

Status of Contaminated Sites in India

1. Background

Several contaminated dumpsites are in various parts of country, where hazardous and other wastes were dumped historically and which resulted in contamination of soil, groundwater, sediment and surface water thereby posing health and environmental risks. Most of the contaminated sites created when industrial hazardous wastes had been disposed by occupiers in unscientific manner or in violation of the rules prescribed. Some of the sites were developed historically when there was no regulation on management of hazardous wastes. In some instances, polluters, responsible for contamination, have been either closed down their operations or the cost of remediation is beyond their capacity, thus the sites remains a threat to the environment.

Contaminated sites may include production areas, landfills, dumps, waste storage and treatment sites, mine tailings sites, spill sites, chemical waste handler and storage sites located in various land-uses. Basic types of contaminated sites are as under:

- "Point" sites, such as dumps of waste or individual contaminated facilities;
- "Area" sites, a site within a broader area of on-going and legacy contamination where the site of concern needs to be addressed in this wider context. An example of this is an individual dump within an industrial area, where there are also other sources of pollution;
- "Municipal dumps", which may contain hazardous substances dumped before the municipality gained effective control;
- "Brown-fields", which may or may not have clear ownership and which have development potential if the contamination problems can be successfully resolved;

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. hazardous waste, soils, groundwater, surface water and sediments by adopting various in-situ or ex-situ clean-up technologies up to a predefined remediation target levels for each identified constituent.

2. Definitions

As per the guidance document published by MoEF&CC, definitions of probably contaminated and contaminated sites are given below:

- (i) **Probably Contaminated Sites:** "Sites with alleged (apparent, purported) but not scientifically proven presence of constituents of contaminants or substances caused by humans at concentrations and characteristics which can either pose a significant risk to human health or the

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environment with regard to present or future land use plan [pattern] or exceeding specific concentrations or standards prescribed for human health and or the environment"

- (ii) **Contaminated Sites:** "Contaminated sites are delineated areas in which the constituents and characteristics of the toxic and hazardous substances, caused by humans, exist at levels and in conditions which pose existing or imminent threats to human health and/or the environment".

3. Action Taken on Assessment and Remediation of Contaminated Sites

There are 240 sites in 21 States, out of which 127 are contaminated sites and the remaining 113 sites identified as probable contaminated sites. Progresses have been observed in terms of preparation of DPRs and execution of remediation works. The details of the same are as below:

- i. Remediation works have been initiated in 13 sites, covered in 06 States namely; Gujarat (2), Jharkhand (1), Maharashtra (1), Tamil Nadu (2), Odisha (4) and Uttar Pradesh (3). These remediation works have been taken up primarily by the responsible party/industry as per the directions of Hon'ble NGT and are being monitoring by CPCB and concerned SPCBs. Details of these sites is given at **Table-1**.
- ii. Preparation of DPR is completed & Remediation required for 11 sites, in States namely; Kerala (3), Telangana (1), Tamil Nadu (1), Uttar Pradesh (5) and West Bengal (1). These remediation works may take up primarily by the responsible party/industry and will be monitored by concerned SPCBs (Ref.: **Table-2**).
- iii. Preparation of DPR is underway in 4 sites, in States namely; Madhya Pradesh (3), and Goa (1) (Ref.: **Table-2**).

Table-1: List of 13 sites for which remediation works initiated by Responsible Parties

S. No.	Name of the Site	CoCs	Action taken/Initiated by SPCB
1.	Effluent Channel Project Limited (ECPL), Baroda Effluent Canal, Vadodara District, Gujarat	Chromium, Lead, Arsenic, Cadmium, Mercury, Phenolic compounds, Color, Sulphate, Chloride, & TDS (COD)	Remediation work is underway by Dye-manufacturing and Pharmaceutical industries (Responsible Parties).
2.	Swastik Organic, Sabar Dairy Road, Piplodi, Gujrat	Zinc, Lead, VOCs, Aromatic Hydrocarbons (BTEX), Color	i) Hazardous waste lying at the site was already lifted and disposed of through TSDF. ii) In the downstream at village Boriya Khurad, groundwater samples of few bore-wells were

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S. No.	Name of the Site	CoCs	Action taken/Initiated by SPCB
			reported as contaminated with reddish brown coloured water. iii) Remediation work is underway.
3.	Roro hills, Jharkhand - 833201	Asbestos	Remediation of the site is underway by Dept. of Mining, Jharkhand.
4.	M/s Godavari Bio-Refineries, Ahmed Nagar District, Maharashtra	colour and elevated values of COD, SO ₄ , Chlorides and volatile fatty acids	Contaminated groundwater is being remediated by applying Bioremediation technique and the same is underway.
5.	Dumpsite JCL-I (Outside the Premises of M/s Jayshree Chemicals Ltd Near Rushikulya River), Odisha	Mercury	i) DPR has been prepared under NCEF project of MoEF&CC and CPCB. ii) Remediation work as per DPR is underway by Responsible Party.
6.	Dumpsite JCL-III (Outside the Premises of M/s Jayshree Chemicals Ltd Near Rushikulya River), Odisha		
7.	Jayashree Chemicals, Ganjam, Odisha		
8.	Site OCL-I, ORICHEM abandoned site (inside the premises of M/s Orichem Ltd and also outside the boundary of wall), Talcher, Odisha	Hexavalent Chromium	i) DPR has been prepared under NCEF project of MoEF&CC and CPCB. ii) As per direction of OSPCB, lifting & disposal of hazardous waste to TSDF followed by stabilization is underway.
9.	M/s HUL, Kodaikanal, Tamil Nadu	Mercury	Trail remediation was done by M/s HUL. Soil remediation by applying Soil washing and Vacuum retorting is underway by M/s HUL.
10.	Tondairpet, Chennai, Tamil Nadu	Petroleum Hydrocarbons, DRO, GRO, etc.	Remediation of the site by applying Soil Vapour Extraction is underway by M/s BPCL.

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S. No.	Name of the Site	CoCs	Action taken/Initiated by SPCB
11.	Khanchandrapur, Rania Kanpur Dehat, UP	Hexavalent Chromium	DPR has been prepared under NCEF project of MoEF&CC and CPCB. Lifting & disposal of Cr(VI) contaminated hazardous waste through TSDFs followed by stabilization is underway.
12.	Industrial Area Meerut Road, Ghaziabad, Uttar Pradesh	Hexavalent Chromium	Cr(VI) in groundwater is remediated by applying: (i) Pump & Treat (P&T) technique, (ii) Bioremediation technique, Remediation work is underway since 2012.
13.	Lohia Nagar C Block, Ghaziabad		

4. Summary on Action Taken

1. Total No. of Sites covering in 21 states (Status as on Dec., 2022)	240*
2. No. of Probable contaminated sites (Preliminary site Assessment is underway)	113
3. No. of Contaminated sites	127
- Detailed Project Reports (DPRs) completed/Remediation required	12
- Detailed Project Report (DPR) is underway	04
- Remediation (on-going)	13
- Detailed Site Investigation Study required	56
- Preliminary site Assessment is underway	42

* Inventory of contaminated sites in India is given at 'Table-2'.

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Table-2: RD-wise list of Contaminated/Probable Contaminated Sites and actions initiated by SPCBs/PCC								
S. No.	CPCB-RD	States/UT	Updated status as on 09.12.2022			Remediation Work (Underway)	DPR completed & Remediation required	DPR preparation underway
			Total Sites	Probable Contaminated Sites (PCS)	Contaminated Sites (CS)			
1	RD-Chennai	Andhra Pradesh	2	2	0			
2	RD-Shillong	Assam	3	2	1			
3	RD-Bhopal	Chhattisgarh	5	3	2			
4	RD-Chandigarh	Delhi (NCR)	15	5	10			
5	RD-Bengaluru	Goa	3	2	1			1
6	RD-Vadodara	Gujarat	24	15	9	2		
7	RD-Chandigarh	Haryana	14	10	4			
8		Himachal Pradesh	1	0	1			
9	RD-Kolkata	Jharkhand	14	12	2	1		
10	RD-Bengaluru	Karnataka	23	13	10			
11		Kerala	9	5	4		3	
12	RD-Bhopal	Madhya Pradesh	13	6	7			3
13	RD-Pune	Maharashtra	6	0	6	1		
14	RD-Kolkata	Odisha	32	7	25	4		
15	RD-Chandigarh	Punjab	9	0	9			
16	RD-Bhopal	Rajasthan	4	2	2			
17	RD-Chennai	Tamil Nadu	11	5	6	2	1	
18		Telangana	10	7	3		1	
19	RD-Lucknow	Uttar Pradesh	34	11	23	3	6	
20		Uttarakhand	1	0	1			
21	RD-Kolkata	West Bengal	7	6	1		1	
Total			240	113	127	13	12	4