

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

ORIGINAL APPLICATION NO. 137/ 2024/EZ

(Earlier OA No. 608/2024/PB)

News Item Titled" After Bangaluru,
Water Crisis Hits Kolkata City as
Ground Water level depletes in
Many area, Residents express
concern" appearing in India.com,
dated 22.04.2024

...Applicant(s)

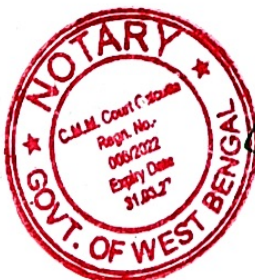
Versus

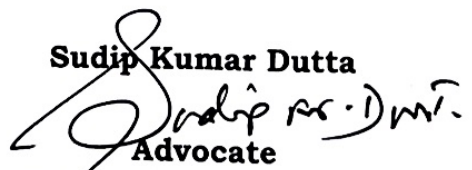
West Bengal Pollution Control
Board and Others.

....Respondents

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Sudip Kumar Dutta

 Advocate
 For State of West Bengal.

Before the National Green Tribunal, Eastern Zone Bench, Kolkata

ORIGINAL APPLICATION NO. 137/ 2024/EZ

(Earlier OA No. 608/2024/PB)

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Versus

West Bengal State Pollution Control Board and Others

.... Respondents

AFFIDAVIT ON BEHALF OF RESPONDENT NO. 5, STATE WATER INVESTIGATION DIRECTORATE, WITH THE ORDER OF THE HON'BLE GREEN TRIBUNAL, EASTERN ZONE, ORDER DATED 26.07.2024

I, Shri Alok Sarkar, son of Late Subal Chandra Sarkar, aged about 59 years, by faith: Hindu, by occupation- Government Service, residing at 26P, DPP Road, P.O-Naktala, Kolkata- 700047, now posted as Director, State Water Investigation Directorate, under Water Resources Investigation & Development Department, Government of West Bengal having its office at Nirman Bhawan (3rd Floor), Bidhannagar, Kolkata – 700091, do hereby solemnly affirm and state as follows:-



19 1 SEP 2024

Alok Sarkar

DIRECTOR
State Water Investigation Directorate
Government of West Bengal

1. I am working as Director, in the office of the State Water Investigation Directorate, under Water Resources Investigation & Development Department, Government of West Bengal and I have made myself acquainted with the facts and circumstances of this case and am competent to affirm this affidavit.
2. That by an order dated 26.07.2024 the Hon'ble National Green Tribunal, Eastern Zone, Kolkata, was pleased to direct to include the State Water Investigation Directorate in the array of as respondents as Respondent No.5 and to file Affidavit.
3. That this affidavit is being affirmed in pursuant to the solemn order passed by the Hon'ble Tribunal on 26.07.2024.
4. That by an order dated 26.07.2024 he Hon'ble National Green Tribunal, Eastern Zone, Kolkata, was pleased to implead State Water Investigation Directorate (SWID), in the array of Respondents as 'Respondent No. 5' and further directed the respondents to file Counter-Affidavit. The Hon'ble National Green Tribunal, Eastern Zone, Kolkata has directed State Water Investigation Directorate (SWID) to address the issues of Kolkata City within four weeks.

Asok Sam

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State Water Investigation Directorate
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BRIEF SUBMISSIONS:

5. In this connection, the respectful submission is that, the State Water Investigation Directorate is an investigation Directorate under Water Resource Information Development Department (WRID&D), Govt. of West Bengal mainly carrying out investigation and assessment in respect to Ground water resources of the State. The principal activities are:

- Periodical monitoring of Ground water level.
- Periodical Monitoring of water quality.
- Conduct Census of Minor Irrigation Schemes and Census of water bodies.
- Estimation of Ground Water Resources jointly with Central Ground Water Board (CGWB) based on the Norms of Ground Water Estimation Committee (GEC Norms).
- Implementation of "West Bengal Ground Water Resources (Management, Control & Regulation) Act, 2005" in the State of West Bengal.
- Implementation of pilot schemes for artificial recharge to ground water.
- Collection, preservation and interpretation of hydro-meteorological data.
- Exploration of prospect of ground water extraction in problematic areas by sinking Exploratory Tube Wells & Observation Wells and




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determination of Aquifer Characteristics by Aquifer Performance Tests.

- Geophysical investigation.
- Providing technical assistance to users in the matter of withdrawal and use of surface and ground water resources.
- Nodal agency of NHP for Groundwater part.

6. This is also to mention that an Act titled "The West Bengal Ground Water resources(Management, Control and Regulation) Act, 2005(West Bengal act XVIII of 2005) was enacted and the West Bengal Ground Water Resources (Management, Control and Regulation) Rules, 2006 thereof was finalized and aim into force with effect from 1st august,2006 for proper utilization of Ground water Resources through effective management and regulation in West Bengal. Two tier authority systems have been set up by the State Govt. for implementation of this Act.

- a. **District Level Authority (District)/Corporation Level Authority (KMC area)**
- b. **State Level Authority**
- c. **High Level Authority only for Industrial purpose.**

Private bore wells in various housing complexes and industrial units are to obtain Permit from Corporation Level Ground Water Resources Authority. Entire process and database is maintained by State Water



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Investigation Directorate, Government of West Bengal, KMC water supply bore wells are also registered.

7. That in this connection, the respectful submission is that the Kolkata Municipal Corporation area is bounded by river Hooghly in the Northwest, South 24 Parganas District in the South and South-West, Salt Lake City in the East and North 24 Parganas District in the North. The area falls between North Latitudes of 22°28'00" and 22°37'30" and East Longitudes 88°17'30" and 88°25'00". KMC covers an area of 187.33sq.km. and is divided into 141 wards and 15 nos. of borough (Fig-1). The color photograph of the map is given below:

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BOROUGH MAP OF KOLKATA MUNICIPAL CORPORATION AREA

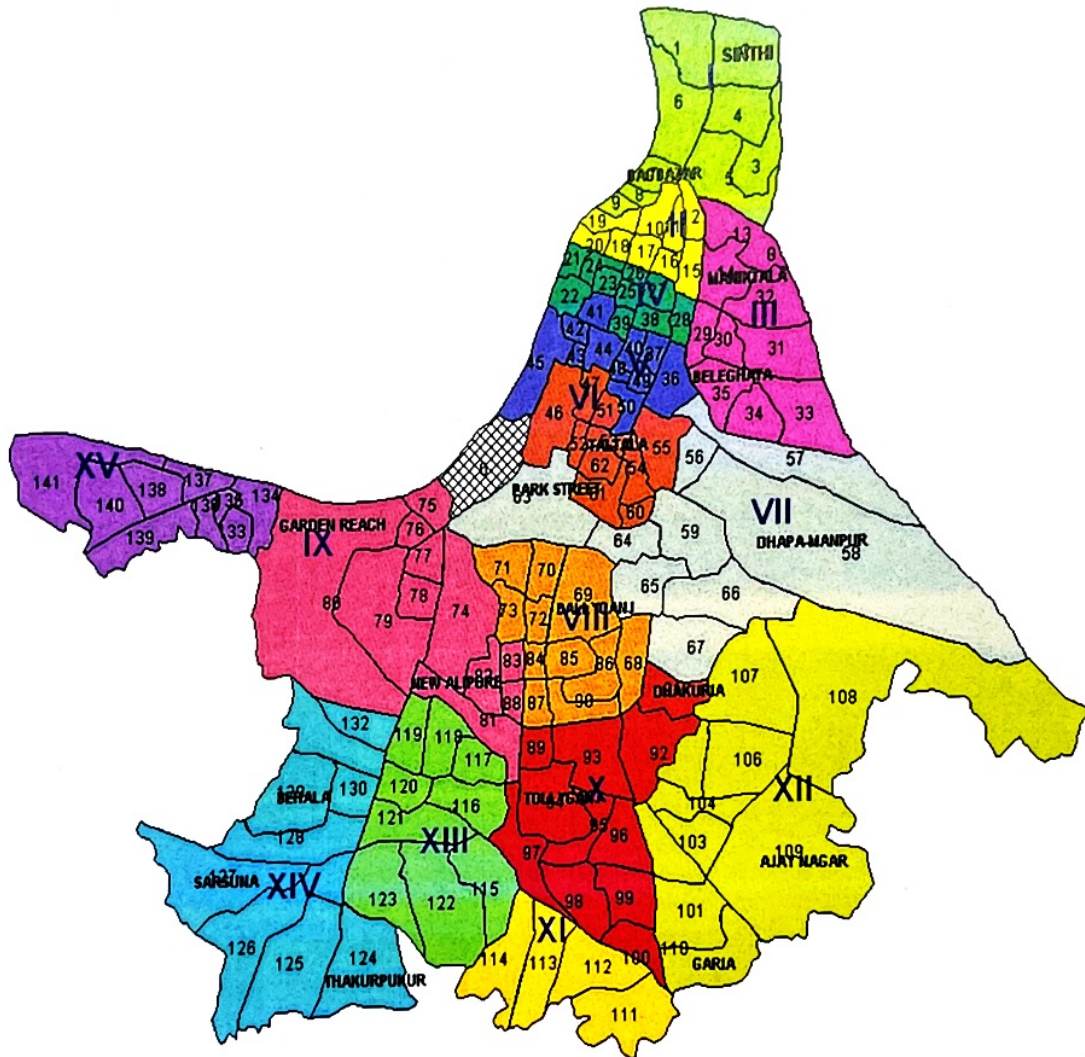
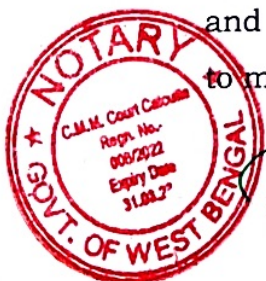


Fig 1.

8. The panel diagram (Fig-2) prepared on the basis of the Lithological logs of the tube wells indicates that there are two regionally extensive clay beds throughout KMC area within the depth of 400mbgl. The depth of occurrence of the basal clay bed varies from place to place but in general it occurs from 300m to 450m bgl (below ground level) and the depth gradually decreases southward. The top clay bed of 10m to more than 60m thick occurs above the entire alluvium sequence from



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the ground surface in KMC area. The thickness of this clay bed varies from place to place. Both top and bottom clays are dark grey in colour, sticky, plastic and often found to contain strings of silt and fine sand. Sands of various grades with occasional gravel occur between these two clay beds form **the main aquifer system** in KMC area. Thin lenses of very fine-grained sand and silt in the silt clay layer also occur above the top clay layer at some places around Ballyganj, Tollyganj, Tijola, Dhakuria, Kasba, Santoshpur, Garia, Behala, Barish and Thakurpur in the marshy/swampy lands. The thickness of these sand and silt layers varies from place to place. In the levee deposits along the bank of river Hugli, lenses of sand of fine to coarse grained are also present above the top clay bed at some places. The thickness of this sand bed also varies from place to place.

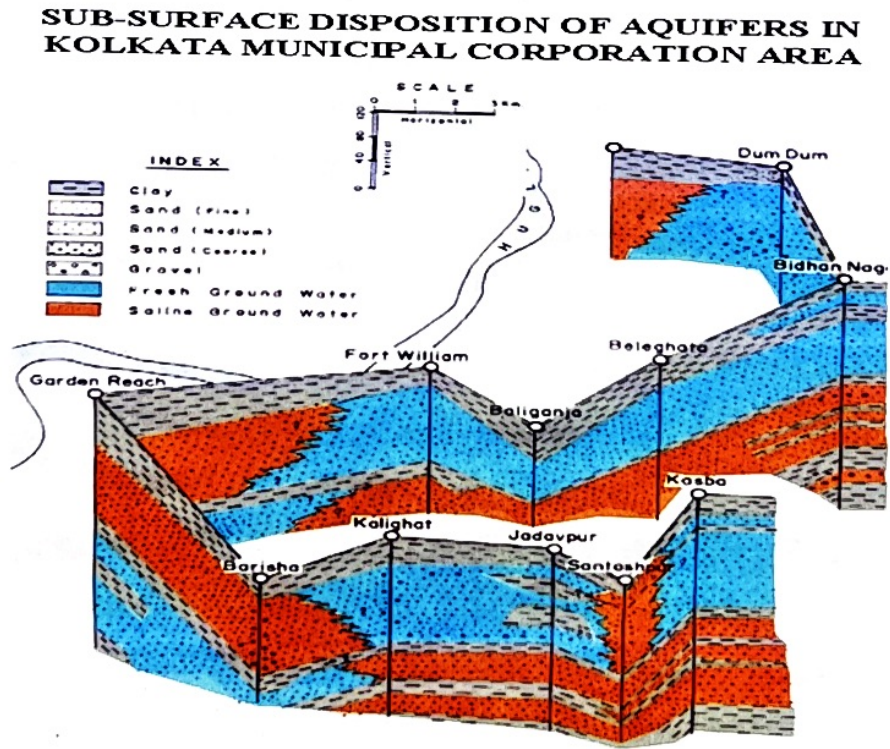



Fig 2.




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9. Nature and depth of aquifer system: The sub-surface disposition of the aquifers indicates that the blanket of clay (10m to 60m thick) at the top of the sedimentary sequence imparts confined to semi confined nature to the groundwater occurring in the aquifers below this clay blanket. The aquifers below this clay bed consist of fine to coarse sand, which are occasionally mixed with gravel. The thickness of the individual aquifer varies from place to place with the frequent occurrence of clay lens within them. The principal productive freshwater aquifer occurs within the depth span of 60-180m below ground level in the major part of the area except in the western part as discussed above. In the western part in Garden Reach-Barisha Sector and around Kashipur, west of Dumdum brackish water aquifers occur down to depth of 160m bgl(below ground level) and 200 m bgl respectively from the surface. These brackish water aquifers are underlain by fresh water aquifers. In Santoshpur area at the extreme south all the aquifers within 300 m bgl are brackish.

10. Occurrence of ground water: In general ground water in KMC area occurs under confined to semi confined condition. A typical hydro chemical situation exists in KMC area. In the major part of KMC area fresh ground water overlies the brackish ground water except in the western part starting from Fort William in the central part on the bank of river Hugli and Kalighat in the south and in a localized body around Kasipur, west of Dumdum in the north, where brackish ground water overlies the fresh ground water. In the levee deposit on the bank of Hugli River thin lens of shallow aquifer occur within 12mbgl, where ground water occurs under water table condition. Ground water also occurs under unconfined condition within 17m below ground level in



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the marshy/swampy lands around Ballyganj, Tollyganj, Tiljola, Dhakuria, Kasba, Santoshpur, Garia, Behala, Barish and Thakurpur. Ultimate source of ground water is the rainwater that influenced the ground water trend and shows that recharge- draft balance is more or less stabilized in KMC area.

11. Rainfall data from Indian Meteorological Department (IMD), Government of India given below in a tabulated format:

Normal Rainfall Data of IMD Actual Rainfall Data of IMD

Year	Total Monsoon Rainfall (in mm)	Total Non-Monsoon Rainfall (in mm)	Total Annual Rainfall (in mm.)	Total Monsoon Rainfall (in mm)	Total Non-Monsoon Rainfall (in mm)	Total Annual Rainfall (in mm.)
2010	1067.9	350.8	1418.7	731.9	312.3	1044.2
2011	1067.9	350.8	1418.7	1260.1	259	1519.1
2012	1067.9	350.8	1418.7	826.3	263.3	1089.6
2013	1067.9	350.8	1418.7	918.9	429.3	1348.2
2014	1067.9	350.8	1418.7	939.2	176.6	1115.8
2015	1067.9	350.8	1418.7	1374.4	177.7	1552.1
2016	1067.9	351.5	1419.4	1009.1	210.4	1219.5
2017	1062.4	350.8	1413.2	1008.2	406	1414.2
2018	1042.4	361.8	1404.2	784.9	174	958.9
2019	1047	361.1	1408.1	737.5	508.7	1246.2
2020	1047	359.8	1406.8	962.4	479.3	1441.7
2021	1047	359.8	1406.8	1241.3	614	1855.3



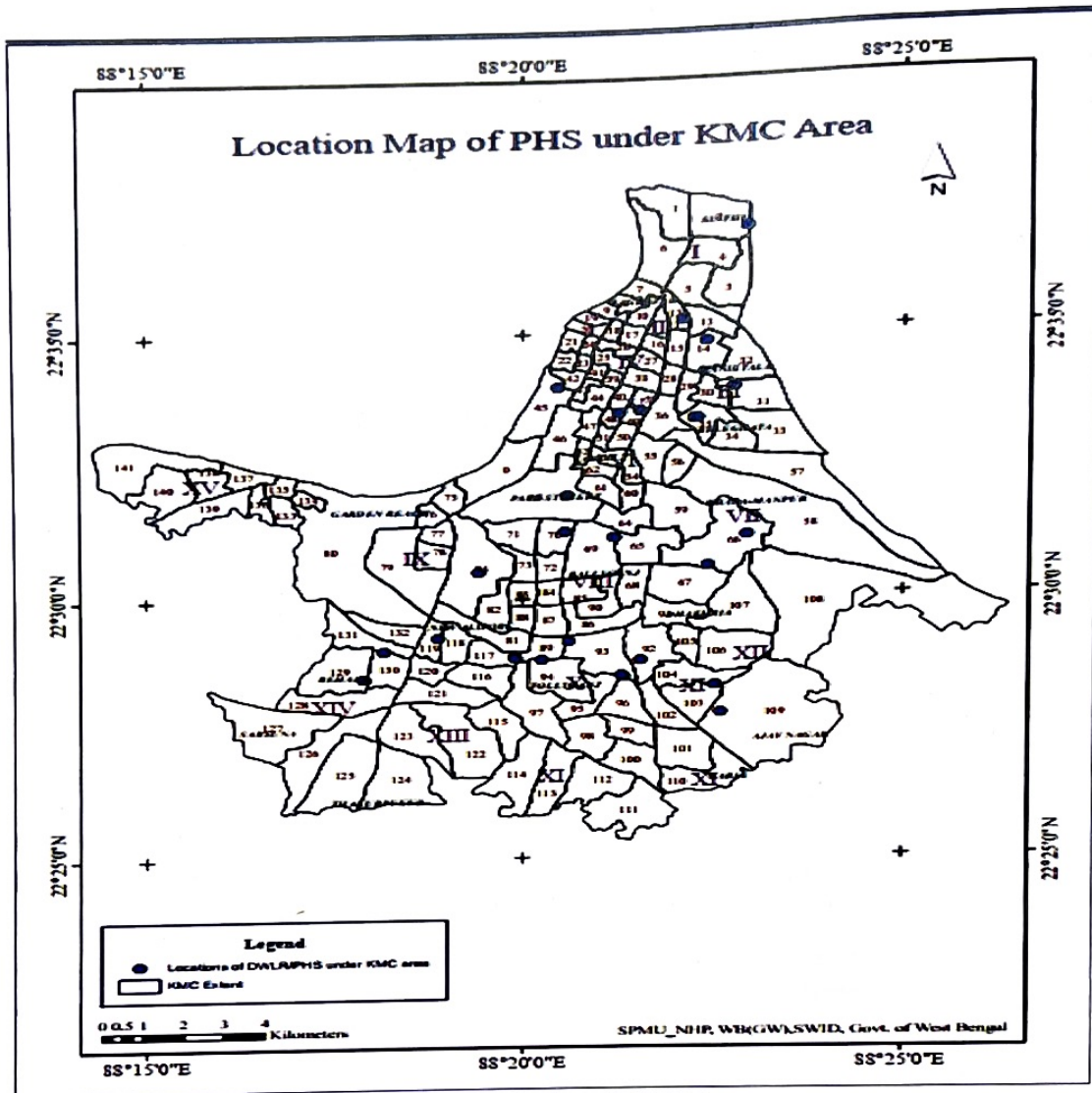
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12. Ground Water Resources Monitoring by SWID: The State Water Investigation Directorate (SWID), Govt. of West Bengal every year carries out 4-sets of monitoring of the Depth to the Ground Water Level (in the month of January, April, August & September) long with Pre-monsoon & Post-monsoon Ground Water quality monitoring in KMC Area. There are 47 nos. of Permanent Hydrograph Station (PHS) in KMC area. The Depth to Ground Water Level (GWL) monitoring and Ground Water (GW) quality monitoring (pre-monsoon & post-monsoon) is the basic routine work of SWID. *The colour photographs are annexed herewith and marked as Annexure - P-1 and P-2.*



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PHS Stations of SWID

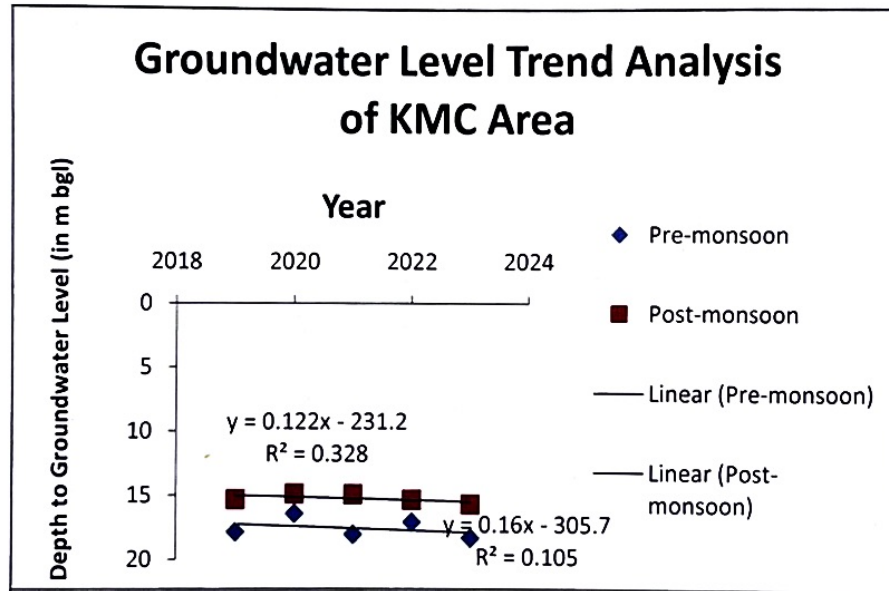
Accordingly, as per the available data of S.W.I.D for KMC area, the average Depth to Water Level (DTWL) for Pre-monsoon and Post-monsoon of last five (5) years (2019-2023) have been prepared. The graph prepared with this data are showing a **slight declining** trend of the Depth to Water Level (DTWL) in both in **Pre- Monsoon (16 cm)** & **Post monsoon (12 cm)** season in KMC area.



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Year	2019	2020	2021	2022	2023	Deviation in last 5 years (in m)
Pre-monsoon (in m)	17.91	16.48	18.1	17.14	18.38	0.47
Post-monsoon (in m)	15.37	14.92	14.98	15.4	15.74	0.37



PHS Stations of SWID

13. Ground Water Resources Management, Control and Regulation by SWID: An act titled "The West Bengal Ground Water Resources (Management, Control & Regulation Act, 2005) & West Bengal Ground Water Resources (Management, Control & Regulation Rules, 2006 & Amendments came into force to manage, control and regulate the indiscriminate extraction of ground water as well as to monitor the widespread contamination of ground water in West Bengal.



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Corporation Level Authority (CLA) is responsible for implementation of this State Act in the Kolkata Municipal Corporation Area.

Any user in KMC area desires to sink a well with mechanical or electrical pump motor for infrastructure, industrial and or commercial purposes have to obtain Permit from Corporation Level Authority. The Corporation Level Authority is chaired by the Municipal Commissioner of the Corporation and Superintending Geologist is the Member Secretary of that committee. This Authority has the power to issue **Permit** for extraction of Ground Water at the rate not exceeding 100 cubic meters per hour from each well under intimation to the **State Level Authority**.

The Progress of the **CLA(Corporation level Authority under GWR Act,2005)** depicted in a tabulated format:

Total No. of applications	No. of Approved cases in CLA	No. of Total Permit	No. of Rejected cases	No. of CLA Meeting till date.
1000	724	581	246	38

14. Ground Water assessment in KMC area: As the Ground water occurs under confined condition, the piezometric head is quite deep in few areas of Kolkata Municipal Corporation due to heavy withdrawal of Ground water. During 2021-22 Ground Water Resource Assessment for confined aquifers of West Bengal attempted for the first time. Following

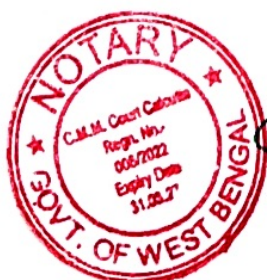


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GEC-2015 Estimation methodology Ground Water Resources of **Confined aquifers** of Kolkata estimated as follows:

District	Dynamic Confined Ground Water Resources (ham)		In-Storage Confined Ground Water Resources (ham)		Total Confined Ground Water Resources (ham)	
	Fresh	Saline	Fresh	Saline	Fresh	Saline
Kolkata	40.39	0	12690.9	0	12731.3	0

Source: Report on Ground Water Resources by CGWB & SWID as on 31.03.23



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15. Conclusion:

- a) There is a thick top clay layer (10 m to 60 m) is present throughout the KMC area making the aquifer bellow a **confined to semi confined type**. Average Pre-monsoon & Post-monsoon Groundwater levels are 16 mbgl to 18 mbgl and 14 mbgl to 15.50 mbgl (meter below ground level) respectively.
- b) Average Pre-monsoon & Post-monsoon Groundwater level shows **insignificant declining trend (<20cm)** for the period from 2018 -2023.
- c) Considering the last few years Groundwater data of KMC area the water level fluctuation (Pre and Post) showing a range from 1 mbgl to 1.5 mbgl. (meter below ground level)
- d) The arsenic concentration in the Groundwater is found beyond the acceptable limit ($> 0.01\text{mg/l}$) only in only in few wards viz. 55, 96,109,113 and 122 of KMC with sporadic occurrences.
- e) The iron concentration in the Groundwater is beyond the acceptable limit (i.e. 1mg/l) found in ward no. 07, 16, 37, 75, 94, 108, 120 etc. of KMC area.
- f) **Artificial Groundwater recharge should be deployed** to areas where there are declining trend of Pre-monsoon & Post-monsoon depth to groundwater levels in the KMC area.



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State Water Investigation Directorate
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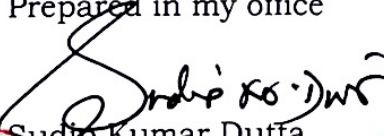
g) Population pressure caused by rapid Urbanization and Metropolitanization results a tremendous increase in demand for Ground water that greatly disturbed the aquifer recharge- withdrawal equilibrium. This process may have impacted groundwater level and resulted gradual decline in water Level over the years,

h) However, KMC started replacing gradually the ground water supply by the treated surface water of Hooghly River. **As a result, a noticeable positive change in the trend of the DTWL in both in Pre & Post monsoon season in KMC area has been observed.**

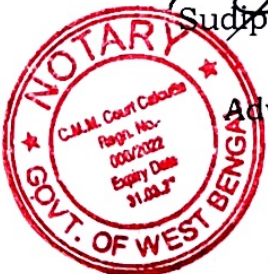
16. It is therefore prayed that the Hon'ble Tribunal may pass necessary order or further orders as it deem fit and proper in the interest of justice.

17. The statements made in paragraph 1 to 13 are based on information derived from the record which are usually kept and maintained by the answering respondents in the ordinary course of business and which I belief to be true and rest thereof are my humble submission before this Hon'ble Tribunal.

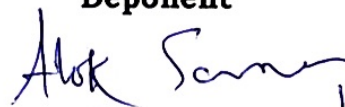
Prepared in my office


Sudip Kumar Dutta

Advocate



Deponent


11.09.24

Director,

State Water Investigation Directorate

N. DASGUPTA

Notary

Regn. No. 006/2022

3, Bankshal Street

Calcutta-700001

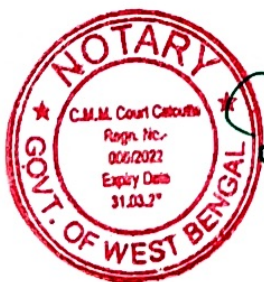
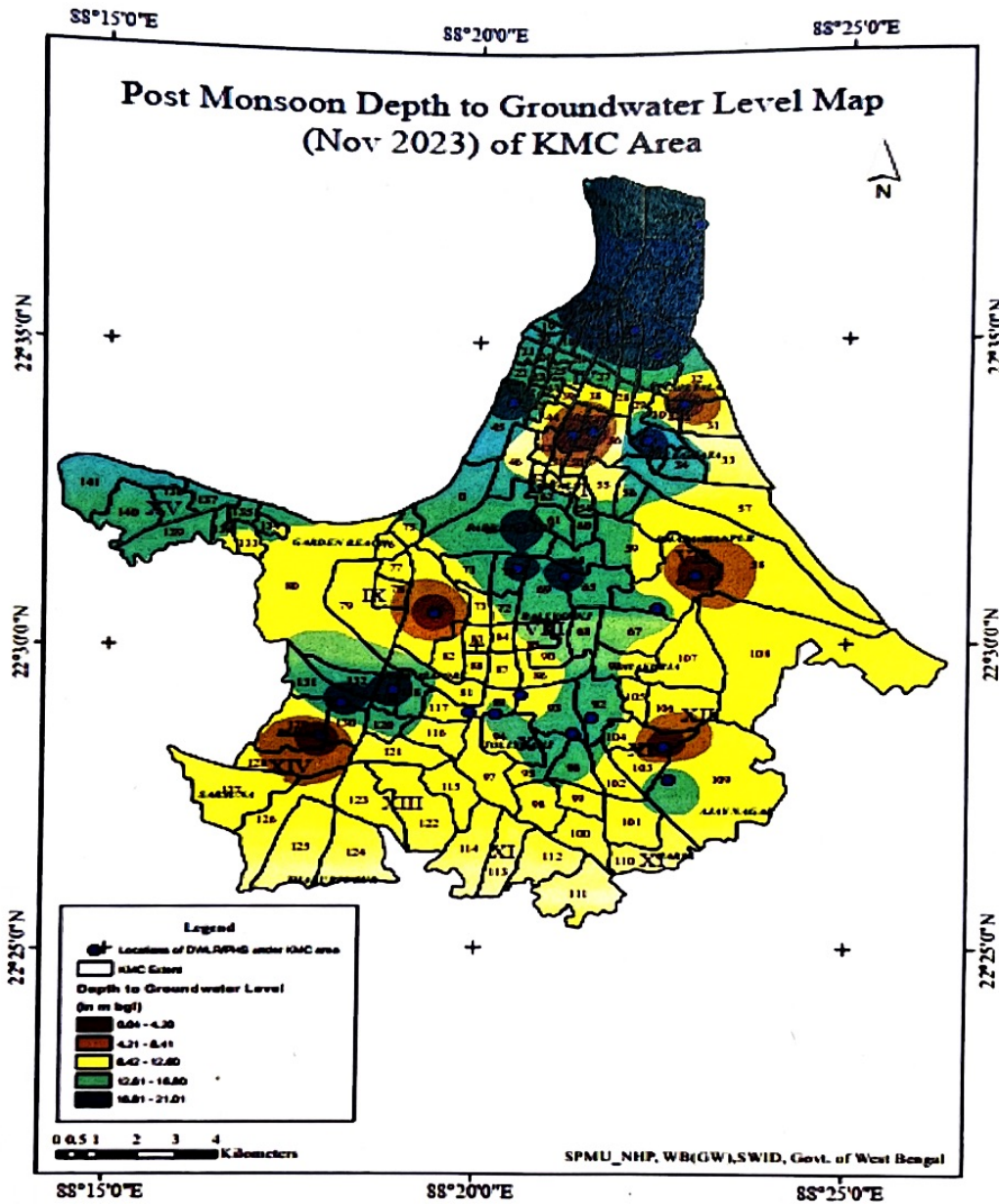
11 SEP 2024

SOLEMNLY AFFIRMED
&
Declared Before me
on Identification Adv.



NOTARY
N. DAS GUPTA
C.M.M. Court
Govt. W.B.

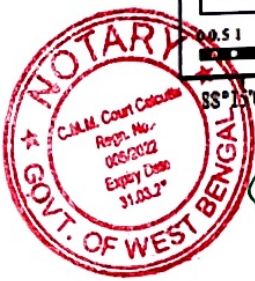
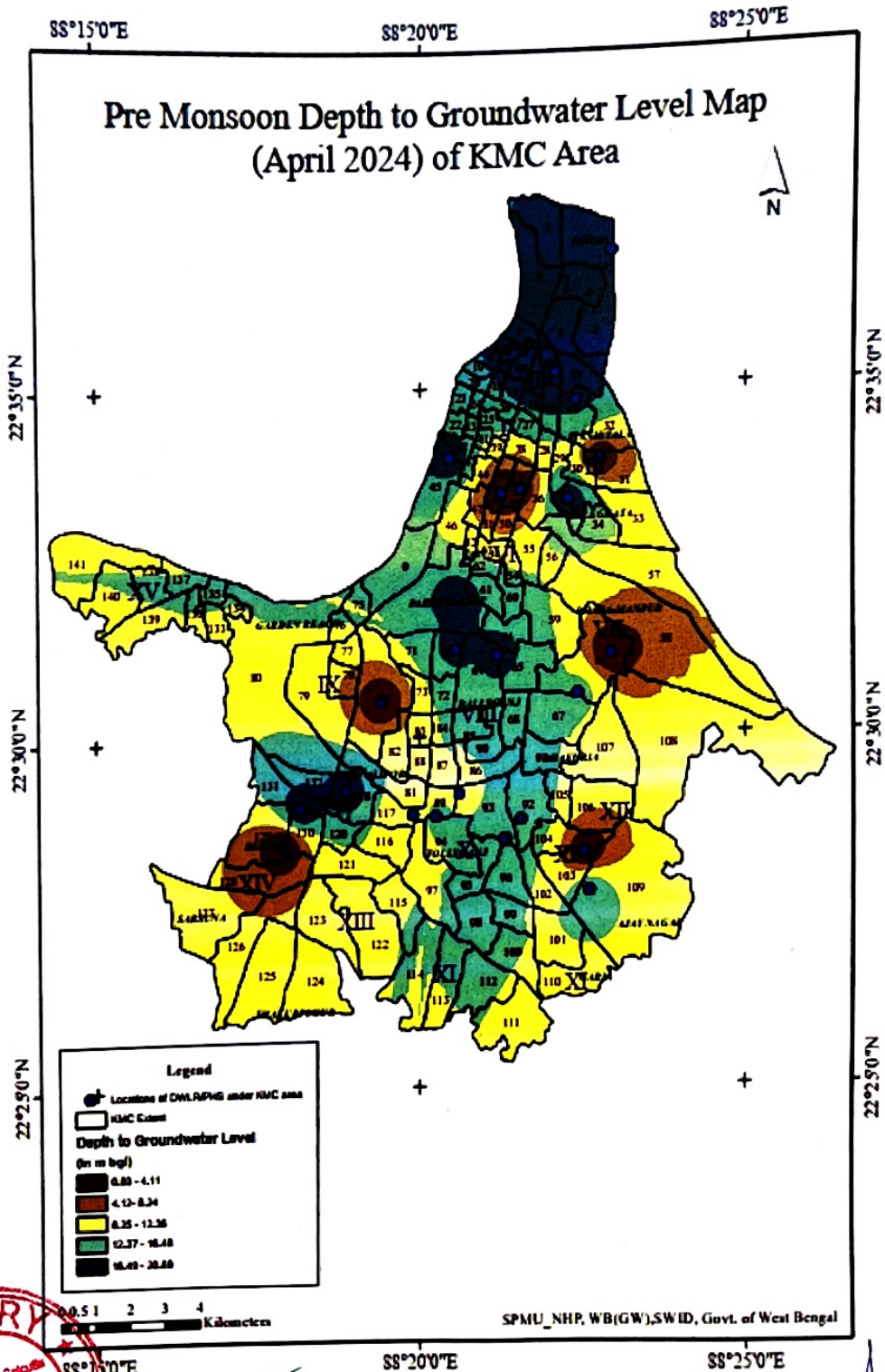
Annexure - P-1



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Annexure - P-2



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