BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

SOUTHERN ZONE, CHENNAI

IN

Original Application No.265 of 2017 (SZ)

With

Original Application No.17 of 2021 (SZ)

With

Original Application No.01 of 2022 (SZ)

IN THE MATTER OF

Applicant : N. G Soman

Vs

Respondents : Bharat Petroleum Company Ltd Kochi & Others

WITH

Applicant : Vipin Nath A. V & Sinu C. Jacob

Vs

Respondents : M/s. Bharat Petroleum Corporation Limited & Others

WITH

Applicant : Kuzhikkad Residents Association

Vs

Respondents : The Secretary MoEF&CC & Ors.

REPORT FILED BY THE CHIEF ENVIRONMENTAL ENGINEER, REGIONAL OFFICE, ERNAKULAM FOR AND ON BEHALF OF THE KERALA STATE POLLUTION CONTROL BOARD

Standing counsel for the 3rd and 4th respondents in O.A 265 of 2017

Rema Smrithi. V. K., Advocate
Additional Standing Counsel,
National Green Tribunal, (SZ), CHENNAI

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Respondents : M/s. Bharat Petroleum Corporation Limited & Others

WITH

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Vs
Respondents : The Secretary MoEF&CC & Ors.

VOLUME 1

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Dated this the 29th Day of April 2025

Standing counsel for the 3rd and 4th respondents in O.A 265 of 2017

Rema Smrithi. V. K., Advocate
Additional Standing Counsel,
National Green Tribunal, (SZ), CHENNAI

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REPORT FILED BY THE CHIEF ENVIRONMENTAL ENGINEER, REGIONAL OFFICE, ERNAKULAM FOR AND ON BEHALF OF THE KERALA STATE POLLUTION CONTROL BOARD

I, Baburajan P K, aged 53 years, am working as Chief Environmental Engineer, Regional Office, Kerala State Pollution Control Board, Ernakulam. I am competent to and duly authorized to represent the Board in the above application. I know the facts and circumstances of the case. The factual submissions made here under are true and correct to the best of my knowledge, information and belief. I am swearing this report based on the best of my knowledge, information and belief and the facts revealed from the records.

BABURAJAN P.K.
Chief Environmental Engineer

1. It is respectfully submitted that a case on the same subject matter was earlier filed before the Hon'ble High Court, WP(C) No.7268/2013 by Sri Reghu V.K. and others, alleging that the operation of the two industries M/s BPCL Kochi Refinery and M/s Hindustan Organic Chemicals Limited forces the petitioners to live in extremely unsafe environment, resulted from the unscientific manner of acquiring land leaving strips of land which can't be put into any productive use where the case was disposed vide order dtd 08.04.2022 **(Annexure R3-1)**, with full liberty to the Chief Secretary to conduct any further meetings to be held subject to the convenience of the petitioners.

2. It is respectfully submitted that further, a CoC No. 1024 of 2023 of WP(C) No 7268 of 2013 was filed by Sri. Sajeev Kumar & Sri. Vinod Kumar before the Hon'ble High Court of Kerala, in which the Board was directed to conduct monitoring in the alleged (Ayyankuzhi) area vide order dated 13/03/2024 in IA.No. 4/2024 **(Annexure R3-2)**. Ambient air monitoring was then carried out on 29/03/2024 and 30/03/2024 from District Office-2, Perumbavoor and as per this report, the ambient air quality was within the limits, whereas the ambient noise levels were found to exceed the ambient noise standards for residential area. The data from ambient air monitoring was compared with National Ambient Air Quality Standards, copy of which is produced herewith as **Annexure R3-3**, and the results of noise monitoring was compared with ambient air quality standards in respect of noise for residential area, which is produced herewith as **Annexure R3-4**. Subsequently, a hearing was conducted on 22.05.2024 at District Office-2, Perumbavoor, Ernakulam after which directions were issued to the three companies in the case, namely M/s BPCL Kochi Refinery, M/S Hindustan Organic Chemicals Limited & Prodair Air Products India Pvt Limited. True copy of the letter dated 09/07/2024 issued to M/s BPCL Kochi Refinery is produced herewith as **Annexure R3-5**. The companies were directed to take various measures such as conducting a detailed noise survey for 15 continuous days, providing additional noise monitoring station and proposal for additional sound reduction measures to be implemented in the company. Accordingly, M/s BPCL Kochi Refinery has submitted noise monitoring report for continuous 15 days vide email dated 12/03/2025. The true copy of the report is furnished as **Annexure R3-6**. It was also informed by the company vide letter dated 22/08/2024 **(Annexure R3-7)** that online sound monitoring stations were installed near the boundary of MSBP and PDPP area.

BABURAJAN P.K.
Chief Environmental Engineer

3. It is respectfully submitted that further as per the direction of the Hon'ble High Court in CoC No. 1024 of 2023 of WP(C) No 7268 of 2013, vide interim order dated 04-09-2024, 30 days continuous air, water and sound monitoring was conducted from 04/12/2024 to 03/01/2025 from the District Office-2, Perumbavoor.

4. The results obtained in this monitoring is as follows: Based on the air quality monitoring results, ambient air quality parameters, including SO_2, NO_x and NH_3 were found to be within the permissible limits, while Respirable Suspended Particulate matter (RSPM or PM_{10}) levels exceeded the permissible limit on a single occasion and particulate matter size equal to or less than 2.5 µm ($PM_{2.5}$) levels were found to be exceeding the permissible limit on 15 out of 30 days during the monitoring period. Noise level monitoring results indicated higher values above the permissible limits both during the day time and night time. The analysis report of the water from the wells in Ayyankuzhi area indicates that its quality does not meet potable standards. The data of well water sample analysis was compared with Indian Standard Specifications for Drinking water (IS 10500: 2012), copy of which is produced herewith as **Annexure R3-8**. Copy of the analysis reports are produced herewith and marked as **(Annexure R3-9), (Annexure R3-10)** and **(Annexure R3-11)**. Necessary follow up actions will be taken by the Board in this regard. Report regarding the same is filed in the Hon'ble High court in CoC No. 1024 of 2023 of WP(C) No 7268 of 2013.

5. It is respectfully submitted that the case CoC No. 1024 of 2023 of WP(C) No 7268 of 2013 is under consideration of the Hon'ble High court of Kerala.

All that is stated above are true to the best of my knowledge information and belief.

Dated this the 29th Day of April 2025

BABURAJAN P.K.
Chief Environmental Engineer

CHIEF ENVIRONMENTAL ENGINEER
REGIONAL OFFICE, ERNAKULAM

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

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Dated this the 29th day of April 2025

Adv.Rema Smrithi.
ADDITIONAL STANDING COUNSEL FOR THE RESPONDENT:

2022:KER:20168

IN THE HIGH COURT OF KERALA AT ERNAKULAM

PRESENT

THE HONOURABLE MR. JUSTICE DEVAN RAMACHANDRAN

FRIDAY, THE 8TH DAY OF APRIL 2022 / 18TH CHAITHRA, 1944

WP(C) NO. 7268 OF 2013

PETITIONERS:

1 REGHU V.K.
S/O.KUTTAPPAN, VETTIKKATTUPARAMBIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

2 BHASKARAN.P.V.
S/O.PAPPU, VANIYAMKOTTU THADATTIL PUTHENPURA, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

3 V.N.MOHANAN
S/O.NARAYANAN, VETTIKKATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

4 V.S.RAJAPPAN
S/O.SANKU, VETTIKKATTU KAROTTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

5 V.K.SURENDRAN
S/O.KUNJAN, EDATHATTU, AYYANKUSHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

6 V.N.SASI
S/O.NARAYANAN, VETTIKKATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

7 K.A.SANTHOSH
S/O.AYYAPPAN, KIZHAKKEPUTHEN PURAYIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

8 CHANDRAMMA.K.P.
D/O.AYYAPPAN, KIZHAKKEPUTHEN PURAYIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

9 VIJAYAMMA PRAKASAN
D/O.AYYAPPAN, KIZHAKKEPUTHEN PURAYIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

10 V.N.MOHANAN
S/O.NANU, VANIYAMKOTTU THADATTIL PUTHEN PURAYIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

11 LEKSHMANAN.K.N.
S/O.NARAYANAN, PUTHEN PURAYIL, AYYANKUZHI,PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

12 NANU AYYAPPAN
S/O.NANU, KIZHAKKE PUTHENPURAYIL,
AYYANKUZHI,PUTHENKURISHU VILLAGE,AMBALAMUGHAL P
O, ERNAKULAM DIST

13 SAJEEVKUMAR V N
S/O.NANU VANIYAMKOTTU THADATHIL PUTHEN PURAYIL,
AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P
O, ERNAKULAM DIST

14 VALSALA RAMAKRISHNAN
D/O.KUNJAN, VETTIKKATTUKAROTTU, AYYANKUZHI,
PUTHENKURISHU VILLAGE, AMABALAMUGHAL P O,
ERNAKULAM DIST

15 BIJU V K
S/O.KUNJAN, VETTIKKATTU, AYYANKUZHI,
PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O.,
ERNAKULAM DISTRICT.

16 AMMINI RAMAN
D/O.KUNJAN,VETTIKKATU KAROTTU,
AYYANKUZHI,PUTHENKURISHU VILLAGE, AMBALAMUGHAL
P.O., ERNAKULAM DISTRICT.

17 SALAJAKUMARI PRASAD
D/O.AYYAPPAN, KIZHAKKE PUTHEN PURA,
AYYANKUZHI,PUTHENKURISHU VILLAGE, AMBALAMUGHAL
P.O., ERNAKULAM DISTRICT.

18 KUNJAN
S/O.KOCHUKUTTY, VETTIKKATTU,
AYYANKUZHI,PUTHENKURISHU VILLAGE, AMBALAMUGHAL
P.O., ERNAKULAM DISTRICT.

19 THANKAMMAVAVU
OLIPURATHU,AYYANKUZHI,PUTHENKURISHU VILLAGE,
AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

20 KUTTAN RAJAN
PATHANATTU , AYYANKUZHI, PUTHENKURISHU VILLAGE,
AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

21 PAPPUNANU
VANIYAMKOTY
THADATHILPUTHENPURA,AYYANKUZHI,PUTHENKURISHU
VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

22 GEETHASOMAN
D/O.NANU, PALATHADATHIL, AYYANKUZHI,
PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O.,
ERNAKULAM DISTRICT.

23 RAJAN K A
S/O.AYYAPPANKUTTY, PANDUKUZHI,
AYYANKUZHI,PUTHENKURISHU VILLAGE, AMBALAMUGHAL
P.O., ERNAKULAM DISTRICT.

24 BINDU MON P K
S/O.KRISHNANKUTTY, VETTIKKATTUKAROTTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

25 JISHNU SASI
EDATHATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

26 PRASANNA MOHANAN
D/O PARAYILO, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL, P.O, ERNAKULAM DISTRICT

27 (CHELLAMMA BHASKARAN) *
VANIYAMKOTTU THADATTIL PUTHEN PURA, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O, ERNAKULAM
* PETITIONER 27 IS SUBSTITUED AS "BABU, AGED 53 YEARS, S/O NARAYANAN, PUTHENPURAYAIL,
VANIYAMKOTTU THADATHIL, KUZHIKKADUKARAI, PUTHENKURISHU VILLAGE, AMBALAMUGAL P.O, ERNAKULAM DIST.
(AS PER ORDER DATED 03-11-2021 IN I.A 2/21)

28 BIJU MON. P.K
VETTIKKATTUKAROTHU, AYYANKUZHI, PUEHTNKURISHU VILLAGE, MABALAMUGHAL, P.O, ERNAKULAM DISTRICT

29 REJI V.R.
S/O RAJAPPAN, VETTIKAROTTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT

30 ISSAC.K. O
S/O OUSEPH, KUTTEDATHU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT

31 SHAJI V.K
S/O KUNJAN,VETTIKKATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

32 SHIJO.
S/O VARGHESE, KOCHU KAREEKKATTIL,AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT

33 APPU V.K
S/O KUNJAN VETTIKKATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

34 BITTY KUMARI
SYAM NIVAS, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

35 PRABHAKARAN
S/O KUNJAN, VETTIKATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT

36 LATHAKRISHNANKUTTY
VETTIKATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT

37 ANIL RAJ
S/O KUTTAPPAN, CHELAKUZHI, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT

38 LISSY ALIAS
KAREEKATTIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT

39 VALSALA THANKAPPAN
MAZHUVANNIPRAMBIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT

40 PRASANNA.M.B
KOTTOORANB VEETTIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT

41 GOPI V.P.
S/O PAPPU, VETTIKKATTUKAROTTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT

42 GRIJASASI
VETTIKATTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMIGHAL P.O., ERNAKULAM DISTRICT.

43 ACHUTHANKUNHIKRISHNAN (DECEASED)
S/O. KUNHIKRISHNAN, MAZHUVANNIPARAMBIL, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGAL P.O., ERNAKULAM DISTRICT.

44 OMANAKUTTAN
SYAM NIVAS, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGAL P.O., ERNAKULAM DISTRICT.

45 VINDO V.A
S/O. APPU, VETTIKATTUKAROTTU, AYYANKUZHI, PUTHENKURISHU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT.

*46 ADDL.P46: THANKAMMA,AGED 75 YEARS, W/O ACHUTHAN
MAZHUVANNIPARAMBIL, KUZHIKKADUKARA, PUTHENKURISHU VILLAGE, AMBALAMUGAL P.O, ERNAKULAM DIST

*47 ADDL. P47:PANKAJAKSHAN, AGED 52 YEARS, S/O ACHUTHAN
MAZHUVANNIPARAMBIL, KUZHIKKADUKARA, PUTHENKURISHU VILLAGE, AMBALAMUGAL P.O, ERNAKULAM DIST

*48 ADDL. P48 : CHANDRAN, AGED 20 YEARS, S/O ACHUTHAN
AGED 20 YEARS, MAZHUVANNIPARAMBIL,

KUZHIKKADUKARA,
PUTHENKURISHU VILLAGE, AMBALAMUGAL P.O,
ERNAKULAM DIST

*49 ADDL.P49: SULOCHANAN, AGED 42 YEARS, S/O ACHUTHAN
AGED 42 YEARS, MAZHUVANNIPARAMBIL,
KUZHIKKADUKARA,
PUTHENKURISHU VILLAGE, AMBALAMUGAL P.O,
ERNAKULAM DIST
(ADDL PETITIONERS 46 TO 49 ARE IMPLEADED AS PER ORDER DATED 03-11-2021 IN I.A 1/21)

BY ADV SMT.M.HEMALATHA

RESPONDENT/S:

1 THE DISTRICT COLLECTOR, COLLECTORATE, KAKKANAD,
ERNAKULAM DISTRICT - 682 030.

2 THE GENERAL MANAGER
HINDUSTAN ORGANIC CHEMICALS LIMITED,
AMBALAMUGHAL, ERNAKULAM - 682 302.

3 KOCHY REFINERIES LTD. REPRESENTED
BY ITS CHAIRMAN AND MANAGING DIRECTOR - KRL,
AMBALAMUGHAL, ERNAKULAM - 682 302.

4 THE UNION OF INDIA, REPRESENTED BY SECRETARY,
PETROLEUM AND NATURAL GASES, NEW DELHI - 110
001.

5 VADAVUKODED PUTHENCRUZ PANCHAYATH
REP. BY THE SECRETARY, PUTHENCRUZ - 682 308.

6 KERALA STATE POLLUTION CONTROL BOARD
REP. BY SENIOR ENVIRONMENTAL ENGINEERT,
GANDHI NAGAR, KADAVANTHRA, COCHIN - 682 020.

*7 SIVAN
AGED 63, S/O.PARUKUTTY, VANIYANCHIRA KARAVATTEE
HOUSE, ASAMANNOOR KARA, ASSAMANNOOR VILLAGE,
KUNNATHUNADU TALUK, PERUMBAVOOR, ERNAKULAM.

*8 PARUKUTTY
AGED 61, W/O.KUTTAN, PEECHAMBILLY VEEDU,
KARIYAD, AKAPPARAMBU, NEDUMBASERRY VILLAGE,
ERNAKULAM.

*9 REJI
AGED 39, S/O.KUTTAN, PEECHAMBILLY VEEDU,
KARIYAD, AKAPPARAMBU, NEDUMBASERRY VILLAGE,
ERNAKULAM.

*10 USHA
AGED 35, D/O.KUTTAN, PEECHAMBILLY VEEDU,
KARIYAD, AKAPPARAMBU, NEDUMBASERRY VILLAGE,
ERNAKULAM.

*11 AMMUKUTTY
W/O.DHAMODHARAN, PEECHAMBILLY VEEDU,
ELAKAMBAKAPILLY, KOOVAPPADY, PERUMBAVOOR.

*12 THANKAMNI
D/O.DHAMODHARAN,PEECHAMBILLY VEEDU,
ELAKAMBAKAPILLY, KOOVAPPADY, PERUMBAVOOR.

*13 GIRIJA
D/O.DHAMODHARAN,PEECHAMBILLY VEEDU,
ELAKAMBAKAPILLY, KOOVAPPADY, PERUMBAVOOR.

*14 GEETHA
D/O.DHAMODHARAN,PEECHAMBILLY VEEDU,
ELAKAMBAKAPILLY, KOOVAPPADY, PERUMBAVOOR.

*15 SUNI
D/O.DHAMODHARAN,PEECHAMBILLY VEEDU,
ELAKAMBAKAPILLY, KOOVAPPADY, PERUMBAVOOR.

GOPALAN
*16 S/O.KUNJU, KARAVATTE VATTIKKATTU HOUSE,
ASAMANNOOR KARA, ASAMANNOOR VILLAGE,
PERUMBAVOOR.

*17 MANI
S/O.KUNJU, KARAVATTE VATTIKKATTU HOUSE,
KUZHIKKATTU KARA, PUTHENCRUZ VILLAGE,
PERUMBAVOOR.
(ADDL R7 TO R17 ARE IMPLEADED AS PER ORDER DATED
31.07.2013 IN IA NO.9363/13)

*18 GOVERNMENT OF KERALA, REPRESENTED BY CHIEF
SECRETARY, GOVERNMENT SECRETARIAT,
THIRUVANANTHAPURAM - 695 001.

*19 BHARAT PETROLEUM CORPORATION LIMITED
INDUSTRIAL & COMMERCIAL KOCHI TERRITORY OFFICE,
KOCHI REFINERY MARKETING OFFICE, AMBALAMUGHAL,
KOCHI - 682 302, REPRESENTED BY ITS CHAIRMAN.
(ADDL R18 AND R19 ARE IMPLEADED AS PER ORDER
DATED 08.06.15 IN IA 1060/15)

BY ADVS.
SRI. T.NAVEEN SC, KERALA STATE POLLUTION CONTROL
BOARD,
SRI.M.GOPIKRISHNAN NAMBIAR
M.HEMALATHA
SHRI.P.VIJAYAKUMAR, ASG OF INDIA
SRI.K.JOHN MATHAI
SRI.JOSON MANAVALAN
SRI.KURYAN THOMAS

SRI.PAULOSE C. ABRAHAM
SRI.RAJA KANNAN
MANU S., ASG OF INDIA
P.BENNY THOMAS
P.GOPINATH (SR.)
V.KRISHNA MENON
E.K.MADHAVAN
S.RENJITH
SHRI.P.PARAMESWARAN NAIR, SC, NAVODHAYA VIDHYALAYA SAMITI
P.VIJAYAMMA
K.S.ARUN KUMAR

SRI.S.HANIL KUMAR SPL.G.P.

THIS WRIT PETITION (CIVIL) HAVING COME UP FOR ADMISSION ON 08.04.2022, THE COURT ON THE SAME DAY DELIVERED THE FOLLOWING:

JUDGMENT

The petitioners say that they are now caught between two large Industrial Units on either side of their properties and that they are now virtually sandwiched between them, thus rendering their lives difficult, dangerous and almost impossible.

2. Smt.M.Hemalatha – learned counsel for the petitioners, explained her clients' case in the shortest possible manner saying that their properties are between those belonging to the BPCL-KRL and Hindustan Organic Chemicals Ltd and that both of them do not want to acquire it, thus forcing the petitioners to live an extremely unsafe environment. She, therefore, prays that Government of Kerala be directed to take essential steps to either acquire the lands in question and rehabilitate her clients, or to grant them some benefits, so that they can re-locate themselves to another apposite location.

3. Noticing the plight of the petitioners and their misery as projected in this Writ Petition, I had passed the following order on 15.09.2021.

Read Order dated 01.06.2020.

2. The Bharat Petroleum Corporation Limited (BPCL) now says that they cannot acquire the land in question.

3. The resultant consequence is that the land now in possession of the petitioners have virtually turned into a "ghost one" incapable of being put to any productive use. Since the properties are sandwiched between those belonging to the BPCL and Hindustan Organic Chemicals Limited and since both these Companies say that they don't want to acquire it, I am certain that the Government of Kerala will have to now step in and find a solution, particularly when the petitioners are those belonging to the lowest sections of the society and have been now pushed to great detriment for no fault of theirs.

4. *Prima facie*, the predicament faced by the petitioners is on account of the fact that acquisitions are being done in an unscientific manner, leaving strips of land which cannot be used.

5. I, therefore, direct the 18th respondent - Government of Kerala and the 1st respondent – District Collector to inform this Court how the continued prejudice to the petitioners can be allayed and how they can be rehabilitated in terms of law.

6. I also leave them liberty to consider whether this property can be acquired and put to use for any cause under their command for this purpose.

List this case for further consideration on 01.10.2021.

4. Subsequently, when every time this case was called - and it was listed at least 6 or 7 times - the learned Senior Government Pleader went on assuring this Court that meetings were being called by the competent Authorities with various entities seeking as to whether the afore request of the petitioners can be acceded to.

5. However, even today, Sri.Hanil Kumar – learned Senior Government Pleader, submitted that no break-through has been obtained, but fairly offered that if the petitioners are willing to appear before the Chief Secretary of the Government on a date and time to be fixed by this Court, said Authority will hear them, as also various other stakeholders and take an apposite decision, as is practically possible.

6. I must say that the afore affirmation given by the learned Senior Government Pleader is certainly comforting because the petitioners now have a glimmer of hope, in the Chief Secretary having now offered to take a final decision in their matter, after hearing all sides.

7. I, therefore, asked the learned counsel for the petitioners whether her clients will be in a position to appear before the Chief Secretary and she submitted that they will do so at 11 a.m on 05.05.2022. The learned Senior Government Pleader also acceded to this.

Resultantly, I order this Writ Petition, with a direction to the Chief Secretary of the Government of Kerala to hear the

petitioners and every other necessary stakeholders, at 11 a.m. on 05.05.2022; thus culminating in an appropriate order with respect to their specific contentions in this Writ Petition, affording them all empathy required to a citizen of this nation, as expeditiously as is possible but not later than two months thereafter.

Needless to say, if the Chief Secretary requires any further meetings to be held, he will be at full liberty to requisition the same, subject to the convenience of the petitioners; and this Court stops this judgment with the hortative hope that productive and affirmative decisions will be taken, so as to allay the misery and angst of the petitioners, which have been impelled in this Writ Petition.

Sd/-

RR **DEVAN RAMACHANDRAN**

JUDGE

APPENDIX OF WP(C) 7268/2013

PETITIONER EXHIBITS

EXHIBIT-P1: TRUE COPY OF THE SITE PLAN I.

EXHIBIT-P2: TRUE COPY OF THE PHOTOGRAPHS.

EXHIBIT-P3: TRUE COPY OF THE COMMISSION REPORT IN O.P.NO.32328/01 BEFORE THIS HONOURABLE COURT.

EXHIBIT-P4: TRUE COPY OF THE NOTIFICATION NO.19514/J2/2000/ID DATED 26.7.2000.

EXHIBIT-P5: TRUE COPY OF THE NOTIFICATION G.O.(RT) NO.2932/2012/RD DATED 23.5.2012.

EXHIBIT-P6: TRUE COPY OF RESOLUTION DATED 25.1.2013.

EXHIBIT-P7: TRUE COPY OF THE REPRESENTATION SUBMITTED BEFORE THE 1ST RESPONDENT.

EXHIBIT-P8: TRUE COPY OF THE POSTAL RECEIPTS AND ACKNOWLEDGEMENT CARDS.

EXHIBIT-P9: TRUE COPY OF THE NEWS PAPER REPORT IN MALAYALA MANORAMA DAILY.

EXHIBIT P10	TRUE COPY OF THE D.O.LETTER No.07/PRL.SECY/CM/2014 DATED 10-02-2014
EXHIBIT P11	TRUE COPY OF THE REPRESENTATION DATED 27-07-2020
EXHIBIT P12	TRUE COPY OF THE AWARD UNDER SECTION 12(2) of the land acquisition act received by one of the claimants dated 31-12-2013 in lac 192/13
EXHIBIT P13	TRUE COPY OF THE LETTER ISSUED BYTHE SPECIAL TAHISILADAR (LA) OFFICE OF THE KOCHI REFINERIES, TRIPUNITHURA DATED 24-07-2017
EXHIBIT P14	TRUE COPY OF MINUTES NO.3765/06 DATED 17-01-2007
EXHIBIT P15	TRUE COPY OF THE SETTLEMENT DEED NO.3238/1/19 DATED 27.06.2019

RESPONDENT EXHIBITS

EXHIBIT R3 (a)	TRUE COPY OF ROUGH SKETCH SHOWING THE LAND HELD BY THE 3RD RESPONDENT, 2ND RESPONDENT AND THE PROPERTY OF THE PETITIONERS.

EXHIBIT R3 (b)	TRUE COPY OF OBJECTION TO THE COMMISSION REPORT IN WP(C) No.32328 OF 2001 FILED BY THE 3RD RESPONDENT.
EXHIBIT R7(a)	COPY OF THE JUDGEMENT DATED 12-02-2001 IN O.S.No.244 OF 1995 OF THE HON'BLE SUB COURT PARAVUR.
EXHIBIT R7(b)	COPY OF THE PRELIMINARY DECREE DATED 12-02-2001 IN O.S.No.244 OF 1995 OF THE HON'BLE SUB COURT PARAVUR.

IN THE HIGH COURT OF KERALA AT ERNAKULAM

PRESENT

THE HONOURABLE MR. JUSTICE DEVAN RAMACHANDRAN

Wednesday, the 13th day of March 2024 / 23rd Phalguna, 1945

IA.NO.4/2024 IN CONTEMPT CASE(C) NO. 1024 OF 2023(S) IN WP(C) 7268/2013

APPLICANT/2ND ADDITIONAL RESPONDENT/1ST RESPONDENT IN WP(C):

THE DISTRICT COLLECTOR, COLLECTORATE, ERNAKULAM.

RESPONDENTS/PETITIONERS & RESPONDENTS 1,3,4 & 5/PETITIONERS & 18TH RESPONDENT IN WP(C):

1. **SAJEEV KUMAR V.N., S/O NANU, VANIYAMKOTTU THADATHIL PUTHEN PURAYIL, AYYANKUZHI, PUTHENKURISU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT- 682 302.**
2. **VINOD. V.A., S/O APPU, VETTIKKATTUKAROTTU AYYANKUZHI, PUTHENKURISU VILLAGE, AMBALAMUGHAL P.O., ERNAKULAM DISTRICT- 682 302.**
3. **SRI. V.P. JOY, CHIEF SECRETARY, GOVERNMENT OF KERALA, SECRETARIAT, STATUE, THIRUVANANTHAPURAM - 695 001.**
4. **THE PRINCIPAL SECRETARY TO GOVERNMENT, REVENUE DEPARTMENT, SECRETARIAT, THIRUVANANTHAPURAM.**
5. **SRI.V. VENU, CHIEF SECRETARY, GOVERNMENT OF KERALA, SECRETARIAT, STATUE, THIRUVANANTHAPURAM - 695 001.**
6. **THE CENTRAL POLLUTION CONTROL BOARD, NEW DELHI.**

Application praying that in the circumstances stated in the affidavit filed therewith the High Court be pleased to direct the petitioners in the above Contempt Petition to cooperate with the tests proposed to be conducted by the State Pollution Control Board, at the subject area, in the interest of justice.

This Application coming on for orders upon perusing the application and the affidavit filed in support thereof, and upon hearing the arguments of GOVERNMENT PLEADER for the applicant in IA/R2 in COC, SMT. M. HEMALATHA, Advocate for R1 & R2 in IA/petitioners in COC, GOVERNMENT PLEADER for R3 TO R5 in IA/R1,R3,R4 in COC, SRI.M.AJAY Advocate for R6 in IA/R5 in COC, SRI. T. NAVEEN, STANDING COUNSEL for the State Pollution Control Board, ADDL.R6 in COC and of SRI. S. MANU, DEPUTY SOLICITOR GENERAL OF INDIA, the court passed the following:

P.T.O.

DEVAN RAMACHANDRAN, J.

I.A.No.4 of 2024
in
Con.Case(C)No.1024 of 2023

Dated this the 13th day of March, 2024

O R D E R

The District Collector says that, unless tests are completed, a final decision in favour of the petitioners cannot be taken.

2. I find some force in the afore submissions and am certainly of the view that necessary and adequate tests will have to be done.

3. I, therefore, direct the Environmental Engineer of the State Pollution Control Board ('Board', for short) to immediately conduct the tests as required in this I.A.; however, involving the petitioners, though making it clear that they cannot intervene. The petitioners will be at liberty to inform the Engineer/Engineers of their legitimate concerns,

which will also be taken into account and their opinion reflected in the resultant report.

4. I direct the Environmental Engineer to complete the afore exercise at the earliest, since the petitioners cannot be allowed to continue to suffer, as they now assert; and hence expect the report to be filed by the next posting date.

5. At this time, Smt.M.Hemalatha – learned counsel for the petitioners, pointed out that the tests will have to be conducted when the 'Plants' are functioning and even within their precincts. This will be kept in mind by the Engineer/s of the 'Board'; and I record that this has been affirmed by Sri.T.Naveen – learned Standing Counsel for the 'Board'.

List, therefore, on 02.04.2024.

Sd/-
DEVAN RAMACHANDRAN
JUDGE

H/o
akv

रजिस्ट्री सं० डी० एल०-33004/99 REGD. NO. D. L.-33004/99

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग III—खण्ड 4
PART III—Section 4
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 217] नई दिल्ली, बुधवार, नवम्बर 18, 2009/कार्तिक 27, 1931
No. 217] NEW DELHI, WEDNESDAY, NOVEMBER 18, 2009/KARTIKA 27, 1931

राष्ट्रीय परिवेशी वायु गुणवत्ता मानक

केन्द्रीय प्रदूषण नियंत्रण बोर्ड

अधिसूचना

नई दिल्ली, 18 नवम्बर, 2009

सं. बी-29016/20/90/पी.सी.आई.-I.—वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 (1981 का 14) की धारा 16 की उपधारा (2) (एच) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए तथा अधिसूचना संख्या का.आ. 384(ई), दिनांक 11 अप्रैल, 1994 और का.आ. 935 (ई) दिनांक 14 अक्टूबर, 1998 के अधिक्रमण में केन्द्रीय प्रदूषण नियंत्रण बोर्ड इसके द्वारा तत्काल प्रभाव से राष्ट्रीय परिवेशी वायु गुणवत्ता मानक अधिसूचित करता है, जो इस प्रकार है:-

राष्ट्रीय परिवेशी वायु गुणवत्ता मानक

क्र. सं.	प्रदूषक	समय आधारित औसत	परिवेशी वायु में सान्द्रण		
			औद्योगिक, रिहायशी, ग्रामीण और अन्य क्षेत्र	पारिस्थितिकीय संवेदनशील क्षेत्र (केन्द्र सरकार द्वारा अधिसूचित)	प्रबोधन की पद्धति
(1)	(2)	(3)	(4)	(5)	(6)
1	सल्फर डाई आक्साइड (SO_2), $\mu g/m^3$	वार्षिक*	50	20	-उन्नत वेस्ट और गाईक
		24 घंटे**	80	80	-पश्चवेगनी परिदीप्ती
2	नाइट्रोजन डाई आक्साइड (NO_2), $\mu g/m^3$	वार्षिक*	40	30	-उपांतरित जैकब और हॉचाइजर (सोडियम-आर्सेनाईट)
		24 घंटे**	80	80	-रसायनिक संदीप्ति
3	विविक्त पदार्थ (10माइक्रान से कम आकार)या PM_{10}, $\mu g/m^3$	वार्षिक*	60	60	-हरात्मक विश्लेषण
		24 घंटे**	100	100	-टोयम
					-बीटा तनुकरण पद्धति

4	विविक्त पदार्थ (2.5 माइक्रान से कम आकार या $PM_{2.5}$, $\mu g/m^3$	वार्षिक* 24 घंटे**	40 60	40 60	-हरात्मक विश्लेषण -टोयम -बीटा तनुकरण पद्धति
5	ओजोन (O_3) $\mu g/m^3$	8 घंटे** 1 घंटा**	100 180	100 180	-पराबैगनी द्वीप्तिकाल -रासायनिक संदीप्ति -रासायनिक पद्धति
6	सीसा (Pb) $\mu g/m^3$	वार्षिक* 24 घंटे**	0.50 1.0	0.50 1.0	ई.पी.एम 2000 या समरूप फिल्टर पेपर का प्रयोग करके AAS/ICP पद्धति -टेफलॉन फिल्टर पेपर का प्रयोग करते हुए ED-XRF
7	कार्बन मोनोक्साइड (CO) mg/m^3	8 घंटे** 1 घंटा**	02 04	02 04	-अविपेक्षी अवरक्त (NDIR) स्पैक्ट्रम मापन
8	अमोनिया (NH_3) $\mu g/m^3$	वार्षिक* 24 घंटे**	100 400	100 400	-रासायनिक संदीप्ती -इण्डोफिनॉल ब्लू पद्धति
9	बैन्जीन (C_6H_6) $\mu g/m^3$	वार्षिक*	05	05	- गैस क्रोमेटोग्राफी आधारित सतत् विश्लेषक -अधिशोषण तथा निशोषण के बाद गैस क्रोमेटोग्राफी
10	बैन्जो (ए) पाईरीन (BaP) केवल विविक्त कण, ng/m^3	वार्षिक*	01	01	-विलायक निष्कर्षण के बाद HPLC/GC द्वारा विश्लेषण
11	आर्सेनिक (As) ng/m^3	वार्षिक*	06	06	-असंवितरक अवरक्त स्पैक्ट्रामिती ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके ICP/AAS पद्धति
12	निकिल (Ni) ng/m^3	वार्षिक*	20	20	ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके ICP/AAS पद्धति

* वर्ष में एक समान अंतरालों पर सप्ताह में दो बार प्रति 24 घंटे तक किसी एक स्थान विशेष पर लिये गये न्यूनतम 104 मापों का वार्षिक अंकगणीतीय औसत ।

** वर्ष में 98 प्रतिशत समय पर 24 घंटे या 8 घंटे या 1 घंटा के मानीटर मापमान, जो लागू हो , अनुपालन किये जाएंगे । दो प्रतिशत समय पर यह मापमान अधिक हो सकता है, किन्तु क्रमिक दो मानीटर करने के दिनों पर नहीं ।

टिप्पणी:

1. जब कभी और जहां भी किसी अपने-अपने प्रवर्ग के लिये दो क्रमिक प्रबोधन दिनों पर मापित मूल्य, ऊपर विनिर्दिष्ट सीमा से अधिक हो तो इसे नियमित या निरंतर प्रबोधन तथा अतिरिक्त अन्वेषण करवाने के लिये पर्याप्त कारण समझा जायेगा ।

संत प्रसाद गौतम, अध्यक्ष

[विज्ञापन-III/4/184/09/असा.]

टिप्पणी: राष्ट्रीय परिवेशी वायु गुणवत्ता मानक संबंधी अधिसूचनाएँ, केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा भारत के राजपत्र आसाधरण में अधिसूचना संख्या का.आ. 384 (ई), दिनांक 11 अप्रैल, 1994 एवं का. आ. 935 (ई), दिनांक 14 अक्टूबर, 1998 द्वारा प्रकाशित की गयी थी ।

NATIONAL AMBIENT AIR QUALITY STANDARDS

CENTRAL POLLUTION CONTROL BOARD

NOTIFICATION

New Delhi, the 18th November, 2009

No. B-29016/20/90/PCI-L—In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No.14 of 1981), and in supersession of the Notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect, namely:-

NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual*	50	20	- Improved West and Gaeke
		24 hours**	80	80	-Ultraviolet fluorescence
2	Nitrogen Dioxide (NO_2), $\mu g/m^3$	Annual*	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
		24 hours**	80	80	- Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM_{10} $\mu g/m^3$	Annual*	60	60	- Gravimetric - TOEM
		24 hours**	100	100	- Beta attenuation
4	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ $\mu g/m^3$	Annual*	40	40	- Gravimetric - TOEM
		24 hours**	60	60	- Beta attenuation
5	Ozone (O_3) $\mu g/m^3$	8 hours**	100	100	- UV photometric - Chemilminescence
		1 hour**	180	180	- Chemical Method
6	Lead (Pb) $\mu g/m^3$	Annual*	0.50	0.50	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) mg/m^3	8 hours**	02	02	- Non Dispersive Infra Red (NDIR) spectroscopy
		1 hour**	04	04	
8	Ammonia (NH_3) $\mu g/m^3$	Annual*	100	100	-Chemiluminescence
		24 hours**	400	400	-Indophenol blue method

(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C_6H_6) $\mu g/m^3$	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m^3	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m^3	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m^3	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

SANT PRASAD GAUTAM, Chairman
[ADVT-III/4/184/09/Exty.]

Note: The notifications on National Ambient Air Quality Standards were published by the Central Pollution Control Board in the Gazette of India, Extraordinary vide notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998.

Printed by the Manager, Government of India Press, Ring Road, Mayapuri, New Delhi-110064
and Published by the Controller of Publications, Delhi-110054.

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 14th February, 2000

[1]**[S.O.123(E)** – Whereas, the increasing ambient noise level in public places from various sources, inter-alia, industrial activity, construction activity, [2][fire crackers, sound producing instruments], generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices have deleterious effects on human health and the psychological wellbeing of the people; it is considered necessary to regulate and control of noise producing and generating sources with the objective of maintaining the ambient air quality standards in respect of noise;

Whereas, a draft of Noise Pollution (Control and Regulation) Rule, 1999 was published under the notification of the Government of India in the Ministry of Environment and Forests vide number S.O.528 (E), dated the 28th June, 1999 inviting objections and suggestions from all the persons likely to be affected thereby, before the expiry of the period of sixty days from the date on which the copies of the Gazette containing the said notification are made available to the public;

And, whereas, copies of the said Gazette were made available to the public on the 1st day of July,1999;

And, whereas the objections and suggestions received from the public in respect of the said draft rules have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by clause (ii) of sub- section (2) of section 3, sub-section (1) and clause (b) of sub-section (2) of section 6 and section 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with rule 5 of the Environment (Protection) Rules, 1986, the Central Government here by makes the following rules for the regulation and control of noise producing and generating sources, namely: -

1. Short-title and commencement. -

(1) These rules may be called the Noise Pollution (Regulation and Control) Rules, 2000.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions. - In these rules, unless the context otherwise requires, -

(a) "Act" means the Environment (Protection) Act, 1986 (29 of 1986);

(b) "area/zone" means all areas which fall in either of the four categories given in the Schedule annexed to these rules;

[3][(c) "authority" means and includes any authority or officer authorized by the Central Government, or as the case may be, the State Government in accordance with the laws in force and includes a District Magistrate, Police Commissioner, or any other officer not below the rank of the Deputy Superintendent of Police designated for the maintenance of the ambient air quality standards in respect of noise under any law for the time being in force];

[4][(d) "court" means a governmental body consisting of one or more judges who sit to adjudicate

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1 As published in the Gazette of India, Extraordinary, Par II-Section 3(ii), vide S.O. 123 (E), dated 14.2.2000.

2 Ins.by S.O.50 (E), dated 11.01.2010

3 Subs. by S.O. 1046(E), dated 22.11.2000, w.e.f. 22.11.2000

4 Ins. by S.O. 1046(E), dated 22.11.2000, (w.e.f. 22.11.2000)

disputes and administer justice and includes any court of law presided over by judge, judges or a magistrate and acting as a tribunal in civil, taxation and criminal cases;

(e) "educational institution" means a school, seminary, college, university, professional academies, training institutes or other educational establishment, not necessarily a chartered institution and includes not only buildings, but also all grounds necessary for the accomplishment of the full scope of educational instruction, including those things essential to mental, moral and physical development;

(f) "hospital" means an institution for the reception and care of sick, wounded, infirm or aged persons, and includes government or private hospitals, nursing homes and clinics;]

[1][(g) "person" shall include any company or association or body of individuals, whether incorporated or not;]

[2][(h) "State Government" in relation to a Union territory means the Administrator thereof appointed under article 239 of the Constitution;]

[3][(i) "public place" means any place to which the public have access, whether as of right or not, and includes auditorium, hotels, public waiting rooms, convention centres, public offices, shopping malls, cinema halls, educational institutions, libraries, open grounds and the like which are visited by general public; and

(j) "night time" means the period between 10.00 p.m. and 6.00 a.m.]

3. Ambient air quality standards in respect of noise for different areas/zones. -

(1) The ambient air quality standards in respect of noise for different areas/zones shall be such as specified in the Schedule annexed to these rules.

(2) The State Government [4][shall categorize] the areas into industrial, commercial, residential or silence areas/zones for the purpose of implementation of noise standards for different areas.

(3) The State Government shall take measures for abatement of noise including noise emanating from vehicular movements, [5][blowing of horns, bursting of sound emitting fire crackers, use of loud speakers or public address system and sound producing instruments] and ensure that the existing noise levels do not exceed the ambient air quality standards specified under these rules.

(4) All development authorities, local bodies and other concerned authorities while planning developmental activity or carrying out functions relating to town and country planning shall take into consideration all aspects of noise pollution as a parameter of quality of life to avoid noise menace and to achieve the objective of maintaining the ambient air quality standards in respect of noise.

(5) An area comprising not less than 100 metres around hospitals, educational institutions and courts may be declared [6][by the State Government] as silence area/zone for the purpose of these rules.

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1 Re-numbered and subs. S.O.1046(E), dated 22.11.2000, (w.e.f. 22.11.2000)

2 Re-numbered by Rule 2(ii), ibid.

3 Ins. By S.O. 50 (E), dated 11.01.2010 (w.e.f.11.01.2010)

4 Subs. by S.O.1046(E), dated 22.11.2000, (w.e.f. 22.11.2000

5 Ins. by S.O. 50 (E), dated 11.01.2010

6 Ins. by S.O. 2555 (E), dated 10.08.2017 (w.e.f. 10.08.2017).

[3][Provided that, an area shall not fall under silence area or zone category, unless notified by the State Government in accordance with sub-rule (2).]

4. Responsibility as to enforcement of noise pollution control measures. -

(1) The noise levels in any area/zone shall not exceed the ambient air quality standards in respect of noise as specified in the Schedule.

(2) The authority shall be responsible for the enforcement of noise pollution control measures and the due compliance of the ambient air quality standards in respect of noise.

[1][(3) The respective State Pollution Control Boards or Pollution Control Committees in consultation with the Central Pollution Control Board shall collect, compile and publish technical and statistical data relating to noise pollution and measures devised for its effective prevention, control and abatement.]

5. Restrictions on the use of loud speakers/public address system [2][and sound producing instruments]. -

(1) A loud speaker or a public address system shall not be used except after obtaining written permission from the authority.

[3][(2) A loud speaker or a public address system or any sound producing instrument or a musical instrument or a sound amplifier shall not be used at night time except in closed premises for communication within, like auditoria, conference rooms, community halls, banquet halls or during a public emergency.];

[4][(3) Notwithstanding anything contained in sub-rule (2), the State Government may subject to such terms and conditions as are necessary to reduce noise pollution, permit use of loud speakers or public address systems and the like during night hours (between 10.00 p.m. to 12.00 midnight) on or during any cultural, religious or festive occasion of a limited duration not exceeding fifteen days in all during a calendar year and the concerned State Government or District Authority in respect of its jurisdiction as authorised by the concerned State Government shall generally specify in advance, the number and particulars of the days on which such exemption should be operative.

Explanation. - For the purposes of this sub-rule, the expressions

(i) "festive occasion'' shall include any National function or State function as notified by the Central Government or State Government; and

(ii) "National function or State function "shall include"-

(A) Republic Day;

(B) Independence Day;

(C) State Day; or

(D) such other day as notified by the Central Government or the State Government.]

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1 Ins. by S.O.1569(E), dated 19.9.2006. (w.e.f. 19.09.2006)

2 Ins. by S.O.50 (E), dated 11.01.2010 (w.e.f.11.01.2010).

3 Subs. by S.O.50 (E), dated 11.01.2010

4 Subs. by S.O. 2555 (E) dated 10.08.2017 (w.e.f. 10.08.2017).

[1][(4) The noise level at the boundary of the public place, where loud speaker or public address system or any other noise source is being used shall not exceed 10 dB(A) above the ambient noise standards for the area or75 dB(A) whichever is lower.

(5) The peripheral noise level of a privately owned sound system or a sound producing instrument shall not, at the boundary of the private place, exceed by more than 5 dB(A) the ambient noise standards specified for the area in which it is used].

[2][5A. Restrictions on the use of horns, sound emitting construction equipments and bursting of fire crackers. -

(1) No horn shall be used in silence zones or during night time in residential areas except during a public emergency.

(2) Sound emitting fire crackers shall not be burst in silence zone or during night time.

(3) Sound emitting construction equipments shall not be used or operated during night time in residential areas and silence zones.]

6. Consequences of any violation in silence zone/area. -

Whoever, in any place covered under the silence zone/area commits any of the following offence, he shall be liable for penalty under the provisions of the Act: -

(i) whoever, plays any music or uses any sound amplifiers,

(ii) whoever, beats a drum or tom-tom or blows a horn either musical or pressure, or trumpet or beats or sounds any instrument,

(iii) whoever, exhibits any mimetic, musical or other performances of a nature to attract crowds,

[3][(iv) whoever, bursts sound emitting fire crackers; or

(v) whoever, uses a loud speaker or a public address system.]

7. Complaints to be made to the authority. -

(1) A person may, if the noise level exceeds the ambient noise standards by 10 dB(A) or more given in the corresponding columns against any area/zone [4][or, if there is a violation of any provision of these rules regarding restrictions imposed during night time], make a complaint to the authority.

(2) The authority shall act on the complaint and take action against the violator in accordance with the provisions of these rules and any other law inforce.

8. Power to prohibit etc. continuance of music sound or noise. –

(1) If the authority is satisfied from the report of an officer incharge of a police station or other information received by him [5][including from the complainant] that it is necessary to do so in order to prevent annoyance, disturbance, discomfort or injury or risk person who dwell

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1 Ins. by S.O.50 (E), dated 11.01.2010

2 Ins. by S.O. 50 (E), dated 11.01.2010 (w.e.f. 11.01.2010)

3 Ins.by S.O.50(E), dated 11.01.2010 (w.e.f. 11.01.2010)

4 Ins.by S.O.50(E), dated 11.01.2010 (w.e.f.11.01.2010)

5 Ins.by S.O.1569 (E), dated 19.9.2006 (w.e.f. 19.06.2010)

or occupy property on the vicinity, he may, by a written order issue such directions as he may consider necessary to any person for preventing, prohibiting, controlling or regulating: -

(a) the incidence or continuance in or upon any premises of –

(i) any vocal or instrumental music,

(ii) sounds caused by playing, beating, clashing, blowing or use in any manner whatsoever of any instrument including loudspeakers, [1][public address systems, horn, construction equipment, appliance or apparatus] or contrivance which is capable of producing or re-producing sound, or

[2][(iii) sound caused by bursting of sound emitting fire crackers, or]

(b) The carrying on in or upon, any premises of any trade, a vocation or operation or process resulting in or attended with noise.

(2) The authority empowered under sub-rule (1) may, either on its own motion, or on the application of any person aggrieved by an order made under sub-rule (1), either rescind, modify or alter any such order:

Provided that before any such application is disposed of, the said authority shall afford to the applicant [3][and to the original complainant, as the case may be] an opportunity of appearing before it either in person or by a person representing him and showing cause against the order and shall, if it rejects any such application either wholly or in part, record its reasons for such rejection.

[1] Subs. by S.O.50(E), dated 11.01.2010 (w.e.f. 11.01.2010)

[2] Ins.by S.O.50 (E), dated 11.01.2010. (w.e.f. 11.01.2010)

[3] Ins.by S.O.1569 (E) dated 19.9.2006. (w.e.f.19.09.2006)

SCHEDULE

[See rule 3(1) and 4(1)]

Ambient Air Quality Standards in Respect of Noise

Area Code	Category of Area/Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note: -

1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. [1][***]
4. Mixed categories of areas may be declared as one of the four abovementioned categories by the competent authority.

*dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A "decibel" is a unit in which noise is measured.

"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specific period.

[F. No Q-14012/1/96-CPA]

VIJAI SHARMA, Jt. Secy.

Note: The principal rules were published in the Gazette of India vide number, S.O.123(E), dated 14th February, 2000 and subsequently amended vide S.O.1046(E), dated 22nd November, 2000, S.O. 1088(E), dated 11th October, 2002, S.O. 1569(E), dated the 19th September, 2006, S.O.50(E), dated 11.01.2010 and were last amended vide S.O. 50 (E), dated the 11th January, 2011.

[1] Omitted by S.O. 2555 (E), dated 10.08.2017 (w.e.f. 10.08.2017).

KERALA STATE POLLUTION CONTROL BOARD
കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്
DISTRICT OFFICE (ERNAKULAM–II), PERUMBAVOOR
ജില്ലാകാര്യാലയം (എറണാകുളം-2) പെരുമ്പാവൂർ
PMC. 20/733, Near Kallumkal Auditorium, Perumbavoor – 683 542
എംസി. 20/733, കല്ലുങ്കൽ ഓഡിറ്റോറിയം സമീപം, പെരുമ്പാവൂർ – 683 542
☎: 0484-2593747 e-mail: pcbdo2ekm@gmail.com web: www.keralapcb.nic.in

PCB/EKM/DO-2/GEN-57/18 Date: 09.07.2024

From

The Environmental Engineer

To

M/s. BPCL Kochi Refinery,
Ambalamugal

Sub: In connection with COC No. 1024 of 2023 in WP(C) No. 7268 of 2013 filed by Sri. Sajeev Kumar & Sri. Vinod Kumar before the Hon'ble High Court of Kerala - reg.

Ref: 1. Minutes of the hearing conducted on 22-05-2024 in connection with COC No. 1024 of 2023 in WP(C) No. 7268 filed by Sri. Sajeev Kumar & Sri. Vinod Kumar before the Hon'ble High Court of Kerala.
2. Reply letter furnished in this office on 05-06-2024.
3. Discussion held with the Chief Environmental Engineer, Regional office, Ernakulam, Kerala State Pollution Control Board.

Sir,

Your attention in invited to the above subject and references cited above. In connection with the exceedance of noise level as per sound level monitoring conducted at Ayyankuzhi area, a hearing was conducted in this office on 22-05-2024 vide reference (1). Based on the reply letter submitted by you vide reference (2) and further discussion vide reference (3), you are requested to comply with the following conditions and report to this office immediately.

1. Conduct a detailed noise survey in and around the company premises for 15 continuous days and furnish report along with the data and control measures provided in the company.
2. Provide additional online sound monitoring station near the company boundary pertaining to Ayyankuzhi residential area.

3. Submit proposal for additional sound reduction measures to be implemented in company

You are hereby directed as per section 31A of Air (Prevention & Control of Pollution) Act 1981 to comply with the above directions and report to this office.

Yours faithfully

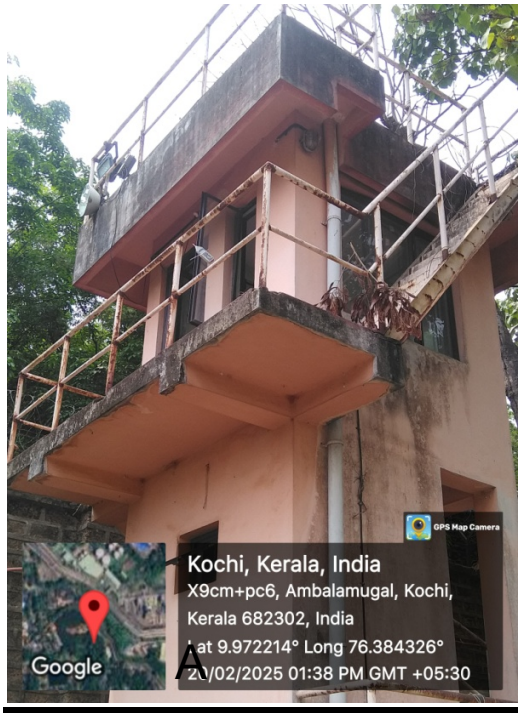
Environmental Engineer

Kerala State Pollution Control Board
DO (EKM 2)
Perumbavoor
683 542

Copy to

Chief Environmental Engineer
Regional Office
Ernakulam

BHARAT PETROLEUM CORPN.LTD
Kochi Refinery, Ambalamugal,
Kochi, Ernakulam
Noise monitoring Location Photos



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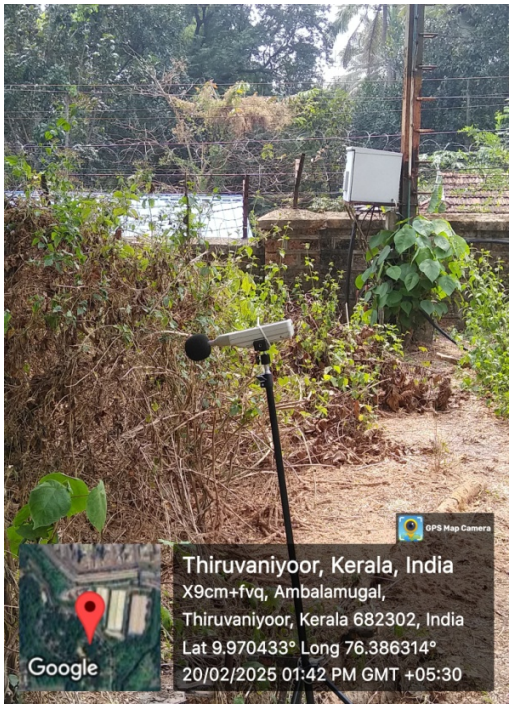

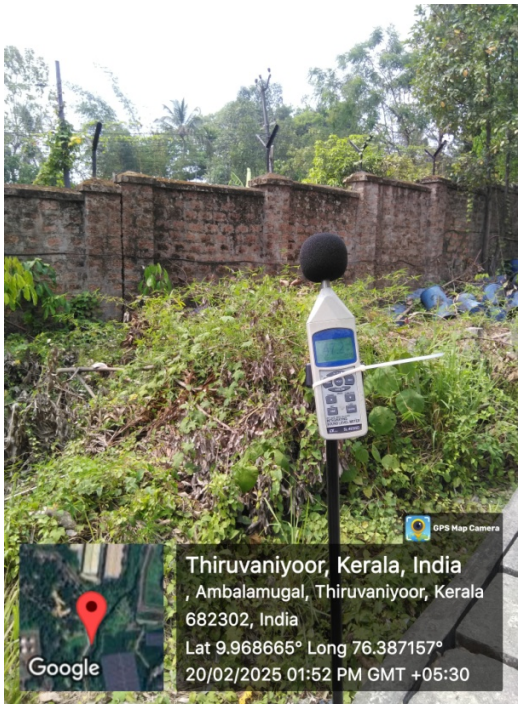

Hubert Enviro Care Systems (P) Ltd.
A-21, III Phase, Thiru Vi Ka Industrial Estate,
Guindy, Chennai - 600 032.
Ph: 42985555 / 43635555 Fax : 42985500
E-mail : labsales@hecs.in

TC-12310

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by CPCB (MoEF & CC)
BIS FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

ULR : TC1231025000008995F
Report No. : HECS/AP/028/210225
Sample ID No : 210225081
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside boundary area of Ayyankuzhi Temple
Environmental Condition : Temperature (°C) : 29.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 24/02/2025
Report Date : 24/02/2025
Sample quantity : NA

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		05-02-2025	06-02-2025	07-02-2025	08-02-2025	09-02-2025
1	06-07	54.7	52.7	56.3	54.9	56.3
2	07-08	55.4	53.4	54.1	52.9	53.2
3	08-09	53.6	52.3	51.6	52.4	51.8
4	09-10	52.6	53.4	52.6	51.5	52.4
5	10-11	62.3	61.9	63.4	62.2	62.7
6	11-12	62.7	61.5	63.9	60.6	61.6
7	12-13	63.5	61.4	62.3	63.4	63.8
8	13-14	62.8	60.5	63.4	62.5	63.2
9	14-15	61.3	62.4	61.3	61.8	61.2
10	15-16	59.3	58.7	60.3	59.7	59
11	16-17	60.2	62.2	58.9	58.3	56.6
12	17-18	56.6	56.9	56.8	56.9	57.9
13	18-19	60.1	60.9	63.5	65.3	63.5
14	19-20	62.3	62.5	60.3	60.3	61.2
15	20-21	62.2	61.2	59.9	59.5	59.2
16	21-22	57.2	54.2	56.4	57.2	58.2
17	22-23	53.2	44.7	44.6	45	47.6
18	23-24	52.4	41	42.5	43.3	41.5
19	00-01	41.6	40.4	42.6	42.1	41.7
20	01-02	40.4	43.7	42.5	43.2	41.4
21	02-03	49.4	52.8	54.6	52.6	51.2
22	03-04	47.3	46.9	49.2	48.5	44.1
23	04-05	46.2	48.6	47.2	45.5	47.2
24	05-06	46.5	45.3	48.2	47.5	46.7
I	**Ld**	**60.4**	**59.9**	**60.5**	**60.3**	**60.3**
II	**Ln**	**49.0**	**47.2**	**48.5**	**47.3**	**46.5**
III	**Ldn**	**58.8**	**58.2**	**58.9**	**58.6**	**58.6**

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 032

D.Anusuya
Lab Manager
Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.
A-21, III Phase, Thiru Vi Ka Industrial Estate,
Guindy, Chennai - 600 032.
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TC-12310

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by CPCB (MoEF & CC)
BIS FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

ULR : TC1231025000008995F
Report No. : HECS/AP/028/210225
Sample ID No : 210225082
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside boundary area of Ayyankuzhi Temple

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 24/02/2025
Report Date : 24/02/2025
Sample quantity : NA

Environmental Condition : Temperature (°C) : 29.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		10-02-2025	11-02-2025	12-02-2025	13-02-2025	14-02-2025
1	06-07	55.7	54.1	53.7	50.4	56.9
2	07-08	52.9	55.2	54.2	57.6	64.1
3	08-09	54.2	53.6	53.1	56.4	62.9
4	09-10	50.6	51.5	53.8	60.5	59.8
5	10-11	64.3	61.6	62.2	61.3	64.8
6	11-12	63.9	63.4	62.1	59.3	65.8
7	12-13	64	63.7	62.4	63.2	58.9
8	13-14	64.1	61.3	64.9	62.4	62.9
9	14-15	60.9	61.6	60.2	62.5	61.9
10	15-16	57.2	58.2	58.6	61.5	64.9
11	16-17	53.6	52.2	53.4	63.4	63.8
12	17-18	58.9	58.6	58.6	62.4	63.9
13	18-19	63.8	60.7	66.3	61.6	61.9
14	19-20	63.4	62.6	61.3	60.5	66.4
15	20-21	59.2	55.6	54.6	59.4	63.8
16	21-22	57.8	58.9	57.4	59.6	66.1
17	22-23	44.9	45.9	44.8	54.5	61
18	23-24	41.7	43	41.8	50.6	57.1
19	00-01	40.9	42.3	41.8	51.5	58
20	01-02	42.2	43.1	42.2	50.4	56.9
21	02-03	50.3	49.4	48.8	48.5	55.9
22	03-04	43.9	45.4	49.4	47.5	53.8
23	04-05	46.5	44.5	47.6	47.6	54.1
24	05-06	48.6	48.3	46.1	47.1	53.6
I	**Ld**	**61.0**	**59.8**	**60.6**	**60.9**	**63.7**
II	**Ln**	**46.1**	**45.9**	**46.3**	**50.4**	**57.0**
III	**Ldn**	**59.3**	**58.2**	**58.9**	**59.3**	**62.4**

HECS CARE SYSTEMS (P) LTD Chennai 600 032

D.Anusuya
Lab Manager
Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.
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TC-12310

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ISO 9001, 14001 & 45001 Certified.

TEST REPORT

ULR : TC1231025000008995F
Report No. : HECS/AP/028/210225
Sample ID No : 210225082
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside boundary area of Ayyankuzhi Temple

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 24/02/2025
Report Date : 24/02/2025
Sample quantity : NA

Environmental Condition : Temperature (°C) : 29.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		15-02-2025	16-02-2025	17-02-2025	18-02-2025	19-02-2025
1	06-07	50.2	52.3	58.7	52.1	52.5
2	07-08	57.4	55.4	61.8	55.2	57.5
3	08-09	56.2	60.7	63.9	60.5	56.5
4	09-10	60.3	59.4	62.5	59.2	60.3
5	10-11	61.1	61.4	64.6	61.2	59.6
6	11-12	59.1	61.7	62.5	61.5	62.4
7	12-13	63	59.7	64.5	59.5	60.6
8	13-14	62.2	62.5	61.5	62.3	59.5
9	14-15	62.3	62.1	62.6	61.9	60.6
10	15-16	61.3	63.1	59.6	62.9	59.4
11	16-17	63.2	61.4	58.6	61.2	60.4
12	17-18	62.2	62.4	63.2	62.2	61.4
13	18-19	61.4	61.5	63.6	61.3	60.4
14	19-20	60.3	60.6	58.7	60.4	59.5
15	20-21	59.2	61.4	60.6	61.2	61.5
16	21-22	59.4	60.6	61.4	60.4	59.2
17	22-23	54.3	53.2	59.6	53	54.1
18	23-24	50.4	51.4	57.8	51.2	52.7
19	00-01	51.3	51.5	57.9	51.3	53.6
20	01-02	50.2	50.4	56.8	50.2	52.5
21	02-03	48.3	49.6	56	49.4	49.6
22	03-04	47.3	51.4	57.8	51.2	48.6
23	04-05	47.4	52.8	59.2	52.6	51.4
24	05-06	46.9	47.5	53.9	47.3	46.4
I	**Ld**	**60.7**	**61.0**	**62.2**	**60.8**	**59.9**
II	**Ln**	**50.2**	**51.3**	**57.7**	**51.1**	**51.7**
III	**Ldn**	**59.1**	**59.4**	**61.1**	**59.2**	**58.5**

Limits set by CPCB:

i. Industrial Area : Day Time-75 dB (A); Night Time-70 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day.

Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); - Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

End of Report

D.Anusuya
Lab Manager
Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.
A-21, III Phase, Thiru Vi Ka Industrial Estate,
Guindy, Chennai - 600 032.
Ph: 42985555 / 43635555 Fax : 42985500
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TC-12310

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TEST REPORT

ULR : TC1231025000008996F
Report No. : HECS/AP/029/210225
Sample ID No : 210225082
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside Boundary area Opposite to Ayyankuzhi Jn

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 24/02/2025
Report Date : 24/02/2025
Sample quantity : NA

Environmental Condition : Temperature (°C) : 29.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		05-02-2025	06-02-2025	07-02-2025	08-02-2025	09-02-2025
1	06-07	53.4	52.5	51.8	52.4	52.7
2	07-08	55.9	52.3	51.7	52.2	55.5
3	08-09	52.4	50.1	49.5	47.3	47.6
4	09-10	48.7	47.4	47.1	46.9	49.3
5	10-11	49.2	49.3	48.4	48.2	48.6
6	11-12	46.3	46.5	46.9	47.3	47.8
7	12-13	47.8	46.3	47.2	48.1	51.2
8	13-14	48.4	47.7	46.1	47.6	46.9
9	14-15	46.3	45.6	45.9	49.3	45.8
10	15-16	52.2	51.2	48.8	49.2	48.8
11	16-17	49.9	50.1	50.2	50.6	54.8
12	17-18	51.2	55.2	55.6	52.6	54.2
13	18-19	49.2	49.5	49.5	46.6	49.5
14	19-20	50.2	51.4	53.2	55.2	53.3
15	20-21	52.4	53.6	54.6	54.5	55.2
16	21-22	57.6	56.2	53.2	52.6	55.2
17	22-23	52.2	54.2	51.2	52.3	50.6
18	23-24	52.4	52.2	51.6	53.3	52.6
19	00-01	52.6	55.1	55.2	52.2	52.6
20	01-02	48.2	46.5	45.2	46.2	43.5
21	02-03	45.3	46.2	43.2	45.6	45.3
22	03-04	44.6	45.2	45.2	41.2	42.3
23	04-05	45.3	45.6	45.3	45.5	45.2
24	05-06	42.3	43.6	44.6	46.2	48.8
I	**Ld**	**51.9**	**51.4**	**51.0**	**50.9**	**52.2**
II	**Ln**	**49.4**	**50.7**	**49.8**	**49.5**	**49.2**
III	**Ldn**	**51.2**	**51.2**	**50.6**	**50.5**	**51.4**

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 032

D.Anusuya
Lab Manager
Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.
A-21, III Phase, Thiru Vi Ka Industrial Estate,
Guindy, Chennai - 600 032.
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TC-12310

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by CPCB (MoEF & CC)
BIS FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

ULR : TC1231025000008996F
Report No. : HECS/AP/029/210225
Sample ID No : 210225082
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside Boundary area Opposite to Ayyankuzhi Jn

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 24/02/2025
Report Date : 24/02/2025
Sample quantity : NA

Environmental Condition : Temperature (°C) : 29.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		10-02-2025	11-02-2025	12-02-2025	13-02-2025	14-02-2025
1	06-07	51.6	52.1	52.3	51.8	58.2
2	07-08	54.7	52.3	52.1	51.7	58.1
3	08-09	49.2	48.3	49.6	49.5	55.9
4	09-10	49.8	48.3	49.2	47.1	53.5
5	10-11	47.5	47.5	49.4	48.4	54.8
6	11-12	48.3	48.3	47.7	46.9	53.3
7	12-13	49.1	48.3	49.3	47.2	53.6
8	13-14	49.7	48	48.6	46.1	52.5
9	14-15	46.4	47.3	48.7	45.9	52.3
10	15-16	49.2	49.2	48.8	48.8	55.2
11	16-17	50.9	50.6	51.2	50.2	56.6
12	17-18	55.2	56.3	55.6	55.6	58.8
13	18-19	48.8	48.5	46.5	49.5	55.9
14	19-20	53.6	56.6	53.4	53.2	59.6
15	20-21	55.6	56.3	56.5	54.6	57.8
16	21-22	52.3	52.3	51.2	53.2	59.6
17	22-23	52.2	53.6	53.1	51.2	57.6
18	23-24	55.1	55.2	52.2	51.6	58
19	00-01	54.2	56.3	55.4	55.2	57.8
20	01-02	42.6	46.5	46	45.2	51.6
21	02-03	42.6	43.2	43.5	43.2	49.6
22	03-04	43.2	45.3	43.2	45.2	51.6
23	04-05	43.2	45.6	42.5	45.3	51.7
24	05-06	48.3	48.9	49.2	44.6	52.7
I	**Ld**	**51.6**	**52.0**	**51.6**	**51.0**	**56.6**
II	**Ln**	**50.5**	**51.8**	**50.5**	**49.8**	**55.0**
III	**Ldn**	**51.3**	**51.9**	**51.2**	**50.6**	**56.2**

HECS ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 032

D.Anusuya
Lab Manager
Authorized Signatory

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TEST REPORT

ULR : TC1231025000008996F
Report No. : HECS/AP/029/210225
Sample ID No : 210225082
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside Boundary area Opposite to Ayyankuzhi Jn

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 24/02/2025
Report Date : 24/02/2025
Sample quantity : NA

Environmental Condition : Temperature (°C) : 29.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		15-02-2025	16-02-2025	17-02-2025	18-02-2025	19-02-2025
1	06-07	51.6	52.2	48.3	47.6	58.9
2	07-08	51.5	52	48.1	47.5	58.7
3	08-09	49.3	49.8	45.9	45.3	56.5
4	09-10	46.9	47.1	43.2	46.5	53.8
5	10-11	48.2	49	45.1	44.2	55.7
6	11-12	46.7	46.2	42.3	53.5	52.9
7	12-13	55.5	46	42.1	43	52.7
8	13-14	45.9	47.4	43.5	45.6	54.1
9	14-15	45.7	45.3	41.4	44.3	53.6
10	15-16	48.6	50.9	46.7	44.6	57.6
11	16-17	52.5	49.8	45.9	46	56.5
12	17-18	55.4	54.9	51	54.7	55.3
13	18-19	49.3	49.2	45.3	45.3	55.9
14	19-20	52.5	51.1	47.2	55.6	57.8
15	20-21	54.4	53.3	49.4	50.4	55.1
16	21-22	55.8	55.9	52	52.6	58.7
17	22-23	57.6	53.9	50	49.6	47.6
18	23-24	51.4	51.9	48	47.4	53.5
19	00-01	55	54.8	50.9	55.4	48.7
20	01-02	45.3	46.2	42.3	43.6	52.9
21	02-03	43	45.9	42	47.7	52.6
22	03-04	45	44.9	41	46.5	51.6
23	04-05	45.1	45.3	41.4	46.9	52
24	05-06	44.4	43.3	45.4	40.4	50
I	**Ld**	**51.9**	**51.1**	**47.2**	**49.9**	**56.3**
II	**Ln**	**51.7**	**50.4**	**46.8**	**49.3**	**51.5**
III	**Ldn**	**51.8**	**50.9**	**47.1**	**49.7**	**55.2**

Limits set by CPCB:

i. Industrial Area : Day Time-75 dB (A); Night Time-70 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day.

Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); - Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

End of Report

D.Anusuya
Lab Manager
Authorized Signatory

HECS-G/Q/FMT/49

Hubert Enviro Care Systems (P) Ltd.
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TEST REPORT

ULR : TC1231025000009853F
Report No. : HECS/AP/030/210225
Sample ID No : 210225083
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark :
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside boundary area Opposite to to Where The PCB Conducted AAQ Monitoring

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 28/02/2025
Report Date : 28/02/2025
Sample quantity : NA

Environmental Condition : Temperature (°C) : 27.6 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		05-02-2025	06-02-2025	07-02-2025	08-02-2025	09-02-2025
1	06-07	47.5	48.4	46.3	47.4	47.2
2	07-08	49.5	47.4	47.5	49.3	48.5
3	08-09	48.5	49.3	48.2	49.4	46.7
4	09-10	48.1	49.4	47.5	47.2	49.4
5	10-11	47.4	48.4	50.4	48.5	47.3
6	11-12	48.6	48.5	47.5	46.7	47.5
7	12-13	47.4	50.5	49.2	45.6	48.5
8	13-14	48.6	48.3	47.4	46.4	52.4
9	14-15	48.6	47.4	48.6	45.7	49.5
10	15-16	47.6	48.3	47.6	47.4	51.4
11	16-17	48.9	49.3	46.4	49.3	49.5
12	17-18	48.6	50.3	47.2	50.4	47.6
13	18-19	47.8	49.3	48.1	48.4	48.5
14	19-20	50.5	50.3	47.4	50.4	47.5
15	20-21	49.3	49.4	47.4	48.5	45.3
16	21-22	47.5	48.5	48.5	49.3	46.7
17	22-23	49.4	48.3	47.5	50.7	48.5
18	23-24	49.5	50.3	43.5	48.5	45.3
19	00-01	48.6	47.4	45.2	49.5	45.4
20	01-02	46.5	45.3	46.4	48.5	47.5
21	02-03	46.5	43.4	48.4	45.7	48.6
22	03-04	46.3	45.5	48.2	47.5	45.4
23	04-05	45.5	48.2	47.8	46.4	47.5
24	05-06	46.3	45.3	48.4	48.5	44.7
I	**Ld**	**48.5**	**49.0**	**47.9**	**48.4**	**48.7**
II	**Ln**	47.6	47.2	47.2	48.4	46.9
III	**Ldn**	**48.2**	**48.5**	**47.7**	**48.4**	**48.2**

HECS ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 032

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Lab Manager
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TEST REPORT

ULR : TC1231025000009853F
Report No. : HECS/AP/030/210225
Sample ID No : 210225083
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside boundary area Opposite to to Where The PCB Conducted AAQ Monitoring

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 28/02/2025
Report Date : 28/02/2025
Sample quantity : NA

Environmental Condition : Temperature (°C) : 32.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		10-02-2025	11-02-2025	12-02-2025	13-02-2025	14-02-2025
1	06-07	47.9	47.5	46.4	48.6	47.5
2	07-08	49.6	49.7	47.4	50.4	46.8
3	08-09	47.3	46.8	47.5	47.5	47.3
4	09-10	47.4	48.7	46.2	48.2	46.2
5	10-11	48.4	49.7	50.4	47.6	50.4
6	11-12	46.3	51.8	49.3	48.5	49.3
7	12-13	48.5	48.4	48.5	48.4	48.5
8	13-14	46.4	48.6	50.4	47.5	50.4
9	14-15	47.5	50.3	48.6	48.5	49.5
10	15-16	50.8	49.3	48.5	49.5	51.4
11	16-17	48.4	48.6	49.3	50.4	46.5
12	17-18	48.5	48.7	50.5	48.6	49.3
13	18-19	46.4	50.5	52.4	50.5	50.4
14	19-20	49.6	49.7	49.3	49.3	49.3
15	20-21	50.3	49.3	49.5	50.6	48.4
16	21-22	49.4	48.9	48.6	49.6	50.3
17	22-23	48.6	46.6	46.5	49.3	46.5
18	23-24	47.4	45.3	45.4	48.5	47.5
19	00-01	49.4	46.8	45.3	50.4	42.4
20	01-02	46.7	45.5	45.7	46.7	46.2
21	02-03	43.4	43.6	46.7	47.5	46.3
22	03-04	45.5	45.6	46.5	44.6	46.4
23	04-05	46.6	43.4	45.7	45.4	46.5
24	05-06	45.4	44.3	45.6	46.5	47.5
I	Ld	**48.5**	**49.3**	**49.2**	**49.1**	**49.1**
II	Ln	**47.0**	**45.3**	**46.0**	**47.8**	**46.4**
III	Ldn	**48.1**	**48.3**	**48.4**	**48.7**	**48.4**

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 032

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Lab Manager
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TEST REPORT

ULR : TC1231025000009853F
Report No. : HECS/AP/030/210225
Sample ID No : 210225083
Sampling Date : 05/02/2025 To 19/02/2025

Name of the Client : M/s. Bharat Petroleum Corpn.Ltd.,

Address of the Client : KOCHI REFINERY, AMBALAMUGAL, KOCHI, ERNAKULAM, INDIA - 682302

Group : Atmospheric Pollution
Sample Name : Ambient Noise Levels (Excluding vibration)
Sample Mark : NA
Sample Reference : NA
Sample Drawn By : M/s.Hubert Enviro care Systems (P) Ltd.
Sample Location : BPCL KR Inside boundary area Opposite to to Where The PCB Conducted AAQ Monitoring
Environmental Condition : Temperature (°C) : 32.0 | Humidity (%) : 56.0
Sampling Method & Plan : IS 9989:1981

Received Date : 21/02/2025
Commenced Date : 21/02/2025
Completed On : 28/02/2025
Report Date : 28/02/2025
Sample quantity : NA

S.No	Time Hrs	Monitoring Location & Hourly Leq Noise Levels in dB(A)				
		15-02-2025	16-02-2025	17-02-2025	18-02-2025	19-02-2025
1	06-07	46.4	46.4	45.4	46.8	47.8
2	07-08	49.5	47.5	48.6	48.5	48.3
3	08-09	47.5	48.3	48.6	48.6	47.5
4	09-10	48.6	46.4	50.5	48.6	47.4
5	10-11	47.5	48.3	47.6	48.4	47.4
6	11-12	48.4	48.3	48.3	49.6	47.5
7	12-13	47.3	49.3	47.5	47.5	48.6
8	13-14	47.4	49.4	49.3	46.4	46.5
9	14-15	48.4	50.4	47.5	48.5	47.5
10	15-16	47.5	49.3	49.6	46.4	46.5
11	16-17	49.6	48.4	48.3	48.4	49.6
12	17-18	50.4	47.4	46.4	48.5	51.4
13	18-19	47.5	48.2	50.4	48.7	47.5
14	19-20	50.4	46.4	47.5	50.4	50.4
15	20-21	49.3	50.4	51.3	50.4	49.3
16	21-22	51.4	48.3	50.3	47.5	47.4
17	22-23	49.4	46.5	49.3	48.6	49.4
18	23-24	51.4	48.1	50.3	47.5	48.3
19	00-01	50.3	47.4	49.3	47.5	48.6
20	01-02	46.5	46.4	47.4	45.4	46.5
21	02-03	46.4	46.6	48.3	45.6	45.5
22	03-04	46.2	44.5	46.5	46.5	45.7
23	04-05	45.4	43.4	46.4	45.6	45.5
24	05-06	46.8	45.3	46.4	46.7	44.6
I	**Ld**	**48.8**	**48.5**	**48.8**	**48.5**	**48.4**
II	**Ln**	**48.3**	**46.3**	**48.2**	**46.8**	**47.1**
III	**Ldn**	**48.6**	**47.8**	**48.6**	**48.0**	**48.0**

Limits set by CPCB:

i. Industrial Area : Day Time-75 dB (A); Night Time-70 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day.

Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); - Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

End of Report

D.Anusuya
Lab Manager
Authorized Signatory

भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड
भारत सरकार का उपक्रम
कोच्चि रिफ़ाइनरी

BHARAT PETROLEUM CORPORATION LIMITED
A Govt. of India Enterprise
Kochi Refinery

KR.HSE.ENV.05. HSSE.KSPCB-08/2024
22/08/2024

To,

The Environmental Engineer,
District Office (Ernakulam– II),
Kerala State Pollution Control Board,
Perumbavoor - 683542

Sub: BPCL – kochi Refinery submission with respect to direction by your good office about COC No: 1024 of 2023 in WP(C) No. 7268 0f 2013 regarding noise survey and additional sound reduction measures.

Ref: Letter No. PCB/EKM/DO-2/GEN-57/18 dated 09.07.2024

Dear Sir,

This is with reference to the letter of even reference no: PCB/EKM/DO-2/GEN-57/18 dated 09.07.2024 issued by your good office. Kindly find below our clarifications on the same.

1) **Conduct a detailed noise survey in and around the company premises for 15 continuous days and furnish report along with the data and control measures in the company.**

   We are in the process of floating tender to invite NABL approved third party for 15 continuous days survey and the report will be submitted on or before Nov-24 end.

2) **Provide additional online sound monitoring station near the company boundary pertaining to Ayyankuzhi residential area.**

   The overall noise level in and around Kochi Refinery including the boundaries near to the concerned area is well within the stipulated norms. We would also like to bring your kind notice that no process units are being operated near the vicinity of the concerned area. In addition to the above, based on your direction, we already installed 2 No's of online sound monitoring station near the boundary of MSBP and PDPP area and their results are found well within the limits.

   In view of the above, we propose to conduct intermittent survey (once in 6 months) in the concerned area by NABL approved third party and the same will be submitted to KSPCB.

3) **Submit proposal for additional sound reduction measures to be implemented in the company.**

As mentioned in point no:1 above, based on the survey outcome, suitable action will be taken.

As a responsible corporate citizen, we have our commitments towards managing the environment and we assure you that BPCL will take all necessary measures to ensure that the environment in our area is maintained normal and always protected.

Thanking you,

For BPCL Kochi refinery

22/8/2024

Sainath C
General Manager (HSE)

भारतीय मानक

पीने का पानी — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

ICS 13.060.20

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

May 2012 **Price Group 6**

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)

Sl 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, *Max*	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)	*p*H 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, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	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.

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, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	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, *Max*	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, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	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, *Max*	0.5	No relaxation	Clause **6** of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	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, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175*	— or APHA 6630
ix)	Polynuclear aromatic hydro-carbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	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, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	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.

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

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
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)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – 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 Water[1)]
(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking*:	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system*:	
	a) *E. coli* 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)	*Treated water in the distribution system*:	
	a) *E. coli* 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.

system including consumers' premises, should be free from virus.

4.2.2 None of the generally accepted sewage treatment methods yield virus-free effluent. Although a number of investigators have found activated sludge treatment to be superior to trickling filters from this point of view, it seems possible that chemical precipitation methods will prove to be the most effective.

4.2.3 Virus can be isolated from raw water and from springs, enterovirus, reovirus, and adenovirus have been found in water, the first named being the most resistant to chlorination. If enterovirus are absent from chlorinated water, it can be assumed that the water is safe to drink. Some uncertainty still remains about the virus of infectious hepatitis, since it has not so far been isolated but in view of the morphology and resistance of enterovirus it is likely that, if they have been inactivated hepatitis virus will have been inactivated also.

4.2.4 An exponential relationship exists between the rate of virus inactivation and the redox potential. A redox potential of 650 mV (measured between platinum and calomel electrodes) will cause almost instantaneous inactivation of even high concentrations of virus. Such a potential can be obtained with even a low concentration of free chlorine, but only with an extremely high concentration of combined chlorine. This oxidative inactivation may be achieved with a number of other oxidants also, for example, iodine, ozone and potassium permanganate, but the effect of the oxidants will always be counteracted, if reducing components, which are mainly organic, are present. As a consequence, the sensitivity of virus towards disinfectants will depend on the *milieu* just as much as on the particular disinfectant used.

4.2.5 Viruses are generally resistant to disinfectants as well as get protected on account of presence of particulate and organic matter in water. Because the difference between the resistance of coliform organisms and of virus to disinfection by oxidants increases with increasing concentration of reducing components, for example, organic matter, it cannot be assumed that the absence of available coliform organisms implies freedom from active virus under circumstances where a free chlorine residual cannot be maintained. Sedimentation and slow sand filtration in themselves may contribute to the removal of virus from water.

4.2.6 In practice, >0.5 mg/l of free chlorine for 1 h is sufficient to inactivate virus, even in water that was originally polluted provided the water is free from particulates and organic matter.

4.2.7 MS2 phage are indicator of viral contamination in drinking water. MS2 phage shall be absent in 1 litre of water when tested in accordance with USEPA method 1602. If MS2 phage are detected in the drinking water, virological examination shall be done by the Polymerase Chain Reaction (PCR) method for virological examination as given in Annex B. USEPA method in Manual of Method for Virology Chapter 16, June 2001 shall be the alternate method. If viruses are detected, the cause shall be determined by immediate further investigation.

4.3 Biological Requirements

4.3.1 Ideally, all samples taken including consumers premises should be free from biological organisms. Biological examination is of value in determining the causes of objectionable tastes and odours in water and controlling remedial treatments, in helping to interpret the results of various chemical analysis, and in explaining the causes of clogging in distribution pipes and filters. In some instances, it may be of use in demonstrating that water from one source has been mixed with that from another.

4.3.2 The biological qualities of water are of greater importance when the supply has not undergone the conventional flocculation and filtration processes, since increased growth of methane-utilizing bacteria on biological slimes in pipes may then be expected, and the development of bryozoal growths such as *Plumatella* may cause operational difficulties.

4.3.3 Some of the animalcules found in water mains may be free-living in the water, but others such as *Dreissena* and *Asellus* are more or less firmly attached to the inside of the mains. Although these animalcules are not themselves pathogenic, they may harbour pathogenic organisms or virus in their intestines, thus protecting these pathogens from destruction by chlorine.

4.3.4 Chlorination, at the dosages normally employed in waterworks, is ineffective against certain parasites, including amoebic cysts; they can be excluded only by effective filtration or by higher chlorine doses than can be tolerated without subsequent dechlorination. *Amoebiasis* can be conveyed by water completely free from enteric bacteria; microscopic examination after concentration is, therefore, the only safe method of identification.

4.3.5 Strict precautions against back-syphonage and cross-connections are required, if amoebic cysts are found in a distribution system containing tested water.

4.3.6 The *cercariae of schistosomiasis* can be detected by similar microscopic examination, but there is, in

any case, no evidence to suggest that this disease is normally spread through piped water supplies.

4.3.7 The cyclops vector of the embryos of *Dracunculus medinensis* which causes dracontiasis or Guinea-worm disease can be found in open wells in a number of tropical areas. They are identifiable by microscopic examination. Such well supplies are frequently used untreated, but the parasite can be relatively easily excluded by simple physical improvements in the form of curbs, drainage, and apron surrounds and other measures which prevent physical contact with the water source.

4.3.8 Cryptosporidium shall be absent in 10 liter of water when tested in accordance with USEPA method 1622 or USEPA method 1623* or ISO 15553 : 2006.

4.3.9 Giardia shall be absent in 10 liter of water when tested in accordance with USEPA method 1623* or ISO 15553 : 2006.

4.3.10 The drinking water shall be free from microscopic organisms such as algae, zooplanktons, flagellates, parasites and toxin producing organisms. An illustrative (and not exhaustive) list is given in Annex C for guidance.

NOTE — In case of dispute, the method indicated by '*' in **4.3.8** and **4.3.9** shall be referee method.

5 SAMPLING

Representative samples of water shall be drawn as prescribed in IS 1622 and IS 3025 (Part 1).

ANNEX A
(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
1622 : 1981	Methods of sampling and microbiological examination of water (*first revision*)
3025	Methods of sampling and test (physical and chemical) for water and waste water:
(Part 1) : 1987	Sampling (*first revision*)
(Part 2) : 2002	Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy
(Part 4) : 1983	Colour (*first revision*)
(Part 5) : 1983	Odour (*first revision*)
(Part 7) : 1984	Taste threshold (*first revision*)
(Part 8) : 1984	Tasting rate (*first revision*)
(Part 10) : 1984	Turbidity (*first revision*)
(Part 11) : 1983	*p*H value (*first revision*)
(Part 16) : 1984	Filterable residue (total dissolved solids) (*first revision*)
(Part 21) : 1983	Total hardness (*first revision*)
(Part 23) : 1983	Alkalinity (*first revision*)
(Part 24) : 1986	Sulphates (*first revision*)
(Part 26) : 1986	Chlorine residual (*first revision*)
(Part 27) : 1986	Cyanide (*first revision*)
(Part 29) : 1986	Sulphide (*first revision*)
(Part 32) : 1988	Chloride (*first revision*)
(Part 34) : 1988	Nitrogen (*first revision*)
(Part 37) : 1988	Arsenic (*first revision*)
(Part 39) : 1989	Oil and grease
(Part 40) : 1991	Calcium
(Part 41) : 1992	Cadmium (*first revision*)
(Part 42) : 1992	Copper (*first revision*)
(Part 43) : 1992	Phenols (*first revision*)
(Part 46) : 1994	Magnesium
(Part 47) : 1994	Lead
(Part 48) : 1994	Mercury
(Part 49) : 1994	Zinc
(Part 52) : 2003	Chromium
(Part 53) : 2003	Iron
(Part 54) : 2003	Nickel
(Part 55) : 2003	Aluminium
(Part 56) : 2003	Selenium
(Part 57) : 2005	Boron
(Part 59) : 2006	Manganese
(Part 60) : 2008	Fluoride
13428 : 2003	Packaged natural mineral water — Specification (*first revision*)
14194	Radionuclides in environmental samples — Method of estimation:
(Part 1) : 1994	Gross beta activity measurement
(Part 2) : 1994	Gross alpha activity measurement
15302 : 2002	Determination of aluminium and barium in water by direct nitrous oxide-acetylene flame atomic absorption spectrometry
15303 : 2002	Determination of antimony, iron and selenium in water by electrothermal atomic absorption spectrometry

ANNEX B

(*Clause* 4.2.7)

POLYMERASE CHAIN REACTION (PCR) METHOD

B-1 GENERAL

The method involves the concentration of viruses from 100 litre of drinking water to 1 ml by membrane filter technique. The concentrate is subjected to amplification using polymerase chain reaction (PCR) and primers based on highly conserved regions of viral genomes. This method can detect as low as 10 genome copies. Stringent precautions are needed to avoid contamination with amplified DNA products leading to false positive reactions. Detection of hepatitis A virus (HAV) RNA and enterovirus (EV) RNA is considered as an indication of presence of viruses in water. Steps involved include concentration of water, RNA extraction, complementary DNA (cDNA) synthesis and PCR.

B-2 CONCENTRATION OF DRINKING WATER

B-2.1 Apparatus

B-2.1.1 *Pressure Pump*

B-2.1.2 *Membrane Filter Assembly with 144 mm Diameter with Tripod Stand*

B-2.1.3 *Pressure Vessel (50 litre capacity) with Pressure Gauge*

B-2.1.4 *Inter-connecting Pressure Tubes*

B-2.2 Reagents

Autoclaved double distilled water shall be used for the preparation of reagents/buffers in this study.

B-2.2.1 *Aluminium Chloride*

B-2.2.2 *HCl/NaOH Urea (Extra Pure)*

B-2.2.3 *Disodium Hydrogen Phosphate* ($Na_2HPO_4.2H_2O$) — 0.2 M, filter sterilized.

B-2.2.4 *Sodium Dihydrogen Phosphate* ($NaH_2PO_4.2H_2O$) — 0.2 M, filter sterilized.

B-2.2.5 *Citric Acid* — 0.1 M, filter sterilized.

B-2.2.6 *L-Arginine* — 0.5 M, filter sterilized.

B-2.2.7 *Urea-Arginine Phosphate Buffer* (*U-APB*) — Mix 4.5 g of urea with 2 ml of 0.2 M NaH_2PO_4 and 2 ml of 0.5 M L - Arginine and make up the volume to 50 ml with sterile distilled water. The *p*H of the eluent shall be 9.0.

B-2.2.8 *Magnesium Chloride* ($MgCl_2$) — 1 M.

B-2.2.9 *McII Vaines Buffer* (*p*H *5.0*) — Mix 9.7 ml of 0.1 M citric acid with 10.3 ml of 0.2 M $Na_2HPO_4.2H_2O$ under sterile conditions.

B-2.3 Procedure

Filter 100 litre of drinking water sample through membrane filter assembly using either positively charged membrane of 144 mm diameter or 0.22 micron diameter pore size nitrocellulose membrane. For positively charged membrane the test water *p*H need not be adjusted. But for the 0.22 micron nitrocellulose membrane adjust the *p*H to 3.5 after adding the aluminium chloride as a coagulant to a final concentration of 0.000 5 M.

At lower *p*H pass the water through the membrane. The flow rate shall be 40 litre/h approximately. After the completion of the filtration, elute the adsorbed particles using 100 ml of urea-arginine phosphate buffer (U-APB). Precipitate the suspended particles using 1 ml of magnesium chloride (1 M). Dissolve the resultant precipitate centrifuged out of the sample in 800-1.0 ml of McII vaines buffer. The processed sample can be stored at refrigerator until required.

B-3 RNA EXTRACTION

B-3.1 Apparatus

B-3.1.1 *Cooling Centrifuge*

B-3.1.2 *Deep Freezer (–20°C)*

B-3.1.3 *Vortex Mixer*

B-3.1.4 *Pipette Man*

B-3.2 Reagents

B-3.2.1 *Cetyl Trimethyl Ammonium Bromide (CTAB) Buffer*

CTAB	:	1 percent
Sodium Dodecyl Sulphate (SDS)	:	1 percent
EDTA	:	20 mM
Sodium Chloride	:	1 M

B-3.2.2 *Phenol, Chloroform and Isoamylalcohol in the ratio of 25:24:1 (PCI)*

B-3.2.3 *Ethanol*

B-3.2.4 *TE Buffer (p*H *8.0)*

Tris base	:	1 M
EDTA	:	0.5 M

B-3.2.5 *Sodium Acetate* — 3 M.

B-3.3 Procedure

Treat 300 µl of concentrated water sample with equal volume of CTAB and 1/10th volume of PCI. Vortex and centrifuge at 5 000 × g for 30 min at 4°C. Add 1/10th volume of 3 M sodium acetate and double the volume of cold ethanol to the aqueous layer. Keep the mixture at either at –20°C for overnight or in liquid nitrogen for 2-5 min. Centrifuge at 10 000 × g, for 30 min at 4°C. Discard the supernatant and air dry the pellet and dissolve it in 20 µl TE buffer.

B-4 COMPLEMENTARY DNA (c DNA) SYNTHESIS

B-4.1 Apparatus

B-4.1.1 *PCR Machine*

B-4.1.2 *Deep Freezer (–20°C)*

B-4.2 Reagents

B-4.2.1 *cDNA Synthesis Kit*

B-4.3 Procedure

Suspend the extracted RNA in 20 µl of cDNA reaction mixture, which consists of 4 µl of 5X reverse transcriptase reaction buffer [250 mM TRIS–HCl (*p*H 8.5), 40 mM KCl, 150 mM $MgCl_2$, 5 mM dithiothreitol (DTT)], 0.5 µl of 10 mM deoxynucleotide phosphate (dNTP), 2 µl of hexa nucleotide mixture, 1 µl of 25 U of Maloney Murine Leukaemia Virus (M-MuLV) reverse transcriptase, 0.5 µl of 20 U of human placental RNase inhibitor. Heat the reaction mixture to 95°C for 5 min and rapidly chill on ice, this is followed by the addition of 1 µl (25 U/µl) of M-MuLV reverse transcriptase. Incubate the reaction mixture as given by the manufacturer of the kit and quickly chill the reaction tube on ice.

B-5 PCR AMPLIFICATION

B-5.1 Apparatus

B-5.1.1 *PCR Machine*

B-5.1.2 *Deep Freezer (–20°C)*

B-5.1.3 *Micropippette*

B-5.2 Reagents

B-5.2.1 *Primers for EV and HAV*

EV sense primer, 5' — TCC TCC GGC CCC TGA ATG CG — 3'

antisense primer, 5' — ATT GTC ACC ATA AGC AGC CA — 3'

HAV sense primer, 5' — GTTTT GCTCC TCTTT ATCAT GCTAT G-3'

antisense primer, 5' — GGAAA TGTCT CAGGT ACTTT CTTTG-3'

B-5.2.2 *PCR Master Mix*

B-5.2.3 *Mineral Oil*

B-5.3 Procedure

B-5.3.1 *PCR Amplification for Hepatitis A Virus (HAV)*

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS–HCl (*p*H 8.3), 50 mM KCl, 2.5 mM $MgCl_2$, 0.01 percent gelatin (1× PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of HAV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min

Denaturation for	1.0 min	at 94°C	} 35 cycles
Annealing for	1.0 min	at 57°C	
Extension for	1.3 min	at 72°C	

Final extension at 72°C for 7 min.

B-5.3.2 *PCR Amplification for Enterovirus (EV)*

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS–HCl (*p*H 8.3), 50 mM KCl, 2.5 mM $MgCl_2$, 0.01 percent gelatin (1X PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of EV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min

Denaturation for	1.0 min	at 94°C	} 35 cycles
Annealing for	1.0 min	at 42°C	
Extension for	2.0 min	at 72°C	

Final extension at 72°C for 7 min.

B-6 AGAROSE GEL ELECTROPHORESIS

B-6.1 Apparatus

B-6.1.1 *Micropippette*

B-6.1.2 *Electrophoresis Apparatus*

B-6.1.3 *Gel Documentation System*

B-6.2 Reagents

B-6.2.1 *Running Buffer* — 50X TAE buffer

Tris base/Tris buffer : 121.00 g

Glacial acetic acid	:	28.55 ml
0.5 M EDTA	:	50 .00 ml
Distilled water (autoclaved)	:	300.45 ml

Make the final volume upto 1 000 ml with deionised distilled water, sterilize and store at 4°C. The final concentration for the preparation of agarose gel and to run the gel shall be 1X.

B-6.2.2 *Tracking Dye* — 6X bromophenol blue.

B-6.2.3 *Ethidium Bromide* — 0.5 µg/ml.

B-6.3 Procedure

Run the PCR amplified product of EV and HAV on 1.5 percent agarose gel using 1X TAE buffer. Load 10 µl of amplified product after mixing it with 1 µl 10X loading dye. Run the molecular weight marker along with the samples. Run the electrophoresis at 100 V for 30 min. Stain the gel with ethidium bromide (0.5 µl/ml) for 20 min. Wash it with distilled water and view under UV transilluminator and photograph the gel to analyse the band pattern. EV gives the band as 155 base pair and the HAV gives band as 225 base pair.

ANNEX C

(*Clause* 4.3.10)

ILLUSTRATIVE LIST OF MICROSCOPIC ORGANISMS PRESENT IN WATER

Sl No. (1)	*Classification of Microscopic Organism* (2)	*Group and Name of the Organism* (3)	*Habitat* (4)	*Effect of the Organisms and Significance* (5)
i)	Algae	a) Chlorophyceae:		
		1) *Species of* Coelastrum, Gomphospherium, Micractinium, Mougeotia, Oocystis, Euastrum, Scenedesmus, Actinastrum, Gonium, Eudorina Pandorina, Pediastrum, Zygnema, Chlamydomonas, Careteria, Chlorella, Chroococcus, Spirogyra, Tetraedron, Chlorogonium, Stigeoclonium	Polluted water, impounded sources	Impart colouration
		2) *Species of* Pandorina, Volvox, Gomphospherium, Staurastrum, Hydrodictyon, Nitella	Polluted waters	Produce taste and odour
		3) *Species of* Rhizoclonium, Cladothrix, Ankistrodesmus, Ulothrix, Micrasterias, Chromulina	Clean water	Indicate clean condition
		4) *Species of* Chlorella, Tribonema, Clostrium, Spirogyra, Palmella	Polluted waters, impounded sources	Clog filters and create impounded difficulties
		b) Cyanophyceae:		
		1) *Species of* Anacystis and Cylindrospermum	Polluted waters	Cause water bloom and impart colour
		2) *Species of* Anabena, Phormidium, Lyngbya, Arthrospira, Oscillatona	Polluted waters	Impart colour
		3) *Species of* Anabena, Anacystis, Aphanizomenon	Polluted waters, impounded sources	Produce taste and odour
		4) *Species of* Anacystis, Anabena, Coelospherium, Cleotrichina, Aphanizomenon	Polluted waters	Toxin producing
		5) *Species of* Anacystis, Rivularia, Oscillatoria, Anabena	Polluted waters	Clog filters

Sl No. (1)	*Classification of Microscopic Organism* (2)	*Group and Name of the Organism* (3)	*Habitat* (4)	*Effect of the Organisms and Significance* (5)
		6) *Species of* Rivularia	Calcareous waters and also rocks	Bores rocks and calcareous strata and causes matted growth
		7) *Species of* Agmenellum, Microcoleus, Lemanea	Clean waters	Indicators of purification
		c) Diatoms (Bacillareophyceae):		
		1) *Species of* Fragillaria, Stephanodiscus, Stauroneis	—	Cause discoloration
		2) *Species of* Asterionella, Tabellaria	Hill streams high altitude, torrential and temperate waters	Taste and odour producing clog filters
		3) *Species of* Synedra and Fragillavia	Polluted waters	Taste and odour producing
		4) *Species of* Nitzchia, Gomphonema	Moderately polluted waters	Cause discoloration
		5) *Species of* Cymbela, Synedra, Melosira, Navicula, Cyclotella, Fragillaria, Diatoma, Pleurogsigma	Rivers and streams impounded sources	Clog filters and cause operational difficulties
		6) *Species of* Pinmularia, Surinella, Cyclotella, Meridion, Cocconeis	Clean waters	Indicators of purification
		d) Xanthophyceae:		
		Species of Botryococcus	Hill streams, high altitude and temperate waters	Produces coloration
ii)	Zooplankton	a) Protozoa:		
		1) Amoeba, Giardia Lamblia Arcella, Difflugia, Actinophrys	Polluted waters	Pollution indicators
		2) Endamoeba, Histolytica	Sewage and activated sludge	Parasitic and pathogenic
		b) Ciliates:		
		Paramoecium, Vorticella, Carchesium, Stentor, Colpidium, Coleps, Euplotes, Colopoda, Bodo	Highly polluted waters, sewage and activated sludge	Bacteria eaters
		c) Crustacea:		
		1) Bosmina, Daphnia	Stagnant polluted waters	Indicators of pollution
		2) Cyclops	Step wells in tropical climate	Carrier host of guinea worm
iii)	Rotifers	a) Rotifers:		
		Anurea, Rotaria, Philodina	Polluted and Algae laden waters	Feed on algae
		b) Flagellates:		
		1) Ceratium, Glenodinium, Peridinium Dinobryon	Rocky strata, iron bearing and acidic waters	Impart colour and fishy taste
		2) Euglena, Phacus	Polluted waters	Impart colour

Sl No.	*Classification of Microscopic Organism*	*Group and Name of the Organism*	*Habitat*	*Effect of the Organisms and Significance*
(1)	(2)	(3)	(4)	(5)
iv)	Miscellaneous Organisms	a) Sponges, Hydra	Fresh water	Clog filters and affect purification systems
		b) Tubifex, Eristalls, Chironomids	Highly polluted waters, sewage and activated sludge and bottom deposits	Clog filters and render water unaesthetic
		c) Plumatella	Polluted waters	Produces biological slimes and causes filter operational difficulties
		c) Dreissena, Asellus	Polluted waters	Harbour pathogenic organisms

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Amend No.	Date of Issue	Text Affected

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Recognised as an Environmental Laboratory Under E(P)A 1986

No. PCB/CL/NAMP REPORT 2024 Ernakulam, Date 14.1.2025

15/1/25

B/H

From

The Chief Environmental Scientist

To

The Environmental Engineer

District Office (Ernakulam-II), Perumbavoor

Sub: Analysis report of Air samples in Ayyankuzhi area reg:-

Ref: Your email regarding results of Ayyankuzhi monitoring dated 14/01/2025

Sir,

Forwarded herewith the revised report (excluding SPM values) of Air samples collected from Ayyankuzhi area on thirty days (from 04.12.2024-03.01.2025). Kindly acknowledge receipt of the same.

Yours Faithfully

CHIEF ENVIRONMENTAL SCIENTIST

Encl: As above

GANDHI NAGAR, KOCHI – 682 020 ഗാന്ധിനഗർ, കൊച്ചി - 682 020
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TC 8525

ANALYSIS REPORT

Ref. No.	Letter No. PCB/PBR/LAB/1/2013 dated 04.12.2024
Received From	Environmental Engineer, District Office II, Ernakulam.
Name of Location	Ayyankuzhi, Perumbavoor.
Source	Ayyankuzhi Area, Perumbavoor, Ernakulam
Sample Condition	Fit for analysis
Sample preservation	As per APHA/IS:3025 (Part-1)
Scientist-in-charge	Dr. Josemin, Environmental Scientist
Sample Type	Air Samples
Sample Collected By	NAMP Operators
Sample volume & container type	30 mL Impinger

SL No	Date of Collection	Date of Receiving	Date of Analysis	SO_2 ($\mu g/m^3$)	No_x ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	RSPM ($\mu g/m^3$)	PM2.5 ($\mu g/m^3$)
				Test Method IS:5182 (Part 2) 2001	Test Method IS: 5182 (Part 6) 2006	Test Method IS:5182 (part25) 2018	Test Method IS:5182 (Part 23)2009	Test Method IS: 5182 (part24) 2019
				LDL-4	LDL-9	LDL-20	LDL-5	LDL-2
1	04.12.24	05.12.24	05.12.24	4.2	5.5	10	33	36
2	05.12.24	06.12.24	06.12.24	2	19.6	10	37	41
3	06.12.24	07.12.24	09.12.24	2	11.8	10	28	43
4	07.12.24	08.12.24	09.12.24	2	11.7	14.5	44	35
5	08.12.24	09.12.24	10.12.24	2	9.9	10	18	33

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6	09.12.24	10.12.24	11.12.24	2	7.0	10	38	40
7	10.12.24	11.12.24	12.12.24	2	8.3	10.8	34	37
8	11.12.24	12.12.24	12.12.24	2	15.0	10	44	84
9	12.12.24	13.12.24	13.12.24	2	6.3	10	31	45
10	13.12.24	14.12.24	16.12.24	2	10.6	10	55	41
11	14.12.24	15.12.24	16.12.24	2	12.5	10	26	50
12	15.12.24	16.12.24	16.12.24	2	14.3	10	41	45
13	16.12.24	17.12.24	18.12.24	4.4	24.0	10	56	103
14	17.12.24	18.12.24	18.12.24	3.7	6.0	10	72	75
15	18.12.24	19.12.24	20.12.24	2.4	21.1	10	69	95
16	19.12.24	20.12.24	20.12.24	2	6.0	10	98	18
17	20.12.24	21.12.24	23.12.24	2	26.2	10	49	76
18	21.12.24	22.12.24	23.12.24	2.4	16.2	10	73	81
19	22.12.24	23.12.24	23.12.24	2	10	21	34	36
20	23.12.24	24.12.24	26.12.24	2	14.3	12.5	48	63
21	24.12.24	25.12.24	26.12.24	3.9	5.1	10	52	40
22	25.12.24	26.12.24	27.12.24	2	19.3	10	50	74
23	26.12.24	27.12.24	28.12.24	2	9.7	10	44	61
24	27.12.24	28.12.24	30.12.24	2.4	11.9	10	25	65
25	28.12.24	29.12.24	30.12.24	2	4.5	10	26	50
26	29.12.24	30.12.24	31.12.24	2	12.8	10	42	77
27	30.12.24	31.12.24	01.01.25	2	4.5	10	59	85
28	31.12.24	01.01.25	03.01.25	2	5.4	10	52	82
29	01.01.25	02.01.25	04.12.25	5	9.0	10	51	90
30	02.01.25	03.01.25	04.01.25	2	4.5	10	106	92

End of Report

14/1/25

Checked By

Dr. Revathy K.A.
Assistant Scientist

Authorised By

Dr. JOSEMIN
Environmental Scientist

Gmail

KSPCB Air Lab <kspcbnamp@gmail.com>

Results of Ayyankuzhi monitoring

PCB Perumbavoor <pcbdo2ekm@gmail.com> Tue, Jan 14, 2025 at 3:24 PM
To: KSPCB Air Lab <kspcbnamp@gmail.com>

Madam,

Please send results of ayyankuzhi monitoring excluding the SPM values as the results are to be submitted to court with CPCB standards.

Regards,

Environmental Engineer

District Office - 2

Kerala State Pollution Control Board,

Perumbavoor.

[Quoted text hidden]

ES | ASS

14/1/25

KERALA STATE POLLUTION CONTROL BOARD
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☎: 0484-2593747 e-mail: pcbdo2ekm@gmail.com web: www.kspcb.kerala.gov.in

PCB/EKM/DO-2/AM-79/2019 Date: 14.01.2025

AMBIENT NOISE LEVEL MONITORING REPORT

Contempt Case(C) No.1024 of 2023(S) in WP(C) 7268/2013.

Date of Monitoring : 04/12/2024 to 03/01/2025

Observation Area : Ayyankuzhi

Co-ordinates : 9° 58' 14.0" N , 76° 23' 09.4" E .

Sl. No	Date	Noise Level dB(A) (L_{eq})	
		Day Time	Night Time
1	04-12-2024	--	59.6
2	05-12-2024	62	59.7
3	06-12-2024	**63.4	58.7
4	07-12-2024	64.1	60.7
5	08-12-2024	62.2	58.7
6	09-12-2024	65.8	59
7	10-12-2024	64.3	59.5
8	11-12-2024	64.6	61.7
9	12-12-2024	*--	*--
10	13-12-2024	*--	**59.3
11	14-12-2024	**64.1	62.2
12	15-12-2024	69.8	60.2
13	16-12-2024	64.5	58.7
14	17-12-2024	64.6	60.5
15	18-12-2024	64.8	59.9
16	19-12-2024	61.1	61.3
17	20-12-2024	63	59.8
18	21-12-2024	64.1	59.7
19	22-12-2024	61.9	59.9

20	23-12-2024	**66.7**	**66.3**
21	24-12-2024	**63.6**	**59**
22	25-12-2024	**62.5**	**60.6**
23	26-12-2024	**64.3**	****59.5**
24	27-12-2024	**64.1**	****61.4**
25	28-12-2024	**66.1**	**63.9**
26	29-12-2024	**63.6**	**59.6**
27	30-12-2024	**65**	**60.9**
28	31-12-2024	**65.2**	**61.3**
29	01-01-2025	**65.6**	**62.3**
30	02-01-2025	**63.2**	**60.5**
31	03-01-2025	**64.9**	--

***Sound monitoring could not be done due to heavy rainfall**

****Sound monitoring partially interrupted due to rainfall**

AMBIENT AIR QUALITY STANDARS IN RESPECT OF NOISE

Area Code	Category Of Area/Zone	Limits in dB(A) Leq	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence zone	50	40

INFERENCE:

According to the current sound monitoring results, the noise level appears to be above the permissible limits both during the day time and night time.

ASHNA SHAJI

ASSISTANT SCIENTIST

KERALA STATE POLLUTION CONTROL BOARD
CENTRAL LABORATORY
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TC 8525

TEST REPORT

Analysis Report No.	PCB/CL/1123/2024-25	**Date**	15.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		10.12.2024
Received From	District Office II, Perumbavoor	**Date of Receipt**		11.12.2024
No. of Sample	01	**Period of Analysis**		12.12.2024 – 13.01.2025
Source	Well water of V.N Mohanan house.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.1

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	6.19	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	36	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	7.9	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	0.03	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	2.2	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	0.36	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	1.8	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	12	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	6	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

11	Phenolic Compounds	mg/L	BDL	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

15/01/2025

Checked By

Sowmya T M
Assistant Scientist

Authorised By

Dr. JOSEMIN
Environmental Scientist

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TC 8525

TEST REPORT

Analysis Report No.	PCB/CL/1123/2024-25	**Date**	15.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		10.12.2024
Received From	Disrtict Office II, Perumbavoor.	**Date of Receipt**		11.12.2024
No. of Sample	01	**Period of Analysis**		12.12.2024 – 13.01.2025
Source	Well water of Manikuttan V.K house.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.2

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.05	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	81	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	9.9	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	0.06	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	BDL	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	3.75	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	BDL	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	14	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	4	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	BDL	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

15/1/2025

Checked By

Sowmya T M
Assistant Scientist

Authorised By

Dr. JOSEMIN
Environmental Scientist

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TEST REPORT

Analysis Report No.	PCB/CL/1123/2024-25	**Date**	15.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		10.12.2024
Received From	District Office II, Perumbavoor.	**Date of Receipt**		11.12.2024
No. of Sample	01	**Period of Analysis**		12.12.2024 – 13.01.2025
Source	Well water of Pramodh V.A house.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.3

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.95	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	110	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	26.7	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	1.7	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	0.04	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	4.4	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	2.75	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	2.5	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	18	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	12	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

11	Phenolic Compounds	mg/L	0.09	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

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15/6/2025

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TEST REPORT

Analysis Report No.	PCB/CL/1178/2024-25	**Date**	21.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		31.12.2024
Received From	District Office II, Perumbavoor	**Date of Receipt**		31.12.2024
No. of Sample	01	**Period of Analysis**		01.01.2025 – 20.01.2025
Source	Well water sample Residence of V.N Mohanan.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.1

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.17	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	40	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	9.9	APHA, 4500-Cl/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	1.9	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	3.8	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	0.2	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	10	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	5.53	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	0.15	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

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TEST REPORT

Analysis Report No.	PCB/CL/1228/2024-25	**Date**	21.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013:	**Date of Collection**		20.12.2024
Received From	District Office II, Perumbavoor	**Date of Receipt**		15.01.2025
No. of Sample	01	**Period of Analysis**		16.01.2025 – 20.01.2025
Source	Well water sample Residence of V.N Mohanan.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.I

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.51	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	36	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	14.8	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	BDL	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	1.5	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	0.6	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	6	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	3.31	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	0.08	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

21/1/2025

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TEST REPORT

Analysis Report No.	PCB/CL/1123/2024-25	**Date**	21.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		31.12.2024
Received From	Disrtict Office II, Perumbavoor.	**Date of Receipt**		31.12.2024
No. of Sample	01	**Period of Analysis**		01.01.2025 – 20.01.2025
Source	Well water sample Residence of Manikuttan V.K.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.II

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.47	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	56	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	11.9	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	BDL	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	13.5	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	BDL	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	32	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	7.7	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	0.29	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

21/11/25

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TEST REPORT

Analysis Report No.	PCB/CL/1228/2024-25	**Date**	21.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		20.12.2024
Received From	Disrtict Office II, Perumbavoor.	**Date of Receipt**		15.01.2025
No. of Sample	01	**Period of Analysis**		16.01.2025 – 20.01.2025
Source	Well water sample Residence of Manikuttan V.K.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.II

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.13	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	67	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	4.9	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	1.2	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	15.5	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	BDL	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	18	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	3.3	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	0.14	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

21/1/25

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TC 8525

TEST REPORT

Analysis Report No.	PCB/CL/1178/2024-25	**Date**	21.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		31.12.2024
Received From	District Office II, Perumbavoor.	**Date of Receipt**		31.12.2024
No. of Sample	01	**Period of Analysis**		01.01.2025 – 20.01.2025
Source	Well water sample Residence of Pramodh V.A.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.III

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.75	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	132	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	29.7	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	2	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	8.7	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	10	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	0.6	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	26	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	6.6	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	0.14	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

21/1/25

Checked By

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Authorised By

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TEST REPORT

Analysis Report No.	PCB/CL/1228/2024-25	**Date**	21.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order daed 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		20.12.2024
Received From	District Office II, Perumbavoor.	**Date of Receipt**		15.01.2025
No. of Sample	01	**Period of Analysis**		16.01.2025 – 20.01.2025
Source	Well water sample Residence of Pramodh V.A.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.III

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.99	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	131	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	30.7	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	9.5	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	14	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	1	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	28	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	9.94	9.94APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	0.26	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

21.1.25

Checked By

Sowmya T M
Assistant Scientist

Authorised By

Dr. JOSEMIN
Environmental Scientist

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TC 8525

TEST REPORT

Analysis Report No.	PCB/CL/1184/2024-25	**Date**	23.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order dated 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		03.01.2025
Received From	District Office II, Perumbavoor	**Date of Receipt**		04.01.2025
No. of Sample	01	**Period of Analysis**		06.01.2025 – 23.01.2025
Source	Well water sample Residence of V.N Mohanan.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.I

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.59	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	40	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	8.9	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	1.6	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	1.4	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	0.2	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	6	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	6.63	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	BDL	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

23/01/2025

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Assistant Scientist

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TC 8525

TEST REPORT

Analysis Report No.	PCB/CL/1184/2024-25	**Date**	23.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order dated 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		03.01.2025
Received From	Disrtict Office II, Perumbavoor.	**Date of Receipt**		04.01.2025
No. of Sample	01	**Period of Analysis**		06.01.2025 – 23.01.2025
Source	Well water sample Residence of Manikuttan V.K.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.II

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.08	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	61	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	30.7	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	BDL	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	13.5	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	BDL	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	14	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	4.42	APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	BDL	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

23/01/2025

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TEST REPORT

Analysis Report No.	PCB/CL/1184/2024-25	**Date**	23.01.2025	Format No. PCB/CL/CH/F-7
Ref. No.	Order dated 04.09.2024 in Contempt Case (C) No.1024 of 2023 (S) in WP(C) 7268/2013.	**Date of Collection**		03.01.2025
Received From	District Office II, Perumbavoor.	**Date of Receipt**		04.01.2025
No. of Sample	01	**Period of Analysis**		06.01.2025 – 23.01.2025
Source	Well water sample Residence of Pramodh V.A.	**Scientist-in-charge**		Dr. Josemin
Sample Condition	Fit for analysis	**Sample Type**		Water Samples
Sample collected by	The Environmental Engineer, Disrtict Office II, Perumbavoor,Ernakulam	**Sample volume & container type**		Plastic Can
Sample preservation	As per APHA/IS:3025 (Part-1)	**Type of Test**		Chemical

SAMPLE ID: Station no.III

Sl. No	Parameters	Unit	Value	Test Method	Lowest Detection Limit
1	pH	---	5.62	APHA, 4500-H+B,24th Ed., 2023	1
2	Total Dissolved Solids	mg/L	90.4	APHA, 2540-C, 24th Ed., 2023	10 mg/L
3	Chloride	mg/L	11.8	APHA, 4500-CI/B,,24th Ed ., 2023	1 mg/L
4	Sulphide	mg/L	BDL	APHA, 4500 S2 F, 24th Ed., 2023	1 mg/L
5	Fluoride	mg/L	BDL	APHA,4500-FC, 24th Ed., 2023	0.1 mg/L
6	Sulphate	mg/L	3.7	APHA,4500-SO42-e,24th Ed., 2023	1 mg/L
7	Nitrates as Nitrogen	mg/L	17.5	APHA, 4500-NO3, 24th Ed., 2023	0.01 mg/L
8	Turbidity	NTU	0.6	APHA, 2130-B, 24th Ed., 2023	0.2
9	Total Hardness	mg/L	16	APHA, 2340-C, 24th Ed ., 2023	5 mg/L
10	Alkalinity	mg/L	7.7	9.94APHA, 2320-B, 24th Ed., 2023	1.0 mg/L

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11	Phenolic Compounds	mg/L	BDL	APHA, 5530-C,24th Ed.,2023	0.001 mg/L
12	Total Residual Chlorine	mg/L	BDL	APHA, 4500-Cl B,24th Ed., 2023	1 mg/L
13	Oil & grease	mg/L	BDL	APH, 5520-B, 24th Ed.,2023	5 mg/L

--End of Report--

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