

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH AT NEW DELHI
ORIGINAL APPLICATION NO. 109 OF 2022**

IN THE MATTER OF:

Vivek Kamboj & Anr.

...Applicants

VERSUS

Union of India and Ors.

...Respondents

INDEX

S.NO	PARTICULARS	PAGE NO
1.	REPLY TO AFFIDAVIT DATED 10.02.2024 OF THE COMMISSIONER & SECRETARY, URBAN LOCAL BODIES DEPARTMENT, GOVERNMENT OF HARYANA AND ACTION TAKEN REPORT DATED 19.02.2024 OF MUNICIPAL CORPORATION OF GURUGRAM	526-535
2.	<u>ANNEXURE A-1</u> Copy of photographs dated 22.02.2024 of leachate discharge	536-537
3.	<u>ANNEXURE A-2</u> Copy of Drinking Water Specifications of the Bureau of Indian Standards	538-544

THROUGH



RITWICK DUTTA

**RAHUL CHOUDHARY
ADVOCATES**

COUNSEL FOR THE APPLICANT
N-73, Lower Ground Floor, Greater Kailash-I
New Delhi- 110048
Mobile: 9312407881
Email: dclaw160@gmail.com

**NEW DELHI
DATE: 07.03.2024**

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HARYANA AND ACTION TAKEN REPORT DATED 19.02.2024 OF MUNICIPAL
CORPORATION OF GURUGRAM**

MOST RESPECTFULLY SHOWETH:

1. That the above-titled Original Application was filed bringing to the notice of the Hon'ble Tribunal dumping of municipal solid waste in forest areas of Aravallis and discharging of leachate in surrounding areas of Bandhwari landfill site in District Gurugram, Haryana. It was submitted that this action of dumping of waste and discharging leachate is not only in violation of the Solid Waste Management Rules, 2016, Forest (Conservation) Act, 1980, Punjab Land Preservation Act, 1900 but also in violation of several directions including Order dated 07.04.2021 of this Hon'ble Tribunal passed in O.A. No. 415 of 2015, O.A. No. 514 of 2018 and O.A. No. 606 of 2018. That this act of dumping of waste and discharging leachate is also causing irreversible damage to the ecology and environment of the Aravallis as well as causing nuisance to the people living in the Bandhwari village.
2. That vide Order dated 09.01.2024, this Hon'ble Tribunal had directed the following:

"16. Mr. Vikas Gupta, Commissioner and Secretary, Urban Local Bodies Department stated that now he is monitoring the situation everyday and assures that effective and positive results shall be shown within a time bound programme.

17. We accordingly direct him to file a personal affidavit with a clear timeline in respect of various steps, which are necessary to be taken for

clearing not only the entire legacy waste but also for processing of daily generated solid waste and also for protection of damage caused to environment due to seepage of leachate already done and for protecting environment from any future damage.

18. Further, we direct Municipal Commissioner, Gurugram to constitute a team, which will have representative of Haryana State Pollution Control Board to test the quality of ground water of villages Bandhwari, Baliawas, Balola, Gwal Pahari and Dera Mandi and if it is found contaminated, to find out nature of contamination, also to check health conditions of villagers and if necessary, to provide necessary health care facilities to the persons, who are suffering on account of contaminated ground water.

19. The above exercise shall be done within one month i.e., by 10.02.2024."

3. That accordingly, an Affidavit dated 10.02.2024 was filed by the Commissioner & Secretary, Urban Local Bodies Department, Government Of Haryana and Action Taken Report dated 19.02.2024 was filed by the Municipal Corporation of Gurugram.
4. That vide the Action Taken Report and the Affidavit of the Commissioner & Secretary, Urban Local Bodies Department, following common grounds have been raised to show that there is scientific management of waste at Bandhwari site:
 - i. That there is no discharge of leachate on the land surrounding the Bandhwari site.
 - ii. That all parameters of groundwater are within permissible limits and no damage to groundwater was caused due to seepage of leachate.
 - iii. That no person living in the villages surrounding the landfill site have any serious illness.

Reply of the Applicants to Action Taken Report and the Affidavit of the Commissioner & Secretary, Urban Local Bodies Department

5. That the contents of Action Taken Report and the Affidavit of the Commissioner & Secretary, Urban Local Bodies Department are misleading and incorrect. That the Original Application, Additional Affidavit dated 26.05.2022, Additional Affidavit dated 28.01.2023, IA no. 757 of 2023 dated 29.09.2023, Additional Affidavit dated

06.11.2023, Response to Report dated 08.01.2024 and Additional Affidavit dated 21.02.2024 may be read as part and parcel of the present Reply. The Applicants have the following response to make in response to Action Taken Report and the Affidavit of the Commissioner & Secretary, Urban Local Bodies Department:

A. The statement that no leachate is being discharged on the land surrounding Bandhwari site is incorrect and misleading

6. That the averment in the Affidavit (in Para 5 at Page 1277) and Action Taken Report (in Para 4(D) at Page 1401) that there is no discharge of leachate from the Bandhwari landfill site is incorrect.

7. That the Applicant is producing photographs dated 22.02.2024 to show that leachate is still getting discharged from Bandhwari landfill site and getting collected in low lying areas within the Aravalli forest.

Copy of photographs dated 22.02.2024 of leachate discharge is annexed herewith as **ANNEXURE A-1**.

8. That this location where the discharged leachate has reached is located more than a kilometre away from the landfill site.

9. That the Applicants have also pointed out in the past (vide IA No. 757 of 2023 (Application for direction filed on 07.10.2023) at Page 361 and vide Response to Report dated 08.01.2024 of Municipal Corporation of Gurugram at Page 471) that leachate from Bandhwari landfill was getting discharged.

10. That the Applicants had annexed photographs (at Page 403 and Page 507) to state the fact that discharged leachate has reached upto a distance of 1 kilometre from the landfill site and is getting collected in low lying areas and watering holes of animals. This is causing a health hazard to humans as well as animals. Approximately 23,000 kilolitres of leachate is collected in the ponds inside Aravallis, surrounding the landfill.

11. That however, the authorities are still denying the fact that there is no leachate discharge from the land fill site which is resulting in no action taken to stop leachate discharge and no restoration of the contaminated area.

12. That decentralised waste management units may be set-up in the city to ensure that the waste does not reach Bandhwari landfill and is processed at ward level itself.

B. The averment that the parameters of groundwater are within permissible limits is incorrect and misleading

13. That the Affidavit (in Para 6 at page 1278) and Action Taken Report (in Para 2 at Page 1397) has made a categorical statement that,

"all the parameters of ground water are within permissible limit and no damage to ground water due to seepage of leachate has been observed"

14. That this statement is false, misleading and contrary to the reports (Pages 1386, 1387 of the Affidavit and at Pages 1403, 1404 of Action Taken Report) submitted along with the Affidavit and the Action Taken Report. Incorrect information has been provided by the Commissioner & Secretary, Urban Local Bodies Department on Affidavit and by the Municipal Corporation, Gururgram in the Action Taken Report.

15. That the water samples have been taken from 4 locations in Bandhwari, namely, tubewell in premises of mandir (Teen Murti) (S.1), tubewell in premises of Hanuman Mandir (S.2), tubewell in the land of Sh. Pawan (S.3), tubewell in the land of Sh. Vipin Kalra (S.4). Samples have also been collected from 5 locations in Gurugram such as, borewell from police station, Village Bangar (S. 5), borewell from farm house, Village Bangar (S.6), borewell from Governemnt School, Baliyawas (S. 7), borewell from Ram mandir, Gwal Pahari (S. 8) and borewell from Village Mandir, Vidya Chowk, Mandir, Gurugram (S. 9).

16. That the water quality does not match the standards set by the Drinking Water Specifications of the Bureau of Indian Standards. The following table will make it clear that most of the parameters are exceeding the standards:

Parameter	Standard as per BIS	S. 1	S. 2	S. 3	S. 4	S. 5	S. 6	S. 7	S. 8	S.9
Turbidity	1	3.2	0	0	4	2	0	7	2	4
Total Dissolved Solids	500	530	535	540	350	340	870	530	520	450
Calcium	75	68	204	112	74	119	143	163	120	115
Magnesium	30	33	64.2	55	71	61	45	25	34	36
Nitrate	45	12	40	55	102	36	25	11	7	59
Total hardness as CaCo3	200	308	776	506	476	552	544	514	446	438

Copy of Drinking Water Specifications of the Bureau of Indian Standards is annexed herewith as **ANNEXURE A-2**.

17. That it is clear from the above table, that most of the parameters are exceeding the standards by a huge margin. The Affidavit as well as the Action Taken Report have made an incorrect averment that all parameters are within the standards and no damage has been caused to the groundwater due to seepage discharge.

18. That it is also pertinent to mention that the Bureau of Indian Standards requires a detailed analysis when assessing if the water is fit for drinking. The list of parameters which are required to be assessed is given in Drinking Water Specifications of Bureau of Indian Standards. It is submitted that some of the parameters that are required to be assessed (as listed below) were not even measured by the Joint Committee and therefore, it is inconclusive whether such parameters are within standards or not. The parameters which were not measured are as follows:

- i. Aluminium;
- ii. Ammonia;
- iii. Anionic detergents;
- iv. Barium;
- v. Chloramines,

- vi. Copper;
- vii. Free residual chlorine;
- viii. Manganese;
- ix. Mineral oil;
- x. Phenolic compounds;
- xi. Selenium;
- xii. Silver;
- xiii. Sulphate;
- xiv. Total alkalinity;
- xv. Zinc;
- xvi. Cadmium;
- xvii. Cyanide;
- xviii. Lead;
- xix. Mercury;
- xx. Molybdenum;
- xxi. Nickel;
- xxii. Pesticides;
- xxiii. Polychlorinated biphenyls;
- xxiv. Polynuclear aromatic hydrocarbons;
- xxv. Total arsenic;
- xxvi. Total chromium;
- xxvii. Trihalomethanes.

C. That no person with serious illnesses were found in any village around Bandhwari village is incorrect and false

19. That the Affidavit (in Para 7 at Page 1278) as well as the Action Taken Report (in Para 3 at page 1397) has stated that medical camps were organised at the villages around Bandhwari landfill site and it was found that there are no patients suffering from any serious illness.
20. That the Applicant personally visited the Bandhwari and Gwal Pahari villages to collect information on the people who have lost their lives to cancer or are still suffering from cancer.

21. That the following table will give details of the name of the people, date of death and the type of cancer they were suffering from:

Deaths in Village Bandhwari		
Name of the person	Date of death	Type of cancer
Babita	January 2024	Uterus cancer
Khajan	March 2021	Bone cancer
Sheesh Ram	2017	Shoulder and chest cancer
Veer Singh	2018	Large intestine cancer
Balesh	2017	Throat cancer
Meera	December 2019	Kidney cancer
Tejpal	December 2020	Lung cancer
Deaths in Gwal Pahari Village		
Sunil	2023	Liver cancer
Bheem	2020	Throat cancer
Shyam lal	2021	Throat cancer
Persons under treatment in Bandhwari village		
Maja Devi	-	Large intestine cancer
Neesha	-	Throat cancer
Amita	-	Chest cancer
Radha	-	Brain tumour
Shyamvati	-	Breast cancer
Persons under treatment in Gwal Pahari village		
Ramfali Devi	-	Blood cancer
Mahasukh	-	Throat cancer

22. That it is not clear how the medical camps conducted by the authorities were not able to locate the illnesses of the people mentioned above, despite them undergoing testing of 721 people.

23. That this Hon'ble Tribunal may appoint an independent agency to undertake assessment and collect data of the people suffering from terminal illnesses in the 5 villages surrounding Bandhwari landfill site, so that rehabilitative action may be taken.

D. Unsegregated waste is being dumped outside Bandhwari landfill site, in violation of the provisions of Solid Waste Management Rules, 2016

24. That as has already stated in the Additional Affidavit dated 21.02.2024 filed by the Applicant (at Page 511), waste is being dumped at multiple locations outside the Bandhwari landfill site such as on the revenue raasta, on land adjacent to Made Easy school, near Sainik Colony, in Dhuleti Nallah and on forest land (Para 7). It is submitted that this is unsegregated and mixed waste that is being dumped, in complete violation of the Solid Waste Management Rules, 2016. The Applicant has also annexed photographs of the dumped waste at multiple locations.

25. That as was orally stated by the Municipal Corporation of Gurugram and Faridabad during the last hearing dated 22.02.2024, this waste is organic waste and compost, which is being used by farmers in growing crops.

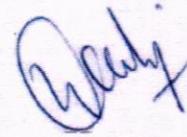
26. That assuming not admitting, that this waste is compost and is being used by farmers, it is the submission of the Applicant that before dumping of such waste, proper testing has to be conducted to ascertain whether it is suitable to be used as compost for agricultural crops. The parameters and standards for this testing is given in Schedule II of the Solid Waste Management Rules, 2016.

27. That Schedule II clearly states that any compost exceeding the standards mentioned therein cannot be used for growing crops.

28. That however, since the authorities have not undertaken any assessment of the waste that is being thrown outside the landfill site, such waste cannot be used for agricultural crops.

29. In light of above, this Hon'ble Tribunal may be pleased to pass appropriate orders/directions.

30) Pass any other order as this Hon'ble Tribunal may deem fit in the facts and circumstances of the present case.



APPLICANT

THROUGH



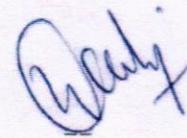
RITWICK DUTTA

**RAHUL CHOUDHARY
ADVOCATES**

COUNSELS FOR THE APPLICANTS
N-73, LGF, Greater Kailash - 1,
New Delhi - 110048
Mobile: +91 9312407881
Email: dclaw160@gmail.com

VERIFICATION

Verified by Vivek Kamboj, aged about 51 years, S/O Y. P. Kamboj, R/O C-579, Sushant Lok-I, Gurugram, Haryana, do hereby verify that the contents of Paragraphs 1 to 30 are true to my personal knowledge and nothing material has been concealed therefrom.



APPLICANT

Place: New Delhi

Date: 07.03.2024

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH AT NEW DELHI
ORIGINAL APPLICATION NO. 109 OF 2022**

IN THE MATTER OF:-

VIVEK KAMBOJ & ANR.

...APPLICANTS

VERSUS

UNION OF INDIA & OTHERS

...RESPONDENTS

AFFIDAVIT

I, Vivek Kamboj, aged about 51 years, S/O Y. P. Kamboj, R/O C-579, Sushant Lok-I, Gurugram, Haryana, presently at New Delhi, do hereby solemnly affirm and declare as under:

1. That I am the Applicant No. 1 in the above titled Original Application, and hence well conversant with the facts and circumstances described in the present case and as such competent to swear this Affidavit.
2. That the contents of the accompanying Reply are true and correct and nothing material has been concealed therefrom.

DEPONENT

VERIFICATION

Verified on this 6 day of MAR, 2024 that the contents of the present Affidavit are true and correct to my knowledge and belief and nothing material is concealed therefrom.

NOTARY PUBLIC APPOINTED BY GOVT. OF INDIA G. S. KHARRANDA		
Notary Reg. No. 735	06 MAR 2024	ADVOCATE ENL. No. D 28781
ATTESTED 9899422266		

DEPONENT

ATTESTED

NOTARY PUBLIC

I, IDENTIFIED THE
DEPONENT WHO HAS
SIGNED IN MY PRESENCE

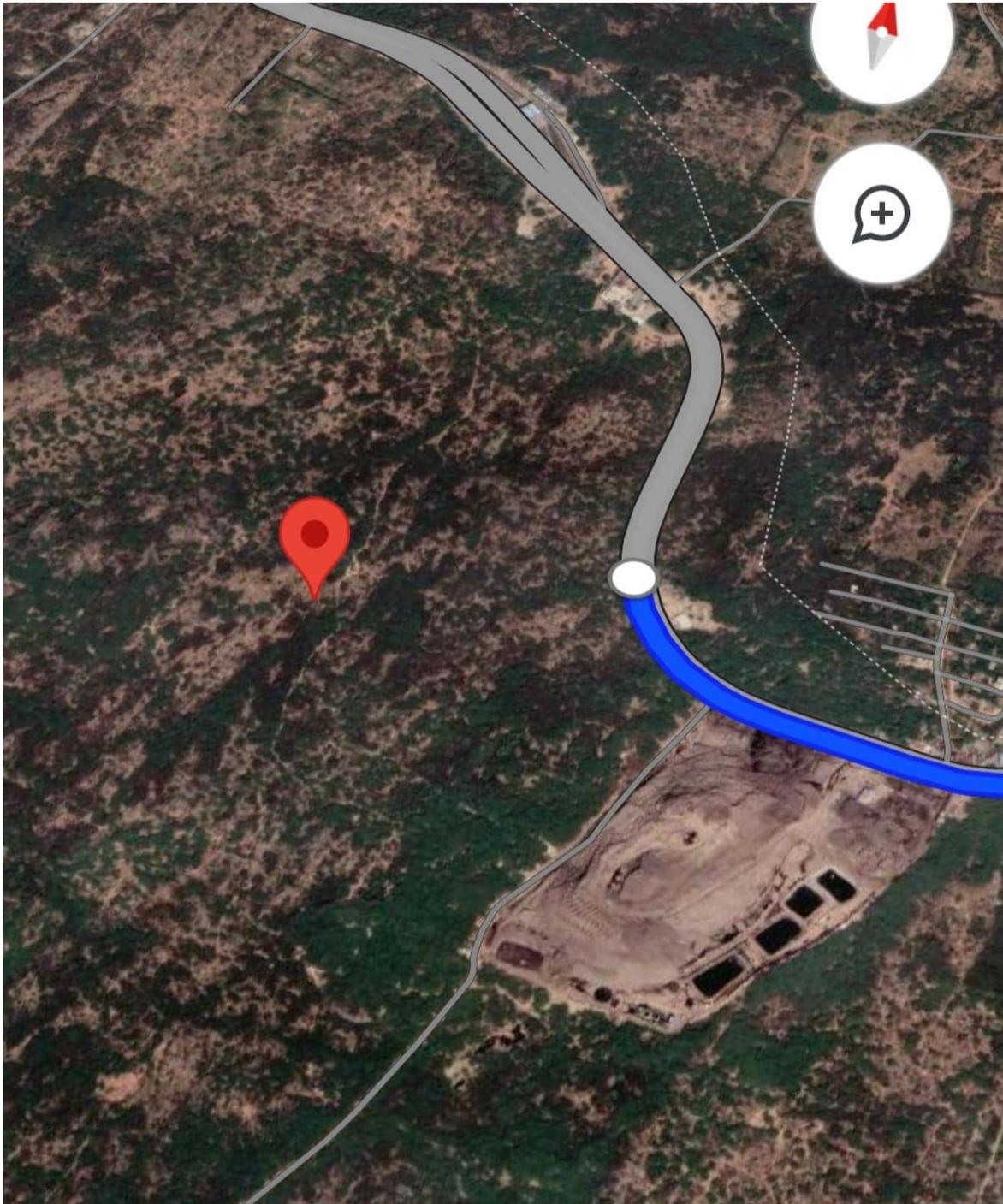
ANNEXURE A-1

Photographs dated 22.02.2024 showing collection of discharged leachate in the Aravalli forest



Snapshot showing the distance between the Bnadhwari landfill and location where leachate was found.

The red arrow is the location where leachate was found, which is more than a kilometre away from the landfill.



भारतीय मानक
पीने का पानी — विशिष्टि
(दूसरा पुनरीक्षण)

Indian Standard
DRINKING WATER — SPECIFICATION
(*Second Revision*)

ICS 13.060.20

© BIS 2012

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
NEW DELHI 110002

**AMENDMENT NO. 1 JUNE 2015
TO
IS 10500 : 2012 DRINKING WATER — SPECIFICATION**

(Second Revision)

[Page 2, Table 2, Sl No. xii), col 3] — Substitute '1.0' for '0.3'.

[Page 3, Table 3, Sl No. x), col 4] — Substitute 'No relaxation' for '0.05'.

(FAD 14)

Publication Unit, BIS, New Delhi, India

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Drinking Water Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard was originally published in 1983. A report prepared by the World Health Organization in cooperation with the World Bank showed that in 1975, some 1 230 million people were without safe water supplies. These appalling facts were central to the United Nations decision to declare an International Drinking Water Supply and Sanitation decade, beginning in 1981. Further, the VI Five-Year Plan of India had made a special provision for availability of safe drinking water for the masses. Therefore, the standard was formulated with the objective of assessing the quality of water resources, and to check the effectiveness of water treatment and supply by the concerned authorities.

The first revision was undertaken to take into account the up-to-date information available about the nature and effect of various contaminants as also the new techniques for identifying and determining their concentration. Based on experience gained additional requirements for alkalinity; aluminium and boron were incorporated and the permissible limits for dissolved solids, nitrate and pesticides residues modified.

As per the eleventh five year plan document of India (2007-12), there are about 2.17 lakh quality affected habitations in the country with more than half affected with excess iron, followed by fluoride, salinity, nitrate and arsenic in that order. Further, approximately, 10 million cases of diarrhoea, more than 7.2 lakh typhoid cases and 1.5 lakh viral hepatitis cases occur every year a majority of which are contributed by unclean water supply and poor sanitation. The eleventh five year plan document of India (2007-2012) recognizes dealing with the issue of water quality as a major challenge and aims at addressing water quality problems in all quality affected habitations with emphasis on community participation and awareness campaigns as well as on top most priority to water quality surveillance and monitoring by setting up of water quality testing laboratories strengthened with qualified manpower, equipments and chemicals.

The second revision was undertaken to upgrade the requirements of the standard and align with the internationally available specifications on drinking water. In this revision assistance has been derived from the following:

- a) EU Directives relating to the quality of water intended for human consumption (80/778/EEC) and Council Directive 98/83/EC.
- b) USEPA standard — National Primary Drinking Water Standard. EPA 816-F-02-013 dated July, 2002.
- c) WHO Guidelines for Drinking Water Quality. 3rd Edition Vol. 1 Recommendations, 2008.
- d) Manual on Water Supply and Treatment, third edition — revised and updated May 1999, Ministry of Urban Development, New Delhi.

This standard specifies the acceptable limits and the permissible limits in the absence of alternate source. It is recommended that the acceptable limit is to be implemented as values in excess of those mentioned under 'Acceptable' render the water not suitable. Such a value may, however, be tolerated in the absence of an alternative source. However, if the value exceeds the limits indicated under 'permissible limit in the absence of alternate source' in col 4 of Tables 1 to 4, the sources will have to be rejected.

Pesticide residues limits and test methods given in Table 5 are based on consumption pattern, persistence and available manufacturing data. The limits have been specified based on WHO guidelines, wherever available. In cases where WHO guidelines are not available, the standards available from other countries have been examined and incorporated, taking in view the Indian conditions.

In this revision, additional requirements for ammonia, chloramines, barium, molybdenum, silver, sulphide, nickel, polychlorinated biphenyls and trihalomethanes have been incorporated while the requirements for colour, turbidity, total hardness, free residual chlorine, iron, magnesium, mineral oil, boron, cadmium, total arsenic, lead, polynuclear aromatic hydrocarbons, pesticides and bacteriological requirements have been modified.

In this revision, requirement and test method for virological examination have been included. Further, requirements and test methods for cryptosporidium and giardia have also been specified.

Routine surveillance of drinking water supplies should be carried out by the relevant authorities to understand the risk of specific pathogens and to define proper control procedures. The WHO Guidelines for Drinking Water Quality, 3rd Edition, Vol. 1 may be referred for specific recommendations on using a water safety approach incorporating risk identification. Precautions/Care should be taken to prevent contamination of drinking water from chlorine resistant parasites such as cryptosporidium species and giardia.

*Indian Standard***DRINKING WATER — SPECIFICATION***(Second Revision)***1 SCOPE**

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 5.

Drinking water shall also comply with bacteriological requirements (*see 4.1*), virological requirements (*see 4.2*) and biological requirements (*see 4.3*).

4.1 Bacteriological Requirements**4.1.1 Water in Distribution System**

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters*(Foreword and Clause 4)*

SI No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, <i>Max</i>	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, <i>Max</i>	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, <i>Max</i>	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, <i>Max</i>	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, <i>Max</i>	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, <i>Max</i>	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, <i>Max</i>	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, <i>Max</i>	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, <i>Max</i>	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl ₂), mg/l, <i>Max</i>	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, <i>Max</i>	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, <i>Max</i>	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, <i>Max</i>	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, <i>Min</i>	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, <i>Max</i>	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, <i>Max</i>	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, <i>Max</i>	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, <i>Max</i>	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO ₃), mg/l, <i>Max</i>	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C ₆ H ₅ OH), mg/l, <i>Max</i>	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, <i>Max</i>	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, <i>Max</i>	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO ₄) mg/l, <i>Max</i>	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H ₂ S), mg/l, <i>Max</i>	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, <i>Max</i>	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as CaCO ₃), mg/l, <i>Max</i>	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, <i>Max</i>	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, <i>Max</i>	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, <i>Max</i>	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, <i>Max</i>	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, <i>Max</i>	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, <i>Max</i>	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, <i>Max</i>	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, <i>Max</i>	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, <i>Max</i>	0.000 5	No relaxation	ASTM 5175*	—
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, <i>Max</i>	0.000 1	No relaxation	APHA 6440	or APHA 6630 —
x)	Total arsenic (as As), mg/l, <i>Max</i>	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, <i>Max</i>	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
a)	Bromoform, mg/l, <i>Max</i>	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
b)	Dibromochloromethane, mg/l, <i>Max</i>	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
c)	Bromodichloromethane, mg/l, <i>Max</i>	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
d)	Chloroform, mg/l, <i>Max</i>	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
a)	Alpha emitters Bq/l, <i>Max</i>	0.1	No relaxation	Part 2	—
b)	Beta emitters Bq/l, <i>Max</i>	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 5 Pesticide Residues Limits and Test Method
(Foreword and Table 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA (4)	AOAC/ ISO (5)
(1)	(2)	(3)		
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyrifos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (<i>o, p</i> and <i>p, p</i> – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water¹⁾
(Clause 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	<i>All water intended for drinking:</i>	
a)	<i>E. coli</i> or thermotolerant coliform bacteria ^{2), 3)}	Shall not be detectable in any 100 ml sample
ii)	<i>Treated water entering the distribution system:</i>	
a)	<i>E. coli</i> or thermotolerant coliform bacteria ²⁾	Shall not be detectable in any 100 ml sample
b)	Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	<i>Treated water in the distribution system:</i>	
a)	<i>E. coli</i> or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
b)	Total coliform bacteria	Shall not be detectable in any 100 ml sample

¹⁾Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

²⁾Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

³⁾It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.