

Contents

Foreword — VII

Preface — IX

List of contributors — XIII

Ravi Naidu, Anthony Umeh, Yanju Liu and Mallavarapu Megharaj

Chapter 1

Per- and polyfluoroalkyl substances in the environment: issues and challenges — 1

Samarasinghe Vidane Arachchige Chamila Samarasinghe, Ayanka Wijayawardena, Anwar Ul Haq Khan, Yanju Liu and Ravi Naidu

Chapter 2

PFAS: an overview of their physicochemical properties and implications — 13

Olalekan Simon Awoyemi, Ravi Naidu, and Cheng Fang

Chapter 3

Sources of PFAS in the environment — 61

Mujtaba Baqar, Biting Qiao, Yiming Yao and Hongwen Sun

Chapter 4

Occurrence, nature, and extent of PFAS contamination in the environment — 83

Christian Vogel and Danny Slee

Chapter 5

Analytical techniques for per- and polyfluoroalkyl substances (PFAS) — 143

C. Zwiener, B. Bugsel and J. Zweigle

Chapter 6

Nontarget screening approaches for PFAS and their applications on contaminated sites — 169

Anthony C. Umeh, Ravi Naidu

Chapter 7

Dynamic transport, sorption, and desorption of PFAS in water-saturated and unsaturated soils — 201

Alvin Lal, Ravi Naidu and Charles J. Newell

Chapter 8

From contamination to clarity: evaluating the role of groundwater modeling in managing and remediating PFAS plumes — 319

Roger Brewer

Chapter 9

Assessment of environmental risk — 337

Zhong-Min Li, Wenlong Li and Kurunthachalam Kannan

Chapter 10

Biomonitoring and health effects of PFAS exposure — 399

Hesham Taher and Rainer Lohmann

Chapter 11

Bioaccumulation of legacy and novel PFAS in the environment — 495

Chuks Kenneth Odoh, Yanju Liu, SVA Chamila Samarasinghe
and Ravi Naidu

Chapter 12

Toxicity of per- and polyfluoroalkyl substances (PFAS) in plants and microbes — 519

Poonam R. Kulkarni, Jens Blotevogel and Charles J. Newell

Chapter 13

PFAS treatment and remediation — 567

Ravi Naidu, Olalekan Simon Awoyemi, Anthony Umeh and Cheng Fang

Chapter 14

A zero PFAS future: transitioning away from forever chemicals — 599

Mark Bowman, Clough Mark, Francis C Ramacciotti, Tamara House-Knight,
Ian Collins, Jacquelyn England, Drew Morgan and Ravi Naidu

Chapter 15

Regulatory perspectives on PFAS — 615

Index — 631