

Action taken by the Greater Visakhapatnam Municipal Corporation
on E-magazine BBC:21st December 2020, on Subject of water
pollution:“Will Vizag be another Eluru?”

Greater Visakhapatnam Municipal Corporation is supplying safe drinking water to the city population of 23.00lakhs @ 105.00LCPD from the all Surface resources of Tatipudu, Raiwada, Yeleru, Mehadrigedda, Mudasarlova and Gambeeram reservoirs having with different capacities. The total quantity of water is being drawn about 80.45MGD from all the sources. Out of which 64.05MGD is catered for domestic purposes and 16.445MGD is catered for industrial and commercial purposes. GVMC is conducting daily water quality tests by collecting samples of 1656nos. For free residual chlorine tests and H₂S strips for ecoli test where pipeline crossing drainage during supply time (45min) in distribution system. The PH regional laboratory Visakhapatnam is collecting the samples for every 15days as a third party.

Regarding the Mehadrigedda reservoir is having capacity of 1.0TMC and supplying drinking water @ 8.00MGD to the public and industries. The water is collected to the MGR by means of rain water runoff from catchment area of Sabbavaram, Kottavalasa and Pendurthi area and also the excess water from the Raiwada canal and Yeleru canal for filling the Mehadrigedda reservoir. The news published in E-magazine BBC on 21st December 2020 stating that pollution rising in Mehadrigedda at this time due to industrial chemical and waste water entering into the Mehadrigedda reservoir as per the photographs enclosed.

In order to prevent pollution from reservoir, GVMC has made efforts to remove weed and notch gobi and floating materials and vegetations periodically with the assistance of moving floated boats. The Regional Public Health Laboratory Visakhapatnam has collected the water samples and analysed physical, chemical and bacteriological parameters and given report enclosed. The Senior analyst has suggested that for removal of chemical brownish colour and traces of nitrite nitrogen pre-chlorination and mixing of Copper Sulphate in water. Accordingly GVMC has taken up the above removal of weed, Notch

Gobi on annual maintenance basis from March 2020 to February 2021 with an estimate cost of Rs.6.80Lakhs and relevant photographs are here with enclosed. But the picture of weed shown in the news published is not within the water body of reservoir. It shows the downstream of spill way gates and indicates that there is no pollution of drinking water in the Dam water body. However GVMC has responded and removed the entire weed and notch present in downstream of spill way gates. The necessary photographs are here with enclosed for information.

CISR-NEERI (National Environmental Engineering Research Institute), HYD. has collected samples from MGR

In order to assess the suitability of the Mehadrigedda reservoir water for domestic/drinking purposes, APPCB team has collected water samples from the Mehadrigedda reservoir on 09-06-2020 at 4 locations as depicted in Figure1. The details of the sampling locations are given in table 1. The samples were analysed for the major water quality parameters, heavy metals, styrene and Bio-assay test.

Discussion on the Water Quality:

The analytical results of the water quality parameters, heavy metals, styrene levels and Bio-assay test are presented in table 2. The details are as follows:

- pH was observed to be in the range 8.01-8.13 which was within the BIS drinking water standards of 6.5-8.5.
- Total dissolved solids were found to be in the range of 276-294 mb/l which was within the limits of BIS.
- DO levels was found to be in the range 3.0 – 7.0 mg/l that shows fairly good levels of oxygen in the water sufficient for aquatic life.
- The BOD values were found to be less than < 2 mg/l and low nutrient levels indicate less biological activity in the lake.
- Styrene Monomer was observed to be Below Detection limit in all Samples (BDL < 0.5 ppb) of the reservoir
- Cyanide was not found in the samples
- E.Coli was not detected in any of the samples.

- COD was found to be in the range of 24-46 mg/l in the four analysed samples.

- Oil and grease was below detection limit in all the samples.

The NEERI has conducted the various parameters (43 Nos.) required for the water quality assessment of Mehadrigedda reservoir as detailed below:

- Styrene concentrations in water samples were observed to be below detection level in all the samples.

- The DO levels indicated good aquatic activity in the reservoir water.

- The BOD values of < 2 indicated less biological activity in the reservoir water.

- Low nutrient values indicate less possibility of eutrophication in the reservoir.

- The bio-assay test indicates that the water needs to be treated before it is used for drinking water purposes

Conclusion:

Based on the water quality results, it is suggested that the Mehadrigedda reservoir water can be used for the drinking purpose after filtration and disinfection (either chlorine or ozone).

Regarding waste water from the habitation of Pendurthi to Meghadrigedda reservoir water bodies :- The GVMC has constructed Sewage Water Treatment plant of 2.0 MLD capacity in Pendurthi area of Rathicheruvu in Div.71. The Sewage generated in Pendurthi residential area is drained in to the natural gedda situated in between Railway track and MGR North side bund only. But it is not entered in to the MGR storage reservoir. In order to treat the waste water, the GVMC has taken up the project of U.G.D network with an estimate cost of Rs.362.00 Crores and the physical progress of the work is at 60% and it is expected to be completed by the end of October 2021.

At present the sewage network with UGD connections is under progress with House Service connections of 15,000 nos. The collected sewage from residential network of Pendurthi will be treated in 54 MLD STP which is under construction at Narava and it will be completed by the end of October

2021. Hence, the question of pollution may not arise in Meghadrigedda Reservoir in future because of pendurthi residential habitation.

Status of Mudasarlova STP: GVMC has constructed STP of capacity 13 MLD at Mudasarlova which is located in the downstream of the Mudasarlova reservoir. GVMC has provided UGD facility for some of the colonies located nearby and also pumping the Sewage from the Hanumanthavaka for treatment. After treatment about 7.0 MLD water is being sold to Golf club adjacent to the STP and remaining treated water joining the Mudasarlova surplus drain and finally enters into the Sea through Pedajalaripeta drain after travelling a distance of 5Km. Pedajalaripeta drain also receives rain water and effluent from septic tank from other neighbouring areas other than MVP colony which is provided with UGD facility and connected to Appughar STP. The Pedajalaripeta drain also carries storm water run-off from MVP colony area and other areas in the catchment.


Superintendent Engineer
Water Supply
GVMC

Government of Andhra Pradesh
REGIONAL PUBLIC HEALTH LABORATORY: VISAKAHAPATNAM

Water analysis report

Sample from: Commissioner GVMC, Visakahapatnam

Collected by: Sri. Y. Siva Rama Krishna Sr. Analyst & GVMC staff

Collected on 27.12.19,

Received on 27.12.19

S.No	Lab. Ref. No	Source of the sample	Colour	Odour	pH	EC in micro mhos/Cm	Nitrite nitrogen as N	Ammonical nitrogen
1	2988	MGR Dam water	Greenish particles present	Odourless	7.1	354	Traces	NIL

Remarks;- The given sample of MGR Dam water slightly greenish particles present and contains traces of Nitrite nitrogen. If this water is used for treatment remove the vegetative matter completely, copper sulphate treatment is applied at adjoining areas of intake raw water and pre chlorination is suggested.

Y. Siva Rama Krishna Sr.
3/1/2020
SENIOR ANALYST WATER
REGIONAL PUBLIC HEALTH LABORATORY
VISAKAHAPATNAM

GOVERNMENT OF ANDHRA PRADESH
REGIONAL PUBLIC HEALTH LABORATORY
VISAKHAPATNAM

Water Analysis Report (Bacteriological)

To : COMMISSIONER,
Greater Visakha Municipal
Corporation, Visakhapatnam

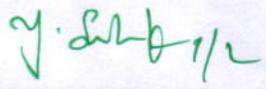
Date of Collection 30.1.2020

Date of Receipt 30.1.2020

Collected By Y.Siva Rama Krishna Sr. Analyst

S.No.	Lab. Ref. No.	Source of the sample	R.C PPM	Colour in Hazen Units	Odour	pH	EC in micro Mhos/Cm	Ammonical Nitrit Nitrogen
1	181	MGR Dam water collected at left side of the well	traces	25	odourless	7.3	485	Nil Nil
2	182	MGR Dam water collected at Right side of the well	traces	25	"	7.5	497	Nil Nil
3	183	MGR Dam water collected at Sump	traces	25	"	7.4	351	Nil Nil

Remarks:- The given sample of MGR dam water colour is 25 Hazen units and odourless and Nitrite Nitrogen is nil. To remove the colour pre chlorination suggested.


SENIOR ANALYST (WATER)
REGIONAL PUBLIC HEALTH LABORATORY
VISAKHAPATNAM

DE (WATER)
30/1/2020
EE-10

ABSTRACT ESTIMATE

Name of the work: Physico Chemically Brownish in Colour and Objectionable odour and Contains traces of Ammonical Nitrogen. The treatment to remove the Colour and odour Prechlorination in Mehadri Gedda Reservoir Dam at Narava.

Estimate Amount Rs. 5,85,000.00

S.I.No	Qty	Description of Item	Rate In Rs.	Per	Amount
1	88000.00 Sqmt	^{geradication} Removal of weed growth, nachu, gobbi, thooti and any other obstructions from the Mehadri Gedda Reservoir dam main regulator to 0.00 Km to 1.20 Km the bottom of the canal and dump the removed material away from work spot including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	3.07	1 Sqmt	2,70,362.40 270160.00
2	300.00 Kgs	Supply and delivery of Chopper Sulphate including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	250.00	1 Kg	75,000.00
3	9.00 Bags	Supply and delivery of Clacium Hypochlorite (Bleaching Powder) 25.00 Kgs Bags including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	650.00	1 Bag	5,850.00
4	20.00 Nos	Hire charges for Mini Boats for Canal work including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	1700.00	1 No	34,000.00
5	150.00 Nos	Engaging Man Mazdoors for Sewer line work for cutting and sectioning and other all work etc., complete	588.00	1 No	88,200.00
6	4.00 Nos	Supply and delivey of Manual Screens for Raiwada Canal including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	10000.00	1 No	40,000.00
Sub Total					513210.00
7	12.00%	Provision for GST @12%			5,13,412.40
8	1.00%	Provision for Labour Chess @1% A.C @1.16%			61,609.49
9	0.10%	Provision for NAC@0.10%			5,134.12
10	LS	Provision for Unforceen Items			513.41
Total					5,85,000.00

[Signature]
30/11/19
AE

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30/11/19
EE-II(WS-M)

**GREATER VISAKHAPATNAM
MUNCIPAL CORPORATION**

Technical Sanction for Rs. 5,85,000

Rupees Five lakh and Eighty five Thousand only

Under Register No. 5119-20/EE-II(WS-M)/RB

Dt: 10/10/2020

EE(WS)
10/10/2020

10/10/2020

DETAILED ESTIMATE

Name of the work: Physico Chemically Brownish in Colour and Objectionable odour and Contains traces of Ammonical Nitrogen. The treatment to remove the Colour and odour Prechlorination in Mehadri Gedda Reservoir Dam at Narava.

Sl. No	Description of Item	Nos.			All Measurements in Meter			Quantity Units	
					L	B	D		
1	Removal of weed growth, nachu, gobbi, thooti and any other obstructions from the Mehadri Gedda Reservoir dam main regulator to 0.00 Km to 1.20 Km the bottom of the canal and dump the removed material away from work spot including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.								
	Along Tank Band	1	x	1	1100.00	50.00		55000.00	Sqmt
	Reverse Pumping Station	1	x	1	550.00	60.00		33000.00	Sqmt
								88000.00	Sqmt
2	Supply and delivery of Chopper Sulphate including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	1	x	1	300.00			300.00	Kgs
3	Supply and delivery of Clacium Hypochlorite (Bleaching Powder) 25.00 Kgs Bags including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	1	x	1	9.00			9.00	Bags
4	Hire charges for Mini Boats for Canal work including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	1	x	2	10.00			20.00	Nos
5	Engaging Man Mazdoors for Sewer line work for cutting and sectioning and other all work etc., complete	15	x	10				150.00	Nos
6	Supply and delivey of Manual Screens for Raiwada Canal including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	1	x	4				4.00	Nos
7	Provision for GST @12%							12.00%	
8	Provision for Labour Chess @1%							1.00%	
9	Provision for NAC@0.10%							0.10%	
10	Provision for Unforceen Items							LS	

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30/12/19
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30/12/19
Dy.EE

EE-II(WS-M)
30/12/19
EE-II(WS-M)

<u>DATA 2019-2020</u>					
Chapter wise item No.	Sl. No.	Item description	Unit	Rate	
CSSR 2019-20, page no 38	1	Removal and eradication of weed growth, nachu, gobbi, thooti and any other obstructions from the Mehadri Gedda Reservoir dam main regulator to 0.00 Km to 1.20 Km the bottom of the canal and dump the removed material away from work spot including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.	sqm	2	
		gvmc labour allowance @40%			0.8
		contractor profit @13.615			0.2723
		per 1 sqm			3.07
CSSR 2019-20, page no 12	2	Engaging Man Mazdoors for Sewer line work for cutting and sectioning and other all work etc., complete	per day	420	
		gvmc labour allowance @40%			168
		man mazdoor per day			588


 30/12/19
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 OYEE 30/12/19


 30/12/19
 EE-II (WIM)



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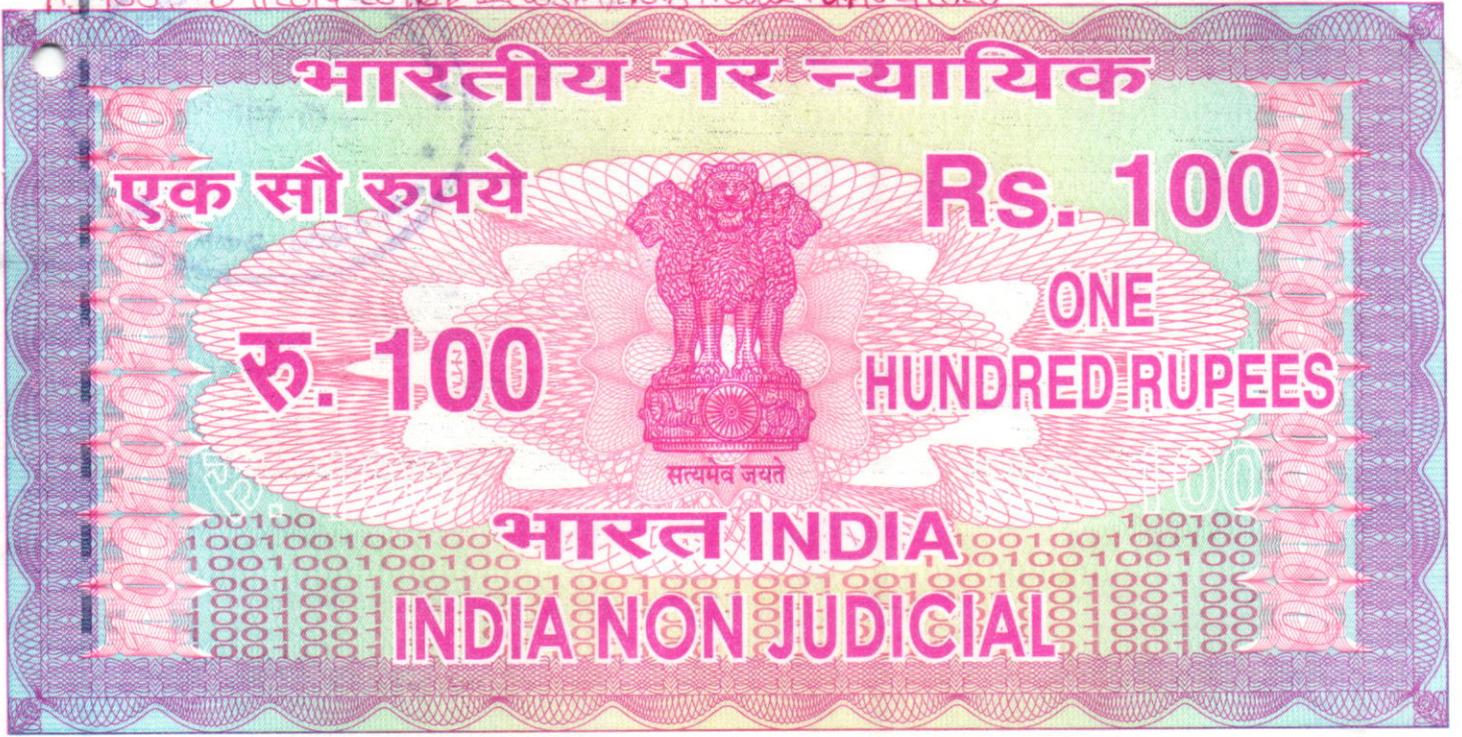
Handwritten notes on the left side of the page, including the number '1001' and other illegible characters.

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Printed text at the bottom left, including the name 'Managing Director' and other partially legible words.

Printed text at the bottom right, including the word 'COMMISSIONER'.

Ag. No: 59/2019-20/BE-II (Gen) (DB) Date: 07/02/2020



ఆంధ్ర ప్రదేశ్ ఆంధ్ర ప్రదేశ్ ANDHRA PRADESH

CH 499931

Sl. No. 4246 Dt. 01-01-20 100/-
Sold to S/o B.S. Prasad S/o late Veera Venkata Rao
Sold to B.S. Innovative pvt ltd, V.S.P

R.V. Lakshmi Maya
R.V. LAKSHMAYYA
Licenced Stamp Vender

L.No.03/19/828/2012, R.L.No:03-19-021/2018
Chandaka, VSP Cell No:-94401 33294

GREATER VISAKHAPATNAM MUNICIPAL CORPORATION
AGREEMENT FOR MUNICIPAL WORKS

- NAME OF THE WORK** : Physico Chemically Brownish in Colour and Objectionable odour and Contains traces of Ammonical Nitrogen. The treatmented to remove the Colour and odour Prechlorination in Mehadrigedda Reservoir Dam at Narava.
- ESTIMATED AMOUNT** : Rs.5,85,000/-
- AGREEMENT AMOUNT** : Rs. 4,80,415.88Ps.
- NAME OF THE CONTRACTOR** : M/s B.S INNOVATIVE PVT LTD.

Agreement made this day _____ between M/s B.S INNOVATIVE PVT LTD, # 8-3-7/1(6), B PALACE HEIGHTS APTS, PEDAWALTAIR JUNCT.ON residing in Visakhapatnam (hereinafter called the contractor) of the one part and the Executive Authority of the Greater Visakhapatnam Municipal Corporation, Visakhapatnam representing the Greater Visakhapatnam Municipal Corporation, Visakhapatnam (hereinafter called the Executive Authority) of the other part.

For COMMISSIONER

07/2/2020

For B S INNOVATIVE (P) LTD

SIGNATURE OF THE CONTRACTOR/FIRM
Managing Director

SCHEDULE - A

NAME OF THE WORK:- Physico Chemically Brownish in Colour and Objectionable odour and Contains traces of Ammonical Nitrogen. The treatment to remove the Colour and odour Prechlorination in Mehadrigedda Reservoir Dam at Narava.

Estimate Amount: 5,85,000/-

Sl. No	Qty.	Description of work	AP D	Rate	(IN WORDS)	Unit of	Amount Rs.
1	2	3	4	5		7	8
1	88000.00	Sqmt Removal and eradication of weed growth, nachu, gobbi, thooti and any other obstructions from the Mehadri Gedda Reservoir dam main regulator to 0.00 Km to 1.20 Km the bottom of the canal and dump the removed material away from work spot including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.		3.07	(Rupees Three and Seven Paisas Only)	1 Sqmt	270160.00
2	300.00	Kgs Supply and delivery of Chopper Sulphate including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.		250.00	(Rupees Two Hundred Fifty Only)	1 1 Kg	75000.00
3	9.00	Bags Supply and delivery of Clacium Hypochlorite (Bleaching Powder) 25.00 Kgs Bags including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.		650.00	(Rupees Six Hundred Fifty Only)	1 Bag	5850.00
4	20.00	Nos Hire charges for Mini Boats for Canal work including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.		1700.00	(Rupees One Thousand Seven Hundred Only)	1 No	34000.00
5	150.00	Nos Engaging Man Mazdocrs for Sewer line work for cutting and sectioning and other all work etc., complete		588.00	(Rupees Five Hundred Eighty Eight Only)	1 No	88200.00
6	4.00	Nos Supply and delivey of Manual Screens for Raiwada Canal including cost and conveyance of all materials and labour charges etc., complete as per SS and as directed by the Department officers.		10000.00	(Rupees Ten Thousand Only)	1 No	40000.00

513210.00

32794.12

480415.88

Tender Percentage @ (-) 6.35% less than the ECV (-)

(Rupees Four lakhs eighty thousand four hundred fifteen point eighty eight paisas Only)


FOR COMMISSIONER

07/2/2020

For B S INNOVATIVE (P) LTD



SIGNATURE OF THE CONTRACTOR / FIRM
Managing Director

Sl. No	Qty.	Description of work	AP D	Rate	(IN WORDS)	Unit of	Amount Rs.
1	2	3	4	5		7	8

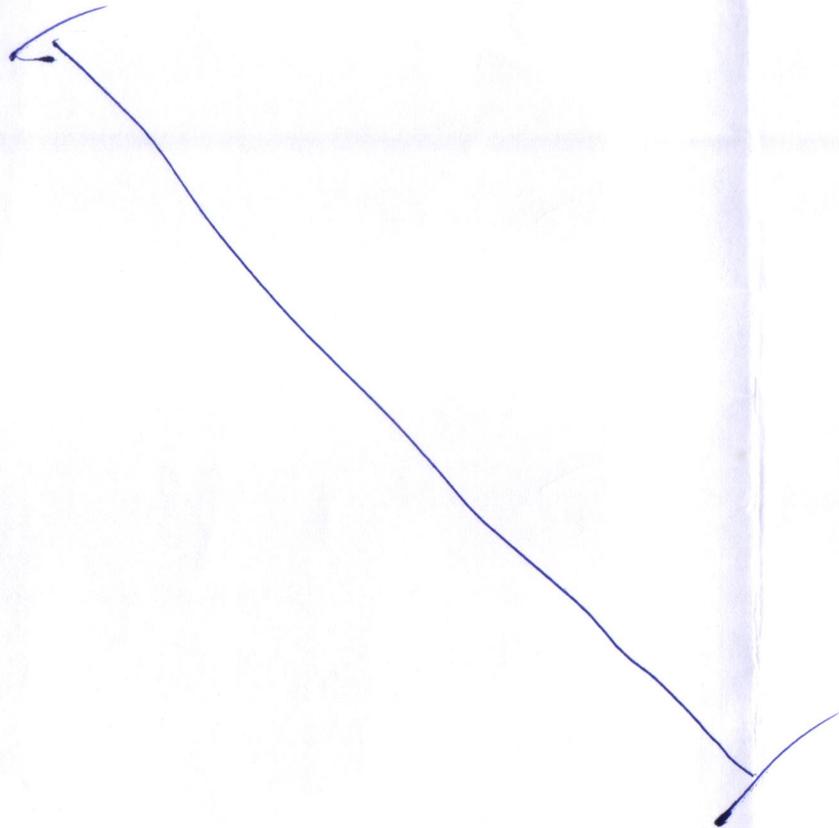
PART-II

Details of Maximum amount reimbursable to the contractor

1) GST is applicable as per Government orders

Note

- 1) Amount in part-II will be reimbursed to the contractor as per the actual bills produced
- 2) Payment will be made after completion of work whenever funds are available in GVMC.



FOR COMMISSIONER
07/2/2020

for B S INNOVATIVE (P) LTD
B.S. Prasad
 (B.S.PRASAD)
 Managing Director
 SIGNATURE OF THE CONTRACTOR / FIRM

GOVERNMENT OF ANDHRA PRADESH
REGIONAL PUBLIC HEALTH LABORATORY
VISAKHAPATNAM

Water Analysis Report

To : COMMISSIONER,
Greater Visakha Municipal
Corporation, Visakhapatnam

Date of Collection 04.02.2020

Date of Receipt 04.02.2020

Collected By Y.Siva Rama Krishna Sr. Analyst & M.Suresh, S.T

S.No.	Lab. Ref. No.	Source of the sample	R.C. P.P.M.	Colour in Hazen Units	Odour	pH	EC in micro Mhos/Cm	Nitrite as N	Ammonical Nitrogen
1	282	Aereators at Nathayyapalem (after Pre chlorination)	0.2	30	odourless	8.0	495	Light traces	Nil
2	283	Raw water Minidi (after Pre chlorination)	0.2	30	odourless	8.0	483	Nil	Nil
3	284	Clarifier water sample at Mindi	0.2	30	odourless	7.8	488	Nil	Nil
4	285	Filter water before Chlorination	0.2	15	odourless	7.6	501	Nil	Nil
5	286	Filter water after Chlorination	2.0	10	odourless	7.6	501	Nil	Nil
6	287	MGR Dam water	Nil	35	odourless	7.7	454	Nil	Nil
7	288	MGR Collection well water at Godavari point	Nil	35	odourless	7.6	434	Nil	Nil
8	288	MGR Collection well at Old Raiwada	Nil	35	odourless	7.7	269	Light traces	Nil

Remarks:- The given samples after treatment chlorinated water colour is reduced to 10 Hazen units. It is within maximum permissible limits for drinking purpose.

If it is intended to use continuously for public supply it is advised to put dual media filters in Water Treatment Plant to remove the colour.

Y. Siva Rama Krishna Sr.
SENIOR ANALYST (WATER)
REGIONAL PUBLIC HEALTH LABORATORY
VISAKHAPATNAM

GOVERNMENT OF ANDHRA PRADESH
REGIONAL PUBLIC HEALTH LABORATORY
VISAKHAPATNAM

Water Analysis Report

To : COMMISSIONER,
Greater Visakha Municipal
Corporation, Visakhapatnam

Date of Collector 9.5.2020

Date of Receipt 9.5.2020

Collected By Y.Siva Rama Krishna Sr. Analyst Regional P.H.Laboratory VSP

Sl.No.	Lab. Ref. No.	Source of the sample	R.C. P.P.M.	Colour in Hazen Units	Odour	pH	EC in micro Mhos/Cm	TDS in mg/L	Nitrite as N	Ammonical Nitrogen
1	807	MGR dam water at Intake well	Nil	45	algal odour	9.0	444	293	Nil	Nil
2	808	MGR dam water collected at 20 feet away form intake well	Nil	80	algal odour	9.1	423	279	Nil	Nil
3	809	MGR dam water at gate	Nil	60	algal odour	9.0	434	286	Nil	Nil
4	810	MGR dam water at Regulator Left Bund	Nil	40	algal odour	8.8	461	304	Nil	Nil
5	811	Infiltration well No: 5 at MGR dam	Nil	7	odourless	7.8	601	396	Nil	Nil
6	812	Infiltration well No: 2, at MGR dam	Nil	20	odourless	7.4	622	410	Nil	Nil
7	813	Raiwada Raw water	Nil	25	odourless	8.8	172	113	Nil	Nil
8	814	Raiwada plant filtered water	Nil	15	odourless	7.9	218	144	Nil	Nil
9	815	Godavari Raw water	Nil	35	odourless	8.4	234	154	Nil	Nil
10	816	Godavari Filtred water	Nil	25	odourless	8.1	242	160	Nil	Nil
11	817	Mindi 2.0 MGD Raw water (Godavari)	Nil	Nil	odourless	7.8	386	255	Nil	Nil
12	818	Mindi 2.0 MGD Filtered water (Godavari)	Nil	Nil	odourless	7.5	386	255	Light traces	Nil
13	819	Mindi 3.0 MGD clear water (Godavari)	Nil	nil	odourless	7.4	388	256	Light traces	Nil
14	820	Sump water at Mindi (6.0 Lakhs)	Nil	Nil	odourless	7.3	384	253	Nil	Nil

Remarks:- At the time of visit ie., on 9.5.2020 the MGR dam edge water water contains submercible plants and algae matter are present. It causes the colour and odour problem. So at the time of vist advised to remove the water plants and algae matter. So the removal water plants manually is going on.

MGR dam water if it is intendend to use continously for public supply it is advised to put dual media filters in Water Treatment Plant to remove the colour and odour

The Mindi 2.0 MGD filtered water and 3.0 MGD clear water contains light traces of nitrite nitrogen . So Regular removal of sludge in the clarifluculator and Regular back washing of filter beds with chlorinated water and cleaning of clear water sump are suggested.

Note: The Regional Public Health Laboratory conducting the water analysis is basic paramaeters only.For further detail examination of aromatic carbon compounds, toxin substances etc., contact the Pollution Control Board/ Environment Protection Training and Research Institute (EPTRI) located at Gachibowli Hyderabad

Y. Siva Rama Krishna Sr.
SENIOR ANALYST (WATER)
REGIONAL PUBLIC HEALTH LABORATORY
VISAKHAPATNAM

11/5/2020
CIVIL ASSISTANT SURGEON
Regional Public Health Laboratory
VISAKHAPATNAM-17

To
The Municipal Commissioner, GVMC, Visakhapatnam
Copy submitted to the Deputy Director, Regional PH Lab.Pedawalatir, Visakahpatnam
Copy submitted to the Director, I.P.M. PH Labs Food (H) Admn, Gollapudi, Vijyawada,

Table 3 : Heavy Metals concentration of the Meghadri Gedda Reservoir sampels

SL.No	Parameter	BIS Desilarblr Limits	BIS Permissible Limits	Sample 1 (Near Locks)	Sample 2 (Middle Point)	Sample 3 (Near Jack wall)	Sample 4 (Near Village)
1	B	0.5	1.0	0.079	0.075	0.076	0.077
2	Cu	0.1	1.5	<0.005	<0.005	<0.005	<0.005
3	Fe	0.3	NR	0.059	0.074	0.092	0.075
4	Mn	0.1	0.3	0.035	0.031	0.029	0.053
5	Zn	5.0	15.0	<0.005	<0.005	<0.005	<0.005
6	Cd	0.0	NR	<0.0005	<0.0005	<0.0005	<0.0005
7	Pb	0.0	NR	<0.0005	<0.0005	<0.0005	<0.0005
8	Hg	0.0	NR	<0.0002	<0.0002	<0.0004	<0.0002
9	N1	--	--	<0.005	<0.005	<0.005	<0.005
10	As	0.0	0.1	0.002	0.002	0.002	0.002
11	Cr	0.1	NR	<0.005	<0.005	<0.005	<0.005
12	Al	0.0	0.2	0.06	0.074	0.093	0.065

Assessment of the Water Quantity of Meghadri Gedda Reservoir, Vizag

Table 2 : Water Quality of Meghadri Gedda Reservoir

SL.No	Parameter	Units	BIS Desirablr Limits	BIS Permissible Limits	Sample 1 (Near Locks)	Sample 2 (Middle Point)	Sample 3 (Near Jack wall)	Sample 4 (Near Village)
1	Temperature	C	--	--	25.1	24.9	25	25.1
2	PH	--	6.5	8.5	8.01	8.13	8.06	8.08
3	Color	Hazen	--	--	59	30	58	53
4	Conductivity	US/CM	--	--	513	506	506	512
5	TDS	mg/L	500	2000	289	294	276	288
6	DO	mg/L	--	--	4.5	7	3	4.5
7	BOD	mg/L	--	--	1.2	1.4	1.3	1.5
8	TSS	mg/L	--	--	4.5	7	3	4.5
9	Turbidity	NTU	1	5	0.6	0.6	0.5	0.4
10	Total Alkalinity	as CaCO ₃ in mg/L	200	600	152	148.0	136.0	148
11	Total Hardness		200	600	96	100	100	100
12	CA Hardness		--	--	60	64	52	60
13	Mg Hardness		--	--	36	36	48	40
14	Chloride	mg/L	250	1000	48	48	48	50
15	Sulphates	mg/L	200	400	27	27	29	27
16	Fluoride	mg/L	1	1.5	0.3	0.5	0.4	0.3
17	Sodium	mg/L	--	--	50	52	50	50

SL.No	Parameter	Units	BIS Desirablr Limits	BIS Permissible Limits	Sample 1 (Near Locks)	Sample 2 (Middle Point)	Sample 3 (Near Jack wall)	Sample 4 (Near Village)
18	Potassium	mg/L	--	--	7	7	7	7
19	Nitrate (NO ₃ -N)	as mg /L	45	NR	1.5	1.4	2.6	2.6
20	Nitrate (NO ₂ -N)	mg/L	--	--	BDL	BDL	BDL	BDL
21	Ammonia -N	mg/L	--	--	1.68	2.24	1.12	1.4
22	AVP (P-PO ₄)	mg/L	--	--	0.086	0.058	0.032	0.031
23	TP	mg/L	--	--	0.102	0.096	0.06	0.111
24	Surfactants	mg/L	--	--	BDL	BDL	BDL	BDL
25	Cyanide	mg/L			0.05	NR	ND	ND
26	COD	mg/L	--	--	44	46	24	24
27	Oil & Grease	mg/L	--	--	BDL	BDL	BDL	BDL
28	Styrene	ug/L	--	--	BDL	BDL	BDL	BDL
29	TC	CFU/100 ml	Shall not be detecatble in any 100 ml of sample		TNC	2720	TNC	TNC
30	FC	CFU/100 ml			TNC	120	320	2560
31	E coli	CFU/100 ml			ND	ND	ND	ND

WATER SAMPLE TESTING

Dt. 11.03.2021

EE	Section	Wards	Name of the A.E	F.R.C. for water samples/Day			
				Agency	Dept.	F.R.C. Passed	F.R.C. not passed
1	2			3	4	5	6
EE I	Bhemili		A. Suman	30	15	45	0
	AE 28	1 to 3	M.Satyanarayana	34	24	58	0
	AE 24 Yandada	4 to 6	D.Srihari	85	65	150	0
	AE 17	7,8,9,10p,11,12p,13,14 p,32p,33p, & 34p	Shaik Raheem	72	25	97	0
	AE-15 HLR	10p,14p,15p,16,17,18 &19p	D. Wilson	23	18	41	0
	AE-16		V.Satyanarayana	37	26	63	0
EE II	AE-TSR		RSR Ganapathi Subba rao	33	22	55	0
	AE 13	12p, 15p, 27p, 28p, 29, 30, 31, 32p & 44	A. Vasudevan	36	64	100	0
	AE 12	22 to 23	A. Vasudevan	33	25	117	0
		25 & 26	RSR Ganapathi Subba rao	34	25		0
	AE 14	19p, 20p, 21, 27p, 28p	D. Manohara Rao	31	50	81	0
	AE 19 & 20	38, 39, 40, 41, 42, 43	P.Ganesh	60	45	105	0
	AE 18 & 15	33p, 34p, 35, 36, 37	Mohan Kumar	35	20	55	0
	AE 21	45, 46, 47, 48, 49	G. Kanaka Raju (Malk)	60	30	90	0
EE III	16-Merged	55, 56, 57	Rajkumar Reddy	72	90	162	0
	KBR	50 to 53, 58, 60(P), 61,	Rajkumar Reddy	75	80	155	2
	1MGD	59, 60(P), 63, 64, 65	G.Kanaka Raju	40	52	92	0
	AKP	1 to 34	E.Eswarao	65	35	100	0
	AE 24 GPT		KG Rajashekar	35	20	55	0
	9-Merged	66 to 72	KG Rajashekar	30	20	50	0
		Total	920	751	1671	2	

S. No.	Water Release at Source (on Previous day)	Realisation at Tail end (after 5 days release)	Source details						GVMC (Narava+Gwk+ Aganampudi)
			RINL	Gangavaram Port	NTPC	APIIC	Others Anakapalle	RWS	
1	Through Yeleswaram Reservoir : 250 cusecs Irrigation : 1150cusecs	90.475	35.640	0.187	2.652	9.455	0.00	0.900	41.641
2	Through Kateru Pump House : 0 cusecs								

S. No.	Source	Treated WS (in MGD)		Source details								Source Sustainability as per present inflows
		Normal Supply	Present Supply	Max. Water Level	Min Draw down Level	Allocation (per Irrig. Year)	Usage so far	Report day Water Level				
SURFACE WATER - 6 Sources		76.50	65.01									
1	YLMC	43.25	33.04									
1	Yeleru reservoir (on River Yeleru) 156 Km			86.56 Mts	72.54 Mts	5.00+2.00 TMC	2.691 TMC	82.22 Mts				
2	Godavari River (Kateru Pump house) 56 Km			18.00 Mts	+++ Mts	5.00 TMC	0.130 TMC	12.50 Mts				
	Yeleru Left Main Canal											
	a) Godavari WT Plant (33 MGD) at Narava	21.00	20.87									
	b) Siddardha nagar WTP (2.64 MGD) at Gwk	1.80	1.80									
	c) Sundarayya colony WTP (10 MGD+2 MGD)	5.40	5.40									
	d) Mindhi	5.40	0.00									
	e) Raw water to DGNP 2MGD, MES 0.5 MGD	2.25	0.00									
	f) Aganampudi WT Plant (18.70 MGD)	2.00	2.21									
	g) Narava WT Plant (9.24 MGD)	5.40	2.76									
3	Raiwada Reservoir (on River Sarada) 76 KM	15.00	13.657	114.00 Mts	99.00 Mts	1.65 TMC	0.838 TMC	108.04 Mts				
	a) Raiwada WT Plant at Narava											
4	MGR 8.5 MGD (1.852 Cusecs) Meghadri Gedda Reservoir (MGR) 20Km	7.65	8.44									
	a) MGR to Mindhi	5.40	5.40	61' Ft.	44' Ft.	1.00 TMC	0.711 TMC	58'.05" Ft.				
	b) Raw water to DGNP 2MGD, MES 0.5 MGD	2.25	3.04									
	c) MGR Reverse Pumping (in absence of YLMC)		0.00									
	i. Godavari WT Plant	0.00	0.00									
	ii. Siddardha nagar WTP (12 MLD) at Gajuwaka	0.00	0.00									
5	Thatipudi 10MGD (18.50 cusecs) Thatipudi Reservoir (on River Gostani)56 Km	10.00	9.87	297' Ft.	251' Ft.	0.65 TMC	0.459 TMC	292.60 Ft.				
6	Gambheeram Gambheeram Gedda Reservoir (GGR) 30 Km - on Gambheeramgedda	0.60	0.00	126' Ft.	107' Ft.	0.05 TMC	0.00 TMC	120'.06" Ft.				
Sub-Surface WATER: Infiltration wells		8.86	8.93									
7	Gosthani Gosthani river 40 Km	5.55	6.12	35' Ft.	21' 6" Ft.			27'.50" Ft.				
	i. Bhoni (1/6)	4.00	4.518									
	ii. Samayya valasa (3/6)	0.86	0.864									
	iii. Nagarapalem (1/4)	0.69	0.737									
8	Mudasaralova reservoir ** 10 Km	0.50	0.00	169' Ft.	152'	0.06 TMC	0.00 TMC	163'.10" Ft.				
9	MGR (7/7)	1.50	1.50									
10	Sarada River (4/4) 40 Km	1.31	1.31									
GROUND WATER		2.75	2.75									
11	Through Power Bores - 219 PWS Schemes	2.25	2.25									
12	Through Hand Bores - 8,224 Nos.	0.50	0.50									
Grand Total		88.11	76.69									**
Net Total		74.89	65.19									

S. No	Consumer	Agmt Qty (MGD)		Supply Qty (MGD) (as per meter reading)		Usage (MGD)	
		Raw Water (MGD)	Treated Water (MGD)	Raw Water	Treated Water	Industrial at 70%	Domestic at 30%
1	Industries - 69 consumers, 82 connections		12.985		16.779	11.745	5.034
2	Industries - 2 consumers, 2 connections Naval Dockyard (DGNP), MES-104 area *	1.766		3.382		2.131	0.913
3	Domestic - 13 consumers, 13 connections		0.205		0.166		0.166
Total		14.956		20.327		13.876	6.113

DGNP, MES are taking Raw water(RW) and treating on own. Treated Water = 90%RW

S. No.	Category	Treated Water (MGD)
1	Industrial Need	13.88
2	Domestic * (Population 2.30 Millions)	51.31
Total		65.19

Per Capita Supply : 101.41 LPCD Present Supply
120.59 LPCD Normal supply
150 LPCD

Water Supply through tankers in un-served & ill-served areas											
Tankers											
	1KL	2KL	5KL	6KL	7KL	10KL	12KL	20KL	Trips	Total Qty	
GVMC/Institutional / Hired Tanker Trips		24	100	37	0	3			164		
Paid tankers-Dial a tanker (Rs.200/- GVMC, 250/- Owner)			0						0		
Autos (Rs.40/- KL GVMC, No specific rate for owner)	236								236		
Tankers (Rs.40/- KL GVMC, No specific rate for owner)		49	142	7	0	13	1	3	215	MLD	MGD
Qty	236	73	242	44	0	16	1	3	615	2.09	0.46

Complaints attended:						
S. No	Type of complaints	Opening Balance	Received on the day	Total	Attended	Balance
1	Pipe line leakages	90	51	141	47	94
2	Bore well repairs (out of 8224 bore wells)	15	19	34	20	14

Water Samples Quality Check / day				
S.No.	Water sample taken by	Number	QC passed	QC not passed
1	Agency	920	920	0
2	Department	751	751	0
Total		1,671		

TARIFF:	
Bulk Water Tariff:	Raw Water: Rs.40/KL, Clear Water: Rs 60/KL
Semi Bulk Tariff:	Up to 5KL Rs 10/- Flat, 5 to 20 KL Rs 10/- Per KL, Above 20KL Rs15/- Per KL, Minimum 600/- Per Month
Domestic:	Rs 60/- Per Month for BPL, Rs 120/- Per Month for APL

Assessment of the Water Quality of the Meghadri Gedda Reservoir, Visakhapatnam

**Sponsor: Andhra Pradesh Pollution Control Board (APPCB)
Visakhapatnam**

Preamble:

An accident occurred at LG Polymers, Visakhapatnam where the stored styrene monomer in vertical MS storage tank of 2500 KL capacity has spread to the surrounding villages of Venkatapuram, Padmanabhapuram, SC & BC Colony. The High Power Committee appointed directed Andhra Pradesh Pollution Control Board (APPCB), Vizag to get the samples re-analysed of Meghadri Gedda Reservoir. In this regard, APPCB approached CSIR-NEERI, Hyderabad Zonal Centre for getting the samples analysed and submit a report of the same.

Water Quality Meghadri Gedda Reservoir:

In order to assess the suitability of the Meghadri Gedda Reservoir water for domestic/drinking purposes, APPCB team has collected water samples from the Meghadri Gedda reservoir on 09-06-2020 at 4 locations as depicted in Figure 1. The details of the sampling locations are given in Table 1. The samples were analysed for the major water quality parameters, heavy metals, styrene and Bio-assay test.

Discussion on the Water Quality:

The analytical results of the water quality parameters, heavy metals, styrene levels and Bio-assay test are presented in table 2. The details are as follows:

- pH was observed to be in the range 8.01 - 8.13 which was within the BIS drinking water standards of 6.5 – 8.5.
- Total dissolved solids were found to be in the range of 276-294 mg/l which was within the limits of BIS
- DO levels was found to be in the range 3.0 - 7.0 mg/l that shows fairly good levels of oxygen in the water sufficient for aquatic life.
- The BOD values were found to be less than < 2 mg/l and low nutrient levels indicate less biological activity in the lake
- Styrene Monomer was observed to be Below Detection Limit in all Samples (BDL < 0.5 ppb) of the reservoir
- Cyanide was not found in the Samples
- E.Coli was not detected in any of the samples



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- COD was found to be in the range of 24-46 mg/l in the four analysed samples
- Oil and grease was below detection limit in all the samples

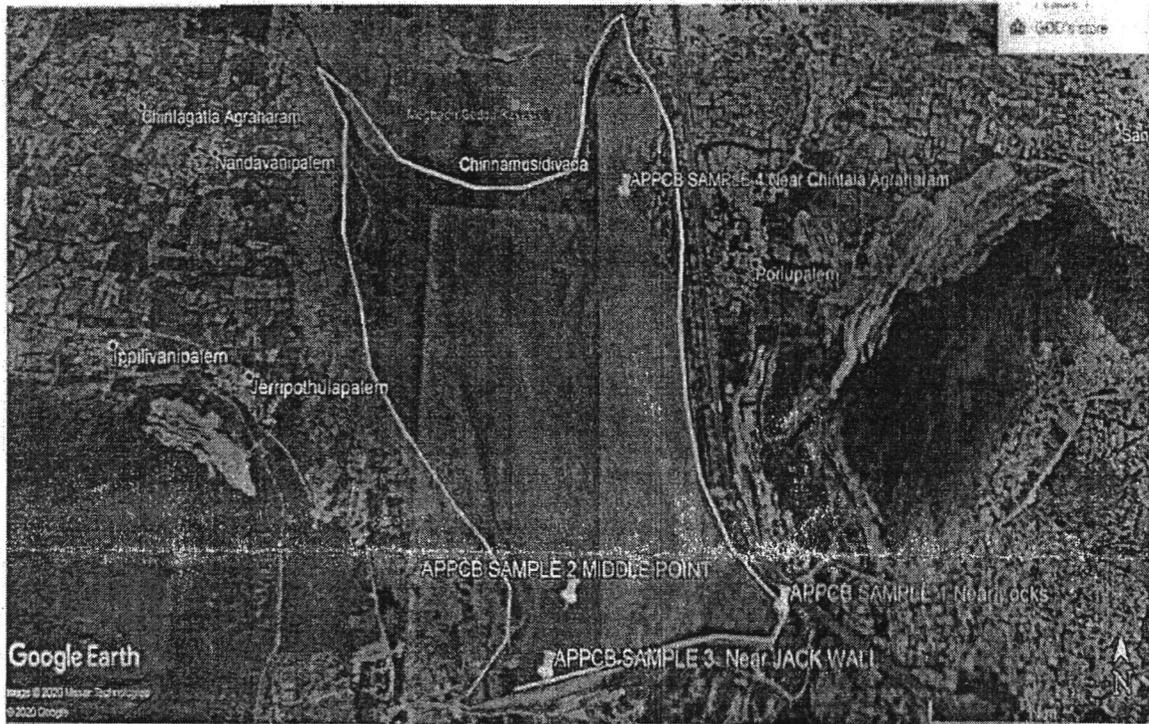


Fig.1 Meghadrigedda Reservoir Sampling Points

Table 1: Sampling Points of Meghadri Gedda Reservoir

S. No	Sample Location	Latitude	Longitude
1.	Sample 1: Near Locks	N 17.75966°	E 83.19509°
2.	Sample 2: Middle Point	N 17.75998°	E 83.1858°
3.	Sample 3: Near Jack Wall	N 17.757476°	E 83.18484°
4.	Sample 4: Near Chintala Agraharam Village	N 17.77681°	E 83.18856°

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Table 2: Water Quality of Meghadri Gedda Reservoir

Sr. No.	Parameter	Units	BIS Desirable Limits	BIS Permissible limits	Sample 1 (Near Locks)	Sample 2 (Middle Point)	Sample 3 (Near Jack wall)	Sample 4 (Near Village)
1.	Temperature	°C	--	--	25.1	24.9	25.0	25.1
2.	pH	--	6.5	8.5	8.01	8.13	8.06	8.08
3.	Color	Hazen	--	--	59	30	58	53
4.	Conductivity	µs/cm	--	--	513	506	506	512
5.	TDS	mg /L	500	2000	289	294	276	288
6.	DO	mg /L	--	--	4.5	7.0	3.0	4.5
7.	BOD	mg /L	--	--	1.2	1.4	1.3	1.5
8.	TSS	mg /L	--	--	4.5	7.0	3.0	4.5
9.	Turbidity	NTU	1.0	5.0	0.6	0.6	0.5	0.4
10.	Total alkalinity	as CaCO ₃ in mg/L	200	600	152	148	136	148
11.	Total Hardness		200	600	96	100	100	100
12.	Ca Hardness		--	--	60	64	52	60
13.	Mg Hardness		--	--	36	36	48	40
14.	Chloride	mg /L	250	1000	48	48	48	50
15.	Sulphates	mg /L	200	400	27	27	29	27
16.	Fluoride	mg /L	1.0	1.5	0.3	0.5	0.4	0.3
17.	Sodium	mg /L	--	--	50	52	50	50
18.	Potassium	mg /L	--	--	7	7	7	7
19.	Nitrate (NO ₃ -N)	as mg /L	45	NR	1.5	1.4	2.6	2.6
20.	Nitrite- (NO ₂ -N)	mg /L	--	--	BDL	BDL	BDL	BDL
21.	Ammonia-N	mg /L	--	--	1.68	2.24	1.12	1.40
22.	AVP (P-PO ₄)	mg /L	--	--	0.086	0.058	0.032	0.031
23.	TP	mg /L	--	--	0.102	0.096	0.060	0.111

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तामका, हैदराबाद / Tamaka Hyderabad

Assessment of the Water Quality of Meghadri Gedda Reservoir, Vizag



24.	Surfactants	mg /L	--	--	BDL	BDL	BDL	BDL
25.	Cyanide	mg /L	0.05	NR	ND	ND	ND	ND
26.	COD	mg /L	--	--	44	46	24	24
27.	Oil & Grease	mg /L	--	--	BDL	BDL	BDL	BDL
28.	Styrene	µg/L	--	--	BDL	BDL	BDL	BDL
29.	TC	CFU/100ml	Shall not be detectable in any 100 ml of sample		TNC	2720	TNC	TNC
30.	FC	CFU/100ml			TNC	120	320	2560
31.	E coli	CFU/100ml			ND	ND	ND	ND

*NR: No Relaxation

Table 3: Heavy Metals concentration of the Meghadri Gedda Reservoir samples

S.No.	Parameter	BIS Desirable Limits	BIS Permissible limits	Sample 1 (Near Locks)	Sample 2 (Middle Point)	Sample 3 (Near Jack wall)	Sample 4 (Near Village)
1.	B	0.5	1.0	0.079	0.075	0.076	0.077
2.	Cu	0.05	1.5	<0.005	<0.005	<0.005	<0.005
3.	Fe	0.3	NR	0.059	0.074	0.092	0.075
4.	Mn	0.1	0.3	0.035	0.031	0.029	0.053
5.	Zn	5.0	15.0	<0.005	<0.005	<0.005	<0.005
6.	Cd	0.03	NR	<0.0005	<0.0005	<0.0005	<0.0005
7.	Pb	0.01	NR	<0.0005	<0.0005	<0.0005	<0.0005
8.	Hg	0.001	NR	<0.0002	<0.0002	0.0004	<0.0002
9.	Ni	--	--	<0.005	<0.005	<0.005	<0.005
10.	As	0.01	0.05	0.002	0.002	0.002	0.002
11.	Cr	0.05	NR	<0.005	<0.005	<0.005	<0.005
12.	Al	0.03	0.2	0.06	0.074	0.093	0.065

*All units in mg/L; NR: No Relaxation

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Bio-Assay Test:

Environmental bioassay is an experimental process wherein the assessment of toxicity on biological organisms is tested. The purpose of this test is to determine the acute toxicity of substances (toxicants) to fish in fresh water. Acute toxicity is an exposure test of short duration (days). Aquatic ecosystems are affected by numerous natural and chemical substances. These substances may be responsible for possible impacts on the structure and function of aquatic organisms. Since chemical analysis of pollutants does not cover all toxic substances, bioassays have been developed for bio-monitoring and evaluation of toxic substances in freshwater and natural ecosystems. Bioassays assess the potential harm of toxicants and are based on the response of living organisms to the toxicants in the water.

Test Procedure: The zebra fishes were obtained from a local aquarium. All fishes were transferred directly into a glass aquarium of 20 litres capacity for acclimatization. The fishes were acclimatized in uncontaminated (dilution) water (normal tap water) for three days before they were used. The test was performed using five glass aquariums filled with different test solution concentrations by mixing the sample and normal tap water. One control experiment i.e. with normal tap water was run and measurements of pH and temperature were carried out during the test. In the remaining four aquariums, five fishes were transferred directly into each glass aquarium filled with 1 litre of test water samples with minimum handling. No food was offered during the exposure period i.e. 96 hours. Fish behaviour and mortality were observed and recorded as frequently as possible during the exposure period. The Bioassay test has been carried out on the Meghadri Gedda Reservoir sample and the results are presented in Table 3.

Dilution/control water: Drinking-water supply, good-quality, uncontaminated natural water.

Test fish: Zebra fish (*Danio rerio*), in good health and free from any apparent malformation.

Test type: Static (test solutions remain unchanged through the test duration). The test was performed without pH adjustment because pH of test solutions was within the range 6.5-8.7

Test duration: 96 hours; **Feeding:** No food supplied to the test fishes during exposure period.; **Aeration:** None

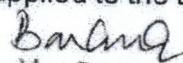

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Table 4: Bio-assay test results and fish mortalities during exposure period

Sample ID	Concentration of test sample (% v/v)	pH	Temp (°C)	No. of fish tested	Mortality percentage during exposure period						
					2 hr	6 hr	12 hr	24 hr	48 hr	72 hr	96 hr
Control-1	0	7.12	30.6	5	0	0	0	0	0	0	0
Sample 1	100	7.73	30.7	5	0	0	0	0	0	0	0
	75	7.58	30.6	5	0	0	0	0	0	0	0
	50	7.56	30.4	5	0	0	0	0	0	0	0
	25	7.56	30.5	5	0	0	0	0	0	0	0
Sample 2	100	7.66	30.6	5	0	0	0	0	0	0	0
	75	7.66	30.4	5	0	0	0	0	0	0	0
	50	7.56	30.4	5	0	0	0	0	0	0	0
	25	7.55	30.5	5	0	0	0	0	0	0	0
Sample 3	100	7.64	30.6	5	0	0	0	0	0	0	0
	75	7.54	30.5	5	0	0	0	0	0	0	0
	50	7.50	30.5	5	0	0	0	0	0	0	0
	25	7.57	30.6	5	0	0	0	0	0	0	0
Sample 4	100	7.65	30.7	5	0	0	0	0	1	0	0
	75	7.61	30.7	5	0	0	0	0	0	0	0
	50	7.49	30.6	5	0	0	0	0	0	0	0
	25	7.28	30.7	5	0	0	0	0	0	0	0

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The bio-assay test reveals that the fishes were alive in the samples with concentration of 25%, 50%, 75% for all the period of the test. Out of the 5 fishes in 100% sample, one fish died at 48-hr exposure time period. This is to state that the reservoir water needs to be treated before being used for drinking water purpose.

Conclusion:

Based on the analysis results and bio-assay test, the following conclusions were drawn:

- Styrene concentrations in water samples was observed to be below detection level in all the samples
- The DO levels indicated good aquatic activity in the reservoir water
- The BOD values of < 2 indicated less biological activity in the reservoir water
- Low nutrient values indicate less possibility of eutrophication in the reservoir
- The bio-assay test indicates that the water needs to be treated before it is used for drinking water purposes.

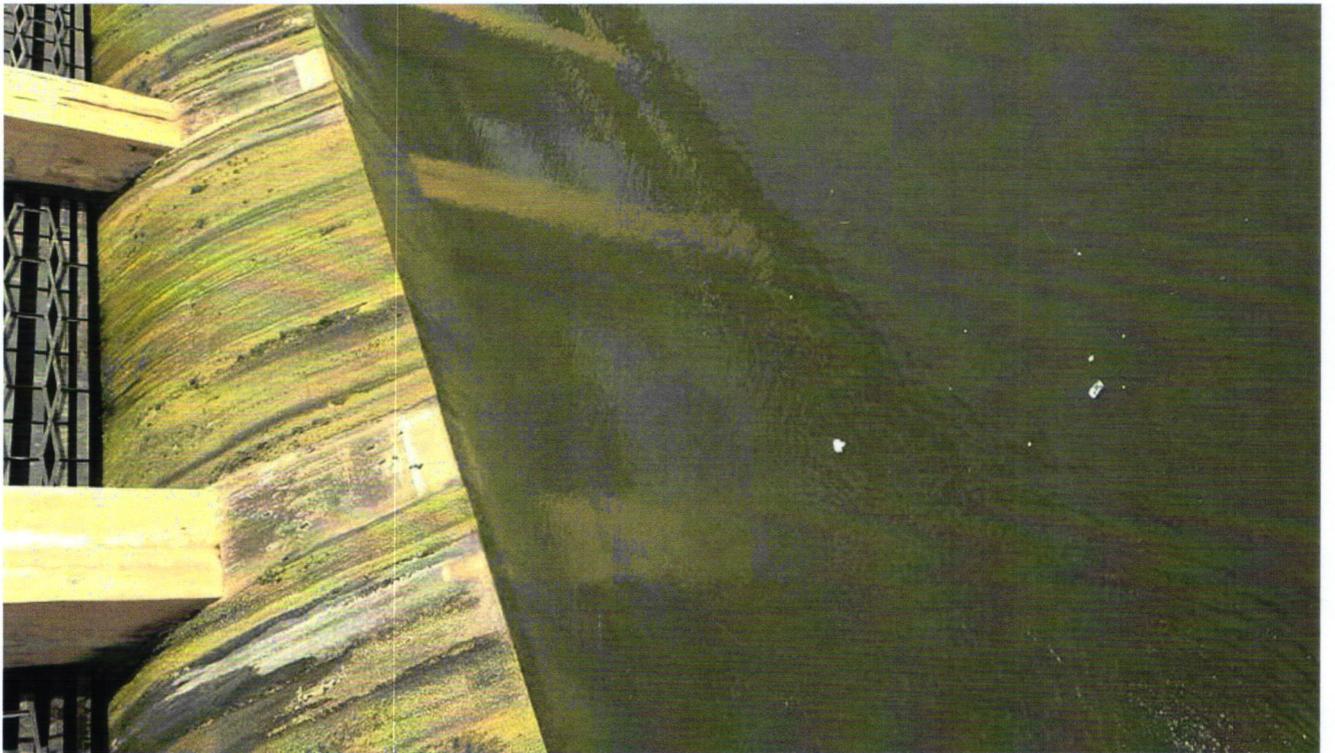
Based on the water quality results, it is suggested that the Meghadri Gedda Reservoir water can be used for the drinking purpose after filtration and disinfection (either chlorine or ozone).

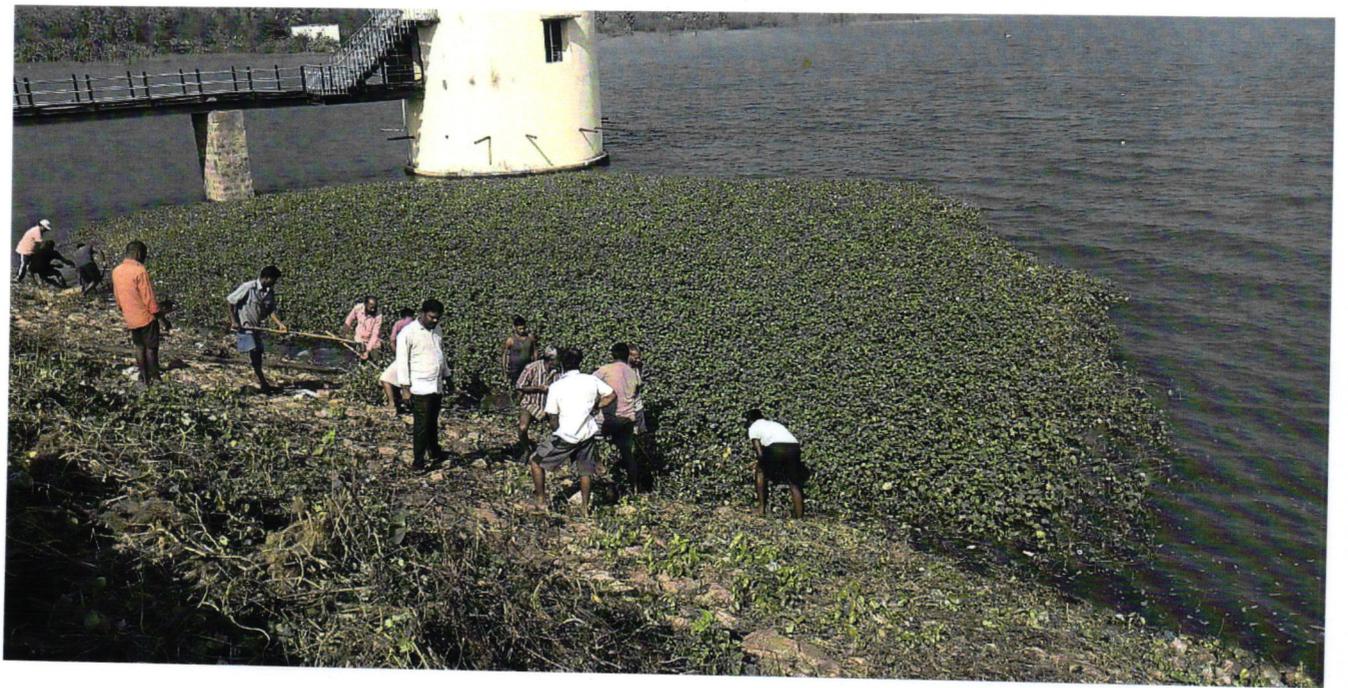
Basha

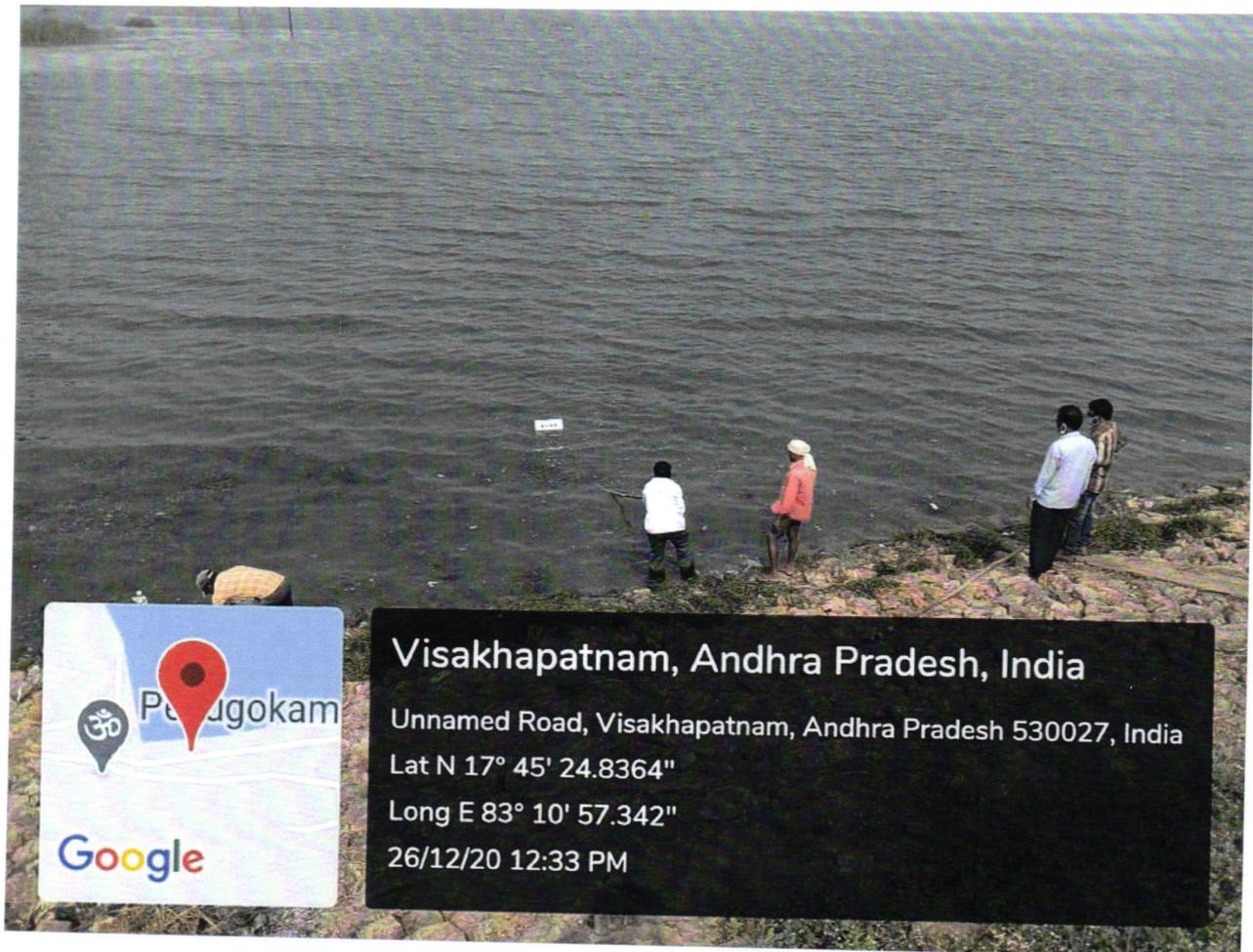
डॉ. शोक बाशा
Dr. Shaik Basha
वैज्ञानिक तथा प्रमुख / Scientist & Head
सीएसआईआर-नीरी क्षेत्रीय केंद्र
CSIR-NEERI Zonal Centre
तारनाका, हैदराबाद / Tarnaka, Hyderabad-7



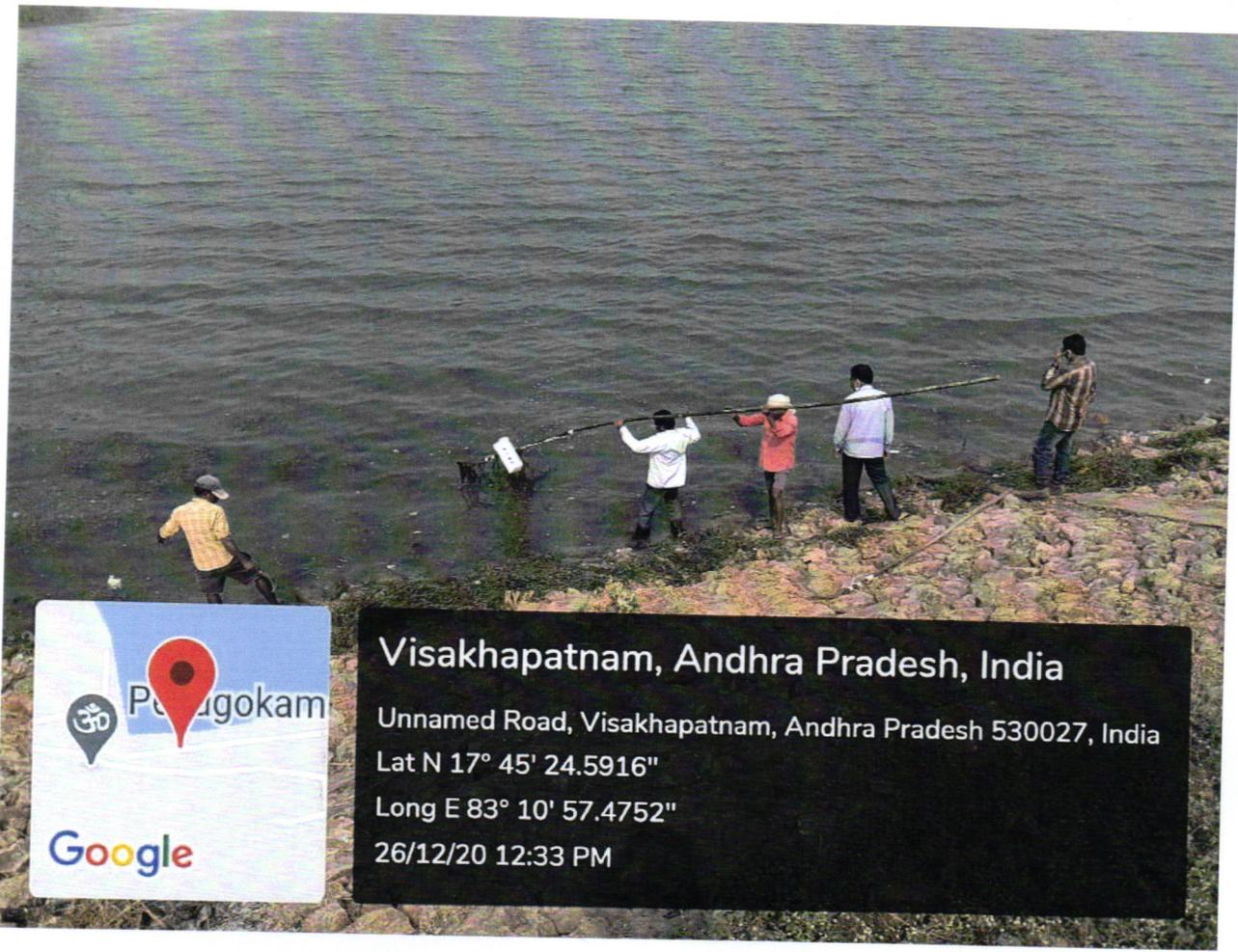








Visakhapatnam, Andhra Pradesh, India
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Visakhapatnam, Andhra Pradesh, India
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