BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH AT NEW DELHI
O.A. NO. 717 OF 2024

IN THE MATTER OF:

News Item titled "***People Are Breathing in Cancer-Causing Chemicals in their cars study finds***"
Appearing in NDTV.com
Dated 08.05.2024 .... *SUO MOTO*

VERSUS

UNION OF INDIA & ORS. .... RESPONDENTS

N.D.O.H: 28-04-2026

INDEX

S. No.	PARTICULARS	PAGE No.
1.	ADDITIONAL AFFIDAVIT ON BEHALF OF THE RESPONDENT NO.3 INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR) TO THE SUO-MOTO ORIGINAL APPLICATION UNDER THE NATIONAL GREEN TRIBUNAL ACT, 2010 IN TERMS OF ORDER DATED 24.12.2025.	1 - 6
2.	**ANNEXURE A-1:** A COPY OF THE TECHNICAL PROGRESS REPORT.	7 - 17

(SIKRI & COMPANY)
ADVOCATES FOR RESPONDENT No. 3.
229, LAWYERS CHAMBERS,
DELHI HIGH COURT
NEW DELHI 110003
MOBILE NO. 9311331805
EMAIL: sikrico@sikrilaw.com

PLACE: NEW DELHI
DATED: 25.04.2026

BEFORE THE NATIONAL GREEN TRIBUNAL,

PRINCIPAL BENCH AT NEW DELHI

O.A. No. 717 of 2024

IN THE MATTER OF:

News Item titled **"People Are Breathing In Cancer- Causing Chemicals in their cars study find"** appearing in NDTV.com dated 08.05.2024 ... *SUO-MOTO*

Versus

UNION OF INDIA & ORS. ... RESPONDENTS

ADDITIONAL AFFIDAVIT ON BEHALF OF RESPONDENT No. 3- INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR) TO THE *SUO-MOTO* ORIGINAL APPLICATION UNDER THE NATIONAL GREEN TRIBUNAL ACT, 2010 IN TERMS OF ORDER DATED 24.12.2025:

Most Respectfully Showeth:

I, Jagdish Rajesh, S/o Shri R. Jagdish, aged about 58 years, presently working as Deputy Director General (Admin.) in Indian Council of Medical Research (ICMR), V. Ramalingaswami Bhawan, Ansari Nagar, New Dlehi-110029, do hereby solemnly affirm and state as under:

1. That I am presently working as Deputy Director General (Admin.), Indian Council of Medical Research (ICMR), and authorized to file this Affidavit on behalf of Respondent No. 3.

NOTARY R. V. SINGH Advocate Regd. No. 2282 Commission valid upto 24-10-2027 Area-Delhi GOVT. OF INDIA

2

2. That liberty is further craved in making such other and further submissions/filing Additional Affidavits as may be required in the facts of the case subsequently or as may be directed by this Hon'ble Tribunal.

3. That this Hon'ble Tribunal has taken cognizance of the present matter keeping in view the *News Item titled "People Are breathing In Cancer Causing Chemicals in their cars study find" appearing in NDTV.com dated 08.05.2024* and *vide* Order dated 02.07.2024, was pleased to implead the answering Respondent in the instant Original Application on the issue involved in the present matter.

4. That this Hon'ble Tribunal *vide* Order dated 24.12.2025, taking due notice of the previous status report dated 22.12.2025, directed the answering Respondent to file a further detailed progress report at least one week before the next date of hearing, i.e., 28.04.2026. The instant affidavit is being filed in compliance with the said directions on the basis of the information received.

5. That at the outset it is humbly submitted that the detailed proposal provided a target timeline of 18 months for completion of the proposed study. That for convenience, the same is reproduced as hereunder:

Target in months	**0-3**	**4-6**	**7-9**	**10-12**	**13-15**	**16-18**
Recruitment, Procurement of	[redacted]					

NOTARY R.V. SINGH Adv. Regn. No. 2282 Commissioner Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

analytical standards and consumables.						
Preparation of SOP & Method validation.						
Sample collection.						
Analysis of results obtained & interpretation.						
Report preparation, submission & dissemination.						

6. That the answering Respondent has received a comprehensive technical progress report from the Principal Investigator at the ICMR- National Institute of Occupational Health, Ahmedabad. This report details the specific laboratory validations, procurement status and field activities conducted upto April, 2026. A copy of the Technical Progress Report is annexed herewith as **ANNEXURE A-1.**

7. That it is humbly submitted that the answering Respondent in compliance of the directions of this Hon'ble Tribunal had on 22.12.2025 filed a status report detailing the work which had been completed/undertaken since the date of sanction of the project i.e., 24.09.2025 to 22.12.2025 (03 months approx.). The work details as provided therein is as under:

A. The recruitment process of the staff (Two Project Technicians-III and one helper) was completed.

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

4

B. Procurement of Solvents as well as Certified Reference Materials for the three flame retardants was also completed. The procurement of metabolites of the flame retardants and other consumables was under process.

C. Field visits were made to two vehicle agencies for the purpose of enrolling study participants.

D. The procurement of LC-MS equipment was also under process.

8. That it is humbly submitted that the work(s) which have been carried out since the submission of previous progress report dated 22.12.2025 to present day (04 months approx.) is as follows:

A. **Procurement of Chemicals and Consumables:**

i. That the procurement of metabolites of flame retardants which earlier were under process has been completed.

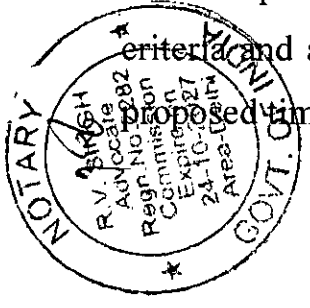
ii. That the procurement of all the necessary laboratory consumables earlier under process has also finished.

B. **Method Validation (4 – 6 months):**

That method development and validation for the analysis of target compounds in 'blood matrices' has been successfully completed. That however, the method developments and validation for urinary metabolites in 'urine matrices' is currently ongoing.

C. **Sample Collection (7 – 12 months):**

That sample collection has been planned in accordance with the pre-defined criteria and administrative formalities have been initiated in lines with the proposed timelines for the same.



5

9. That in light of the above, it is most humbly submitted that the study is progressing in a systematic and time-bound manner as per the proposed timelines as delineated in the original schedule. The answering Respondent is taking all necessary steps for completing the study. That furthermore, the answering Respondent shall be complying with the directions of the Hon'ble Tribunal as and when passed by this Hon'ble Tribunal.

10. **PRAYER**:

That therefore in view of the above submissions, it is humbly prayed that this Hon'ble Tribunal may be pleased to take on record the instant affidavit and consider the submissions made therein.

DEPONENT

जगदीश राजेश / JAGDISH RAJESH
उपमहानिदेशक (प्रशा.) / Deputy Director General (Admn.)
भारतीय आयुर्विज्ञान अनुसंधान परिषद / Indian Council of Medical Research
स्वास्थ्य अनुसंधान विभाग (स्वास्थ्य एवं परिवार कल्याण मंत्रालय)
Department of Health Research (Ministry of Health & Family Welfare)
वी. रामालिंगस्वामी भवन, अंसारी नगर, नई दिल्ली – 110029
V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi-110029

NOTARY
R.V. SINGH
Advocate
Regn.No.2282
Commission
Expire on
24-10-2027
Area-Delhi
GOVT. OF INDIA

6

VERIFICATION:

I, Jagdish Rajesh, S/o Shri R. Jagdish, aged about 58 years, presently working as Deputy Director General (Admin.) Indian Council of Medical Research (ICMR), V. Ramalingaswami Bhawan, Ansari Nagar, New Delhi- 110029, do hereby solemnly affirm and declare, that the above reply has been drafted by our counsel as per instructions and the contents of the reply are true and correct as per official record and the best of my knowledge and belief, no part of it is false and nothing material has been concealed therefrom.

21/11/2017

who has signed in my presence

NOTARY
V. SINGH
Advocate
Regn.No.2282
Commission
Expire on
24-10-2027
Area-Delhi
GOVT. OF INDIA

DEPONENT

जगदीश राजेश / JAGDISH RAJESH
उपमहानिदेशक (प्रशा.) / Deputy Director General (Admn.)
भारतीय आयुर्विज्ञान अनुसंधान परिषद / Indian Council of Medical Research
स्वास्थ्य अनुसंधान विभाग (स्वास्थ्य एवं परिवार कल्याण मंत्रालय)
Department of Health Research (Ministry of Health & Family Welfare)
वी. रामालिंगस्वामी भवन, अंसारी नगर, नई दिल्ली–110029
V. Ramalingaswami Bhawan, Ansari Road, New Delhi-110029

Solemnly affirmed before me, read over & explained to the deponent

Notary Public, DELHI

24 APR 2026

Annexure A-1

7

HUMAN BIOMONITORING OF FLAME RETARDANTS AMONG INDIAN PROFESSIONAL DRIVER: "A CROSS-SECTIONAL COMPARATIVE STUDY"

IntramuralProject/FlameRetardants/NCD-2025 (251611)

Progress Report

Submitted By

Dr. P. SIVAPERUMAL
PRINCIPAL INVESTIGATOR

CHEMICAL SCIENCES DIVISION

ICMR-NATIONAL INSTITUTE OF OCCUPATIONAL HEALTH
RESEARCH, MEGHANINAGAR, AHMEDABAD-380016

INDIAN COUNCIL OF MEDICAL RESEARCH | NATIONAL INSTITUTE OF OCCUPATIONAL HEALTH

Submitted To

INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR)
(MINISTRY OF HEALTH & FAMILY WELFARE)
GOVERNMENT OF INDIA
NEW DELHI – 110 029

8

Contents

T/C

T/C

10

List of Tables

T/C

11

List of Figures

12

IRIS Cell Project ID: IntramuralProject/FlameRetardants/NCD-2025 (251611)

Annual Progress Report: Intramural Project

1. **Project Title:** Human Biomonitoring of Flame Retardants Among Indian Professional Drivers: "A Cross-Sectional Comparative Study".

2. **Name of Principal Investigator: Dr. Sivaperumal, Perumal**
   Address: Scientist-E, Chemical Science Division, ICMR-National Institute of Occupational Health Research, Meghaninagar-Ahmedabad-380016

3. **Name of Co-Principal Investigator:**
   Name of Co-Principal Investigator: Dr. Kuldip Upadhyay,
   Scientist-D, Chemical Science Division, ICMR-National Institute of Occupational Health Research, Meghaninagar-Ahmedabad-380016
   Name of Co-Principal Investigator: Dr. Ankit Viramgami,
   Scientist-D, Health Science Division, ICMR-National Institute of Occupational Health Research, Meghaninagar-Ahmedabad-380016
   Name of Co-Principal Investigator: Dr. Nikhil Kulkarni,
   Scientist-C, Chemical Science Division, ICMR-National Institute of Occupational Health Research, Meghaninagar-Ahmedabad-380016

4. **Date of start:** 03.11.2025

5. **Approved duration of Project:** 1.5 years

6. **Objectives:**
   I. To assess exposure of flame retardants and their metabolites among professional drivers.
   II. To compare biological level of flame-retardants/their metabolite in variable climatic conditions and vehicular stratification.

T/C

13

7. Methodology:

7.1 Study Design (Biological monitoring)

This study adopts a zone-stratified biomonitoring approach to assess human exposure to organophosphate flame retardants (OPFRs)—specifically TCIPP, TDCIPP, and TCEP—with respect to exposure from interior environment of cars. The design considers India's climatic diversity and targets professional drivers with prolonged and routine in-cabin exposure.

7.1.1 Climatic Zone Stratification

Three major climatic zones will be selected to represent thermal and geographic diversity influencing chemical emission patterns:

- Hot and arid zones
- Cold Zone
- Hot and humid zones

7.1.2 Participant Selection and Vehicle Types

In each zone, a total of 60 drivers will be included in study. These will be stratified based on the type of vehicle they operate:

- 20 participants driving SUVs
- 20 participants driving Sedans
- 20 participants driving Hatchbacks

This structure enables comparison across vehicle categories within each climate zone.

7.1.3 Selection criteria for subjects

Inclusion criteria

- An apparently healthy male subjects with age 23-50 years driving car since a minimum of 5 years
- Driver should have average at least 15 days of usage of car in a month

Exclusion criteria:

- Drivers with diabetes and hypertension
- Drivers with known hepato-renal dysfunction in last six month

7.1.4 Selection criteria for control

TC

14

Inclusion criteria

- Apparently healthy age-gender matching subjects who are not commuting in cars more than 5 days in a month with average duration in less than 30 minute

Exclusion Criteria

- Person with diabetes and hypertension
- Person with known hepato-renal dysfunction in last six month

7.1.5 Sampling Scheme and Biological Collection for drivers

Each driver will contribute 2 biological samples, split across two time points:

- Pre-Shift Sampling
  - Urine sample (before shift)
- Post-Shift Sampling
  - Urine sample (after shift)
  - 5 ml Blood sample (after shift)

Therefore, per Driver = 3 biological samples
Per zone = 60 drivers × 3 samples = 180 biological samples
Total across 3 zones = 3 × 180 = 540 biological samples

This design allows for intra-individual pre/post comparison as well as inter-vehicle and inter-zone exposure profiling.

Sampling Framework by Zone

Zone	Vehicle Type	Participants	Samples per Participant	Total Samples per Vehicle Type	Total Samples per Zone
Hot and arid Zones	SUV	20	3 (1 pre + 2 post)	60	180
	Sedan	20		60	
	Hatchback	20		60	

15

Zone	Vehicle Type	Participants	Samples per Participant	Total Samples per Vehicle Type	Total Samples per Zone
Cold Zone	SUV	20	3 (1 pre + 2 post)	60	180
	Sedan	20		60	
	Hatchback	20		60	
Hot and Humid Zone	SUV	20	3 (1 pre + 2 post)	60	180
	Sedan	20		60	
	Hatchback	20		60	
Total	–		–	–	540 Biological Samples

7.1.6 Sampling Scheme for Controls

A control group comprising 50% of the total number of selected subjects will be included for comparative analysis. 5 ml of blood samples will also be drawn from these control participants. Accordingly, the total number of controls selected would be

Per zone: 50% of 60 subjects = 30

Total number of controls: 30 x 3 = 90

No. of samples for control and their duration:

Urine sample: 1

Blood sample: 1

Therefore, per participant = 2 biological samples

Per zone = 30 participants × 2 samples = 60 biological samples

TC

16

Total across 3 zones = 3 × 60 = 180 biological samples

Type of samples	Driver group	Control group	Total samples
Urine samples	360	90	450
Blood samples	180	90	270
Total Samples	540	180	720

8. Detail progress of the work carried out during the period:

A. Staff Recruitment

The recruitment of project staff has been successfully completed in accordance with the project requirements.

B. Procurement of Laboratory Consumables

All necessary laboratory consumables have been procured, including certified reference materials (CRMs) for flame retardant compounds such as TDCIPP, TCIPP, and TCEP, along with their respective metabolites. Additionally, essential solvents and reagents, including acetonitrile, n-hexane, methanol, formic acid, sodium chloride, magnesium sulfate ($MgSO_4$), and LC-MS grade water, have been procured to support analytical work.

C. Field Visit for Identification of Suitable Study Participants

Field visits were conducted at two vehicle agencies located in Ahmedabad and Gandhinagar, representing hot and arid zones. Discussions were held with the agencies to facilitate the enrollment of study participants across three categories of vehicle drivers.

D. Method Development and Validation

Method development and validation for the analysis of target compounds in blood matrices have been successfully completed, whereas method development and validation for urinary metabolites in urine matrices is currently ongoing.

17

9. A summary sheet of not more than two pages under following heads (Title, Introduction, Rationale, Methodology, Results, Translational Potential)

9.1 Title:

Human Biomonitoring of Flame Retardants Among Indian Professional Drivers: "A Cross-Sectional Comparative Study".

9.2 Introduction

India's rapidly expanding passenger vehicle sector has significantly increased the use of synthetic materials such as polyurethane foams, plastic composites, and textiles in vehicle interiors, enhancing comfort and aesthetics. However, these materials often contain semi-volatile organophosphate flame retardants (OPFRs) like TCIPP, TDCIPP, and TCEP, which are not chemically bound and gradually off-gas into the cabin environment. This emission is further intensified by high ambient temperatures in India, where parked vehicles can exceed 50°C, leading to elevated concentrations of these chemicals inside cars. Consequently, drivers and passengers face continuous exposure through inhalation, dermal contact, and ingestion of contaminated dust, raising potential health concerns including endocrine disruption, neurotoxicity, and other long-term effects. In response, the proposed research aims to comprehensively evaluate the health risks associated with flame retardant exposure among drivers by collecting and analysing air, dust, and biological samples. The study will employ advanced analytical techniques such as GC-MS/MS and LC-MS/MS, along with human biomonitoring and exposure modelling, to better understand exposure pathways, quantify risks, and support the development of safer automotive material standards and public health guidelines.

9.3 Rationale:

- Increasing use of synthetic materials in vehicle interiors has led to the incorporation of organophosphate flame retardants (OPFRs), which can be released into cabin air and dust, especially under high-temperature conditions common in India
- This results in continuous exposure of occupants, with drivers being particularly vulnerable due to prolonged time spent inside vehicles
- Elevated in-vehicle temperatures significantly enhance the off-gassing and accumulation of these chemicals
- There is a lack of India-specific data on OPFR levels and their associated health risks
- Absence of regulatory standards for in-cabin air quality and chemical emissions further increases concern
- A systematic assessment is needed to evaluate real-world exposure and health risks