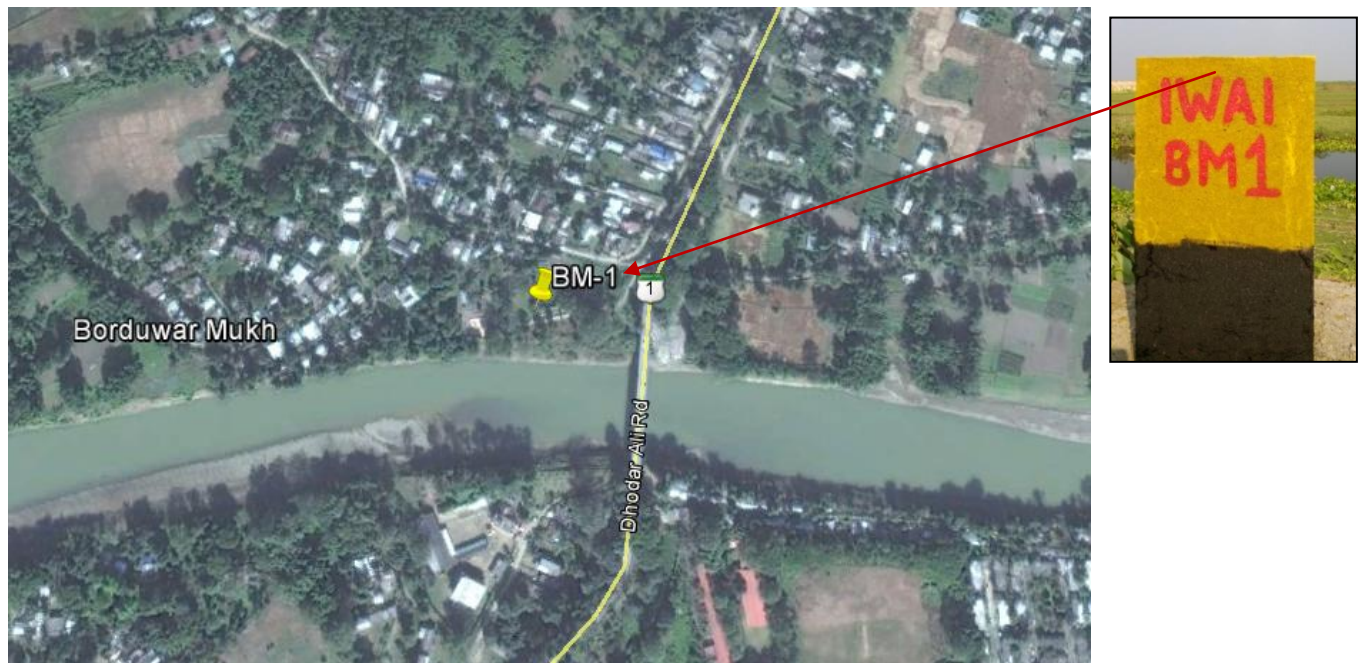


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**Annexure-10 Bench Mark Forms:-**

BM Name	Northing (m)	Easting (m)	Latitude (N)	Longitude (E)	RL (m)
BM 1	2979032.849	672755.565	26°55'20.76"	94°44'23.51"	99.250
Pillar Established by: - Precision Survey Consultancy. Surveyor – Mr. Avijit Biswas; Date of Establishment – 22.09.2015					
<b>Station Description :-</b>					
Benchmark is located near Sunpora Gohain village.					
The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.					
The pillar extends 60.cms above ground level. Inscription “IWAI”, “PSC” and BM No can be seen on the face of the pillar.					
The measurements of the bench mark pillar from notable locations / edges as follows:					
North from Road -0.56km.					
East From Road-1.39km.					
<b>Life of Station : 15Yrs</b>		<b>Datum: - WGS 84</b>		<b>ZONE :46 R</b>	



**Figure 29 BM Form & Google image view of BM-1**



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BM Name	Northing (m)	Easting (m)	Latitude (N)	Longitude (E)	RL (m)
BM 2	2982569.353	666811.888	26°55'20.76"	94°44'23.51"	96.038
Pillar Established by: - Precision Survey Consultancy. Surveyor – Mr. Avijit Biswas; Date of Establishment – 22.09.2015					
<b>Station Description :-</b>					
Benchmark is located near Meteka Pather village.					
The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.					
The pillar extends 60.cms above ground level. Inscription “IWAI”, “PSC” and BM No.can be seen on the face of the pillar.					
The measurements of the bench mark pillar from notable locations / edges as follows:					
North from Road – 1.63km.					
South From Road-0.86 km.					
<b>Life of Station : 15Yrs</b>		<b>Datum: - WGS 84</b>		<b>ZONE :46 R</b>	



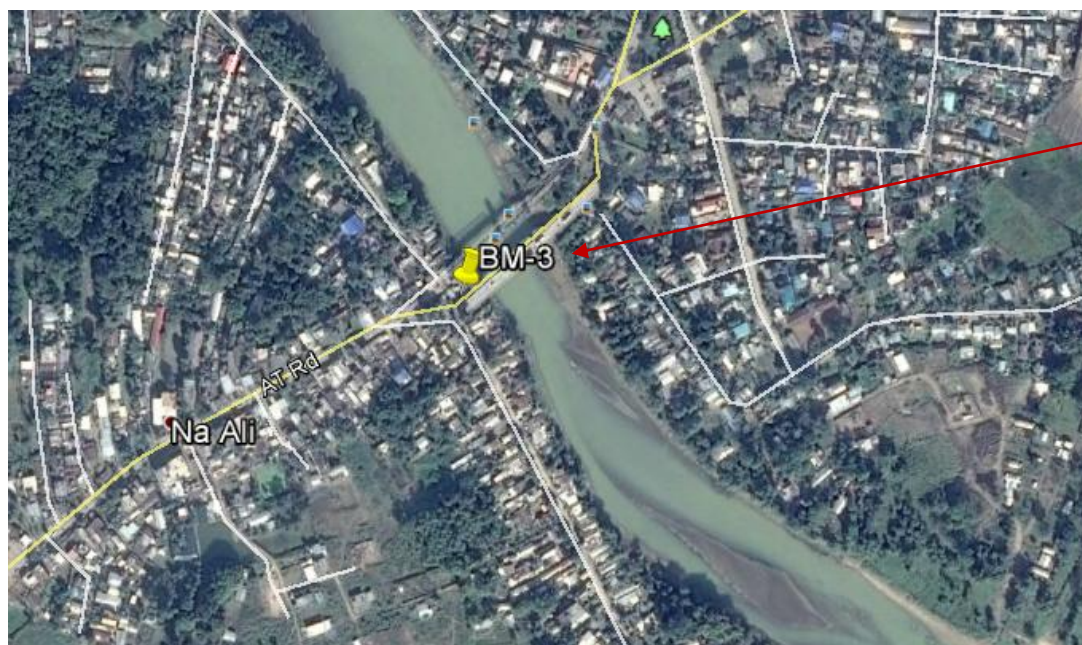
**Figure 30- BM Form & Google image view of BM-2**



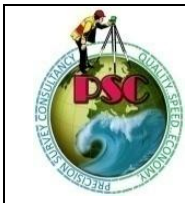
**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



BM Name	Northing (m)	Easting (m)	Latitude (N)	Longitude (E)	RL (m)
BM 3	2984758.456	661730.247	94°37'46.59"	26°58'31.57"	95.270
Pillar Established by: - Precision Survey Consultancy. Surveyor – Mr. Avijit Biswas; Date of Establishment – 25.09.2015					
<b>Station Description :-</b>					
Benchmark is located at Rupahi Pathar village.					
The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.					
The pillar extends 60.cms above ground level. Inscription “IWAI”, “PSC” and BM No.can be seen on the face of the pillar.					
The measurements of the bench mark pillar from notable locations / edges as follows:					
West From Bridge–7.0800m.					
<b>Life of Station : 15Yrs</b>		<b>Datum: - WGS 84</b>		<b>ZONE :46 R</b>	



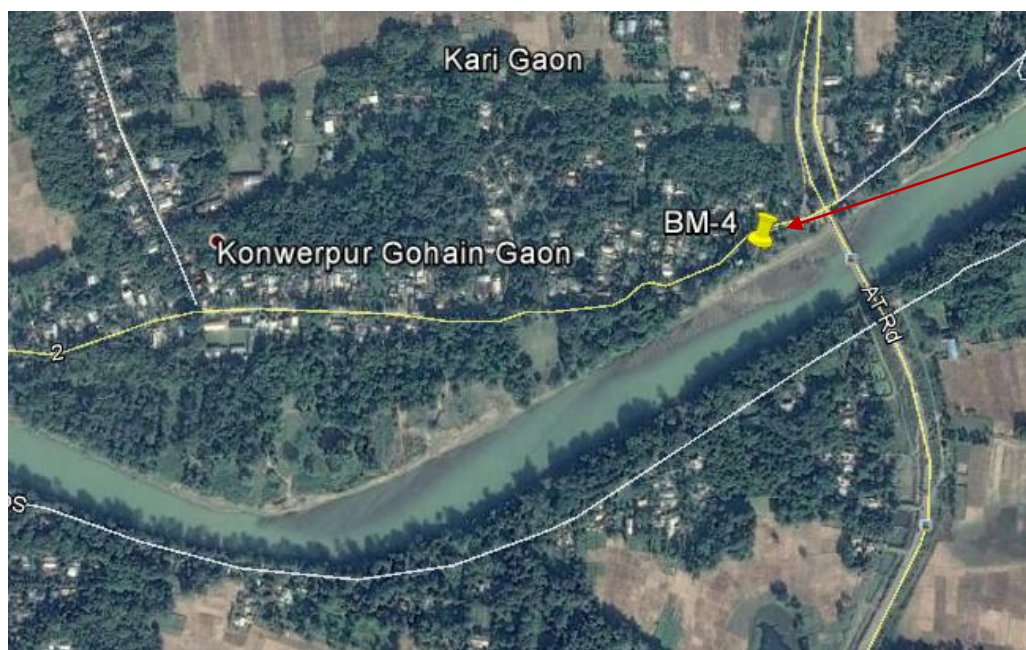
**Figure 31- BM Form & Google image view of BM-3**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



BM Name	Northing (m)	Easting (m)	Latitude (N)	Longitude (E)	RL (m)
BM 4	2985461.853	656658.021	94°34'42.99"	26°58'56.50"	93.750
Pillar Established by: - Precision Survey Consultancy. Surveyor – Mr. Avijit Biswas; Date of Establishment – 25.09.2015					
<b>Station Description :-</b>					
Benchmark is located near Jagara Hati village.					
The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.					
The pillar extends 60.cms above ground level. Inscription “IWAI”, “PSC” and BM No.can be seen on the face of the pillar.					
The measurements of the bench mark pillar from notable locations / edges as follows:					
Westside from A.T Road -0.11km.					
<b>Life of Station : 15Yrs</b>		<b>Datum: - WGS 84</b>		<b>ZONE :46 R</b>	



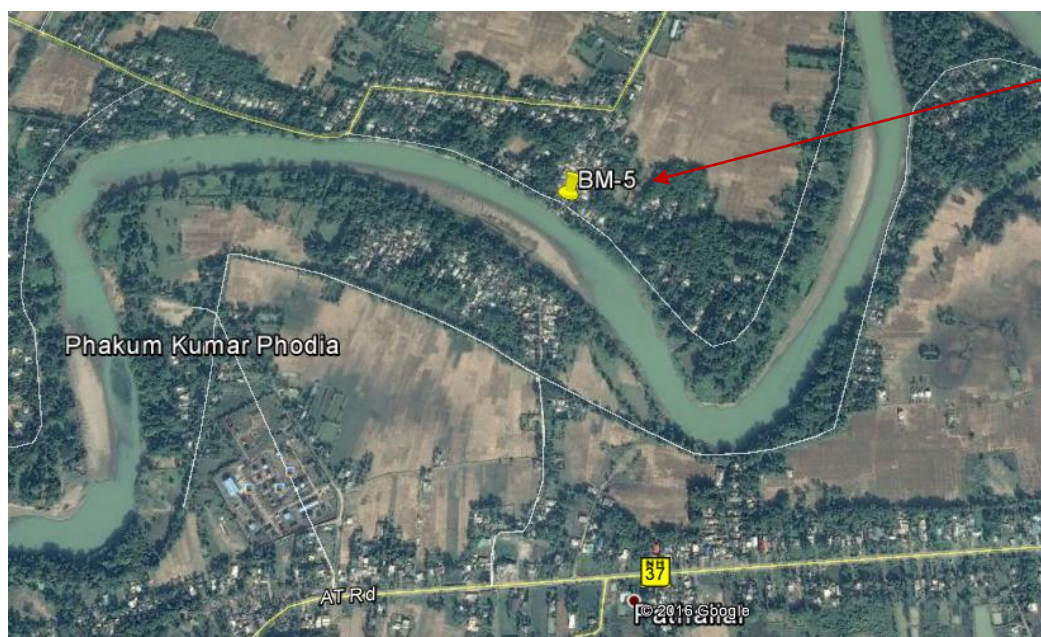
**Figure 32- BM Form & Google image view of BM-4**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



BM Name	Northing (m)	Easting (m)	Latitude (N)	Longitude (E)	RL (m)
BM 5	2982885.059	654022.073	94°33'6.24"	26°57'33.87"	94.120
Pillar Established by: - Precision Survey Consultancy. Surveyor – Mr. Avijit Biswas; Date of Establishment – 27.09.2015					
<b>Station Description :-</b>					
Benchmark is located near at Bhatiapara village.					
The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.					
The pillar extends 60.cms above ground level. Inscription “IWAI”, “PSC” and BM No.can be seen on the face of the pillar.					
The measurements of the bench mark pillar from notable locations / edges as follows:					
South From NH-37-0.84 km.					
North From Road-0.23 km.					
<b>Life of Station : 15Yrs</b>		<b>Datum: - WGS 84</b>		<b>ZONE :46 R</b>	



**Figure 33- BM Form & Google image view of BM-5**

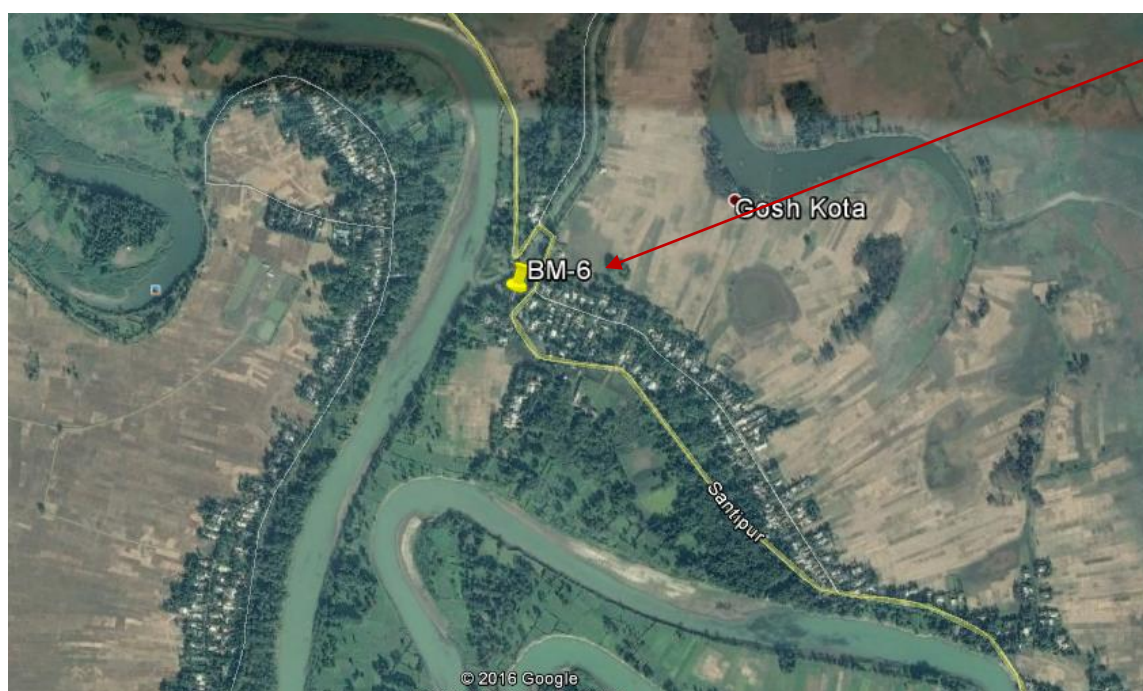




**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



BM Name	Northing (m)	Easting (m)	Latitude (N)	Longitude (E)	RL (m)
BM 6	2985631.118	649136.932	94°30'10.27"	26°59'5.01"	87.215
Pillar Established by: - Precision Survey Consultancy. Surveyor – Mr. Avijit Biswas; Date of Establishment – 02.10.2015					
<b>Station Description :-</b>					
Benchmark is located beside EC road near Goshkota village.					
The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.					
The pillar extends 60.cms above ground level. Inscription “IWAI”, “PSC” and BM No.can be seen on the face of the pillar.					
The measurements of the bench mark pillar from notable locations / edges as follows:					
West from Road – 0.04km. South from NH-37- 5.55km.					
<b>Life of Station : 15Yrs</b>	<b>Datum: - WGS 84</b>			<b>ZONE :46 R</b>	



**Figure 34- BM Form & Google image view of BM-6**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



BM Name	Northing (m)	Easting (m)	Latitude (N)	Longitude (E)	RL (m)
BM 7	2987835.928	645798.674	94°28'10.14"	27° 0'17.90"	87.420

Pillar Established by: - Precision Survey Consultancy. Surveyor – Mr. Avijit Biswas;  
Date of Establishment – 05.10.2015

**Station Description :-**

Benchmark is located beside EC road near Saraguri village.

The BM is denoted by a “.” mark engraved on a plate. The plate is fixed on a 5cm diameter GI pipe. The GI pipe is cemented with construction pillar of 30cmX30cmX150cm.

The pillar extends 60.cms above ground level. Inscription “TWAI”, “PSC” and BM No.can be seen on the face of the pillar.

The measurements of the bench mark pillar from notable locations / edges as follows:

West from Disang mukh road–2.59km.

<b>Life of Station : 15Yrs</b>	<b>Datum: - WGS 84</b>	<b>ZONE :46 R</b>
--------------------------------	------------------------	-------------------



**Figure 35- BM Form & Google image view of BM-7**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Annexure-11 Levelling Calculation:**

**Leveling from BM-7 to GS-5**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.348					87.420	BM-7
0.553		2.985		2.637	84.783	
0.320		2.428		1.875	82.908	
0.550		2.155		1.835	81.073	
		1.274		0.724	80.349	GAUGE STATION-5

**Leveling from BM-6 to GS-4**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.365					87.215	BM-6
0.485		2.660		2.295	84.920	
0.355		2.442		1.957	82.963	
		2.397		2.042	80.921	GAUGE STATION-4

**Leveling from CP-R-5 to GS-3**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.486					86.550	CP-R5
0.885		2.350		1.864	84.686	
0.550		2.050		1.165	83.521	
		1.960		1.410	82.111	GAUGE STATION-3

**Leveling from BM-5 to GS-2**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.885					94.120	BM-5
0.340		3.153		2.268	91.852	
0.655		3.080		2.740	89.112	
0.205		2.855		2.200	86.912	
0.556		2.074		1.869	85.043	
		1.940		1.384	83.659	GAUGE STATION-2



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Leveling from BM-4 to GS-1**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.560					93.750	BM-4
0.535		2.882		2.322	91.428	
0.358		2.658		2.123	89.305	
0.283		1.985		1.627	87.678	
		1.668		1.385	86.293	GAUGE STATION-1

**Leveling from BM-4 to GS-9**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.347					93.750	BM-4
0.685		3.480		3.133	90.617	
0.267		1.998		1.313	89.304	
0.434		1.850		1.583	87.721	
		1.855		1.421	86.300	GAUGE STATION-9

**Leveling from BM-3 to GS-8**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.840					95.270	BM-3
0.685		1.995		1.155	94.115	
0.365		2.115		1.430	92.685	
0.495		2.965		2.600	90.085	
0.378		2.448		1.953	88.132	
		2.067		1.689	86.443	GAUGE STATION-8

**Leveling from BM-3 to GS-6**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.820					95.270	BM-3
0.674		3.155		2.335	92.935	
0.785		2.880		2.206	90.729	
0.678		2.625		1.840	88.889	
		2.667		1.989	86.900	GAUGE STATION-6

**Leveling from BM-1 to GS-7**

BS	IS	FS	RISE(+)	FALL(-)	RL (m)	REMARKS
0.562					99.250	BM-1
0.339		3.320		2.758	96.492	
0.395		2.995		2.656	93.836	
0.497		2.655		2.260	91.576	
		2.880		2.383	89.193	GAUGE STATION-7

**Table 23 Leveling Calculation of Dikhu River**



FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)



**Annexure-12 Soil Sample Report:-**

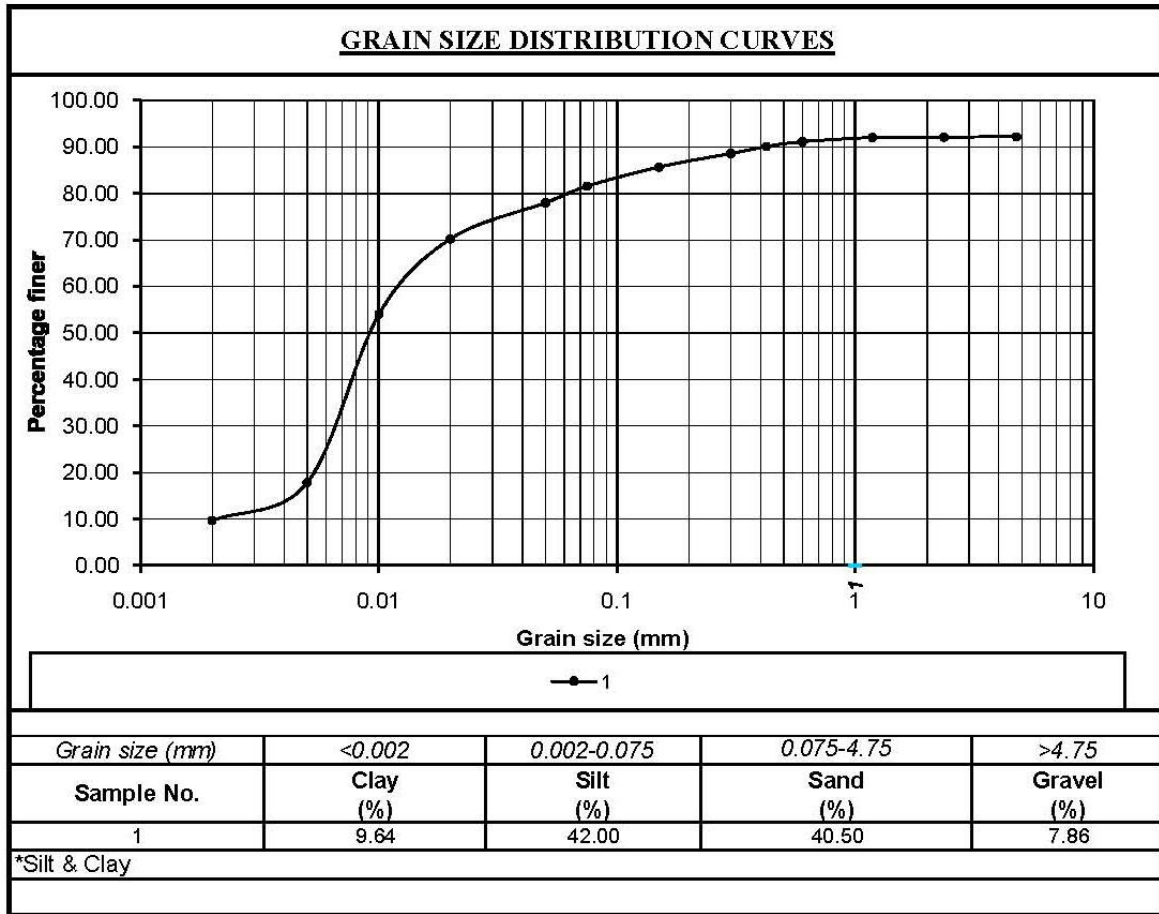
**RESULT OF TEST OF SOIL SAMPLES**

**SITE: DIKHU RIVER**

SITE-DIKHU RIVER										
PHYSICAL ANALYSIS OF SOIL										
SL. NO	B.M	GRAVEL (%)	SAND (%)	SILT+CLAY (%)	SPECIFIC GRAVITY	PH VALUE	SILT	CLAY	Cu	Cc
1	1	7.86	40.50	51.64	2.62	7.20	42.00	9.64	6.27	1.51
2	3	6.45	26.50	67.05	2.66	7.40	59.50	7.55	4.43	0.95
3	7	6.50	38.00	55.50	2.63	7.20	46.50	9.00	5.77	1.42

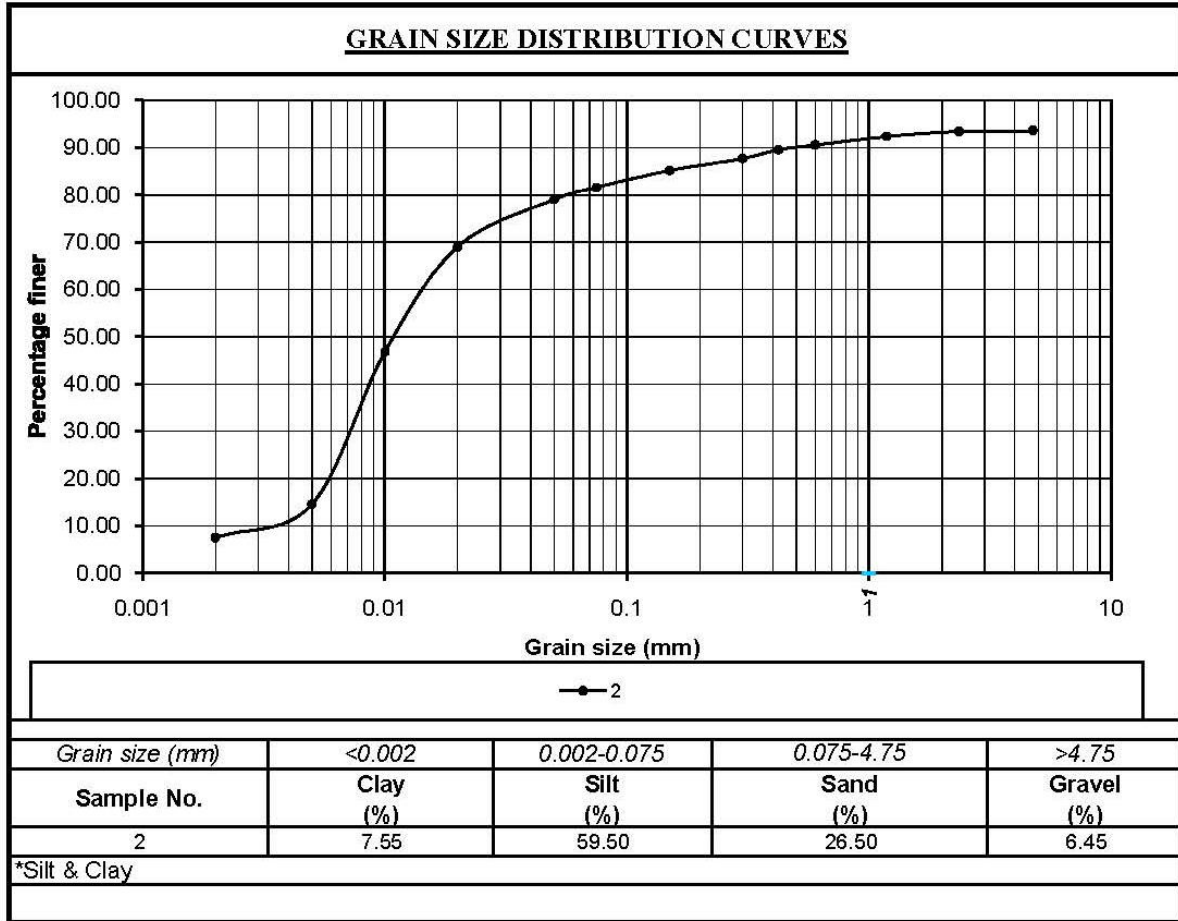


**FINAL FEASIBILITY REPORT ON  
 “DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
 IN ASSAM ( 63.205KMS)**



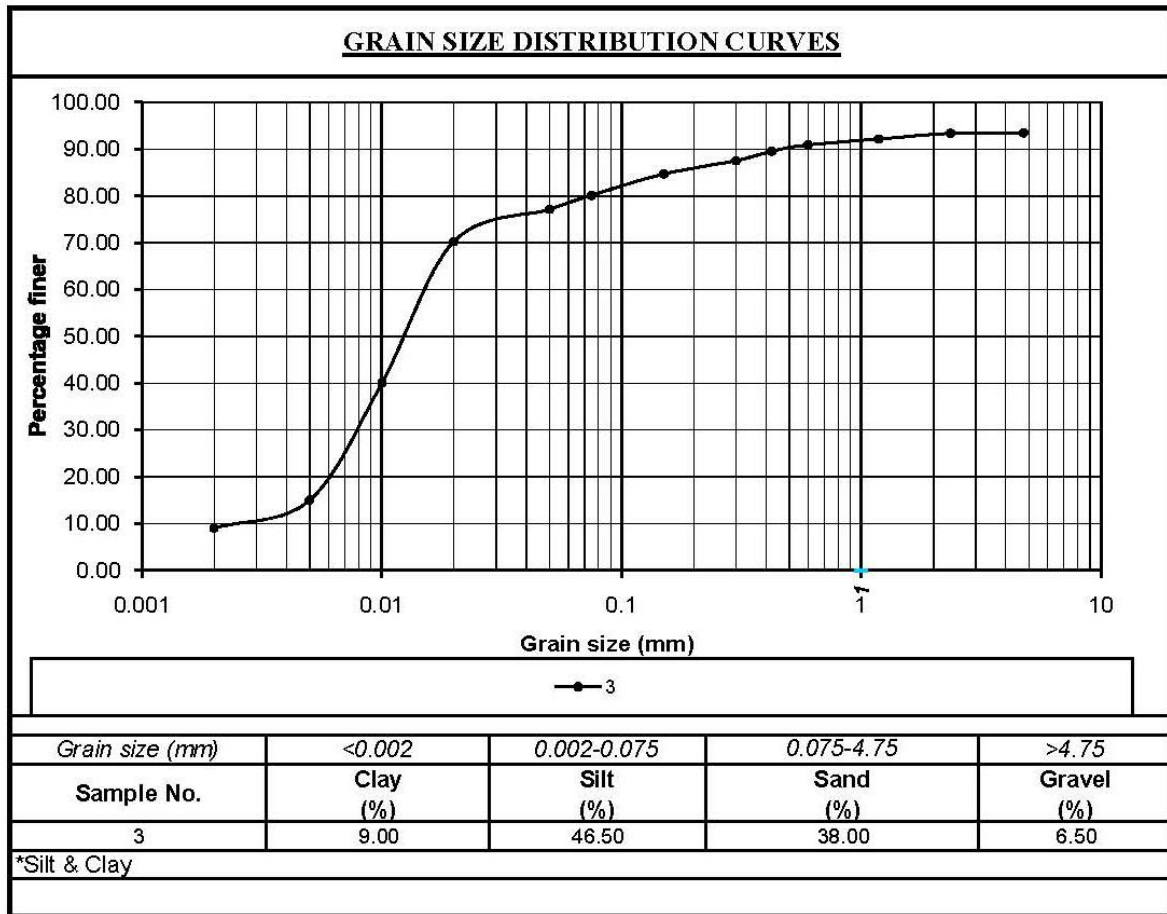


**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**





**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**







**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Annexure-13 Water Sample:-**

<b>RESULTS OF EXAMINATION OF SAMPLES OF WATER</b>					
<b>SITE- RIVER DIKHU</b>					
<b>PARAMETER – pH Value at 25° C</b>					
<b>SL.NO;</b>	<b>B.M</b>	<b>LOCATION</b>	<b>PARAMETER</b>	<b>WATER SAMPLE RESULTS</b>	<b>PERMISSIBLE LIMIT IS:456-2000</b>
1	1	UPPER	pH Value at 25° C	6.9	6.5 – 8.5
2		MIDDLE		7.2	
3		LOWER		7.1	
4	3	UPPER		7.0	
5		MIDDLE		7.1	
6		LOWER		7.2	
7	7	UPPER		7.1	
8		MIDDLE		7.2	
9		LOWER		6.9	

<b>PARAMETER –Chloride as Cl (mg/l)</b>					
<b>SITE- RIVER DIKHU</b>					
<b>SL.NO;</b>	<b>B.M</b>	<b>LOCATION</b>	<b>PARAMETER</b>	<b>WATER SAMPLE RESULTS</b>	<b>PERMISSIBLE LIMIT IS:456-2000</b>
1	1	UPPER	Chloride as Cl (mg/l)	4	2000 mg/l for concrete not containing embedded steel and 500 mg/l for reinforced concrete work.
2		MIDDLE		4	
3		LOWER		3	
4	3	UPPER		3	
5		MIDDLE		4	
6		LOWER		3	
7	7	UPPER		3	
8		MIDDLE		4	
9		LOWER		3	

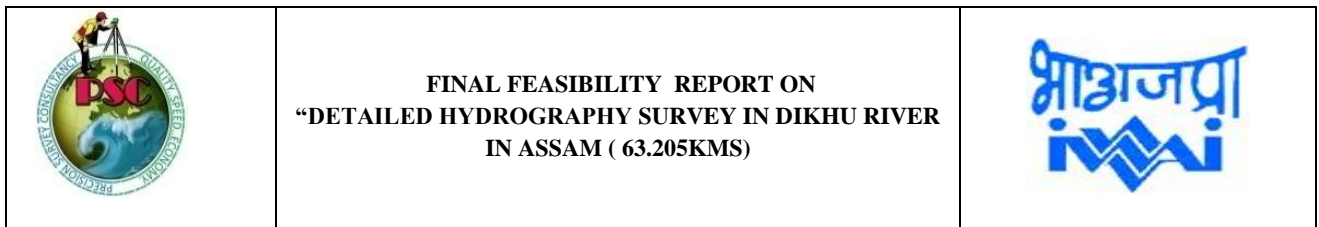


**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



<b>PARAMETER –Sulphates as SO<sub>4</sub> (mg/l)</b>					
<b>SITE- RIVER DIKHU</b>					
<b>SL.NO;</b>	<b>B.M</b>	<b>LOCATION</b>	<b>PARAMETER</b>	<b>WATER SAMPLE RESULTS</b>	<b>PERMISSIBLE LIMIT IS:456-2000</b>
1	1	UPPER	<b>Sulphates as SO<sub>4</sub> (mg/l)</b>	213	<b>400 (mg/l)</b>
2		MIDDLE		275	
3		LOWER		267	
4	3	UPPER		214	
5		MIDDLE		275	
6		LOWER		266	
7	7	UPPER		212	
8		MIDDLE		276	
9		LOWER		266	

<b>PARAMETER –Sediment Concentration (mg/l)</b>					
<b>SITE- RIVER DIKHU</b>					
<b>SL.NO;</b>	<b>B.M</b>	<b>LOCATION</b>	<b>PARAMETER</b>	<b>WATER SAMPLE RESULTS</b>	<b>PERMISSIBLE LIMIT IS:456-2000</b>
1	1	UPPER	<b>Sediment Concentration (mg/l)</b>	26	<b>2000 (mg/l)</b>
2		MIDDLE		30	
3		LOWER		37	
4	3	UPPER		25	
5		MIDDLE		32	
6		LOWER		35	
7	7	UPPER		25	
8		MIDDLE		30	
9		LOWER		36	



**Annexure-14 Calibration Certificate:-**

**PAN INDIA CONSULTANTS PVT. LTD.**  
SALES DEPARTMENT

CORPORATE ADDRESS : 105, PHASE IV, UDYOG VIHAR, GURGAON-122015, HARYANA, INDIA  
PHONES : +91 124 4300950, 4013954. FAX : +91 124 2346646, 2342880, CIN - U74899DL1985PTC021177  
e-mail : paie@panindiagroup.com, paie@vsnl.com, www.panindiagroup.com

**CALIBRATION CERTIFICATE**

<b>CUSTOMER NAME</b>	<b>:</b>	<b>PRECISION SURVEY CONSULTANCY</b>
<b>ADDRESS</b>	<b>:</b>	<b>Po: Salap (Jatin Xerox Center) Dist: Howrah Pin: 711409</b>
<b>INSTRUMENT</b>	<b>:</b>	<b>DGPS EQUIPMENTS</b>
<b>SERIES</b>	<b>:</b>	<b>SPS 855</b>
<b>SERIAL NUMBER</b>	<b>:</b>	<b>5431R03128, 5340K46115</b>
<b>CALIBRATION DATE</b>	<b>:</b>	<b>15/12/2014</b>
<b>VALIDITY</b>	<b>:</b>	<b>14/12/2015</b>

**THIS IS TO CERTIFY THAT THE ABOVE INSTRUMENT WAS CHECKED AND CALIBRATED IN ACCORDANCE WITH THE APPLICABLE FACTORY PROCEDURES.**

For **PAN INDIA CONSULTANTS PVT. LTD.**

**AUTHORISED SIGNATORY**

REGD. OFFICE : OFFICE NO. 1, D-4, COMMERCIAL AREA, VASANT KUNJ, NEW DELHI-110070, INDIA  
PHONES : +91 11 26137657, 26137659, 26899952, 26899962, 26132214 FAX : +91 11 26138633  
e-mail : nmspl@panindiagroup.com URL : www.panindiagroup.com

**Figure 36- Calibration Certificate of DGPS**



FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)



**PAN INDIA CONSULTANTS PVT. LTD.**

SALES DEPARTMENT

CORPORATE ADDRESS : 105, PHASE IV, UDYOG VIHAR, GURGAON-122015, HARYANA, INDIA  
PHONES : +91 124 4300950, 4013954, FAX : +91 124 2346646, 2342880, CIN - U74899DL1985PTC021177  
e-mail : paie@panindiagroup.com, paie@vsnl.com, www.panindiagroup.com

**CALIBRATION CERTIFICATE**

CUSTOMER NAME	:	PRECISION SURVEY CONSULTANCY
ADDRESS	:	P.O. –SALAP (Jatin Xerox Center) Dist. –Howrah Pin: 711 409
INSTRUMENT	:	ECHO –SOUNDER
SERIES	:	500MF
SERIAL NUMBER	:	B5MF0560
CALIBRATION DATE	:	28/04/2015
VALIDITY	:	27/04/2016

THIS IS TO CERTIFY THAT THE ABOVE INSTRUMENT WAS CHECKED AND CALIBRATED IN ACCORDANCE WITH THE APPLICABLE FACTORY PROCEDURES.

For **PAN INDIA CONSULTANTS PVT. LTD.**

  
**AUTHORISED SIGNATORY**

REGD. OFFICE : OFFICE NO. 1, D-4, COMMERCIAL AREA, VASANT KUNJ, NEW DELHI-110070, INDIA  
PHONES : +91 11 26137657, 26137659, 26899952, 26899962, 26132214 FAX : +91 11 26138633  
e-mail : nmspl@panindiagroup.com URL : www.panindiagroup.com

**Figure 37- Calibration Certificate of Echo Sounder**



FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)



**SOUTH**

**SOUTH PRECISION INSTRUMENT PVT. LTD.**

FA - 229 B, Ground Floor, Mansarover Garden, New Delhi-110015  
Ph. : 011- 45544114, 65568870 Fax: 011- 45530854 Mob.: 9999999255

**Calibration Certificate**

**SOUTH Precision Instrument Pvt. Ltd.** Calibration laboratory certifies that the instrument has been inspected, tested and calibrated in accordance with the documented procedures using measuring and test equipment, which are traceable to national standards and of the international accepted standard.

We hereby certify that the instrument mentioned below meet the specification and result of the traceability is carried out in accordance to our company's standard.

**INSTRUMENT TYPE** : GPS RTK  
**MODEL** : S-86T  
**MAKE** : SOUTH  
**INSTRUMENT SR. NO.** : S86951117129438GEM  
W1286752342GM  
**CALIBRATION DATE** : 10/02/2015  
**VALID UPTO** : 09/02/2016  
**ISSUED TO** : PRECISION SURVEY CONSULTANCY

For SOUTH PRECISION INSTRUMENT PVT. LTD.  
For SOUTH PRECISION INSTRUMENT PVT. LTD.  
Authorized Signatory

Authorized Signatory

Figure 38- Calibration Certificate of GPS-RTK



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Annexure-15 Site Picture:-**



**Figure 39- Bathymetry Instrument**



**Figure 40- Topography Instrument**



**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



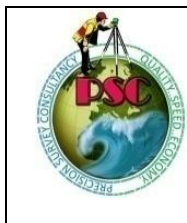


FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)



Figure 41- Site Picture of River Bank Side





**FINAL FEASIBILITY REPORT ON  
“DETAILED HYDROGRAPHY SURVEY IN DIKHU RIVER  
IN ASSAM ( 63.205KMS)**



**Annexure-16 Survey Chart:-**

<b>LIST OF SURVEY CHARTS OF DIKHU RIVER ( NW-32 )</b>								
Sl. No.	Chart No.	Location	Chainage (Form.....km. To.....km.)	Chart Datum And Water Level w.r.t. MSL			Value of Reduction	Remarks
				Chainage (km.)	CD (m.)	WL (m.)		
1	P_01	Saraguri to Gosh kota	0.000 km to 8.695 km	0.616	80.875	80.349	0.526	GS-5
				9.646	81.971	80.921	1.050	GS-4
2	P_02	Gosh kota to Sungia	8.695 km to 18.514 km	9.646	81.971	80.921	1.050	GS-4
				20.964	83.345	82.111	1.234	GS-3
3	P_03	Sungia to Sesur Khowa	18.514 km to 26.548 km	20.964	83.345	82.111	1.234	GS-3
				24.500	83.775	83.659	0.116	GS-2
4	P_04	Sesur Khowa to Gara Kush	26.548 km to 34.851 km	24.500	83.775	83.659	0.116	GS-2
				34.273	84.961	86.293	-1.332	GS-1
5	P_05	Gara Kush to Arjun Guri	34.851 km to 41.428 km	34.364	84.972	86.300	-1.328	GS-9
				42.390	85.947	86.443	-0.496	GS-8
6	P_06	Arjun Guri to Hatimuria	41.428 km to 46.194 km	42.390	85.947	86.443	-0.496	GS-8
				42.643	85.955	86.990	-1.035	GS-6
7	P_07	Hatimuria to Singha Duwar Grant	46.194 km to 52.465 km	42.643	85.955	86.990	-1.035	GS-6
8	P_08	Singha Duwar Grant to Moiramora Handique	52.465 km to 59.805 km	63.088	88.435	89.193	-0.758	GS-7
9	P_09	Moiramora Handique to Borduwar Mukh	59.805 km to 63.205 km	63.205	88.435	89.193	-0.758	GS-7

**Table 24- Survey Chart**

**Note: Scale:** - 1:5000 in each survey Chart

**Survey period:** - 21<sup>st</sup> September, 2015 to 22<sup>nd</sup> October, 2015

✦ **G.S:-** Gauge Station