

**BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE AT CHENNAI**

**O.A.No.143 of 2021**

**BETWEEN**

Tribunal on its own motion-SUO MOTU Based on the News item in Eenadu Newspaper Edition Dated: 12.06.2021, "Dredging along the embankments of Krishna River to be stopped".

**... APPLICANT**

**-VS-**

The Chief Secretary to Government of Andhra Pradesh  
& 10 others

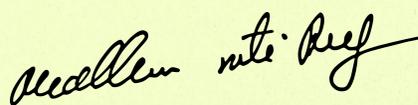
**... RESPONDENTS**

**INDEX**

<b>Sl.No.</b>	<b>DATE</b>	<b>Description of the Document</b>	<b>Page No.</b>
1.	21-10-2021	Additional counter Affidavit filed by 11 <sup>th</sup> Respondent	1 - 6
2.		Bathametric survey 2019-20 & 2020-21 ( <b>Annexure-I</b> )	7 - 24
3.		Order copy in O.A.No 935/2018 ( <b>Annexure-II</b> )	25 - 26

It is certified that all the documents contained in the above annexure are true copies.

Date: 21.10.2021



  
**Chief Engineer**  
**Krishna Delta System**  
**Vijayawada-2.**

**M/S MADHURI DONTI REDDY  
ADVOCATE**

**STANDING COUNCIL FOR GOVERNMENT OF  
ANDHRA PRADESH**

**A.P. POLLUTION CONTROL BOARD  
T.T.D. SUPREME COURT OF INDIA**

#S2, Royal Castle, 26, Gill Nagar Extension, Choolaimedu,  
Chennai - 600 094. Mobile: 98407 98460 / 6383121322

**COUNSEL FOR 1 to 11<sup>th</sup> Respondent**

- 1 -

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE BENCH AT CHENNAI**

**Original Application No.143 / 2021**  
(Under Section 18(1) read with Sections 14 & 15, of National  
Green Tribunal Act 2010)

**IN THE MATTER OF:**

Tribunal on its own motion-SUO MOTU Based on the News item  
in Eenadu Newspaper Edition Dated: 12.06.2021, "Dredging  
along the embankments of Krishna River to be stopped".

... Applicant

-VERSUS-

1. **The Chief Secretary to Government of Andhra Pradesh**  
1<sup>st</sup> Block, 1<sup>st</sup> Floor, Interim Government Complex  
A.P. Secretariat Office, Velagapudi, Guntur  
Andhra Pradesh – 522 237.  
Ph: 863 2441024, Email: [cs@ap.gov.in](mailto:cs@ap.gov.in)
2. **Special Chief Secretary of Andhra Pradesh**  
Department of Environment, Forest, Science and Technology,  
4<sup>th</sup> Block, Ground Floor, Room No.268,  
A.P. Secretariat Office, Velagapudi, Guntur District,  
Andhra Pradesh – 522 237.  
Ph: 0863 2444438.  
Email: [splcs\\_efst@ap.gov.in](mailto:splcs_efst@ap.gov.in)
3. **Principal Secretary of Andhra Pradesh**  
Department of Revenue, Land &  
Disaster Management  
4<sup>th</sup> Block, Ground Floor, Room No.135,  
A.P. Secretariat Office, Velagapudi,  
Guntur, Andhra Pradesh – 522 237.  
Ph: 0863 2444558.  
Email: [prlsecy\\_rev@ap.gov.in](mailto:prlsecy_rev@ap.gov.in)
4. **Principal Secretary of Andhra Pradesh**  
Department of Agriculture & Cooperation  
4<sup>th</sup> Block, Ground Floor, Room No.188,  
A.P. Secretariat Office, Velagapudi,  
Guntur, Andhra Pradesh – 522 237  
Ph: 0863-2444539  
Email: [prlsecy\\_agr@ap.gov.in](mailto:prlsecy_agr@ap.gov.in)
5. **Special Chief Secretary of Andhra Pradesh**  
Department of Water Resources  
4<sup>th</sup> Block, 1<sup>st</sup> Floor, Room No.216  
A.P. Secretariat Office, Velagapudi,  
Guntur, Andhra Pradesh – 522 237.  
Ph: 0863 2444248.  
Email: [splcs\\_wrd@ap.gov.in](mailto:splcs_wrd@ap.gov.in)

  
**Chief Engineer**  
**Krishna Delta System**  
Vijayawada-2.

6. **Principal Secretary of Andhra Pradesh**  
Department of Mines & Geology  
2<sup>nd</sup> Block, Ground Floor, Room No.101  
A.P. Secretariat Office, Velagapudi,  
Guntur, Andhra Pradesh - 522 237.  
Tel: 0863 2442117  
Email: [secy\\_mines@ap.gov.in](mailto:secy_mines@ap.gov.in)
7. **Amaravati Metropolitan Region Development Authority**  
Rep. by Metropolitan Commissioner  
Lenin Center, Governorpet, Vijayawada  
Andhra Pradesh - 520002.  
Ph: 7095599001  
Email: [commissioner.amrda@amrda.org](mailto:commissioner.amrda@amrda.org)
8. **The District Collector**  
Guntur District  
District Collectorate, Collector Office Road  
R and B Quarters, Guntur  
Andhra Pradesh - 522004  
Ph: 0863-2234990  
Email: [collector\\_gntr@ap.gov.in](mailto:collector_gntr@ap.gov.in)
9. **The District Collector**  
Krishna District  
District Collectorate,  
CollectorateMain Building  
Chilakalapudi, Machilipatnam  
Andhra Pradesh - 521002  
Ph: 08672252668  
Email: [collector\\_krsn@ap.gov.in](mailto:collector_krsn@ap.gov.in)
10. **Engineer-In-Chief (Irrigation)**  
Water Resource Department  
Door No.48-10-9/1, N.H. Feeder Road  
Near Ramvarappadu Circle, Currency Nagar  
Vijayawada, Andhra Pradesh-520 008  
Phone: 8790999939  
Email: [encirrigationap@gmail.com](mailto:encirrigationap@gmail.com)
11. **The Chief Engineer**  
Krishna Delta System  
TTD Kalyana Mandapam Road  
Opp. CM Camp Office, Buckinghampeta  
Vijayawada, Andhra Pradesh -520 008  
Ph: 0866-2575314  
Email: [cekdsuja@gmail.com](mailto:cekdsuja@gmail.com)

... Respondents

**ADDITIONAL COUNTER AFFIDAVIT FILED BY THE**  
**11<sup>th</sup> RESPONDENT**

I, C. Narayana Reddy, S/o. Chenna. Krishna Reddy, Aged about 59 years, Occ: Chief Engineer, Krishna Delta System,

  
**Chief Engineer**  
**Krishna Delta System**  
**Vijayawada-2.**

Vijayawada, Krishna District, R/o. Vijayawada, Krishna District,  
do hereby solemnly affirm and sincerely state as follows:-

1. I am the 10<sup>th</sup>& 11<sup>th</sup> Respondent in the above said matter and I am authorized to swear to this Additional counter affidavit and am conversant with the facts and circumstances of the said matter.

2. This respondent denies each and every averment made in the affidavit filed in support of the application as false and incorrect except those that are specifically admitted herein in this Additional counter affidavit.

3. It is respectfully submitted that this Hon'ble Tribunal order dated 30.09.2021 para No.7 and 8 as follows;

*7. When a question was posed to the learned counsel appearing for the State of Andhra Pradesh regarding the area as to where the dredged materials were permitted to be stacked or stored and whether it is an agricultural land or any other land owned by the Government Department, whether any study has been conducted earlier quantifying the quantity of debris or silt that will have to be removed as part of dredging and also certain quantity of dredged materials and manner in which it was disposed of during the previous year mentioned in the counter affidavit filed, then the learned counsel appearing for the respondents wanted time to get clarification regarding these aspects.*

*8. So considering the circumstances, we feel that some time can be granted to the official respondents to clarify those aspects and submit a further report to this*

  
**Chief Engineer  
Krishna Delta System  
Vijayawada-2.**

**Tribunal.** It is submitted that the number of ponds are required for stacking dredged material and these ponds can be formed on vacant margin lands in both Private and Government lands adjacent to the area proposed for de-silting. Some of the margin lands on right side of River Krishna in Guntur district which were acquired by the CRDA (AMRDA) through Land Pooling System (LPS) and are under the control of CRDA (AMRDA) i.e., Government land.

4. It is submitted that, Bathametric survey has been conducted during the year 2019-20 & 2020-21 ( **Annexure-I**)on upstream of Prakasam Barrage from KM 0.00 to KM 13.50 by Water Resources Department to study the storage capacity lost and for quantifying the quantity of debris or silt deposits on upstream of Prakasam Barrage and submitted to the Hon'ble NGT in compliance to the directions in O.A.No 935/2018. ( **Annexure-II**)

5. Further, it is submitted during the year 2016 to 2018 the de-silted material was handed over to Mines & Geology Department and the same was disposed off without causing any damages to environment and flood banks on either side of the Krishna River.

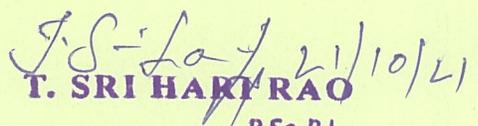
In the above circumstances, it is humbly prayed that this Hon'ble Tribunal may be pleased to dismiss the above Original Application No.143 of the 2021 and pass such further or other orders as this Hon'ble Tribunal may deem fit and proper in the facts and circumstances of the case and thus render justice.

Solemnly affirmed at Vijayawada  
on this the 21<sup>st</sup> day of October, 2021  
and signed his name in my presence  
ADVOCATE, Vijayawada

  
**Chief Engineer**  
**Krishna Delta System**  
Vijayawada-2.

Before me

ADVOCATE VIJAYAWADA

  
**T. SRI HARI RAO**  
B.Sc., B.L.,  
**NOTARY & ADVOCATE**  
VIJAYAWADA - 520 002,  
Andhra Pradesh

**VERIFICATION**

I, C. Narayana Reddy Kumar, S/o. C. Krishna Reddy , Aged about 59 years, Occ: Chief Engineer, Krishna Delta System, Vijayawada, Krishna District, R/o. Vijayawada, Krishna District do hereby verify that the contents of Paras of Counter Affidavit are based on record and information are true to the best of my knowledge and belief.

Hence, verified on the 21<sup>st</sup> day of October,2021 at Vijayawada

  
**DEPONENT**  
**Chief Engineer**  
**Krishna Delta System**  
**Vijayawada-2.**

  
**T. SRI HARI RAO**  
**B.Sc.,B.L.,**  
**NOTARY & ADVOCATE**  
**VIJAYAWADA - 520 002,**  
**Andhra Pradesh**

**BEFORE THE HONOURABLE NATIONAL GREEN  
TRIBUNAL SOUTHERN ZONE AT CHENNAI**

**O.A.No.143 of 2021**

**BETWEEN**

Tribunal on its own motion-SUO MOTU Based on the News item in Eenadu Newspaper Edition Dated: 12.06.2021, "Dredging along the embankments of Krishna River to be stopped".

**... APPLICANT**

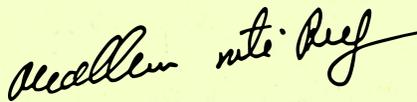
**-VS-**

The Chief Secretary to Government of Andhra Pradesh  
& 10 others

**... RESPONDENTS**

**ADDITIONAL COUNTER AFFIDAVIT FILED BY THE  
11<sup>TH</sup> RESPONDENT**

Date:-21.10.2021



**M/S MADHURI DONTI REDDY  
ADVOCATE**

**STANDING COUNCIL FOR GOVERNMENT OF  
ANDHRA PRADESH**

**A.P. POLLUTION CONTROL BOARD  
T.T.D. SUPREME COURT OF INDIA**

#S2, Royal Castle, 26, Gill Nagar Extension, Choolaimedu,  
Chennai – 600 094. Mobile: 98407 98460 / 6383121322

**COUNSEL FOR 11<sup>th</sup> Respondent.**

# Report on Hydrographic Survey in Krishna river upstream side from Prakasam Barrage to Ibrahimpatnam.



*Client:*

**SUPERINTENDING ENGINEER**  
Irrigation Circle, Vijayawada  
Water Resources Department  
Government of Andhra Pradesh



*Contractor:*

**BSP HYDRO DREDGING WORKS PVT LTD**  
D.No. 3-10-87/16, Flat – 401, DSR Residency  
Near Rly. Gate, Garagaparru Road  
BHIMAVARAM – 534 202

## INTRODUCTION

### General

Conducting Hydrographic Survey in Krishna river upstream side from Prakasam Barrage to Ibrahimpatnam, A.P. has been entrusted to BSP Hydro Dredging Works Pvt. Ltd., Bhimaaram vide AP Irrigation Department's Work Order No.:SE/IC/VJA/DB/ATO/1224M dt. 16-11-2019.

### Location Map (Courtesy: Google Earth)



Figure-1: Krishna River from Prakasam Barrage to Ibrahimpatnam (Not to scale)

## SUMMARY OF RESULTS

Syqwest Bathy 500 DF dual frequency echo sounder was utilized to acquire the bathymetric data in the area of interest. Hemisphere R110 DGPS system was used as positioning system. Both of these equipments are mounted on survey boat for data acquisition.

A value of 1508 m/s was used as the average velocity of sound in river water which was applied

in the environmental setup during bathymetric acquisition. The data so obtained was then processed using Hypack.

Water Levels have been supplied by Irrigation Department on hourly basis from the observations made from Barrage's sill level i.e., +13.73 m above MSL.

All the bathymetry data was plotted on scales of 1:3000. The values depicted in the charts are the water depths at the time of survey.

The minimum and maximum water depths observed from bathymetric survey are 0.04 m and 14.76 m.

The details of the survey findings are given in Section 13.0 of this report.

## **OBJECTIVE & SCOPE OF WORK**

### **Objective**

To carry out Hydrographic survey in Krishna River from Prakasam Barrage to Ibrahimpatnam as detailed in the scope of work and to analyze the collected data.

### **Scope of Work:**

The scope of work for this Hydrographic survey was detailed in Superintending Engineer, Irrigation Circle, Vijayawada's Tender Notice No. 2/2019-20, Dt.21.09.2019 (3rd call) dt.21-09-2019 and Work Order No. SE/IC/VJA/DB/ATO/1224M, dated 16-11-2019.

- a) Hydrographic Survey in Krishna River water spread area at FRL from Prakasam Barrage to Ibrahimpatnam area (About 13.5 km above Barrage) by Echo sounding method across Krishna River in regular grid intervals of 10m. (Both in X & Y Planes) – 2 Times.



## METHODOLOGY

Prior to rigging up of survey equipment on to survey boat, a pre-task meeting was held at the Site Office near Punnami Ghat, Vijayawada between project team to determine and adopt best strategies for executing the survey.

Bathymetry and positioning equipment were installed and tested prior to commencement of survey activities. All relevant location data, geodetic parameters, working drawings of the survey areas and Water Levels on hourly basis were provided by AP Irrigation Department.

### Area of Interest

The area of survey is from Prakasam Barrage to Ibrahimpatnam near Vijayawada city in the State of Andhra Pradesh, India. The details of Survey area boundaries are given below.

COORDINATES OF HYDROGRAPHIC SURVEY AREA				
WGS-84 Spheroid, UTM Projection, Central Meridian - 81° East, Zone - 44 North				
S. No.	Geographical Co-ordinates		UTM Co-ordinates	
	Latitude (N)	Longitude (E)	Easting (m)	Northing(m)
1	16°30'42.5240"	80°36'22.9624"	457994.4100	1825591.5600
2	16°30'05.6800"	80°36'10.6384"	457626.8500	1824460.1200
3	16°34'22.5042"	80°28'09.3282"	443379.0100	1832384.8600
4	16°34'03.9247"	80°28'03.1065"	443193.1200	1831814.4200

Coordinates of Hydrographic Survey Area

## GEODETIC PARAMETERS

The present survey was conducted in WGS-84. The parameters of the datum are as given below:

WGS-84 –Spheroid Parameters	
Ellipsoid	WGS-84
Semi Major Axis	6378137.000 meters
Semi Minor Axis	6356752.314 meters
Flattening(1/f)	298.2572236
Projection Parameters	
Projection Type	UTM Zone 44
Central Meridian	081°00'00"E
Reference Latitude	00°00'0.00"N
Scale Factor	0.9996000
False Easting	500000m
False Northing	0m

**Table 2: Geodetic Parameters**

## SUVEY EQUIPMENT SUMMARY

**For positioning of survey vessel and to aid navigation, the following system was used:**

- 1x Hemisphere R110 DGPS system
- Accessories & Consumables

**For recording single point water depths, the following equipment was used:**

- 1x Syqwest Bathy 500 DF Echosounder with sufficient thermal paper rolls
- 1x Dual frequency transducer 33 kHz/200 kHz + mounting pole
- 1x Bar plate
- Accessories & Consumables

**For on-line route guidance, log navigation data, to provide QC of navigation data, etc., the following software were used:**

- 1x Hypack data acquisition and processing software
- 2x Laptops
- Accessories & Consumables

**For processing of data and generated of drawings the following software were used:**

- 1x Hypack
- 1x AutoCAD

**Common Equipment and Accessories:**

- 2x Junction box
- 1x Multimeter
- 5x Life Jackets
- 2x 230v/24v AC to DC Converter
- 1x Measuring Tape
- 1x Life Buoy

**SURVEY EQUIPMENT DETAILS**

**Positioning Equipment**

The Global Positioning System (GPS) is a burgeoning technology, which provides unrivalled accuracy and flexibility of positioning for navigation and surveying data capture. Knowing ones precise position out at sea and over water at every given instant is fundamental to the process of any surveying as all other data are correlated with respect to this position to develop the overall picture in terms of drawings, charts and maps. The more accurately one knows the position out in the survey field more accurate is the final rendition of data.

There is no need of any fixed land or marine based reference to obtain position. The GPS NAVSTAR (Navigation Satellite timing and Ranging Global Positioning System) is a satellite- based navigation, timing and positioning system. The GPS provides continuous three- dimensional positioning 24 hrs a day throughout the world. The technology seems to be beneficiary to the GPS user community in terms of obtaining accurate data up to about few meters for navigation, meter-level for mapping, and down to millimeter level for geodetic positioning with the aid of various advanced techniques of GPS navigation called Differential GPS (DGPS) and Real Time Kinematic GPS (RTK)

The entire system comprises a bird cage constellation of satellites flying in orbits. Operated by the US department of Defense (USDoD), as of 2009, 08 out of 30 satellites currently in orbit and healthy are expected to be available at any point of time at every

place on the earth.

GPS satellites transmit two coherent beacon signals: Link 1 (L1) and Link 2 (L2). The L1 beacon is broadcast at a frequency of 1575.42 MHz and the L2 at 1227.60 MHz. The L1 signal is modulated with two pseudo random noise (PRN) codes: a protected (P) code and a clear/acquisition (C/A) code. Civilian receivers to obtain GPS system information can use the C/A code. The P code is encrypted for military use and is the only ranging broadcast on the L2 beacon. Each satellite has its own unique C/A (and P) code to provide satellite identity for acquisition and tracking. The C/A code is 1023 bits long and repeats every millisecond.

GPS receiver calculates its position by precisely timing the signals received from the GPS satellites orbiting high above the Earth at orbital heights of 20,000 to 24,000 Kilometres. Each satellite continually transmits messages containing the time the message was sent, orbital information (the ephemeris), and the general system health and coarse orbital data of all GPS satellites (the almanac). The receiver measures the transit time of each message and computes the distance from each satellite. The principle of trilateration is used to combine these distances with the location of the satellites to determine the receiver's location. A position thus obtained is called a GPS or Autonomous GPS position and is only accurate to  $\pm 7$  to 12 metres due to various factors contributing to the errors in determining the precise distance between the Satellites and the receivers.

With the Selective Availability (SA) switched off in May 2000, civilian GPS users around the world will no longer experience positioning errors up to 100 metre (approximate 300 feet). However, random errors are still added to SA to keep GPS a more powerful tool for the military. Today, the common GPS units intended for civilian users are accurate to within 20 metres (approximately 60 feet); although in good conditions, units should display an error of less than 10 metres. This is an excellent standard for normal vessel navigation but not quite adequate for precise work such as hydrographic and topographic surveying, charting and mapping for Hence there are various other options available for increasing the accuracy of the GPS positioning. Hence, we look at other techniques such as DGPS and RTK.

As our requirement is met more than adequately by DGPS, corrections from nearby beacon receiver were utilized.

This area of interest falls within the zone of Antaredi beacon area. DGPS corrections are

available from this beacon and can be digitized to obtain high accuracy GPS positions. These take the form of computed-observed (C-O) values for each satellite calculated at the reference station and transmitted to the survey vessel. The C-O's are applied to the pseudo ranges at the survey vessel's GPS receiver and the corrected position output goes to the navigation and data logging computer.

### **Hemisphere Series R110 Positioning System**

Hemisphere R110 System has been deployed for this survey work.

This high accuracy, multipurpose receiver is based on our patented Crescent technology and is capable of receiving GPS, SBAS signals as well as radio-beacon, relying on consistent sub-meter performance with standard SBAS



differential and Hemisphere GPS-exclusive COAST technology that maintains accuracy during temporary loss of differential signal. The



crescent R100 offers many differential correction options for various environments and worldwide coverage. The simpler user interface and expensive software features make Crescent R 100 the ideal solution for professional mapping, guidance and navigation applications.

This system is upgradeable to output messages up to 20Hz. The menu system provides an easy way to configure your system and the status LEDs give a quick update on the condition of the receiver.

#### **Advantages:**

- Feature-packed Sub-meter DGPS Positioning
- Provides reception of GPS, SBAS, and Coast Guard beacon
- Automatic dual channel SBAS and beacon tracking for more reliable signal reception
- Delivers sub-meter positioning at rates of up to 20 Hz
- Raw measurement data available for post-processing applications
- COAST™ technology uses old differential corrections for up to 40 minutes, or more, without significant performance loss
- Small and lightweight form factor

## SURVEY BOAT

Hydrographic surveys from Prakasam Barrage to Ibrahimpatam was conducted by deploying the survey boat. DGPS system and echo-sounder systems were installed on this boat.

SUMMARY OF SURVEY BOAT	
BOAT WITH OBM	
Length	4.80 m
Beam	1.80 m
Depth	0.75 m
Draft	0.40 m
Capacity	5 persons (excluding crew)

Summary of Boat Specifications

## PERSONNEL



The following personnel were involved in the project:

Location	Name	Function
Office	N. Rajasekhar	General Manager
Office/Field	A. Bhujanga Rao	Sr. Surveyor
Field	V. Sudheer	Surveyor
Field	K. Dinesh	Surveyor
Field	K. B. V. Kumar	Asst. Surveyor

Personnel

## **IN HOUSE TESTS**

Hydrographic sensors were functionally wet tested by BSP team prior to departing to the site of survey.

Fix annotation and interfacing from the navigation computer to the above systems was also done.

The following tests were also conducted:

- On-line navigation computer test
- Vessel and sensor offset measurements.
- Single Beam Echo sounder transducer measured and marked for draft readings.

### **On site Installations & Calibrations**

The following on-site calibration and functional tests were undertaken prior to the commencement of survey operations:

- Hemisphere Series R110 DGPS system
- Syqwest Bathy 500 DF Echo Sounder

### DGPS System

#### **Installation:**

The DGPS antenna is installed on a high point of the vessel (generally the monkey deck or the mast) where there is no or minimal obstruction between the satellites and the Antenna. The receiver unit is installed along with the other data logging survey equipment along with the required DC / AC power supply (depending on the various makes / models). The NMEA output using a serial RS232 port is connected to the main navigation computer to enable display of the DGPS position on the Navigation computer both for data logging and real time navigation. As required from the DGPS serial ports or from the Navigation computer data strings are output and configured with other survey equipment on a need- based approach

#### **Calibration:**

DGPS position verification was observed and calibrated against existing and known control point available on the Punnami Ghat Jetty.

Using **Hemisphere** R 110 DGPS system the position was observed and logged for about 40 min and an average of 355 observations was computed at the above location.

The average difference in the easting and northing between the observed co-ordinates and actual coordinates were calculated.

The average of differences in the easting and northing were observed to be within the acceptable limits and hence no offsets were fed into the Hemisphere DGPS system.

#### Single Beam Echo Sounder System

##### **Installation:**

The echo sounder system was installed in consultation with the Department's representatives and operated in accordance with the manufacturer's instructions.

The portable transducer was installed rigidly to a U-Clamp fitted on one side of the of the survey boat; the transducer shoe was kept sufficiently deep in order not to experience turbulence and aeration when the boat steamed at survey speed. The depth of the transducer below water line shall be ascertained by reference to the marks on the pole.

##### **Calibration:**

The echo sounder was interfaced to the Navigation and data Logging computer and confirmed that the digitization of depths is operational.

The bar-check method and physical measurements of the boat draft determined the draft of the boat. Checks were done at before each sounding session. On all such occasions the error observed was zero or near zero. Therefore, no corrections were necessary.

Prior to commenced survey works the Echo sounder was calibrated against a Bar Check. The procedure is carried out to confirm the following constants:

\*Tx = To establish zero error (combined effect of transducer depth and delays in the recorder).

\*\*Vp = To confirm velocity of propagation of sound in saline water.

The Vp established by temperature / salinity measurements were set on the recorder.

With the boat stopped in the water the bar was lowered to at least 2m below the transducer and the nearest mark on the chain set at the water line. The transmission line

was then tuned and adjusted. After the transmission mark is set the apparent depth of the transducer was noted on the analogue record and recorded in the deck log for future reference. Care was taken not to subsequently or inadvertently move the transmission line.

The bar plate is then lowered at 2m intervals to the maximum practical depth. Time was allowed for the bar plate to settle at each depth. Initially the Tx was adjusted to match the recorded depth/digitized to the actual depth since the echoes from the first few metres from the sea surface is dominant with electrical and recorder delays. As the bar plate was lowered deeper the speed of sound was adjusted to the recorded/digitized depth with the actual depth.

On recording the maximum obtainable depth the bar plate was similarly stepped back to the surface. The signal path delay generated by transducer and echo sounder electronics (index) is computed automatically by the system. A value of 1508 m/s (Vp) was used as the average velocity of sound in sea water which was applied in the prevailing environmental setup during acquisition.

<b>SYQWEST BATHY 500 DF SETTINGS</b>	
Frequency	200 KHz/33 KHz
Beam Width	5°/23°
Range on record	As Required
Vertical Scale	1 : 100
Positioning / Tracking	Fixed offset
Transducer Depth	0.5m below water line
Velocity of Propagation	1508 m/sec

**SYQWEST BATHY 500 DF Settings**

#### **Horizontal Control**

The survey boat used for the survey operations throughout the project was positioned by the Differential Global Positioning System (DGPS). Differential corrections were received continuously from the existing DGLL beacon at Antarvedi, East Godavari District while surveying at the area of interest.

The coordinates of this stations is furnished below.

<b>DGLL REFERENCE STATION – ANTARVEDI</b>					
<b>WGS-84 Spheroid, UTM Projection, CM 81° East, Zone 44 North</b>					
<b>DGLL Beacon Location</b>	<b>Latitude (N)</b>	<b>Longitude (E)</b>	<b>Easting (m)</b>	<b>Northing (m)</b>	<b>Frequ ency (kHz)</b>
Antarvedi	16°19'01.1186"N	81°43'32.8446"E	577531.5830	1804136.1390	320.0

**DGLL Reference Station- Antarvedi**

### **Vertical Control**

Vertical Control for the survey area was obtained from the sill level of Prakasam Barrage. The level of the same is 13.73 m above MSL.

All soundings have been reduced to Mean Sea Level (MSL).

### **HSE Policy**

All survey personnel were apprised of the safety aspects and it was ensured that survey vessel was equipped with sufficient PPE gears/life jackets, torches throughout the survey period. In case of any unforeseen eventuality, a first aid kit was made readily available and all the modes of communications were through mobile phones.

It is also ensured that no non-degradable waste was thrown overboard and all the waste accumulated on-board was brought back to the shore to be disposed of properly with responsibility.

## **PRE-PROCESSING PROCEDURES**

### **Handling of Positional Data**

Prior to the processing of the data files the files will be copied. The copied data files contained the positioning information will be converted to generate database points using the Hypack software. Quality Control on the data will be performed during and after the transfer of data to the database.

The following actions will be performed:

- Trace out any '0' fixes and fixes above a maximum standard deviation.
- Display the position fixes geographically and determines if any fixes are spurious and delete accordingly.
- Trace on the distance to delete fixes outside the survey lines corridor.
- The width of the corridor is such that only random fixes are deleted.
- Manually edit the position fixes to remove cluster of fixes overlaps (with caution and due diligence) and back tracking fixes. For the editing of overlaps and back tracking the processing manual should be consulted.
- Smooth the position track if this has been specified by the client. In general, no smoothing is carried out.
- Check the off-track column to ensure that the position fixtures are within specifications and that no unexpected large off tracks are present.

### **Handling of Single Beam Echo Sounding Data**

A single beam echo sounder was used to obtain prevailing river bed levels.

Prior to the processing of raw data files, the files will be copied. The bathymetric data will have been recorded using a storage cycle specified by the relevant procedure. Data

interval would be set to 10 m as required for charting and generating ASCII files while the fix annotation interval would be set in relation to chart scale for legible plotting. The processing surveyor must ensure that the correct velocity and index have been applied to the bathymetric data.

The data was checked for the presence of unrealistic jumps or spikes in the depth values after eliminating the anomalies the profiles of the survey lines will be plotted on paper and a comparison made on the paper plot and analogue records. No smoothing of the data will be performed unless specified by the client.

## **DATA PROCESSING AND REPORTING**

### **Introduction of Bathymetric Survey**

Throughout history, mapping of the sea/river bed has been important. Echo sounding is a technique for measuring water depths by transmitting acoustic pulses from the surface and listening for their reflection (or echo) from the river bed. This technique has been used since the early twentieth century to provide the vital depth input to charts that now map most of the world's water-covered areas. These charts have permitted ships to navigate safely through the world's oceans. At first only for safe navigation, it is now important for navigation as well as for positioning of offshore installations such as oil platforms or oil and gas pipes.

In addition, information derived from echo sounding has aided in laying trans-oceanic telephone cables, exploring and drilling for off-shore oil, locating important underwater mineral deposits, and improving our understanding of the Earth's geological processes.

The mapping is done through bathymetry, the measurement of depths of water in oceans, seas and lakes. Historically, depths were measured by using a lead-line, later on single beam echo-sounders were used and presently multi-beam echo-sounders are used. Devices that use sounds in such an application fall under the family of instruments known as sonars Echo-sounders are also known as sonars - Sound Navigation Ranging.

The ability of sound to travel over such great distances allows remote sensing in a water environment. The local speed of sound can change depending on the conditions of the water such as its salinity, pressure, and temperature, but it is independent of the characteristics of the sound itself—all sound waves travel at the local speed of sound. In a typical ocean environment, the speed of sound is in the neighbourhood of 1500 meters

per second (m/s).

The main problem in bathymetric mapping is to achieve a good resolution while maintaining the positional accuracy of the bottom, preferably obtaining the bathymetric measures in real time. In addition, it is important to keep the costs as low as possible, which means mapping a widest possible cross track. As in most signal processing applications, there is a trade between divergent needs. The trade in bathymetric sonars is between cross-track coverage, accuracy and resolution. Currently, the most important bathymetric sonars are of two types: side scan sonars and multi beam sonars.

Syqwest Bathy 500 DF single frequency echo sounder was utilised to acquire the bathymetric data. The data so obtained was then processed using Hypack processing module.

#### **Navigation**

All of the data required for processing were logged in HYPACK 6.2B navigation software.

#### **Positioning**

The measured offsets for all equipment were entered into the navigation system and processed with Hypack software to enable track charts to be plotted with respect to their true offsets of the sensor data. These included:

- GPS position absolute of the primary positioning system
- Common Reference Point
- Single Beam Echo sounder

The DGPS antenna was directly mounted above the echo-sounder transducer during the period of survey. Hence, there was no necessity to put offset as additional input in the navigation software.

#### **Water Level Reduction**

Water Level data for during the survey has been supplied by the Irrigation Department on hourly basis, which has been used to reduce the soundings from raw depths. All soundings have been reduced to Mean Sea Level (MSL).

#### **Bathymetric Data**

Syqwest Bathy 500 DF Dual Frequency single beam echo sounder was used to collect the single beam bathymetric data. The logged bathymetric data was compensated and cleaned for false echoes. The data was then reduced to Mean Sea Level by applying corrections from supplied Water level data.

The reduced depth (Chart Depth) which is also the final depth, are computed as below:

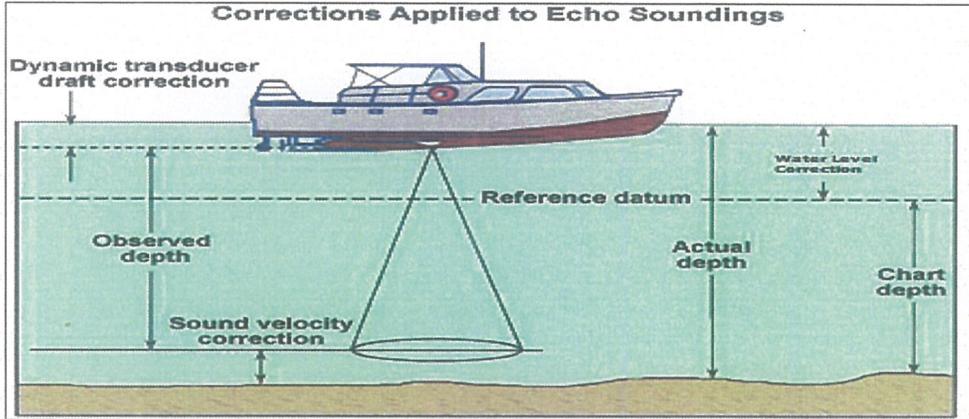


Figure 3: Correction Applied to Echo Soundings

$$\text{Reduced Depth (Chart Depth)} = \text{Actual Depth (Observed Depth + Draft)} - \text{Tide Correction.}$$

## DETAILED RESULTS

### Bathymetry Survey Results

TOTAL VOLUME OF SILT TO BE REMOVED ABOVE ORIGINAL BED LEVEL FROM KM 0.000 TO KM 13.500 AS PER 1ST BATHYMETRIC SURVEY (DEC-2019 & JAN -2020).		
Sl. No.	Mileage	Silt volume to be removed above original bed level ( in Cum)
1	From Km 0.000 to Km 2.000	2021790
2	From Km 2.000 to Km 3.000	1627318
3	From Km 3.000 to Km 4.000	2346845
4	From Km 4.000 to Km 5.000	2148367
5	From Km 5.000 to Km 6.000	1079361
6	From Km 6.000 to Km 7.000	357011
7	From Km 7.000 to Km 8.000	392878
8	From Km 8.000 to Km 9.000	1310469
9	From Km 9.000 to Km 10.000	508263
10	From Km 10.000 to Km 11.000	184515
11	From Km 11.000 to Km 12.000	278960
12	From Km 12.000 to Km 13.000	215358
13	From Km 13.000 to Km 13.500	6570
<b>TOTAL</b>		<b>12477705</b>

<b>TOTAL VOLUME OF SILT TO BE REMOVED ABOVE ORIGINAL BED LEVEL FROM KM 0.000 TO KM 13.500 AS PER 2ND BATHYMETRIC SURVEY (DEC-2020 &amp; JAN -2021).</b>		
<b>Sl. No.</b>	<b>Mileage</b>	<b>Silt volume to be removed above original bed level ( in Cum)</b>
1	From Km 0.000 to Km 2.000	2025763
2	From Km 2.000 to Km 3.000	1777497
3	From Km 3.000 to Km 4.000	2346899
4	From Km 4.000 to Km 5.000	2148451
5	From Km 5.000 to Km 6.000	1081597
6	From Km 6.000 to Km 7.000	377436
7	From Km 7.000 to Km 8.000	644004
8	From Km 8.000 to Km 9.000	1334469
9	From Km 9.000 to Km 10.000	535235
10	From Km 10.000 to Km 11.000	187104
11	From Km 11.000 to Km 12.000	281017
12	From Km 12.000 to Km 13.000	217278
13	From Km 13.000 to Km 13.500	69783
<b>TOTAL</b>		<b>13026531</b>

Item No.05

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH, NEW DELHI**

(By Video Conferencing)

Original Application No. 935/2018

(With report dated 20.07.2020)

Anumolu Gandhi

Applicant(s)

Versus

State of Andhra Pradesh

Respondent(s)

Date of hearing: 24.08.2020

**CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON  
HON'BLE MR. JUSTICE S. P. WANGDI, JUDICIAL MEMBER  
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER  
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER**

Applicant(s): Mr. Sravan Kumar, Advocate

Respondent(s): Mr. R. Venkataramani, Senior Advocate with Mr. G.N. Reddy for State of Andhra Pradesh  
Mr. TVS Raghvendra Sreyas, Advocate for State PCB  
Mr. Aman Bhalla, Advocate for CPCB

**ORDER**

1. Whether the activity termed as 'de-silting' by the State authorities is in fact 'illegal mining' in Krishna river in Andhra Pradesh, as alleged by the applicant, is the question for consideration.
2. Vide order dated 14.02.2020, the Tribunal referred to earlier proceedings and finding conflicting versions in the report, sought a report from an Expert Committee.
3. Accordingly, a report dated 20.07.2020 has been filed. Overall concluding remarks in the report are:-

**“Overall concluding remarks of the Committee Members**

- i. *Water Resource Department, Government of Andhra Pradesh has carried out bathymetric survey in conformity with the established and recommended practices. As per the Bathymetric survey carried out during December, 2019 to January, 2020 present storage capacity of Prakasam barrage is 2.982 TMC. There is loss in storage capacity of 0.089 TMC as compared to the design capacity of 3.071 TMC.*
- ii. *The report submitted by Water Resource Department, Govt. of Andhra Pradesh to Hon'ble NGT is satisfactory.*
- iii. *From the Ecological assessment report it can be inferred that the **cautious use of dredgers & mechanised boats and judicious desilting activity may not have serious impacts on flora and fauna in Prakasam barrage.***
- iv. *Overall the Ecological assessment report is satisfactory excepting the section on Water quality.”*

4. In view of above, no further order is necessary except that the operations be overseen by the same Expert Committee to ensure that no damage is caused to the environment.

A copy of this order be forwarded to the members of the Expert Committee by e-mail.

All pending applications do not survive and are disposed of.

Adarsh Kumar Goel, CP

S. P. Wangdi, JM

Dr. Satyawan Singh Garbyal, EM

Dr. Nagin Nanda, EM

August 24, 2020  
Original Application No. 935/2018  
A