

Status of Contaminated Sites in India

1. Background

There are several contaminated dumpsites in the country where hazardous and other wastes were dumped historically, which has most likely resulted in contamination of soil, groundwater and surface water that pose a risk to human health and the environment. Most of the contaminated sites were created when industrial hazardous wastes were disposed by occupiers in unscientific manner or in violation of the rules. Some of the sites were developed when there was no regulation on management of hazardous wastes. In some instances; polluters, responsible for contamination have either closed down their operations or the cost of remediation is beyond their capacity, thus the sites remains a threat to the environment. These contaminated sites need to be investigated in detailed and remediated on priority, to levels that are acceptable considering human health risks and the environment by adopting appropriate remediation technologies.

Contaminated sites may include landfills, dumps, waste storage & treatment sites, spill sites, chemical waste handling & storage sites.

Contaminated sites often pose multi-faceted health and environmental problems. Dumping or spillage of hazardous wastes or chemicals would adversely impact/affect the surrounding environment, particularly soil, surface water and groundwater and as result, people in impact zone are knowingly or unknowingly exposed to toxic substances. These sites need to be investigated in detail and thereafter remediation activity should be carried out to reduce human health risks and environmental impacts by adopting appropriate remediation technologies.

Remediation of contaminated sites involves cleaning of contaminated media i.e. soil, groundwater, surface water and sediments by adopting various in-situ or ex-situ clean-up technologies up to a pre-defined remediation target levels for each identified constituent. Site specific target levels (SSTLs) for remediation are decided for each site separately adopting risk based assessment approach. Risk based SSTLs for remediation can be derived from either quantitative or qualitative human health risk / ecological risk caused by a particular constituent of concern based on source-pathway-receptor scenario of contaminated site. SSTL for a site is decided after considering various factors such as; cost of remediation, type of intended future land use, feasibility of a remediation technology, etc.

2. Initiatives on Inventory and Implementation of Assessment and Remediation of contaminated sites

There is limited experience in the country on remediation of contaminated sites. Projects initiated by MoEF&CC under Capacity Building for Industrial Pollution Management Project (CBIPMP) and National Clean Energy Fund (NCEF) are providing to understand the gaps in existing institutional & legal framework and also for deriving an implementation framework by undertaking actual remediation projects as pilot basis.

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MoEF&CC had implemented “Capacity Building Program for Industrial Pollution Management Project (CBIPMP) (2010-17) to formulate National Program for Remediation of Polluted Sites (NPRPS) that includes following Assignments:

- (i) **Assignment-1:** Inventory of mapping and probable contaminated sites
- (ii) **Assignment-2:** Development of Guidance document for assessment and remediation of contaminated sites
- (iii) **Assignment-3:** Development of legal, institutional and financial framework for remediation of contaminated sites

3. Action Taken on Assessment and Remediation of Contaminated Sites

- i) **103 sites** have been identified as **confirmed contaminated sites**. Out of which;
 - a) Remediation underway : 07 sites
 - b) Detailed Project Reports (DPRs) completed & Remediation required : 10 sites
- ii) For remaining **93 probable contaminated sites**, investigation is underway by SPCBs/PCCs.

4. Available Guidance Documents for Assessment and Remediation of contaminated sites

- i) “Guidance document for Assessment and Remediation of Contaminated Sites in India” by MoEF&CC” in 2017.

The Guidance document prepared under the “Capacity Building Program for Industrial Pollution Management Project (CBIPMP) b MoEF&CC, comprising over all approach for Assessment and Remediation of Contaminated Sites, which includes three Volumes as below:

- **Volume I:** Methodologies & Guidance
- **Volume II:** Standards & Checklists
- **Volume III:** Tools & Manuals

A general framework of methodologies & guidance document covering the entire process of intervention at a contaminated site, from its initial identification to post remediation measures, has been developed with the following 14 distinct steps:

- Step-1:** Identification of suspected/probably contaminated sites
- Step-2:** Preliminary Investigation of suspected/probably contaminated sites
- Step-3:** Notification of contaminated sites
- Step-4:** Include in list of contaminated sites
- Step-5:** Remedial Investigation & Risk Assessment
- Step-6:** Remedial design, selection of option, detail costing, & DPR
- Step-7:** Approval of DPR & funding requirements and financing mechanisms
- Step-8:** Implementation of Remediation
- Step-9:** Validation and approval of remediation works

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Step-10: Post remediation plan

Step-11: Post remediation action

Step-12: Cost recovery

Step-13: Deletion from list of contaminated sites

Step-14: Site reuse/re-development

- ii) "Reference document on Identification, Inspection and Assessment of Contaminated Sites" by CPCB in 2020.
- iii) "Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Waste and Penalty" by CPCB in 2016.

Table-3: State wise distribution of CS & PCS as on March, 2025

S. No.	States/UTs	Updated status as on March, 2025			Remediation Work underway	DPR completed & Remediation required
		Total Sites	Probable Sites (PCS)	Contaminated Sites (CS)		
1	Assam	2	2	0		
2	Chhattisgarh	4	2	2		
3	Delhi (NCR)	7	1	6		
4	Goa	3	2	1		
5	Gujarat	13	3	10	1	
6	Haryana	13	9	4		
7	Jharkhand	14	12	2		
8	Karnataka	22	12	10		
9	Kerala	3	0	3		2
10	Madhya Pradesh	9	5	4		1
11	Maharashtra	6	0	6	1	
12	Odisha	30	7	23	1	1
13	Punjab	6	0	6		1
14	Rajasthan	6	2	4		
15	Tamil Nadu	11	4	7	2	1
16	Telangana	10	7	3		1
17	Uttar Pradesh	30	19	11	2	2
18	West Bengal	7	6	1		1
Total		196	93	103	7	10
