CHAPTER V

WATER QUALITY MONITORING AND SURVEILLANCE

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Regular testing of water supplied is a pre-requisite for supply of potable water to households and public institutions. The ill-effect of contaminated water on the human body, especially in infants, children, immune-compromised people and pregnant women is critical for public health. So, testing of water samples and surveillance of water sources are necessary to prevent possible contamination of water and avoid water-borne diseases as well.

Drinking water quality monitoring and surveillance are distinct, however, closely related activities. The drinking water quality is to be 'monitored' by supplier/ agency responsible for making provision of assured tap water supply, whereas the surveillance of water quality at grass root level is the responsibility of the GP or its sub-committee, *i.e.,* VWSC. Further, GSDA has been entrusted with the work of exploration, development and augmentation of groundwater resources in the State and water quality testing.

5.1 Water quality testing

JJM guidelines on WQMS prescribe that sub-division/block laboratory will test all the water sources under its jurisdiction; once for chemical parameters and twice for bacteriological parameters (pre and post monsoon) in a year, covering all sources of a block and for at least 13 basic water quality parameters. Further, the samples tested positive were to be referred to the district laboratory immediately. As per para 10.5 of JJM guidelines, the States/ UTs were required to hold regular review meetings to monitor the water quality status. The data of testing was to be made available in public domain on the IMIS portal by capturing the water quality monitoring through laboratory tests at all levels as per the prescribed frequency.

5.1.1 Shortfall in water quality testing source

Audit observed from block wise data of testing shown in IMIS that in five of the selected six districts, there was a shortfall in testing of water sources during the period October 2022 to March 2024 as shown in **Table 16**.

Table 16: Shortfall in testing of water samples in blocks of the selected districts

Name of the district	Bacteriological parameters		Chemical parameters
	Pre-monsoon (in *per cent)*	Post-monsoon (in *per cent)*	(in *per cent)*
Ahilyanagar	0 to 93	0 to 17	No shortfall
Thane	11 to 84	0 to 56	No shortfall
Jalgaon	4 to 53	7 to 30	6 to 19
Solapur	21 to 97	3 to 96	0 to 11
Pune	3 to 100	0 to 45	0 to 54

Source: Information furnished by department

Senior Geologists, GSDA of the concerned districts replied that the laboratory conducted all the testing of the samples received. However, the shortfall in testing was attributed to collection of samples by *Jalsurakshak* (Waterman) and data entry issues in IMIS.

In the Exit Conference (December 2025), Government stated that due to non-functional water sources or permanent closing of sources, the shortfall in testing was seen as water from these sources was not collected for testing. The proposal to delete non-functional sources from WQMIS was sent (March 2025) to NJJM. The department (SWSM) would monitor the data regarding active/ inactive sources of water.

5.1.2 Water quality tests using Field Testing Kits

JJM guidelines prescribed that GP and/ or its sub-committee, *i.e.,* VWSC/Paani Samiti/ User Group, *etc*., should identify, train and appoint five women from local community to conduct water quality tests using Field testing kit (FTK)/ bacteriological vials and report the results.

Audit observed that;

- The IMIS JJM dashboard of two[27] villages in Ahilyanagar district showed that five women each were trained in these two villages for conducting water quality tests through FTK. However, during physical verification, audit noticed that woman trained for testing of water using FTK could not perform the testing using FTKs. Further, no records of test results were maintained in Punatgaon. The EE, ZP Ahilyanagar, stated that training would be imparted to five women.
- In Fulpat village of Dharangaon block in Jalgaon, Audit observed that no FTK was available at the GP and record of testing of water done was also not maintained. EE, ZP, Jalgaon stated that FTK was made available later, and GP was instructed to maintain the records thereafter.

These instances show poor water quality monitoring and surveillance at VWSC level.

In the Exit conference (December 2025) Government stated that water testing with FTK would be ensured and record would be maintained at GP level.

5.1.3 Water quality testing data

Water Quality Management Information System (WQMIS) is an online portal and app developed to monitor and manage drinking water quality in rural areas, allowing public access to laboratory information and facilitating sample testing for safe water. On scrutiny of the WQMIS data, Audit noticed following discrepancies:

[27] Shingve Tukai and Punatgaon of Newasa block.

- In four selected villages[28] of Thane districts, the number of tests done was shown more than the number of samples received for testing.
- In Ahilayanagar, audit observed that in 2023-24, out of 561 contaminated samples, action was taken in case of 495 contaminated samples, and in 66 contaminated water samples, action was pending.
- In Ahilyanagar, 301 water samples received from blocks were not tested in district laboratories.

On this being enquired, Sr. Geologist, GSDA, Ahilyanagar stated (October 2024) that out of 66 samples reported on IMIS, only 22 samples were received and pending testing of 301 water samples shown in WQMIS was due to aberration in data entry.

- In Jalgaon district, 577 water samples were not tested even after receipt in laboratory during the period from 2021-22 to 2023-24. Sr. Geologist, GSDA, Jalgaon stated that all the samples received in the laboratories were tested but test reports were yet to be uploaded.

The unreliable data in public domain indicates poor water quality monitoring on the part of department.

In the Exit Conference (December 2025), the Government stated that the samples which were not as per the required parameters of laboratory, were rejected for testing. Further, the samples shown as submitted online but not tested within the stipulated time were due to vacancies at laboratories.

5.2 Infrastructure for water quality testing

GSDA has six regional, 28 districts and 144 sub-divisional laboratories in the State for conducting water quality testing on various parameters including pH, electrical conductivity, hardness, chloride, calcium, sodium, potassium, sulphate, nitrate and minor elements like fluoride and iron.

5.2.1 State laboratory not established

Para 10.1 of the JJM guidelines provides the State laboratories would test at least five *per cent* of the total drinking water samples across all district level laboratories with random and uniform geographical spread including positively tested samples referred by district/ sub-division/mobile laboratories.

Audit observed that the State laboratory was not established.

Further, in the six selected districts, 9591 and 9471 water samples for bacteriological and chemical testing respectively were found positive during the years 2020-21 to 2023-24. As such, in the absence of the State laboratory,

[28] Kukambhe and Vehloli Budruk in Shahapur block and Piseand Dohale in Bhiwandi block.

random checking of five *per cent* tested samples at district laboratories was not carried out.

In Exit Conference (December 2025), Government stated that construction work of state laboratory is completed and would be functional by June 2026.

5.2.2 Accreditation of sub-division laboratories

JJM guidelines envisaged strengthening of water quality testing laboratories by setting-up/ upgradation of district/ sub-division laboratories and monitoring by undertaking laboratory assessment and improvement plans which includes accreditation of drinking water quality testing laboratories. GSDA got recognition/accreditation certificate for its laboratories from NABL. The scope of testing in respect of certificate for accreditation by NABL included testing on seven parameters[29]. In case of certificate for recognition by NABL, testing on 11 parameters[30] of basic water quality importance is included.

Audit observed that GSDA got accreditation from NABL only for the six regional and 28 district laboratories whereas the 143 sub-division laboratories in the State were only recognized by NABL rather than accredited. One sub-division laboratory was yet to get recognition from NABL.

Audit further observed that;

- In Shingve Tukai village of Ahilyanagar district, water sample was found fit (October 2024) for drinking after test from sub-divisional laboratory. However, the water sample from the same source when tested (October 2024) at the instance of Audit in the district laboratory, was found chemically as well as biologically unfit.
- In two water sources (ESR-1 & 2) in Kashti village of Ahilyanagar district, water samples found fit (September 2024) in test from sub-divisional laboratory, however, water samples tested (September 2024) by the concerned staff of ZP in the district laboratory were found biologically unfit.

The above cases indicate the need for accreditation of sub-division laboratory for better water quality testing mechanism. In the absence of State laboratory, the GSDA could not formulate a system for immediate re-testing of contaminated water samples.

In the Exit Conference (December 2025), Government stated that recognition of the laboratory is proficiency test based and accreditation is actual assessment of the laboratory in the laboratory premises. For accreditation process, laboratory needs to maintain more records for which full-fledged manpower is

[29] Electric conductivity, fluoride, iron, nitrate, pH, TDS and total hardness.

[30] pH, turbidity, total dissolved solids (TDS), chloride, total hardness, alkalinity, calcium, magnesium, colour, odour and taste.

required, and laboratory has manpower vacancy at some places. All subdivision level laboratories are currently NABL recognized, but state will go for accreditation of all subdivision level laboratories in due course.

5.3 Installation and commissioning of Electro-Chlorination system

Electro-Chlorinators (ECs) produce hypochlorite by passing electric current through salt water. This disinfects the water and makes it safe for human use. ECs are mostly installed before/ at the inlet of ESR to give sufficient time for disinfection. ECs were required to be installed at each Single Village Scheme (SVS) for water supply in rural areas of the State to ensure safe drinking water for villagers.

SWSM issued work order in two phases (June 2022 and May 2023) to three agencies[31]for survey, designing, providing, installation and commissioning of ECs across SVS in the State for villages covered under JJM. For 36,272 SVS in the State, work orders (WO) were issued for 25,840 SVS, of which, 25,524 ECs were supplied. Against the supplied 25,524 ECs, 16,224 ECs were installed (October 2025). The progress of installation was only 63.56 *per cent* against supply. There were 13,745 ECs commissioned (October 2025) which was 53.85 *per cent* of supplied.

In the selected six districts, Audit observed that out of 4,932 ECs supplied, 2649 installed and 1990 were commissioned. 723 ECs were not yet supplied. The commissioning of ECs against supply was 40.34 *per cent* as shown in **Table 17**.

Table 17: Number of Electro-chlorinators supplied, installed and commissioned

Name of the district	Number of ECs to be supplied	Number of ECs supplied	Number of ECs installed	Number of ECs commissioned	Percentage of installation to supply
Ahilyanagar	952	945	629	497	66.56
Jalgaon	1338	1299	681	562	52.42
Kolhapur	943	447	138	132	30.87
Pune	1249	1228	731	526	59.53
Solapur	861	701	292	133	41.65
Thane	312	312	178	140	57.05
Total	**5655**	**4932**	**2649**	**1990**	**53.71**

Source: Information furnished by SWSM

In the Exit Conference (December 2025), Government stated that the installation and commissioning of electro-chlorination unit is dependent on commissioning of water supply schemes. Remaining units would be installed by March 2026.

[31] M/s SMC-CAPCO-PLUTO Joint Venture, M/s MTP-INNOVINC-HES Joint Venture and M/s Rites Water Solutions (I) Pvt Ltd.

The reply is not acceptable as the electro-chlorination was to be installed and commissioned in the existing schemes also through which water is being supplied irrespective of the commissioning of new schemes.

Conclusion

The Government did not ensure conducting water testing from all the sources regularly. In five of the selected six districts, there was a significant shortfall in testing water sources. Instances like number of tests done was more than the number of samples received for testing, water samples received from blocks were not tested in district laboratories, water samples were not tested even after receipt in laboratory indicate that there were discrepancies in water quality testing data. No action was taken against the contaminated water samples and samples were not tested even after receipt in the laboratory. The infrastructure for water quality testing was found wanting as the State laboratory was not established and accreditation of sub-division laboratories was yet to be done.

Recommendations

- *Government may strengthen the process for water quality testing and reporting along with strengthening the water testing facility by early establishment of the State laboratory.*
- *Government may consider NABL recognition and accreditation of all sub-division laboratories in the State to make the process of testing of water samples more reliable.*