

**BEFORE THE NATIONAL GREEN TRIBUNAL,
EASTERN ZONE BENCH, KOLKATA**

O.A. No. 34/2023/EZ

IN THE MATTER OF:

IN RE-NEWS ITEM PUBLISHED IN THE
TIMES OF INDIA NEWSPAPER,
CALCUTTA EDITION DATED
23.03.2023 TITLED KOLKATA WATER
TABLE DIPS 2M IN 5 YEARS, EXPERTS
FLAG RISE IN ARSENIC, SALINITY

...APPLICANT

VERSUS-

CENTRAL GROUND WATER AUTHORITY & ORS ...RESPONDENT(S)

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Filed through:-

Ashok Prasad

**ASHOK PRASAD,
ADVOCATE**



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**COUNTER AFFIDAVIT/REPLY FOR AND ON BEHALF OF THE
CENTRAL GROUND WATER BOARD (CGWB), KOLKATA**

MOST RESPECTFULLY SHOWETH:

I, Dr. Anadi Gayen, aged about 55 years, employed / appointed as the Regional Director, Central Ground Water Board, Kolkata, functioning / officiating at Kolkata, do hereby solemnly affirm and declare as under:-

1. That I am the authorised signatory in the aforementioned matter. On the basis of records, I am well conversant with the facts of the case and hence, competent to swear this affidavit.
2. That I have read and understood the order dated 23.03.2023 of Hon'ble NGT, Eastern Zone Bench, and filed this Counter Affidavit in compliance of directions under Para 1 & 2 of the order.
3. That I have read and understood the contents of the present Affidavit and state that the contents mentioned in the Affidavit are true and correct to the best of my knowledge.



BRIEF SUBMISSIONS

4. That the O.A. No. 34/2023/EZ is a Suo Moto case filed by the Hon'ble National Green Tribunal to restrain Respondent No. 1 from proceeding any further in the matter of "Kolkata Water Table Dips 2.1 m in 5 years, Experts flag rise in arsenic, salinity" news report published in the 'Times of India (TOI)' Newspaper, Calcutta edition dated 23.03.2023.

5. That the Hon'ble Tribunal under its order dated 24.04.2023 quoted as follows:

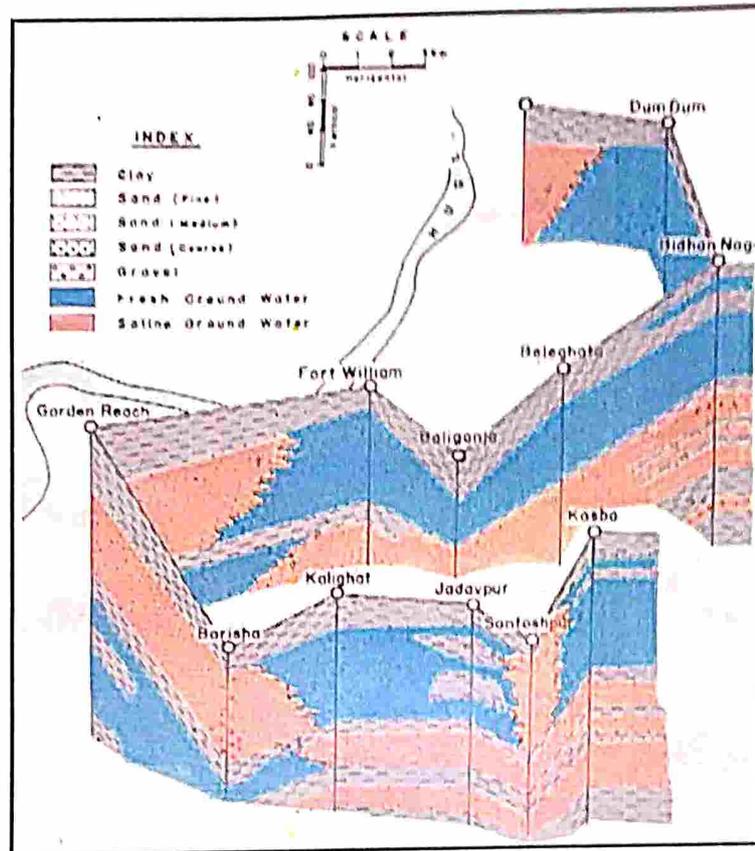
1. An analysis of the Central Ground Water Board's data on groundwater for 2017-21 has revealed a 2.1m drop in Kolkata's groundwater level, a decline of 18.6% over the level recorded five years ago. For South 24 Parganas, the drop is 2.5m, or 27.8% from what it was five years ago. If left unchecked, the depletion for Kolkata could be 44% by 2025,.....Groundwater levels in Kolkata and South 24 Parganas are dipping at an alarming rate, scientists have warned. In Kolkata, homes are primarily responsible for groundwater depletion while in the districts, it is the agriculture sector that withdraws the maximum quantity of ground water. "The withdrawal is much higher than replenishment. This is why critical areas are increasing.

6. That the Hon'ble Tribunal under its order dated 24.04.2023 observed as follows:

2. The article states that the data submitted by the Central Ground Water Board shows that between 2017-21 the ground water level in Kolkata has dropped by 2.1m which is a decline of 18.6% over the level recorded five years ago. For South 24 Parganas, the drop-in ground water level is 2.5m, or 27.8% from what it was five years ago. If the depletion in ground water in Kolkata is not checked, the 3m fall in ground water level would reach 44% by 2025 as per the research data. It is also reported that higher arsenic contamination has already been reported in Kolkata and South 24 Parganas which is likely to increase due to depletion of ground water.



7. That in this connection, the respectful submission is that in the mentioned area i.e. **Kolkata city** and **South 24 Parganas** district, in sub-surface, multiple water bearing zones (aquifers) exists. These water bearing zones are mostly composed of sand and they are separated by layers of Clay. The below mentioned figure represents sub-surface disposition of such zones in KMC area.



The top clay zone is 10-60m thick. Within this top clay zone, there are some pockets of sand, which hold water, in the area. These small sand zones are called **Perched aquifers** and the deeper zones are called **Confined Aquifers**. These perched aquifer zones support Dug-wells. On the other hand the deeper Confined Aquifer horizons are exploited through tube-wells.

8. Central Ground Water Board (CGWB) conducts **monthly monitoring for Kolkata city and four (4) times in a year for South 24 Parganas district as part of its Ground Water regime monitoring programme**. Depth-to-water levels are collected from both dug wells and tube wells. Dug-well data represents the Water-table of perched aquifers of the area. While

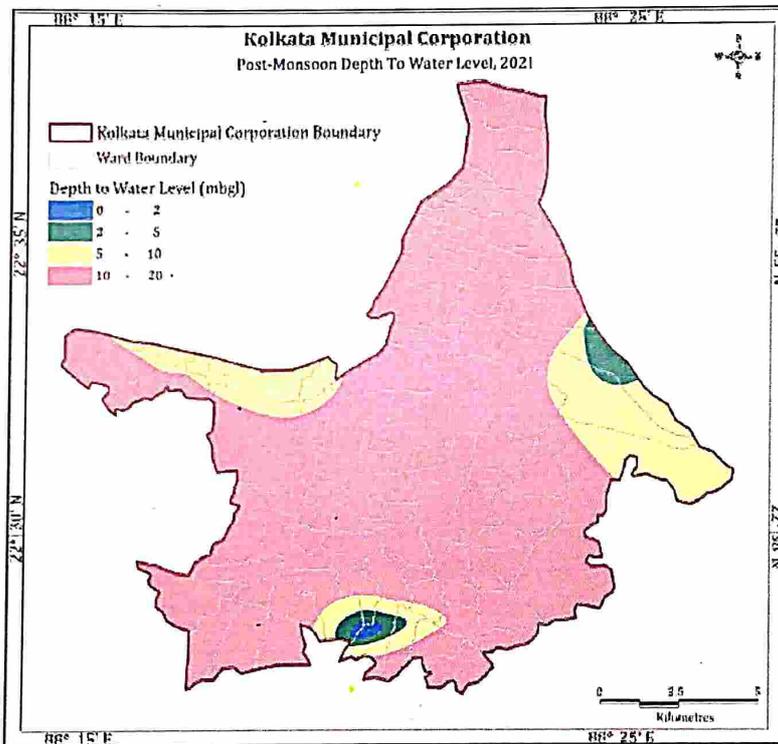
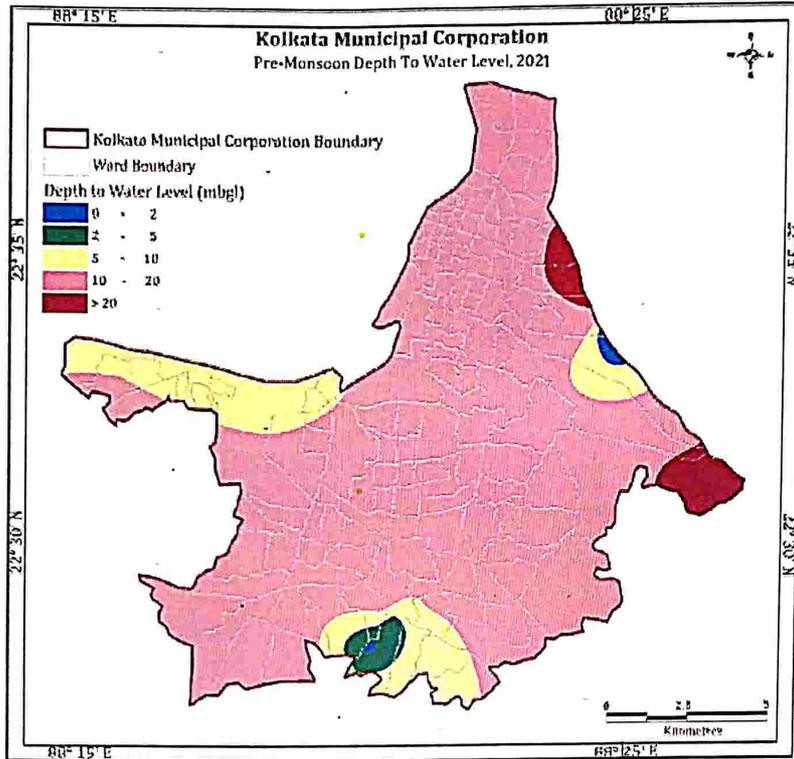


tube-well represents the data of confined aquifers depending on the depth of groundwater measuring station. These field measured data sets are compiled and reflected in the **Annual Ground water Yearbook** of the regions as monitored. These annual ground water yearbooks for West Bengal are available through CGWB Website (<https://cgwb.gov.in/GW-Year-Book-State.html>) from 2013-14 to 2021-22. At present, CGWB, ER measures the following number of observation wells.

District	No.
KMC	35
S24 Parganas	131

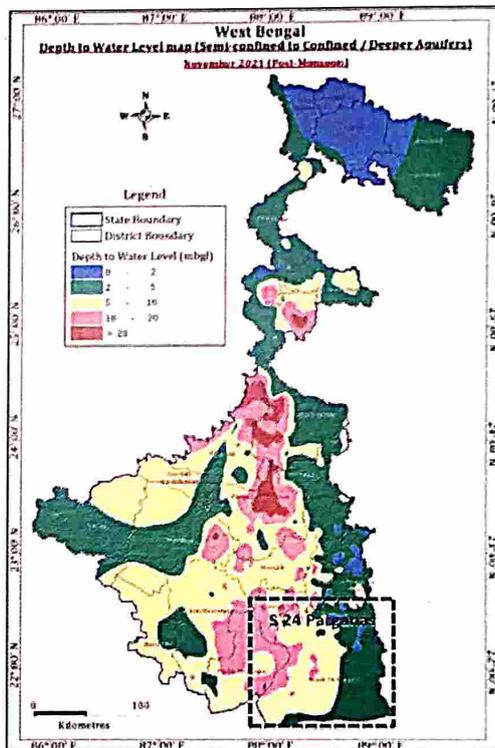
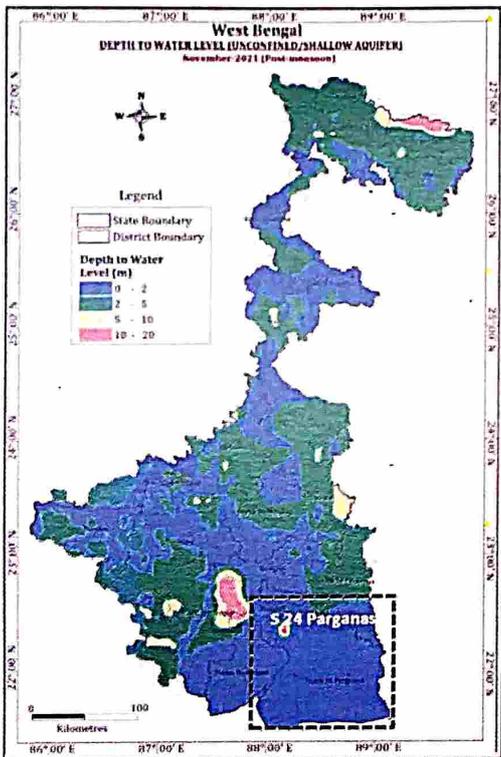
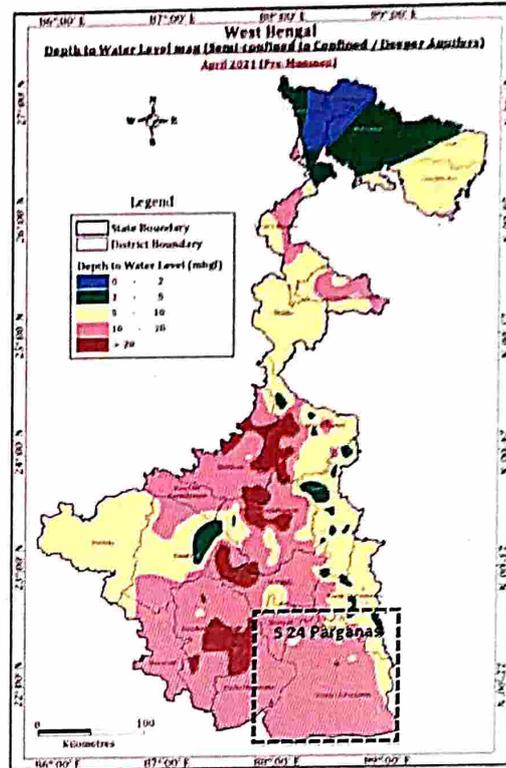
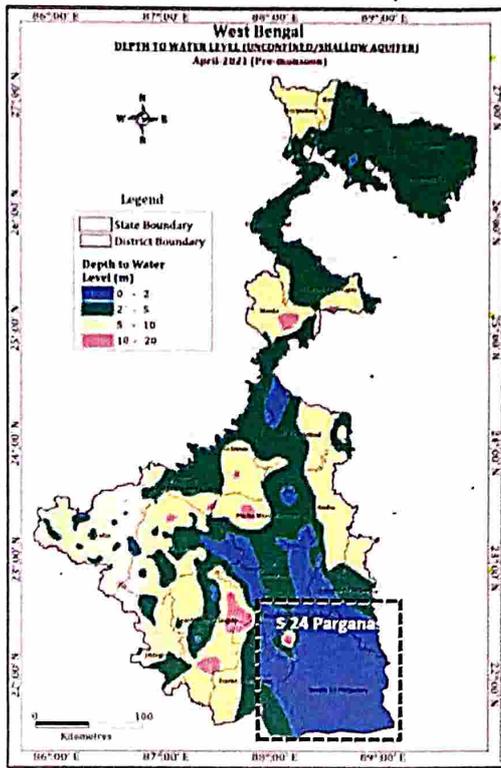
9. Field data are tabulated and validated to arrive at representative water level for particular observation well at a particular point of time. Moreover, apart from water level data, water level trend is much more observation point specific. As the Water Level is mathematically a surface, a single a Water level Trend can never represent a large area. **Hence water level contour maps and water level trend maps are prepared for specific aquifer selecting observation points representing that aquifer only.** For **Kolkata city and South 24 Parganas district**, such contour maps are prepared mainly **for Top Confined layer**. Prepared maps are available in CGWB Website (<https://cgwb.gov.in/GW-Year-Book-State.html>). The perched aquifer zones are isolated and of limited extent and not used for drinking purposes today. Hence, data from them are collected mainly for reference purposes.
10. Water level are also season specific which **decline in Summer time** (pre-monsoon season) and **rise after Rainy period** (post-monsoon season). Water level of **Kolkata city and South 24 Parganas district** is no exception. The prepared map for the year 2021 regarding Kolkata City and South 24 Parganas district are given here. The maps clearly show fluctuations are taking place only in few areas.





Depth to Water level Map of **Kolkata city**





Aquifer-wise Depth to Water level Map of South 24 Parganas District



*Frequency Table for Water levels in KMC and S 24 Parganas
for the year 2017 and 2021 (Pre- and Post-monsoon seasons)*

District	Period	No.	0-2 m		2-5 m		5-10 m		10-20 m		> 20 m	
			No	%	No	%	No	%	No	%	No	%
KMC	Apr -17	33	0	0	3	9.1	0	0	27	81.8	3	9.1
KMC	Nov-17	33	2	6.1	1	3.0	1	3.0	29	87.9	0	0
KMC	Mar -21	26	2	7.7	1	3.8	1	3.8	19	73.1	3	11.5
KMC	Nov-21	28	3	10.7	0	0	2	7.1	23	82.1	0	0
S24 Parganas	Apr -17	100	6	6	10	10	56	56	28	28	0	0
S24 Parganas	Nov-17	96	12	12.5	29	30.2	36	37.5	19	19.8	0	0
S24 Parganas	Apr -21	113	3	2.7	6	5.3	10	8.8	92	81.4	2	1.8
S24 Parganas	Nov-21	110	15	13.6	23	20.9	53	48.2	19	17.3	0	0

11. Perusal of the last five years CGWB collected data (2017-2021) of Groundwater level show location specific rise or fall in depth to water level in both districts. Station specific trends shows that **more number of stations shows rise than fall in KMC area in both Pre- and post-monsoon season**. On the other hand in South 24 Parganas district during Pre-monsoon season more number of stations shows fall than rise and during Post-monsoon season more number of stations shows rise than fall. Data analysis is given below.

A. Frequency of Stations Observing Rise/Fall for the period 2017-2021

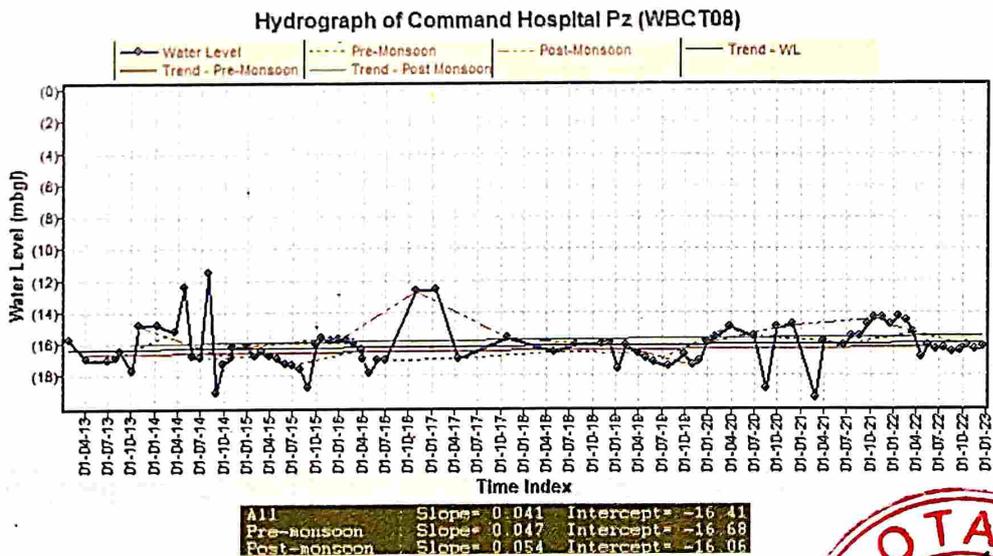
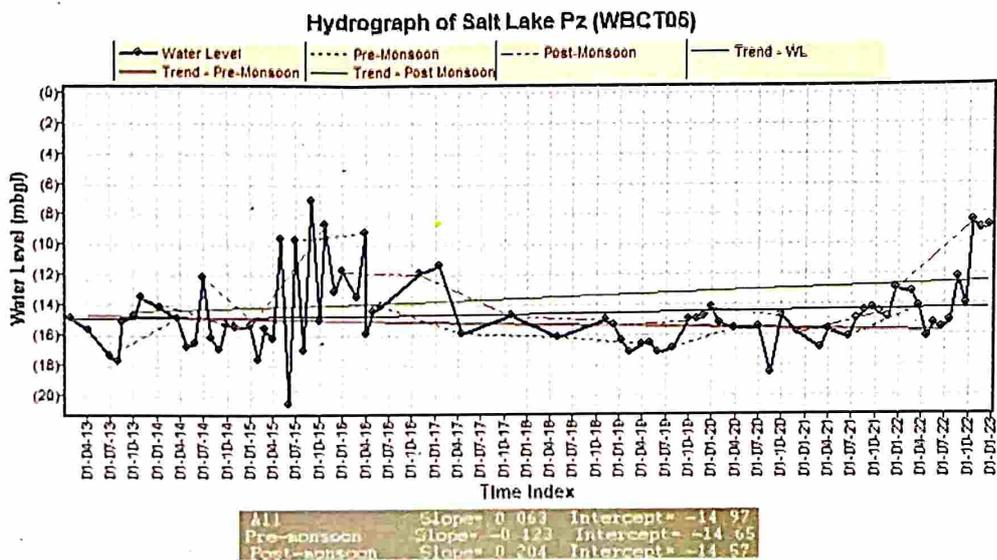
District	Period	Pre-monsoon				Post-monsoon			
		Rise		Fall		Rise		Fall	
		Nos.	%	Nos.	%	Nos.	%	Nos.	%
KMC	2017-21	17	63	10	37	23	76.7	7	23.3
S24 Parganas	2017-21	9	16.1	47	83.9	29	53.7	25	46.3

B. Quantum of Observed Rise/Fall for the period 2017-2021 in m/year

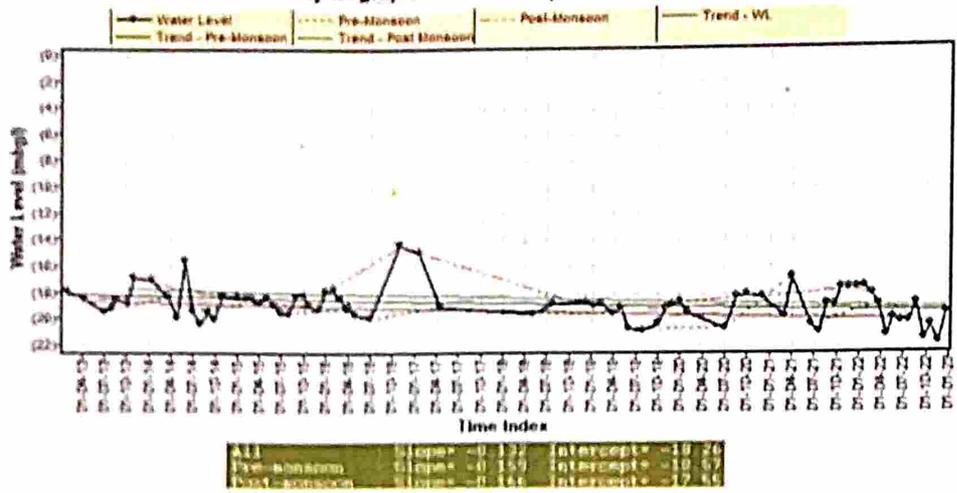
District	Period	Pre-monsoon				Post-monsoon			
		Rise		Fall		Rise		Fall	
		Max	Min	Max	Min	Max	Min	Max	Min
KMC	2017-21	1.98	0.10	1.64	0.05	4.11	0.06	0.68	0.06
S24 Parganas	2017-21	0.81	0.06	2.49	0.04	1.9	0.001	1.16	0.01



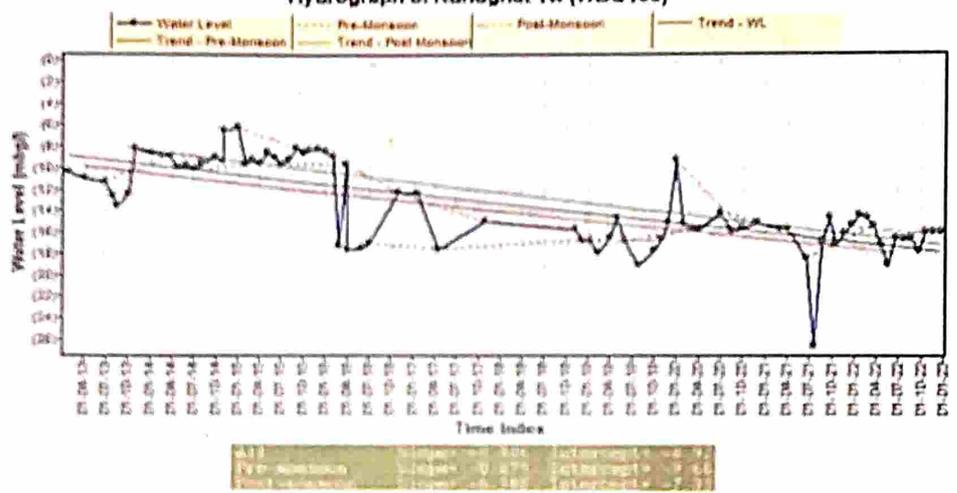
Surely with gradual increase of population, groundwater withdrawal has increased in both KMC and South 24 Parganas. This process impacted groundwater level and resulted in decline in water level over the years. Hydrographs, i.e. time-series plot of water level for a particular well, show temporal change in water level. It also reflects the temporal change in groundwater recharge-draft balance for the area. Few prepared hydrographs for KMC and South 24 Parganas district representing last 10 years (2013-2022/23) are given here.



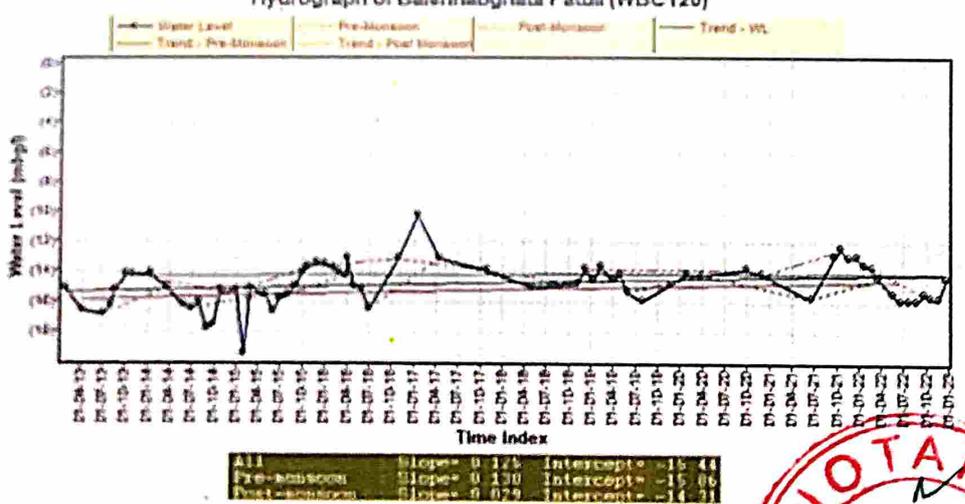
Hydrograph of Dum Dum (WBC T09B)

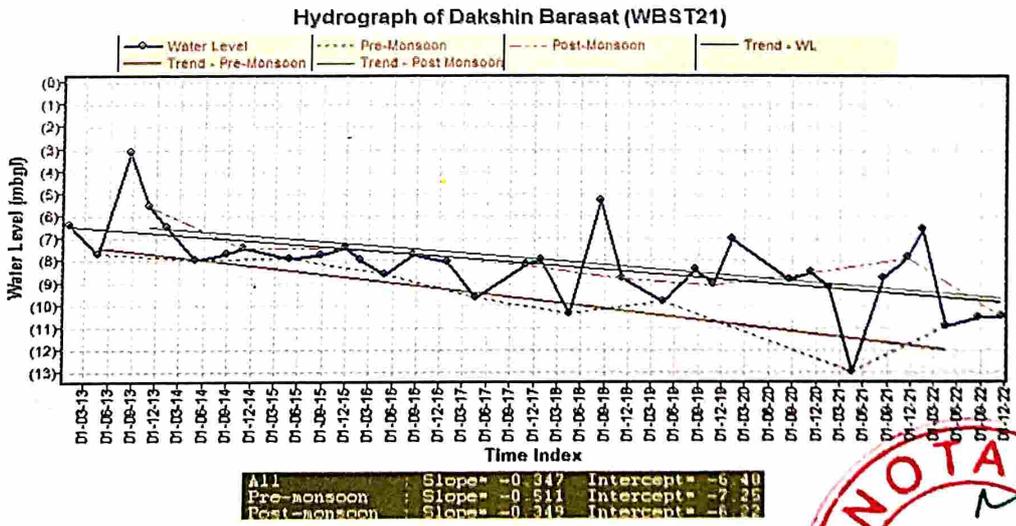
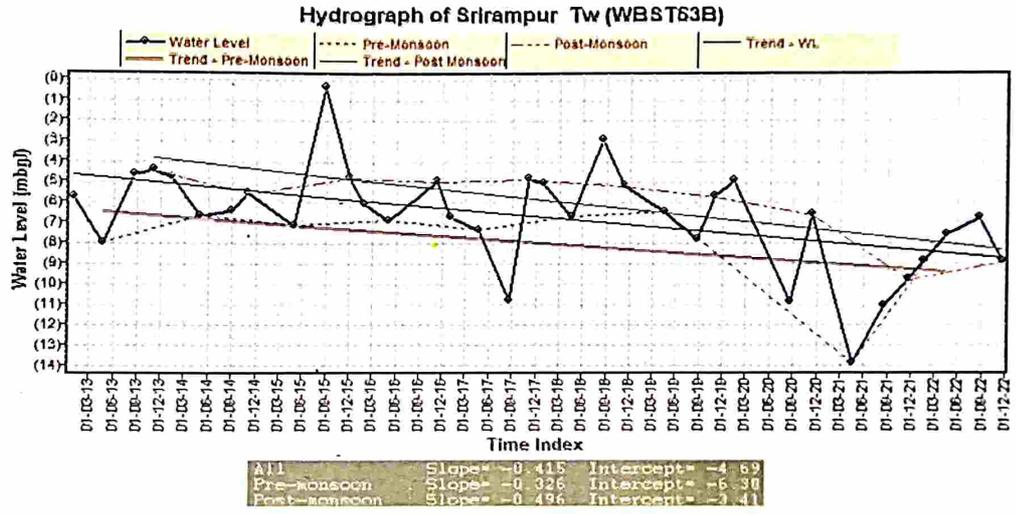
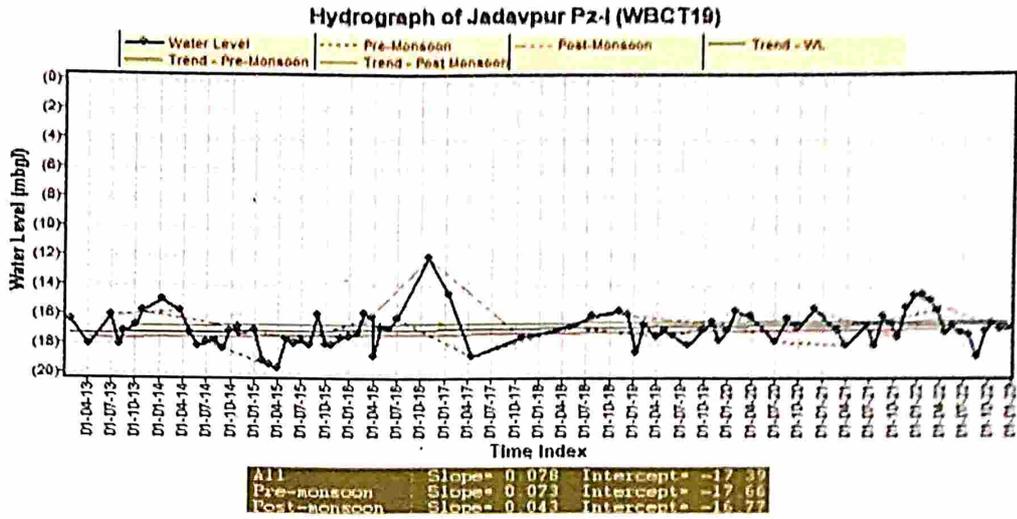


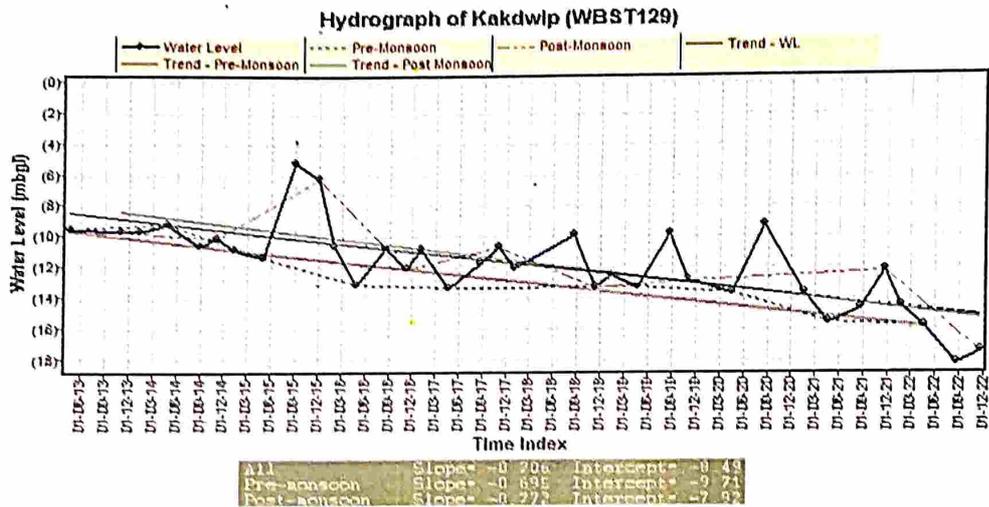
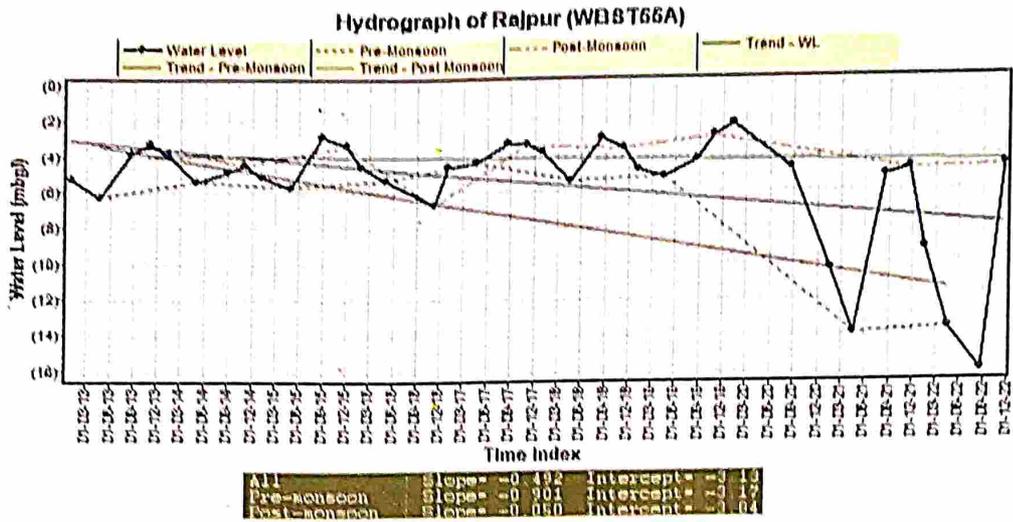
Hydrograph of Kundghat Tw (WBC T06)



Hydrograph of Balshnabghata Patuli (WBC T20)







These Hydrographs show that during last 10 years decline in water level is more prominent in South 24 Parganas district than KMC. KMC hydrographs mostly does not show any decline except Kudghat area (Well ID WBCT06). On the other hand, in South 24 Parganas district falling trend is observed with maximum fall at Kakdeep area (Well ID WBST129). It shows groundwater recharge-draft balance is more stabilised in KMC area than South 24 Parganas district.

That in this connection, the respectful submission is that the said report in TOI dated 23.03.2023 has forecasted a decline of 44% in Kolkata in 2025. However, the groundwater levels recorded by CGWB during last five years, for Kolkata and South 24 Parganas districts do not conform to those trends.



12. As per the said report, various experts have cautioned about various adverse impacts of the decline in groundwater level. These opinions are mostly generalized in nature as in case of **Kolkata city and South 24 Parganas district**, *Top Confined layer is generally tapped for water supply which not directly connected with River System of the area. Moreover with water level within 20 m considering top clay layer maximum thickness of 60 m indicates pressurised state of Top Confined Aquifer System.* CGWB studies have not so far found any significant correlation between the depletion of groundwater level and water quality in these two districts. Particularly aspect of Salinity and Arsenic were mentioned by the experts.

A. Salinity

Electrical Conductivity (EC) and Total Dissolved Solids (TDS) are two parameters which are universally accepted as indicator of salinity. In **Kolkata city and South 24 Parganas district** saline zones are already present which were formed in geological past during marine regressing and formation of Bengal Delta. Sub-surface zone map given earlier depicts identified brackish water zones under KMC area.

Below given year-wise frequency table of observed EC values does not show any significant change over the period 2017-2021.

i. Year-wise variation of EC in Kolkata City and South 24 Parganas District

(EC values are in $\mu\text{s}/\text{cm}$ at 25°C)

District	Year	Total Number of samples analysed	0-250		250-500		500-1000		1000-1500		1500-2000		>2000	
			μs		μs		μs		μs		μs		μs	
			N	%	N	%	N	%	N	%	N	%	N	%
Kolkata	2017	16	0	0	0	0	4	25.0	5	31.3	5	31.3	2	12.5
Kolkata	2018	18	0	0	0	0	4	22.2	5	27.8	8	44.4	1	5.6
Kolkata	2019	14	0	0	0	0	3	21.4	2	14.3	7	50.0	2	14.3
Kolkata	2020	13	0	0	0	0	5	38.5	4	30.8	2	15.4	1	7.7
Kolkata	2021	16	0	0	0	0	4	25.0	4	25.0	6	37.5	2	12.5



District	Year	Total Number of samples analysed	0-250		250-500		500-1000		1000-1500		1500-2000		>2000 μs	
			μs		μs		μs		μs		μs		μs	
			N	%	N	%	N	%	N	%	N	%	N	%
S24P	2017	79	0	0	4	5.1	27	34.2	23	29.1	14	17.7	11	13.9
S24P	2018	51	0	0	1	2.0	22	43.1	19	37.3	3	5.9	6	11.8
S24P	2019	56	0	0	1	1.8	25	44.6	15	26.8	4	7.1	11	19.6
S24P	2020	61	0	0	2	3.3	28	45.9	17	27.9	7	11.5	7	11.5
S24P	2021	84	0	0	0	0.0	36	42.9	26	31.0	14	16.7	8	9.5

Below given year-wise frequency table of observed TDS values also does not show any significant change over the period 2017-2021.

ii. Year-wise variation of TDS in Kolkata City and South 24 Parganas District

(TDS values are in mg/L)

District	Year	Total Number of samples analysed	Fresh		Brackish	
			0-1000		> 1000	
			mg/L		mg/L	
			N	%	N	%
Kolkata	2017	16	13	81.3	3	18.8
Kolkata	2018	18	11	61.1	7	38.9
Kolkata	2019	14	5	35.7	9	64.3
Kolkata	2020	13	11	84.6	2	15.4
Kolkata	2021	16	12	75.0	4	25.0

District	Year	Total Number of samples analysed	Fresh		Brackish	
			0-1000		> 1000	
			mg/L		mg/L	
			N	%	N	%
South 24 Pgs	2017	79	61	77.2	18	22.8
South 24 Pgs	2018	51	43	84.3	8	15.7
South 24 Pgs	2019	56	42	75.0	14	25.0
South 24 Pgs	2020	61	50	82.0	11	18.0
South 24 Pgs	2021	84	68	81.0	16	19.0



B. Arsenic

Arsenic is an extensively discussed issue in recent media. It is known that West Bengal as a state is suffering from **Arsenic (As)** problem. A long patch along the Bhagirathi River is affected by the problem. The same has reported by some researchers in Kolkata City. West Bengal Government has already created **Arsenic Task Force** in 2005 to tackle the problem.

CGWB does not monitor for Arsenic in groundwater on annual basis. However, depending on emerging situations, Arsenic analyses from groundwater monitoring stations of CGWB were carried out in 2015 and 2019. Summary of the results are given below.

District	2015		2019	
	Total Number of samples analysed	Number of samples having Arsenic above permissible limit	Total Number of samples analysed	Number of samples having Arsenic above permissible limit
		(>10 µg)		(>10 µg)
Kolkata	26	0	12	0
S 24 Parganas	51	1	56	3

2015				
District	Block	Location	Well ID	As (ppb)
S 24 Parganas	Baruipur	Ramnagar	WBST141	12.0

2019				
District	Block	Location	Well ID	As (ppb)
S 24 Parganas	Bhangar-I	Hariharpur	WBST047A	11.8
S 24 Parganas	Gosaba	Jotirampur Ferryghat	WBST092A	19.6
S 24 Parganas	Sonarapur	Gobindapur	WBST118	46.1

Results shows that no **As** had been detected in Kolkata City whereas **As** had been detected from South 24 Parganas district. The area where **As** is observed in South 24 Parganas district, entire blocks of Bhangar-I and Sonarapur was already declared as **As affected area** by Arsenic Task Force, GoWB.



Para-wise Reply

- 1. That the averments under para 1-6 are matter of record.
- 2. That the averments under para 7-12 are related to the actions of the Respondent No. 1

In view of above submissions, this Hon'ble Tribunal may like to pass appropriate orders as deemed fit and proper in the interest of justice and on the basis of replies of other respondents.

[Signature]
26/06/2023

DEPONENT
Regional Director
Central Ground Water Board (ER)
Ministry of Jal Shakti
Government of India

VERIFICATION

I, DR. ANADI GAYEN, the above-named deponent, do hereby verify that the contents of above this Counter Affidavit are true and correct on the basis of official record maintained by the answering respondent in the daily course of its business and state that neither any material has been concealed therefrom nor is any part of it false.



Signed and verified on this 27th Day of June, 2023 at Kolkata.

[Signature]
26/06/2023

DEPONENT
Regional Director
Central Ground Water Board (ER)
Ministry of Jal Shakti
Government of India

Identified by Me

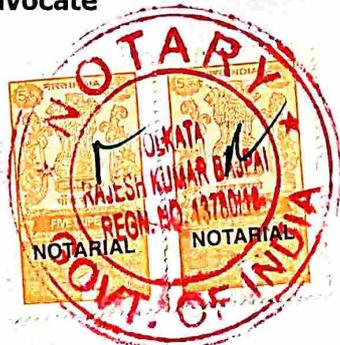
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Advocate

Solemnly Affirm & Declared Before Me on Identification of Ld. Advocate

[Signature]

RAJESH KUMAR BAJPAI
NOTARY GOVT. OF INDIA
Regn. No. 13780/18
C.M.M. Court, Kolkata-W.B



27 JUN 2023

V A K A L A T N A M A

BEFORE THE NATIONAL GREEN TRIBUNAL, EZ BENCH, KOLKATA

OA No. 34 of 2023/EZ

In Re-News Item published in The Times of India Newspaper, Calcutta edition dated 23.03.2023 titled Kolkata Water Table Dips 2m in 5 years, Experts flag rise in arsenic, salinity

Plaintiff
Petitioners

Versus-

Central Ground Water Authority & Ors

Defendant
Opposite Party

On behalf of CENTRAL GROUND WATER BOARD, ER, KOLKATA

Know all men by these presents that by Vakalatnama I/We appoint the Advocates noted below or any of them my/our lawful Advocate or Advocates for filing the Memorandum of appeal or petition in the
for entering Appearance

above matter for appearing in conducting and arguing the same, for depositing or withdrawing any money in connection therewith for moving the Court in any matter connected therewith, for preparing the paper book in the case and for putting in papers petitions etc. on my/our behalf for filing taking back any documents for withdrawing suits or appeals or petitions with permission to institute fresh suits etc. For signing and filing petitions of compromise in connections with said matter and for taking copies of paper form the Record and I/We further say that any act, done by my/one said Advocate or Advocates or by any of them after accepting this Vakalatnama, shall be considered as my/our true and lawful act.

And I/we further hereby agree and undertake to pay the said Advocates his or their fees are settled and all others sums that may be necessary to carry out the requisition of the Court and otherwise to enable the said Advocates to conduct property. Falling which the said Advocates after notice to me/us will be liberty to withdraw form the further conduct to the case.

IN WITNESS WHERE OF I/We sign and execute this Vakalatnama on this the.....20.....day on.....04.....2023

NAME OF ADVOCATES

SH. ASHOK PRASAD

Vakalatnama received
and accepted
Ashok Prasad
Adv.
9882059404
ashokadvh@gmail.com

Anand Bisen
23/03/2023
Central Ground Water Board (ER)
Government of India