

**CLEAN UP MEASURES AND  
ENVIRONMENTAL IMPROVEMENT OF  
ILLEGAL HAZARDOUS DUMP SITES**

**REPORT**

**Submitted to the  
Uttar Pradesh Pollution Control Board, Lucknow**

**By**

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## **PROJECT PERSONNEL**

### **IITR Participants**

Dr. Virendra Misra	Principal Investigator
Dr. Krishna Gopal	Co-Principal Investigator
Dr. R.C. Murthy	Co-Principal Investigator
Miss Anjana Tiwari	Project Assistant
Mr. Bhaskar Shukla	Project Assistant
Miss Preeti Dixit	Project Assistant

### **UPPCB Participants**

Dr. C. S. Bhatt	Member Secretary
Er. S. K. Singh	Chief Environmental Engineer
Er. Brajesh Malaviya	Environmental Engineer
Er. Rajendra Singh	Assistant Environmental Engineer

## **Acknowledgements**

We express our sincere thanks to Dr. C. M. Gupta, Ex-Director and Dr. Ashwani Kumar, Acting Director, Indian Institute of Toxicology Research, Lucknow for their keen interest in this study. Thanks are due also to the timely leads taken by Uttar Pradesh Pollution Control Board (UPPCB) for giving an opportunity to work in major societal important project entitled "Clean up Measures and Environmental Improvement of Illegal Dumpsites" and for financial support. We are grateful to Dr. C. S. Bhatt, Member Secretary, UPPCB, Er. S.K. Singh, Chief Environmental Engineer, UPPCB, Dr. Y.P. Singh, Director, Department of Environment, Uttar Pradesh and Regional Officers of UPPCB at Kanpur, Lucknow and Ghaziabad for their cooperation and support in making our efforts a success. Thanks are also due to various other sections of IITR for extending their help like RPBD and Library and Information Centre. IITR considers it a fortuitous privilege to do the best in this direction and to be involved in follow up studies in this important programme.

## **INTRODUCTION**

The rapid growth of the industry has entirely changed the waste generation scenario in the country. The quantity of waste generated has increased appreciably and the nature of waste generated has become complex. Wastes typically contain a mixture of materials which possess different characteristics and commercial value and will have different composition, physical and chemical properties and thus different intensity of toxicity depending upon the process used for the processing, type of raw material used and then from where it is generated. Of the various types and categories of wastes generated some of them can be recycled and reused to recover metals present in them while rest can be disposed off. Current disposal practice of these solid wastes in India is dumping or stockpiling, but this mode of disposal is now questionable from environmental and economic point of view. The management of these contaminated sites is of great concern in view of the health and environmental risk associated with such sites. Apart from their immediate and direct health and environmental threats, contaminated sites can contribute to the long term deterioration of ambient air, soil, surface water, ground water resources and food chain. Such detrimental effects are inevitable if the contaminated sites are not managed effectively. For this, the remediation of contaminated site is utmost important.

### **Background information**

Information regarding the scenario of hazardous waste generation, status of hazardous waste units, and status of TSDF (Treatment, storage and disposal facilities) and status of incinerators in Uttar Pradesh is given below:

**Table 1: Scenario of Hazardous Waste Generation in Uttar Pradesh as on  
15.11.2007**

Wastes	TPA
Recyclable	117887.366
Incinerable	15193.175
Landfillable	36111.275
Total Amount of Waste Generated	169191.82

**Table 2: Status of HW Units in the state as on 15.11. 2007**

S. No.	HW Units in the state	Quantity
a)	No. of HW generating units in the State / UT	1915
b)	No. of HW generating units for which authorization has been granted	1339
c)	No. of HW generating units for which authorization is under process	283
d)	No. of HW generating units not applied for authorization or for renewal but running without valid authorization	86
e)	Total No. of HW generating units for which closure directions were issued since October, 2003	199
f)	Total No. of HW generating units for which closure directions were revoked since October, 2003	86
g)	Total No. of hazardous waste generating units closed since October, 2003 by the SPCB/PCC	113

**Table 3: Status of TSDFs (Treatment, Storage & Disposal Facilities) as on 15. 11. 2007**

S. No.	TSDFs	Quantity
a)	No. of TSDFs in operation	3
b)	No. of TSDFs under construction	1
c)	No. of Sites notified	3
d)	No. of Sites identified	5

**TSDFs Sites Proposed**

- Bulandshahar
- Mujaffar Nagar

**Table 4: Status of Incinerators as on 15. 11. 2007**

S. No.	Incinerators	Quantity
a)	Total No. of Incinerators in operation	14
	i) No. of Common Incinerators	1
	ii) No. of Captive Incinerators	13
b)	Total No. of Incinerators under installation	NIL
	i) No. of Common Incinerators	NIL
	ii) No. of Captive Incinerators	NIL

**Scope of Work:**

1. Inventorization of potential hazardous waste generating industries and their location in the district, products manufactured and quantities of waste generated in MTA based on information available.
2. Collection of water samples from the hand pump located around the solid waste dumpsite and soil samples from different identified locations from (0 ft to 40 ft depth) for analysis of selected parameters.
3. Recommendation on clean up measures and environmental improvement of the sites such as safe disposal of hazardous wastes, suggestion of suitable methods of treatment and disposal.

**1. Inventorization of potential hazardous waste generating industries and their location in the district, products manufactured and quantities of waste generated in MTA based on information available.**

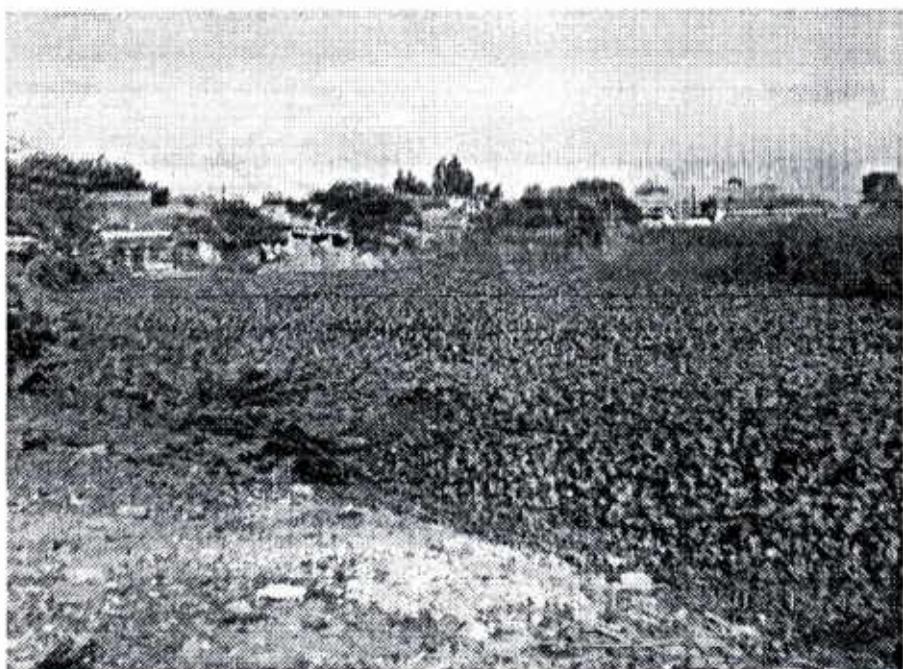
The responsibility of survey of the illegal dumping sites identified by UP Pollution Control Board for clean up measures and environmental improvement on Kanpur and Kanpur Dehat, Lucknow and Ghaziabad was bestowed on ITRC by Uttar Pradesh Pollution Control Board. A team of ITRC Scientist went to above sites along with the respective member of the Regional Office of U.P. Pollution Control Board and gathered the relevant information on specific site. The details are given below:

## **KANPUR and KANPUR DEIHAT**

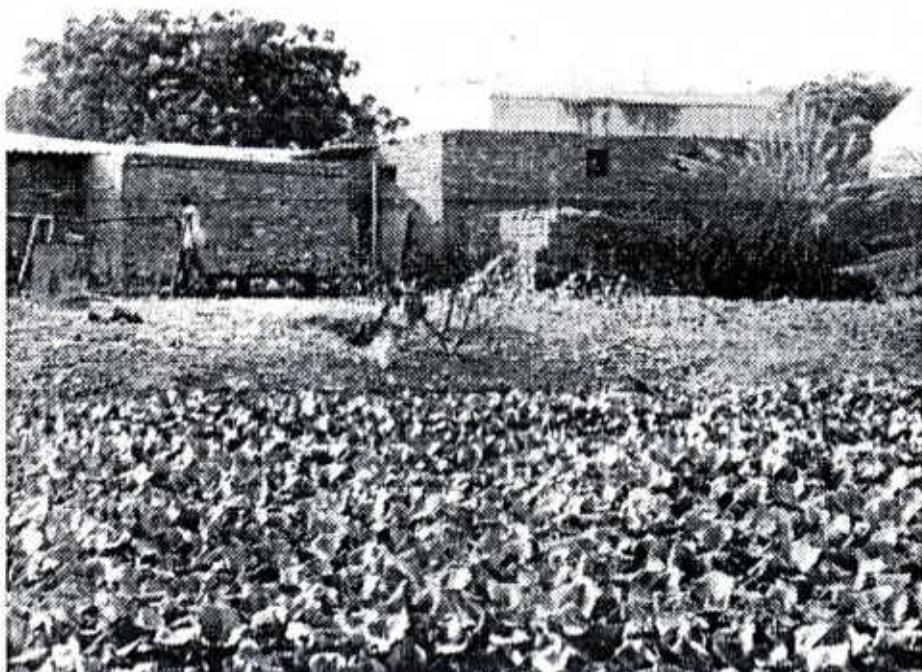
In order to evaluate the impact of hazardous solid waste at illegal waste dumping sites, a team of ITRC Scientists consisting of Dr. Virendra Misra, Dr. Krishna Gopal and Dr. R.C. Murthy visited the UPPCB Regional Office, House Number 5243, Sadbhavna Nagar, UP Avas Vikas Colony, Phase 3, Kalyanpur, Kanpur. They held discussions with Regional Officer Er. S.R. Sachan and Assistant Engineer, Mr. Rajendra Prasad. Mr. Rajendra Prasad accompanied the team to the following illegal dumping sites identified by UPPCB and collected the available information for the nature and characterization of hazardous waste present in the area and the impact of the hazardous waste dump sites on the environment. No information on the technical details of the waste and its quantum could be provided by the UPPCB, Kanpur office.

### **Site 1- Nauraiyakheda**

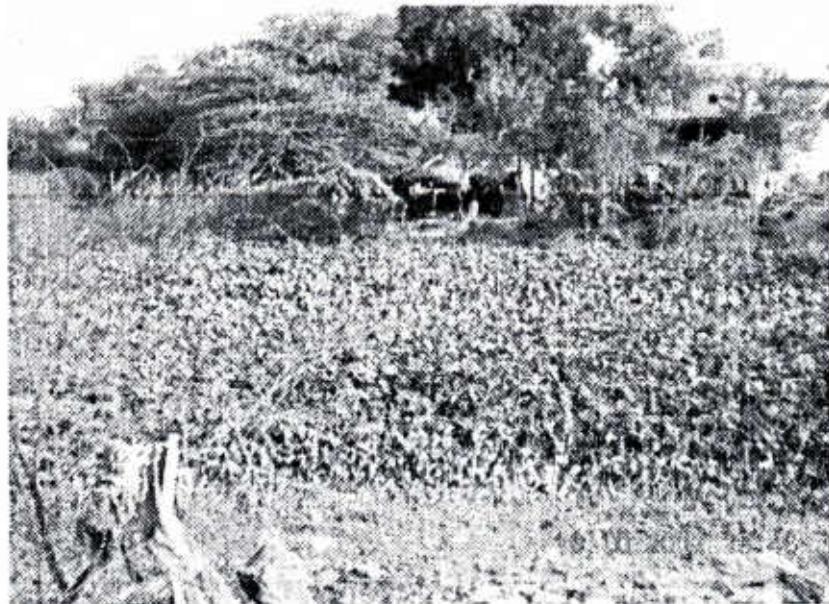
The dumping site covers an area of 6000 square feet filled with water hyacinth and other vegetation. Human settlement 7000-8000. The exact area of the site could not be ascertained due to construction of houses on dump site. Approx. 15,000 Tonnes of waste has been dumped in this area. Main generator was Ashoka Chemicals Pvt. Ltd. (Basic Chrome Sulphate) presently factory closed (long back factory dismantled). Many small-scale industrial units have disposed their wastes and effluents surround the site. Some of them are steel welding, electroplating, powder coating, metal phosphating, sodium hypochlorite trading units. Some lead acid battery waste was also dumped in the area. It was informed that the site was being used for dumping wastes for the last twenty to twenty-five years. Water is not safe for drinking.



Site 1- Nauraiyakheda



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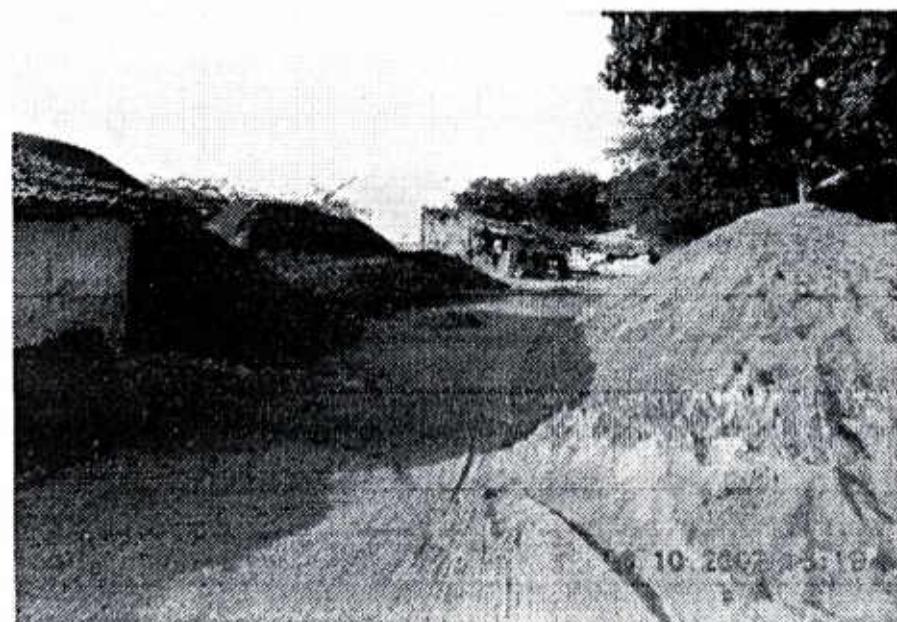


#### Site 1- Nauraiyakheda

#### **Site 2- Juhi Baburaiya (Rakhi Mandi)**

This site covers approximately 5-6 acres of land. The area is densely populated with settlement and households. There is no fresh dumping of waste material. It was informed by the people in the area that about 20-25 years back, the waste from Kanpur Chemicals (engaged in manufacture of BCS) situated about 10 km from the site at Jarib Chowki was dumped at the site. Approx. 10,000 Tonnes of waste has been dumped in this area. Presently the waste is buried at the depth of 3 – 5 ft below the surface. At present the site is very uneven and is being utilized mainly for coal ash dealing (from rubber, foundries and paper industries) and is called as Rakhi Mandi. The exact area of the site could not be ascertained due to construction of houses on the dump site. There is no piped water supply and no sewer line. Water up to 100 feet is contaminated and the water from India Mark II hand pump at a depth of 120 feet is clear. However, it was reported that the cooking of pulses is found difficult due to the hardness of water and the taste is not good. It was observed that a shallow hand pump drawing water from 60-70 feet is slightly yellow and greenish in colour showing the possibility of chromium in the strata. Area of influence of Cr contamination was reported to be around 1-2 km. Main trees in the area are acacia, peepal, gular, neem. Out of 10 India Mark II hand pumps only 5 are in working condition. The residents are ignorant about the health problems associated with the contaminated water. Keeping view of

the environmental conditions, there is a pressing need to conduct a detailed health survey of the residents of the area.



**Site 2- Juhi Baburaiya (Rakhi Mandi)**



**Site 2- Juhi Baburaiya (Rakhi Mandi)**











Table 5: List of Industries in Kanpur covered under Hazardous Waste Rules, 1989

S.N.	Name and address of the unit	Products manufactured in MTA	Hazardous Waste (HW) Generating process as per Schedule 1	HW generating streams as per	HW Generation in MTA as per	HW Generation in MTA as per	Quantity of HW in MTA		
							Sch. 1	Sch. 2	Sch. 1
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)=(7)+(8)	(9)=(7)+(8)
1	M/S Aaisha Tanning Industries, 3-A, 150+Feet Road, Jajmau, Kanpur	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5
2	M/S Aaj Tannery, Sheetla Bazar, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25
3	M/S Aatif Tannery, 103/98-C, Gajipurwa, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25
4	M/S Abdullahi Tannery Pvt. Ltd., 16V, Gajipurwa, Jajmau, Kanpur	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5
5	M/S Affaaq Export, 327/304, Jajmau Kanpur	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5

6	M/S International, 367-Sanjay Nagar, Jajmau, Kanpur	Ahmad	720	30	30.1 30.2	-	45.0	-	45.0	45.0	-
7	M/S Ahmad Tanning Industries, 3-B, Jajmau, Kanpur	Finished Leather	180	30	30.1 30.2	-	11.25	-	11.25	11.25	-
8	M/S Aizaz Tannery (A.R.K. International), 150 Feet Road, Jajmau, Kanpur	Finished Leather	720	30	30.1 30.2	-	45.0	-	45.0	45.0	-
9	M/S Akhtar Tanners, 112-A, Wazidpur, Jajmau, Kanpur	Finished Leather	180	30	30.1 30.2	-	11.25	-	11.25	11.25	-
10	M/S Alig Industries, 36-A, 150 Feet Road, Jajmau, Kanpur	Finished Leather	600	30	30.1 30.2	-	37.5	-	37.5	37.5	-
11	M/S Alig International, 541-150, Jajmau Road, Jajmau, Kanpur	Finished Leather	720	30	30.1 30.2	-	45.0	-	45.0	45.0	-
12	M/S Alladad Tannery, 99/85-A, Jajmau Road, Wazidpur, Jajmau,	Finished Leather	720	30	30.1 30.2	-	45.0	-	45.0	45.0	-

13	Kanpur	M/S Allied & Allied Leather Product, 51, Wazidpur, Jajmau, Kanpur	450 Finished Leather	30 30.1 30.2	- 28.12	- 28.12	- 28.12	- 28.12
14	M/S Almejan Tanning Industries, 94 'A' Wazidpur, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- 11.25
15	M/S Alribhar Leather Pvt. Ltd., 173/157 A-3, Budhiya Ghat, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- 11.25
16	A/S Amaan Tanners II (Alfa Enterprises) 150 Feet Road, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- 22.5
17	M/S Amaan Tanners, 104/90 A(20) 150 Feet Road, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- 22.5
18	M/S Arif Usman Tannery (Ashif Leath.), 150 Feet Road, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- 11.25

19	M/S Asia Tannery Pvt. Ltd.	1-A, Jajmau, Kanpur	900 Finished Leather	30	30.1 30.2	-	56.25	-	56.25	-	-
20	M/S Tanners,	Aslam 560 Wazidpur, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-
21	M/S Tannery,	Aslam Budhiya Ghat, Kanpur	60 Finished Leather	30	30.1 30.2	-	3.75	-	3.75	3.75	-
22	M/S Best Tanning Industries Ltd.,	Pvt. 150 Feet Road, Kanpur	360 Finished Leather.	30	30.1 30.2	-	22.5	-	22.5	22.5	-
23	M/S Tanning Industries,	Bharat 150 Feet Road, Wazidpur, Jajmau, Kanpur	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5	-
24	M/S Blue Star Finishers,	180 996, Wazidpur, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-
25	M/S Bright Tannery (near Zaz Impax)	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-	-
26	M/S Bright	360	30	30.1	-	22.5	-	22.5	22.5	-	-

	Tanning Industries, 380/1-D Street, Kanpur	Iqbal Jajmau,	Finished Leather	30.2					
27	M/S Tanners, 103-104 'A' Wazidpur, Jajmau, Kanpur	Carvan 360 Finished Leather	30 30.2	30.1 30.2	-	22.5	-	22.5	22.5
28	M/S Leather, Wazidpur, Jajmau, Kanpur	Century 360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5
29	M/S Tannery, 192/184, Ram Rai Sarai, Jajmau, Kanpur	Crown 180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25
30	M/S Daimond Tannery Finishers, 40/39, Gajjupurwa, Jajmau, Kanpur	Daimond 180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25
31	M/S Decent Leather Finishers, 40/39, Gajjupurwa, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25
32	M/S Leathers Ltd., 101/87 Wazidpur, Jajmau, Kanpur	Euroashia 720 Finished Leather	30	30.1 30.2	-	45.0	-	45.0	45.0
33	M/S Everest	360	30	30.1	-	22.5	-	22.5	22.5

	Exports, B(3) Ghat, Kanpur	175/15\$ Budhiya Jajmau,	Finished Leather	30.2				
34	M/S Tanners, Budhiya Ghat, Jajmau, Kanpur	Everest 184-C2, Budhiya Ghat, Jajmau, Kanpur	180 Finished Leather	30 30.2	30.1 30.2	- -	11.25 11.25	11.25 11.25
35	M/S Tanning Ind., 184-B, Budhiya Ghat, Jajmau, Kanpur	Everest 180	Finished Leather	30 30.2	30.1 30.2	- -	11.25 11.25	11.25 11.25
36	M/S Tanning Industries 97-A, Wazidpur, Jajmau, Kanpur	Everest 180	Finished Leather	30 30.2	30.1 30.2	- -	11.25 11.25	11.25 11.25
37	M/S Enterprises, Wazidpur, Jajmau, Kanpur	Evergreen 90	Finished Leather	30 30.2	30.1 30.2	- -	11.25 11.25	11.25 11.25
38	M/S Tanners (Leather Tanned), Iqbal street, Kanpur	Faiyaz 180	Finished Leather	30 30.2	30.1 30.2	- -	11.25 11.25	11.25 11.25
39	M/S Enterprises, Gajjupurwa,	Falaq 120	Finished Leather	30 30.2	30.1 30.2	- -	7.5 7.5	7.5 7.5

	Jajmau, Kanpur	600	30	30.1 30.2	-	37.5	-	37.5	37.5
40	M/S Farhat Javi Ki Tannery 175/158 B(4) Budhiya Ghat, Jajmau, Kanpur	Finished Leather							
41	M/S Tanners, Chungi, Jajmau, Kanpur	Farjana Purani Jajmau	180	30	30.1 30.2	-	11.5	-	11.5
42	M/S Tannery, (Farjana & Ashrafabad, Jajmau Road, Kanpur)	Farjana (Farjana Co.)	150	30	30.1 30.2	-	9.37	-	9.37
43	M/S Finished Leather Job Work Industries, 433/398 Jajmau, Kanpur	Finished Leather	300	30	30.1 30.2	-	18.74	-	18.74
44	M/S Firoj Tanners (Unit-1), 379/10 Iqbal Street, Jajmau, Kanpur	Finished Leather	360	30	30.1 30.2	-	22.5	-	22.5
45	M/S Firoj Tanners (Unit-2), 18, Iqbal Street, Jajmau, Kanpur	Finished Leather	180	30	30.1 30.2	-	11.5	-	11.5

46	M/S Tannery, Gajjupurwa, Jajmau, Kanpur	Firoz 180 Finished Leather	30 30.1 30.2	- 11.5	- 11.5	- 11.5	- -
47	M/S Galib Export Pvt. Ltd. (Old Name- M/S Nishat Tannery), Wazidpur, Kanpur	300 Finished Leather	30 30.1 30.2	18.74 - -	18.74 - -	18.74 - -	18.74 - -
48	M/S Gauti Tanners (Kamrudddeen Ki Tannery), Lalltupurwa, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	11.25 - -	11.25 - -	11.25 - -	11.25 - -
49	M/S Gem Tanners, 112-A/3 Wazidpur, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	11.25 - -	11.25 - -	11.25 - -	11.25 - -
50	M/S Globa Industrial Corp. (Unit-2) 150 Feet Road, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	11.25 - -	11.25 - -	11.25 - -	11.25 - -
51	M/S Globe Tanners, 52-A, 150 Feet Road, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	11.25 - -	11.25 - -	11.25 - -	11.25 - -
52	M/S Goodwill Tanners, 98-A, Wazidpur, Jajmau,	180 Finished Leather	30 30.1 30.2	11.25 - -	11.25 - -	11.25 - -	11.25 - -

	Kanpur								
53	M/S Greater Aarafat Tanners, 150 Feet Road, Jajmau, Kanpur	540 Finished Leather	30 30.1 30.2	-	33.75	-	33.75	33.75	-
54	M/S Gujarat Tannery, Sanjay Nagar, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25	-
55	M/S H.K. Tanning, 150 Feet Road, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5	-
56	M/S Habib Leather, 150 Feet Road, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5	-
57	M/S Habib Tannery Pvt. Ltd., 150 Feet Road, Jajmau, Kanpur	600 Finished Leather	30 30.1 30.2	-	37.5	-	37.5	37.5	-
58	M/S Hafiz Sons Tannery Pvt. Ltd., 93-A, Wazidpur, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5	-
59	M/S Hazi Wadde Tannery, 433/398 Makku Said Ka Bhatta	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5	-
60	M/S Hameed	360	30 30.1	-	22.5	-	22.5	22.5	-

	Leather Finishers, 1-B, Gajipurwa, Jajmau, Kanpur	Finished Leather	30.2					
61	M/S HAMRAJ Tanners, Budhiya Ghat, Jajmau, Kanpur	150 Finished Leather	30 30.2	30.1 30.2	- -	9.37 -	9.37 -	9.37 -
62	M/S Harrish Leather Finishers, 150 Feet Road, Jajmau, Kanpur	360 Finished Leather	30 30.2	30.1 30.2	- -	22.5 -	22.5 -	22.5 -
63	M/S Hayat Tanners, Gajipurwa, Jajmau, Kanpur	180 Finished Leather	30 30.2	30.1 30.2	- -	11.25 -	11.25 -	11.25 -
64	M/S Hilton Tanning Industries, Ram Rai Sarai, Jajmau, Kanpur	300 Finished Leather	30 30.2	30.1 30.2	- -	18.74 -	18.74 -	18.74 -
65	M/S Himalya Tanners, 150 Feet Road, Jajmau, Kanpur	300 Finished Leather	30 30.2	30.1 30.2	- -	18.75 -	18.75 -	18.75 -
66	M/S Hina Enterprises, Ram Rai Sarai, Jajmau, Kanpur	120 F.L.	30	30.1 30.2	- -	7.5 -	7.5 -	7.5 -
67	M/S Homera Tanning Ind., 150	900 Finished Leather	30	30.1 30.2	- -	56.22 -	56.22 -	56.22 -

68	M/S Enterprises (Welcome Tannery), Sheetla Bazar, Kanpur	I.S.	150 Finished Leather	30 30.1 30.2	- 9.37	-	9.37	-
69	M/S Imprinal Leather Finishers Pvt. Ltd., 336 Chhabiley Purwa, Kanpur	I.S.	180 Finished Leather	30 30.1 30.2	- 11.25	-	11.25	-
70	M/S Enterprises Eidgha Road	I.S.	India 180 Finished Leather	30 30.1 30.2	- 11.25	-	11.25	-
71	M/S Indian Tanning Industries, 150 Feet Road, Jajmau, Kanpur	I.S.	1800 Finished Leather	30 30.1 30.2	- 112.44	-	112.44	-
72	M/S Insha Leather Finishers, Gajipurwa, Jajmau, Kanpur	I.S.	180 Finished Leather	30 30.1 30.2	- 11.25	-	11.25	-
73	M/S International Fanners Pvt. Ltd., 645 Wazidpur, Jajmau, Kanpur	I.S.	360 Finished Leather	30 30.1 30.2	- 22.5	-	22.5	-

74	M/S Tanners, Gajjupurwa, Jajmau, Kanpur	Iqbal 92/87,	120 Finished Leather	30 30.1 30.2	- 7.5	- 7.5	- 7.5	- 7.5	- -
75	M/S Tannery, Jajmau, Kanpur	Iqbal 16-C-1,	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- -
76	M/S Irfan Tanners, 90/76, Wazidpur, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- -	- -
77	M/S Tanners, Gajjupurwa, Jajmau, Kanpur	Ishaq 180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- 11.25	- -
78	M/S Tannery (Kanpur Tannery) 150 Feet Road, Jajmau, Kanpur	Ishara 1080 Finished Leather	30 30.1 30.2	- 67.5	- 67.5	- 67.5	- 67.5	- 67.5	- -
79	M/S Tanners, 93/79 C, 150 Feet Road, Jajmau, Kanpur	Islam 360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- 22.5	- -
80	M/S Israt Finishers Industries, 173/166, Lallupurwa, Jajmau, Kanpur	120 Finished Leather	30 30.1 30.2	- 7.5	- 7.5	- 7.5	- 7.5	- 7.5	- -

81	M/S Industires, Gajipurva, Jajmau, Kanpur	Jamal 712	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25	-	-
82	M/S Tanners, Ram Rai Sarai, Jajmau, Kanpur	Jeenat 180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25	11.25	-	-
83	M/S Johab Leather Finishers, 87/1, Wazidpur, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25	11.25	-	-
84	M/S Tanning Industries, Ram Rai Sarai, Jajmau, Kanpur	Junaid 360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5	22.5	-	-
85	M/S Tanning Industries, Ram Rai Sarai, Jajmau, Kanpur	Kamaal 1200 Finished Leather	30 30.1 30.2	-	75.0	-	75.0	75.0	75.0	-	-
86	M/S Kazi Leather Industries, Chhabileypurwa, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25	11.25	-	-
87	M/S Lari Leather Finishers(Nisar Sons),166, Gajipurva, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25	11.25	-	-
88	M/S Leather	750	30 30.1	-	46.87	-	46.87	46.87	46.87	-	-

	Embossing,	379/1-D, Iqbal Street, Jajmau, Kanpur	Finished Leather	30.2				
89	M/S World.	Leather 184-A(1) Wazidpur, Jajmau, Kanpur	360 Finished Leather	30 30.2	30.1 30.2	22.5	22.5	22.5
90	M/S Leatherage, 83/69, Hindustan Compound, Jajmau, Kanpur	720 Finished Leather	30 30.2	30.1 30.2	45.0	-	45.0	45.0
91	M/S Liberty Tanners, 173/157 Budhiya ' Ghat Jajmau, Kanpur	120 Finished Leather	30 30.2	30.1 30.2	7.5	-	7.5	7.5
92	M/S Leather (Aman Tannery), Sir Iqbal Street	180 Finishers	30 30.2	30.1 30.2	11.25	-	11.25	11.25
93	M/S Enterprises, 388/356 Bengali Ghat, Kanpur	120 Finished Leather	30 30.2	30.1 30.2	7.5	-	7.5	7.5
94	M/S Tannery, 102/87,Jajmau Road, Kanpur	360 Meraj	30 30.2	30.1 30.2	22.5	-	22.5	22.5
95	M/S Mercury	360	30	30.1	22.5	-	22.5	22.5

	Rubber Unit)	(Tannery 365, Wazidpur, Jajmau, Kanpur	Finished Leather	30.2				
96	M/S Merit Leather Finishers (Firoz Ki Tannery)	840 Finished Leather	30 30.2	30.1 30.2	-	525	-	525
97	M/S Merit Leather Products Pvt. Ltd.	300 Finished Leather	30 30.2	30.1 30.2	-	18.74	-	18.74
98	M/S Minar Ind. (Leather Wide)	180 World Sanjay Nagar	30 30.2	30.1 30.2	-	11.25	-	11.25
99	M/S Model Tannery, Jajmau Road, Kanpur	720 Finished Leather	30 30.2	30.1 30.2	-	45.0	-	45.0
100	M/S Movin Tanners Pvt. Ltd., 91/A, Wazidpur, Jajmau, Kanpur	300 Finished Leather	30 30.2	30.1 30.2	-	18.74	-	18.74
101	M/S N.C. & S. (India), 97/83, Jajmau, Kanpur	360 Finished Leather	30 30.2	30.1 30.2	-	22.5	-	22.5
102	M/S N.J. Tanners (M/S Aarfat Tanners) 201/194,	180 Finished Leather	30 30.2	30.1 30.2	-	11.25	-	11.25

	Sheetla Jajmau	Bazar,							
103	M/S N.R. Tanners, Budhiya Ghat, Jajmau, Kanpur	120	30	30.1 30.2	-	7.5	-	7.5	7.5
104	M/S N.S. Tanners (Unit-2), 83-A, Wazidpur, Jajmau, Kanpur	360	30	30.1 30.2	-	22.5	-	22.5	22.5
105	M/S Nagauri Tanning Industries, 102/88, Wazidpur, Jajmau, Kanpur	180	30	30.1 30.2	-	11.25	-	11.25	11.25
106	M/S Naj Tannery, 150 Feet Road, Jajmau, Kanpur	150	30	30.1 30.2	-	9.37	-	9.37	9.37
107	M/S Naushad Leather Finishers, 30-A, Idgah Road, Jajmau, Kanpur	180	30	30.1 30.2	-	11.25	-	11.25	11.25
108	M/S Nav Durga Tannery, Wazidpur, Jajmau, Kanpur(Near Durga Mandir)	180	30	30.1 30.2	-	11.25	-	11.25	11.25
109	M/S Navratna Tanning Industries, 150 Feet Road,	600	30	30.1 30.2	-	37.5	-	37.5	37.5

110	Jajmau, Kanpur	M/S Naz Leather Finishers, 1407, 150 Feet Road, Jajmau, Kanpur	300 Finished Leather	30 30.1 30.2	- 18.74	- 18.74	18.74 18.74	- -
111	M/S New Era Tanning Centre, Gajipurwa, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- -	- -
112	M/S New International, 16-C, Gajipurwa, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	22.5 22.5	- -
113	M/S New, Leather Line, 88/74 (65) Hindustan Compound, Jajmau, Kanpur	120 Finished Leather	30 30.1 30.2	- 7.5	- 7.5	- 7.5	7.5 7.5	- -
114	M/S New Light Tanners, 150 Feet Road, Jajmau, Kanpur	720 Finished Leather	30 30.1 30.2	- 45	- 45	- 45	45 45	- -
115	M/S New Light Tannery Pvt. Ltd. 150 Feet Road	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	22.5 22.5	- -
116	M/S New Light Tanning Industries, 125, Iqbal Street, Jajmau, Kanpur	900 Finished Leather	30 30.1 30.2	- 56.22	- 56.22	- 56.22	56.22 56.22	- -
117	M/S New	600	30 30.1	- 37.5	- 37.5	- 37.5	37.5 37.5	- -

	Universal Tannery, 419/387, Jajmau, Kanpur	Finished Leather	30.2					
118	M/S Nida Tanners, 189/172, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25
119	M/S Traders, Nisha Gajipurwa, Jajmau, Kanpur	120 Finished Leather	30 30.1 30.2	-	7.5	-	7.5	7.5
120	M/S Noor Tanners, 5-Block, 13, 150 Road, Jajmau, Kanpur	180 F.L.	30 30.1 30.2	-	11.25	-	11.25	11.25
121	M/S Northern Tannery, 150 Feet Road, Jajmau, Kanpur	1220 Finished Leather	30 30.1 30.2	-	138.75	-	138.75	138.75
122	M/S Oriental Tanning Industries, 150 Feet Road, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5
123	M/S Overseas Tanning Corporation, '3'B' A Block, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5
124	M/S Pacific Leather Finishers,	720 Finished Leather	30 30.1 30.2	-	45	-	45	45

125	Ram Rai Sarai, Jajmau, Kanpur	Pacific Leather Pvt. Ltd., 198/200, Gajjupurwa, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- -
126	M/S Pahalwan Tannery (Unit-2), Gajjupurwa, Jajmau, Kanpur	120 Finished Leather	30 30.1 30.2	- 7.5	- 7.5	- 7.5	- 7.5	- -
127	142M/S Pahalwan Tannery (Unit-3), Gajjupurwa, Jajmau, Kanpur	120 Finished Leather	30 30.1 30.2	- 7.5	- 7.5	- 7.5	- 7.5	- -
128	M/S Paramount Tanning Industries (New Name R. Star Leather & Finishers)	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- -
129	M/S Parvej Enterprises, 43/36- A, Sheetla Bazar, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- -
130	M/S Leathers, 104/90/24 Wazidpur, Jajmau, Kanpur	Penja (B)	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- -
131	M/S Penja Tanning	360	30 30.1	- 22.5	- 22.5	- 22.5	- 22.5	- -

	Ind.	Pvt.	L.d.	Finished Leather	30.2				
	104/90	(23)							
	Wazidpur,	Jajmau,							
	Kanpur								
132	M/S	Pioneer	1200	30	30.1 30.2	-	75.0	75.0	-
	Leather	Finishers	Finished Leather						
	Pvt. Ltd.	150 Feet							
	Road								
133	M/S	Prime	300	30	30.1 30.2	-	18.74	18.74	-
	Tanners,	13-A, Idgah Road,	Finished Leather						
	Jajmau,	Kanpur							
134	M/S	Qaiyam	360	30	30.1 30.2	-	22.5	22.5	-
	Leather,	150 Feet	Finished Leather						
	Road,	Jajmau,							
	Kanpur								
135	M/S R.A. Trade &	360	30	30.1 30.2	-	22.5	-	22.5	-
	Industries,	Ram	Finished Leather						
	Rai Sarai,	Jajmau,							
	Kanpur								
136	M/S R.K. Leather	180	30	30.1 30.2	-	11.25	-	11.25	-
	Finishers,	81 (C)2,	Finished Leather						
	Wazidpur,	Jajmau,							
	Kanpur								
137	M/S R.K. Tanners,	360	30	30.1 30.2	-	22.5	-	22.5	-
	150 Feet	Road,	Finished Leather						
	Jajmau,	Kanpur							
138	M/S	Rahim	480	30	30.1 30.2	-	30.0	30.0	-
	Tanners,	180-B, 150 Feet	Finished Leather						
	Road,								

	Jajmau, Kanpur							
139	M/S Corporation Ltd.,	Rahman Pvt. Finished Leather	720 30 30.1 30.2	-	45.0	-	45.0	45.0
	150 Feet Road, Kanpur	Jajmau,						
140	M/S Raja Tannery, 81(C) Wazidpur, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25
141	M/S Tanners Name , Razzaq Tannery), 189/172, Dargah Sharif, Kanpur	Rajala (Old Finished Leather	180 30 30.1 30.2	-	11.25	-	11.25	11.25
142	M/S Tannery, Wazidpur, Jajmau, Kanpur	Rana 102 Finished Leather	240 30 30.1 30.2	-	15.0	-	15.0	15.0
143	M/S Raza Leather Finishers, Ram Rai Sarai, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25
144	M/S Reliance Tanning Industries, 150 Feet Road, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5
145	M/S Renates Estates Export, Ram Rai	900 Finished Leather	30 30.1 30.2	-	56.22	-	56.22	56.22

	Sarai, Kanpur	Jajmau,						
146	M/S Rider Tanning Industries, 712	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25
	Gajjupurwa, Jajmau, Kanpur							
147	M/S Rijwan Tanning Industries, Sanjay Nagar, Jajmau, Kanpur	1440 Finished Leather	30 30.1 30.2	-	90.00	-	90.00	90.00
148	M/S Roshan Tannery, 9, 10, Gajjupurwa, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25
149	M/S Ruksh International, 50A Wazidpur, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	-	22.5	-	22.5	22.5
150	M/S Rustam Tannery, 42/41, Gajjupurwa, Jajmau, Kanpur	120 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25
151	M/S S.A. Tanning Industries, 3-B, 150-Feet Road, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25
152	M/S S.R. Glue & Chemical Works,	180 Finished Leather	30 30.1 30.2	-	11.25	-	11.25	11.25

	(Tanners 129-A, Kanpur	Point) Jajmau,						
153	M/S S.S. Tanners (Aiyaz Tanners)	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	22.5 22.5	- -	- -
154	M/S Saba Tannery, Sheetla Bazar, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	11.25 11.25	- -	- -
155	M/S Sabnam Tannery, Sheetla Bazar, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	11.25 11.25	- -	- -
156	M/S Sabra Leather, 94-E, Mona Nagar, Jajmau, Kanpur	480 Finished Leather	30 30.1 30.2	- 30.0	- 30.0	30.0 30.0	- -	- -
157	M/S Sahara Tanning Industries, 104(C), Wazidpur, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	11.25 11.25	- -	- -
158	M/S Saira Industries, 36-A, Feet Road, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	11.25 11.25	- -	- -
159	M/S Sajeed Tannery, 361/1-D (30B-2) Gajipurwa, Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	11.25 11.25	- -	- -

160	M/S Sams Leather Finishers, 150 Feet Road, Jajmau, Kanpur	360	Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5	-	-
161	M/S Samru Enterprises, B-273-A, Bhalla Estate, Jajmau, Kanpur	180	Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-	-
162	M/S Tannery, 786 Chhabileypurwa, Jajmau, Kanpur	180	Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-	-
163	M/S Seema Tanning India Pvt. Ltd., 104/90 A, Wazidpur, Jajmau, Kanpur	300	Finished Leather	30	30.1 30.2	-	18.74	-	18.74	18.74	-	-
164	M/S Shagun Industries, 94 'A' Wazidpur, Jajmau, Kanpur	300	Finished Leather	30	30.1 30.2	-	18.74	-	18.74	18.74	-	-
165	M/S Shahid Tanners, Dargah Sharif Road, Jajmau, Kanpur	180	Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-	-
166	M/S Shakur (S.R. Tannery) Lalltupurwa, Jajmau Kanpur	180	Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-	-

167	M/S Tannery, 377-D-A, Iqbal Street, Jajmau, Kanpur	Shivli 180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- -
168	M/S Shiwan Tannery, Jajmau, Kanpur	Shiwan 360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- -
169	M/S Sikandar Tannery Pvt. Ltd., Jajmau, Kanpur	180 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- -
170	M/S Society Tannery, Wazidpur, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- -
171	M/S Star Tannery, Ram Rai Sarai, Jajmau, Kanpur	1200 Finished Leather	30 30.1 30.2	- 75.0	- 75.0	- 75.0	- 75.0	- -
172	M/S Star Tanning Industries, Ram Rai Sarai, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	- 22.5	- 22.5	- 22.5	- 22.5	- -
173	M/S Suleman Tanning Industries, 90/76-K Idgah Road, Wazidpur, Jajmau, Kanpur	360 Finished Leather	30 30.1 30.2	- 11.25	- 11.25	- 11.25	- 11.25	- -
174	M/S Tanners, Road, Kanpur	Sultan 2040 Finished Leather	30 30.1 30.2	- 127.5	- 127.5	- 127.5	- 127.5	- -

175	M/S Tannery, 150 Feet Road, Kanpur	Sunrise Finished Leather	900	30	30.1 30.2	-	56.22	-	56.22	-	-
176	M/S Sunshine Tanning Industries, 482/483, Wazidpur, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-	-
177	M/S Super Tannery(India) Ltd. 187/170, Jajmau, Kanpur	4560 Finished Leather	30	30.1 30.2	-	28.5	-	28.5	28.5	-	-
178	M/S 'Supreme' Tanning Industries, 104/90 A-7, Jajmau, Kanpur	600 Finished Leather	30	30.1 30.2	-	37.5	-	37.5	37.5	-	-
179	M/S Swan Tanning Industries, 205, 207	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5	-	-
180	M/S Taj Tanners, 104/190, 150 Feet Road, Kanpur	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5	-	-
181	M/S Tajmmul Tannery, Budhiya Ghat, Kanpur	90 Finished Leather	30	30.1 30.2	-	5.62	-	5.62	5.62	-	-

182	M/S Ta-lat Leather Pvt. Ltd., 29 1, 150 Feet Road, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25 11.25
183	M/S Tanners India, 38-A, 150 Feet Road, Jajmau, Kanpur	720 Finished Leather	30	30.1 30.2	-	45.0	-	45.0 45.0
184	M/S Tanners Co., 97-A, Wazidpur, Jajmau, Kanpur	240 Finished Leather	30	30.1 30.2	-	15.0	-	15.0 15.0
185	M/S Tej Industries, 35 Block A 150 Feet Road, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25 11.25
186	M/S The United Province Tannery Co. Pvt. Ltd., Jajmau, Kanpur	2400 Finished Leather	30	30.1 30.2	-	150.00	-	150.00 150.00
187	M/S Trivani Tanners, 325/302, Jajmau Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25 11.25
188	M/S Union Tanners, 101/87-B, Wazidpur, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25 11.25
189	M/S Unique Tannery, 980 D,	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5 22.5

190	M/S Tannery, Gajjipurwa, Jajmau, Kanpur	Upasana	120	30 30.2	30.1 30.2	-	7.5	-
191	M/S Upper India Tannery (P.) Ltd., 38/32, Jajmau Road, Kanpur	India	1200	30 30.2	30.1 30.2	-	75.0	-
192	M/S Industries, 188/171, Jajmau, Kanpur	Vinus	600	30 30.2	30.1 30.2	-	37.5	-
193	M/S Waheed Tannery, 150 Feet Road, Jajmau, Kanpur		360	30 30.2	30.1 30.2	-	22.5	-
194	M/S Wasif Tannery, 150 Feet Road, Jajmau, Kanpur		900	30 30.2	30.1 30.2	-	56.22	-
195	M/S Yaseen Tannery, 150 Feet Road, Jajmau, Kanpur		120	30 30.2	30.1 30.2	-	7.5	-
196	M/S Enterprises, 174, Wazidpur, Jajmau, Kanpur	Yusuf	180	30 30.2	30.1 30.2	-	11.25	11.25

197	M/S Z.R. Leather Finishers, 263-B, Wazidpur, Jajmau, Kanpur	180 Finished Leather	30	30.1 30.2	-	11.25	-	11.25	11.25	-
198	M/S Zaz Impex, Jajmau Road, Jajmau, Kanpur	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5	-
199	M/S Zaz Sons Export, 4-B, Sheetla Bazar, Jajmau, Kanpur	360 Finished Leather	30	30.1 30.2	-	22.5	-	22.5	22.5	-
200	M/S Zaz Tannery, 1200 Feet' Road, Jajmau, Kanpur	30 Finished Leather	30	30.1 30.2	-	75.0	-	75.0	75.0	-
201	M/S Zeba Tanners, 180/3, Lalltupurwa, Jajmau, Kanpur	150 Finished Leather	30	30.1 30.2	-	9.37	-	9.37	9.37	-
202	M/S K.C.K. Export Pvt. Ltd. Rania	900 Finished Leather	30	30.1 30.2	-	56.22	-	56.22	56.22	-
203	M/S Prachi Leather Pvt. Ltd. Jaintpur	1800 Finished Leather	30	30.1 30.2	-	112.44	-	112.44	112.44	-
204	M/S Amar Brothers Kanpur	360 Finished Leather	30	30.1 30.2	-	22.4	-	22.4	22.4	-
205	M/S Liyan Overseas Dada Nagar	900 Finished Leather	30	30.1 30.2	-	56.22	-	56.22	56.22	-
206	M/S O.E.F. Phool	1800	30	30.1	-	112.44	-	112.44	112.44	-

	Bagh		Finished Leather		30.2				
207	M/S Enterprises , A.G.	A.G.	Lead 300	9	9.1 9.2	-	1.5	-	1.5
	Dada Nagar								
208	M/S A. Honey Battery	Honey Site-5, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5
209	M/S A.K. Ind., Site-4 Panki		Lead 300	9	9.1 9.2	-	1.5	-	1.5
210	M/S A.R. Metal Ind.	A.R. Metal Ind.	Lead 750	9	9.1 9.2	-	3.75	-	3.75
	13 B, Dada Nagar								
211	M/S Enterprises, Site-5, Panki	Ajay D-21	Lead 300	9	9.1 9.2	-	1.5	-	1.5
212	M/S Metal Ind., Site-5, Panki	Akhilesh F-24	Lead 300	9	9.1 9.2	-	1.50	-	1.50
213	M/S Amit 123/445 Fajalganj	Battery	Lead 300	9	9.1 9.2	-	1.50	-	1.50
214	M/S Anand Smelting Co., Upton Estate	Metal	Lead 300	9	9.1 9.2	-	1.50	-	1.50
215	M/S Anand Works, Panki	Metal Site-5,	Lead 300	9	9.1 9.2	-	1.50	-	1.50
216	M/S Anil Co., F-32, Panki	Metal Site-5,	Lead 300	9	9.1 9.2	-	1.50	-	1.50

217	M/S Anil Works, F-8, Panki	Metal Site-3,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
218	M/S Arun Works, F-8, Panki	Metal Site-3,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
219	M/S Ashoka Battery, B-33, Dada Nagar	Metal Site-3,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
220	M/S Dinesh Metal Company, Site-3, Panki	Metal Site-3,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
221	M/S Durga Indu, B-13, Dada Nagar	Metal Site-3,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
222	M/S Gold Battery, Site-5, Panki	Metal Site-5,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
223	M/S Gurudev Enterprises, Dada Nagar	Metal Site-5,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
224	M/S Hari Om Metal, Site-5, Panki	Metal Site-5,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
225	M/S Harsh Battery & Metal Works, Dada Nagar	Metal Site-5,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-
226	M/S Janta Works, J-47, Site-1, Panki	Metal Site-1,	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-

227	M/S Enterprises, Site-5, Panki	Jay	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-	-
228	M/S Krishna Metal Works, G-33, Site-3, Panki	Lead 800	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
229	M/S Kumar Indus., G77, Panki	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
230	M/S Lakhni Metal Ind., Site-5, Panki	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
231	M/S Lucky Metal Indus, B-33, Dda Nagar	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
232	M/S Maa Ind., Site-5, Kanpur	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
233	M/S Mack International, E-21, Site-3, Panki	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
234	M/S Madan Metal Co., Ddada Nagar	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
235	M/S Manoj Metal Works, K7, Site-3, Panki	Lead 2000	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
236	M/S Mayank Metal, Site-5, Panki	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-
237	M/S Narain Metal Co., G-14, Site-3, Panki	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	1.50	-	-

238	M/S R.D. Metal, Site-3, Panki	L 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-	-
239	M/S R.K. Metal Site-5, Panki	Lead 800	9	9.1 9.2	-	1.50	-	1.50	1.50	-	-
240	M/S Raj & Sons, Dda Nagar	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-	-
241	M/S Rajendra Metal Works, Site- 5, Panki	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-	-
242	M/S Rama Metal Co, Site-5, Panki	Lead 300	9	9.1 9.2	-	1.50	-	1.50	1.50	-	-
243	M/S Rama Metal Indus., Site-3, Panki	Lead 600	9	9.1 9.2	-	3.0	-	3.0	3.0	-	-
244	M/S Ramesh Enterprises, Site-5, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
245	M/S S.K.S. Metal Works, Site-3, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
246	M/S Sanjay Metal Works, G-5, Site- 5, Panki	Lead 800	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
247	M/S Shankar Metal Works, Panki 5	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
248	M/S Singh Metal Co, Site-5, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
249	MMS Suraj Metal Works, G32, Site- 3, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-

250	M/S Surendra Metal Works, D75, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
251	M/S Veeja Metal, G-64, Site-3, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
252	M/S Vijay Metal Works, Panki 5	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
253	M/S Virendra Metal Works, E-70, Site-5, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
254	M/S Ydav Metal, Site-5, Panki	Lead 300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
255	M/S Agmotex Ltd., Rania	Textile 600	34	34.3	-	90	-	90	90	-	-
256	M/S Ganesh Polytex Ltd., Raipur, Rania	Textile 1500	34	34.3	-	225	-	225	225	-	-
257	M/S L. Kant Paper Mill Pvt. Ltd. (Process House) Rania	Textile 600	34	34.3	-	90	-	90	90	-	-
258	M/S Premium Bhuthgun Pvt. Ltd., Jainpur	Textile 1200	34	34.3	-	180	-	180	180	-	-
259	M/S Amit Poly Yarns, Panki, B20, Site-1	Textile 150	34	34.3	-	5.0	-	5.0	5.0	-	-
260	M/S Bharat Dyeing Shyam Nagar	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-	-

261	M/S Cawnpore Woollen Mill Civil Lines	1 Lacs Meter W. fabric	24	24.2	-	150.0	-	150.0	-	-
262	M/S Galaxy Deying, Shujatganj	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-
263	M/S Ganga Textile, Site-5	Textile 60	34	34.3	-	1.8	-	1.8	1.8	-
264	M/S Industrial Enterprises, C-15, Site-1, Panki	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-
265	M/S Kanpur Texel 19 Ind Est, Kalpi Road	Textile 150	34	34.3	-	5.0	-	5.0	5.0	-
266	M/S Krishna Dyeing, Panki 1	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-
267	M/S Kwality Zippers, Dada Nagar	Textile 30	34	34.3	-	0.9	-	0.9	0.9	-
268	M/S M. S. Proffing, Jajmau	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-
269	M/S Mahalaxmi Textiles, 155B, Dada Nagar	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-
270	M/S Mahaveer Textiles, Panki 1	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-
271	M/S Saroj Textiles, Dada Nagar	Textile 600	24	24.2	-	18.0	-	18.0	18.0	-
272	M/S Shiva Textiles, Panki	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-

273	M/S Dyeing, Jajimau	Sunrise	Textile 300	24	24.2	-	9.0	-	9.0	9.0	-	-
274	M/S Threads India, Chaubepur	Textile 300		24	24.2	-	9.0	-	9.0	9.0	-	-
275	M/S U.J. Laminators, Dada Nagar	Textile 30		34	34.3	-	0.9	-	0.9	0.9	-	-
276	M/S V. N. Sons (Standar Niwar) Panki 1	Textile 300		24	24.2	-	9.0	-	9.0	9.0	-	-
277	M/S Alimeco, G.T. Road	Electroplating 50		12,34	12.8	-	7.5	-	7.5	7.5	-	-
278	M/S Anoop Print Process ' Uptron, Site, Panki	Electro. P 1500 Pcs		12,34	12.8	-	7.5	-	7.5	7.5	-	-
279	M/S Field Gun Factory, Kalpi Road	Electro. P 1500 Pcs		12	12.5	-	9.0	-	9.0	9.0	-	-
280	M/S H.A.L. Chakeri	Aircraft 1500 Pcs		12,34	12.8	-	7.5	-	7.5	7.5	-	-
281	M/S Industrial Electronic, A-72, Dada Nagar											-
282	M/S Industrial Electronic Devices, Panki-5	Electro p 750 sets		12,34	12.8	-	60	-	60	60	-	-
283	M/S L.M.I. (East Block), Panki, Site-2	Two Wheeler	12,21,34	12.8	34.3	-	45	-	45	45	-	-

284	M/S L.M.L. (West Block), Panki, Site-3	-	12,21,34	21.2 12.8 34.3 12.5, 21.2	-	45	-	45	45	-
285	M/S Packaging Manufacture, Chaubepur	Lohia	15 M/C Electro.P	12,34	12.8 34.3	-	90	-	90	-
286	M/S Electroplating, Site-3, Panki	M.P.	-	-	-	-	-	-	-	-
287	M/S Factory, ' Kalpi Road	Ordnance System,	Armament not disclosed	12,34	12.8 34.3	-	60	-	60	-
288	M/S Roto Mark System, 123/353, Fajalganj	Mark	Electro.P 1500	12,34	12.8 34.3	-	7.5	-	7.5	-
289	M/S Marketing, S 5, Panki 4	S E	Electro.P 15	12	12.5	-	0.6	-	0.6	-
290	M/S Small Arms Factory, Road	Arms	Electro.P 1500 Pcs	12,34	12.8 34.3	-	45	-	45	-
291	M/S A.V. Agro Products Pvt. Ltd., Rania	Agro	30,000 Refinery	34	34.4	-	0.9	-	0.9	-
292	M/S Edible Pvt. Ltd., Rania	Ganpati	30,000 Refinery	34	34.4	-	0.9	-	0.9	-

293	M/S Kampur Edible Oil Ltd., Rania	15,000 Refinery	34	34	-	0.45	-	0.45	0.45	-	-
294	M/S Extraction Pvt. Ltd., Rania	21,000 Refinery	34	34	-	0.63	-	0.63	0.63	-	-
295	M/S Kukrele Paper Mill Pvt. Ltd., Rania	30,000 Refinery	34	34	-	0.90	-	0.90	0.90	-	-
296	M/S Laxmi Edible Pvt. Ltd., Umran, Rania	45,000 Refinery	34	34	-	1.35	-	1.35	1.35	-	-
297	M/S Montora Agro Industries Pvt. Ltd., Rania	24,000 Refinery	34	34	-	0.72	-	0.72	0.72	-	-
298	M/S Montora Oil Product Pvt. Ltd., Rania	15,000 Refinery	34	34	-	0.45	-	0.45	0.45	-	-
299	M/S OM Oil (India) Pvt. Ltd., Rania	30,000 Refinery	34	34	-	0.90	-	0.90	0.90	-	-
300	M/S OM Vanaspatti Udyog Umran, Rania	30,000 Refinery	34	34	-	0.90	-	0.90	0.90	-	-
301	M/S R.P. Edible Pvt. Ltd., Rania	45,000 Refinery	34	34	-	1.35	-	1.35	1.35	-	-
302	M/S Vaibhav Edible Pvt. Ltd., Rania	30,000 Refinery	34	34	-	0.90	-	0.90	0.90	-	-
303	M/S Dinesh Oil Ltd., Site-3, Panki	45,000 Refinery	34	34	-	1.34	-	1.34	1.34	-	-

304	M/S Petrochem Ltd., Rania	Bajrang Pvt.	75,000 Waste Oil	4	4.6 4.1	-	1.0	-	1.0	-	-
305	M/S Lubricants, Rania	Dyanamic	600 Waste Oil	4	4.6 4.1	-	72.0	-	72.0	72.0	-
306	M/S Hindustan Oil Ref., Rania	600 Waste Oil	4	4.1 4.1	-	18.0	-	18.0	18.0	-	-
307	M/S Petrochem Pvt. Ltd., Bhauti	Abhijeet	750 Waste Oil	20	20.3	-	1.0	-	1.0	1.0	-
308	M/S Agarwal Oil Ref., Panki, Kampur	300 Waste Oil	4	4.1 4.6	3.0	-	3.0	3.0	3.0	-	-
309	M/S Bharat Oil Corporation, Panki	510 Waste Oil	4	4.6 4.1	61.2	-	61.2	61.2	61.2	-	-
310	M/S Kaupur Oil Point Ram Nagar, Mandhana	6000 Waste Oil	4	4.1	-	-	-	-	-	-	-
311	M/S Maa Durga Food Pvt. Ltd., Bhooti	7500 Waste Oil	4	4.6 4.1	1.0	-	1.0	1.0	1.0	-	-
312	M/S Mineral Oil Corporation, D-13, Panki-1	900 Waste Oil	4	4.1 4.6	27.0	-	27.0	27.0	27.0	-	-
313	M/S Phoenix Company Pvt. Ltd., Site-3, Panki	3000 Waste Oil	4	4.1	0.1	-	0.1	0.1	0.1	-	-
314	M/S Shivam	-	-	-	-	-	-	-	-	-	-

	Lubricant Corporation, Saresh Bag	Oil						
315	M/S Venus Corp., Panki 1	Oil	3000 Waste Oil	4	4.6 4.1	0.36	-	0.36 0.36
316	M/S Ameltha Textile Pvt. Ltd.	900 BCS	-	-	A-5	-	900	900 -
317	M/S Cerulean Chemicals Ltd.	1500 BCS	-	-	A-5	-	1500	1500 -
318	M/S Chandni Chemical Pvt. Ltd., Rania	900 BCS	-	-	A-5	-	900	900 -
319	M/S Hilzer Chemicals Ltd.	1050 BCS	-	-	A-5	-	1050	1050 -
320	M/S Rukmani Chemicals Pvt. Ltd.,Rania	900 BCS	-	-	A-5	-	900	900 -
321	M/S Waris Chemicals Pvt. Ltd, Rania	1050 BCS	-	-	A-5	-	1050	1050 -
322	M/S I.G.S. Chemicals, Mandhana	600 BCS	-	-	A-5	-	600	600 -
323	M/S Kaleena Chemical, Chaubepur	600 BCS	-	-	A-5	-	600	600 -
324	M/S Khanna Vivek Chemicals, Panki,	300 BCS	-	-	A-5	-	300	300 -

	Site-1				A-5		600	600	600	
325	M/S Unichem (India) Pvt. Ltd., Chaubepur	600 BCS	-	-	-	-	9.0	9.0	9.0	-
326	M/S Gujarat Dyes Stuff Site-1, Panki	Dyes 15	26	26.1	16.2	26.3	-	9.0	-	-
327	M/S K. P. Color Chem., C-1 B, Site-1, Panki	Dyes 90	26	26.1	16.2	26.3	-	105	105	-
328	M/S Kapoor Chemicals, G-40, Site-1	Dyes 15	26	26.1	16.2	26.3	-	9.0	9.0	-
329	M/S ' Kapoor Dyechem Ind. 14B, Dada Nagar	Dyes 15	26	26.1	16.2	26.3	-	9.0	9.0	-
330	M/S R.R Colour Chem A22,23, Panki-4	Dyes 15	26	26.1	16.2	26.3	-	9.0	9.0	-
331	M/S Raj Industries Corporation, 65, Uptton State	Dyes 15	26	26.1	16.2	26.3	-	9.0	9.0	-
332	M/S Regency Dyes, Mandhana	-	-	-	-	-	-	-	-	-
333	M/S Classic Chemicals Site-3, Panki	Chemical 300	9	9.1	9.2	-	1.5	1.5	1.5	-
334	M/S Dhupper Chemicals,	Chemical 300	9	9.2	-	1.5	-	1.5	1.5	-

	Mandhama								
335	M/S JK Traders, 84/7, Fajal Ganj	-	-	-	-	-	-	-	-
336	M/S Jain Chemicals, Dada Nagar	Chemical 100	34	34.4	-	2.0	-	2.0	2.0
337	M/S Jyo Chem Pvt. Ltd., C-23, Panki	-	-	-	-	-	-	-	-
338	M/S Gaurav Pigments Pvt. Ltd., Rania	Pigments 150	34	34.3 34.4	-	2.0	-	2.0	2.0
339	M/S Shreeyam Pigments, Jainpur	Pigments 150	34	34.3 34.4	-	2.0	-	2.0	2.0
340	M/S Peacock Pigment, Mandhama	Pigments 300	34	34.3 34.4	-	4.0	-	4.0	4.0
341	M/S Swadesi Enterprises, Pokharpur	600 Pesticides	29	29.1 29.3	-	6.0	-	6.0	6.0
342	M/S Swadesi Insecticides, Pokharpur	Insecticides 600	29	29.1 29.3	-	6.0	-	6.0	6.0
343	M/S Goodluss Nerolack Paints Pvt. Ltd., Jainpur	4L 27,000 Paint	21	21.1 21.2	-	28.8	-	28.8	28.8
344	M/S Punjab Paints Pvt. Ltd., Fazelganj	4L 30,000 Paints	21	21.1 21.2	-	3.0	-	3.0	3.0
345	M/S L. Kant Paper Mill (Induction	6000 Iron Steel	13	13.1	-	2.0	-	2.0	2.0

	Furnace Rania	Unit	Mawana Steel, Jaipur	6000 Iron Steel	13	13.1	-	2.0	-	2.0	2.0
346	M/S Pepsico India Holdings Ltd., Jaipur	600 Soft drinks	5	5.2	-	20	-	20	-	20	-
347	M/S Hindustan Aqua Ltd., Site-1, Panki	400 Soft drink	5	5.2	-	20	-	20	-	20	-
348	M/S Thermal Power Station, Panki	270 Power	5	5.2	-	30	-	30	-	30	-
349	M/S Industry (Fertilizer Division), Site-1, Panki	-Fertilizer	-	-	-	-	-	-	-	-	-
350	M/S I.C.I. (India) Ltd., Site-1, Panki	500 Catalyst	12.17	12.9	-	2.25	-	2.25	-	2.25	-
351	M/S Bhagwati Metal Processing, H36, Site-1, Panki	150 Zinc Sulphate	6	6.1	-	2.5	-	2.5	-	2.5	-
352	M/S S.K. Metal Works, K27, Panki	L 300 Zinc ash	9	9.1 0.1	-	1.5	-	1.5	-	1.5	-
353	M/S Shree Chemicals, D-118, Site-3, Panki	15 Kg. Zinc sulphate	6	0.1	-	2.5	-	2.5	-	2.5	-
354	R.K. Battery, G- 20, Site-5 Ind. Area Panki Kn.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	-	1.5	-

356	Ajai Udyog, F-16, Site-5, Ind. Area, Panki, Knp.	Battery	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-
357	Ajai Enterprises, G-8, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
358	Ambuj Grinding, F-34, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
359	Anil Metal, D-4, Site-3, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
360	Anil Metal Works, G-34, Site-3, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
361	Baddkau, A-1, Dada Nagar (Naharaiya)	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
362	Bansal & Bansal, F-63, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
363	Classic Chemical, G-36, Site-3, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
364	Ganesh Battery, F-25, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
365	Hari Metal, A-1,	Lead ingot-300	9	9.1	-	1.5	-	1.5	1.5	-	-

	Dada Nagar (Nahariya)			9.2				
366	Kamlesh Metal, G-30, Site-3, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5
367	Kanpur metal Works, H-59, Site-1, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5
368	Krishna & Sons G-33, Site-3, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5
369	Swami Enterprises, B-4, M.T.C., Site-3, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5
370	Kumar Battery, G-66, Site-3, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5
371	Laxmi Metal, D-113, 114, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5
372	Manoj Works, A-1, Dada Nagar (Nahariya)	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5
373	OOMMI, A-1, Dada Nagar (Nahariya)	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5

374	Rajendra Jaiswal, A-1, Dada Nagar (Nahariya)	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
375	Ram Lal, A-1, Dada Nagar (Nahariya)	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
376	Ramsons Metal Works, H-72,Site- 1, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
377	Ritu Metal, A- 17A, Dada Nagar (Nahariya)	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
378	S.S. International, D-103, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
379	Sanjay Metal, D- 38, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
380	Satguru Chemical, E-70, Site-5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
381	Shanti, D-88, Site- 5, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
382	Sharda Battery, G- 65, Site-3, Ind. Area, Panki, Knp.	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-
383	Shiv Shakti (Subhash) Metal,	Lead ingot-300	9	9.1 9.2	-	1.5	-	1.5	1.5	-	-

	G-31, Site-3, Ind. Area, Panki, Knp.							
384	Sony Product, D-42, Site-4, Ind. Area, Panki, Knp.	Lead ingot-300	9 9.2	9.1 9.2	-	1.5	-	1.5
385	Tej Bhadur, A-1, Dada Nagar (Nahariya)	Lead ingot-300	9 9.2	9.1 9.2	-	1.5	-	1.5
386	Vinod Prajapati, A-1, Dada Nagar (Nahariya)	Lead ingot-300	9 9.2	9.1 9.2	-	1.5	-	1.5
387	Yadav Metal, A-1, Dada ' Nagar (Nahariya)	Lead ingot-300	9 9.2	9.1 9.2	-	1.5	-	1.5

2. Collection of water samples from the hand pump located around the solid waste dumpsite and soil samples from different identified locations from (0 ft to 40 ft depth) for analysis of selected parameters.

## **EXPERIMENTAL**

### **Parameters studied in water samples**

- pH
- TDS(Total dissolved solids)
- EC (Electrical conductivity)
- Fluoride
- Nitrate
- Sulphate
- Hardness
- Alkalinity
- Chloride
- TOC (Total organic carbon)
- Heavy Metals (Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn)
- Oranochlorine Pesticide ( HCH isomers in pesticide dumped site)
- Bacteriological Parameters

### **Parameters studied in soil samples**

#### **Heavy Metals**

- Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn
- Oranochlorine Pesticide ( HCH isomers, in pesticide dumped site)

## **Methodology**

### **Collection of water samples**

Total 105 water samples were collected from hand pump (Shallow, India Mark II and Submersible) located around six identified dumping sites namely Nauraiya Kheda,

Kanpur(32), Duncan's Panki , Kanpur (28), Juhi Baburaiya, Kanpur (13), Rania, Kanpur Dehat (13), India pesticide Ltd. Lucknow (8) and Bhowapur, Kaushambhi, Ghaziabad (11) assisted by GPS (Global Positioning System) coordinates. The samples for Physico-chemical Analysis and analysis of heavy metals were collected in plastic bottles, samples for pesticide analysis were collected in glass bottles and samples for Bacteriological analysis were collected in sterilized BOD bottles. All the samples were transported immediately to the laboratory at 4 deg. C.

### **Collection of soil samples**

Total 192 soil samples were collected from the above six dumping sites. The number of soil samples collected from individual sites are Nauraiya Kheda (42), Duncan's Panki (45), Juhi Baburaiya( 26), Rania, Kanpur Dehat (27), India Pesticide Ltd., Lucknow (36) and Bhowapur, Kaushambhi, Ghaziabad (16). These soil samples were collected through bore wells from different depth of the soil starting from 0 ft. to 40 ft. on the basis of GPS (Global Positioning System) coordinates.

### **Physico-chemical analysis of water**

#### **Determination of pH**

The pH of water was determined by the pH meter of Century Portable Water Analysis kit (704).

#### **Determination of EC (Electrical conductivity) and TDS (Total dissolved solids)**

EC and TDS were determined by using ELICO-PE-136 Electronic Water Quality Analyzer.

## **Estimation of Chloride**

Chloride was estimated in the water samples by Argentometric Method (APHA, 2005); Ref.4500 Cl (4-70 to 4-71).

### **Reagents**

- (i)  $K_2CrO_4$  solution: 50 g  $K_2CrO_4$  was dissolved in distilled water.  $AgNO_3$  solution was added till red precipitate was formed and left for overnight. It was filtered and made up to 1 liter with distilled water.
- (ii) Standard  $AgNO_3$  (0.014 N) – 2.395 g of  $AgNO_3$  was dissolved in distilled water. It was made up to 1 liter with distilled water and stored in a brown bottle.

### **Method**

50 ml of water sample was taken in a conical flask and few drops of  $K_2CrO_4$  solution were added. It was then titrated with standard  $AgNO_3$  solution till the red precipitate was formed, this end point was noted.

### **Calculation**

$$\text{Chloride (mg/l)} = S - B \times \text{Normality of standard } AgNO_3 \times 35450 / \text{ml sample}$$

Where S= Volume of  $AgNO_3$  used for titrations sample

B= Volume of  $AgNO_3$

Normality (N) = 0.014

## **Estimation of Fluoride**

Fluoride was estimated in the water samples by Ion Selective Electrode Method (APHA, 2005); Ref.4500 Fl (4-84)

### **Reagents**

- (i) Standard fluoride solution: For preparation of standard fluoride solution, 221 mg NaF was dissolved in 1 liter of distilled water to make stock solution.
- .(ii) TISAB IIIrd-(Total Ionic Strength Adjustment Buffer IIIrd): To 500 ml distilled water, 57 ml glacial acetic acid, 0.589 g NaCl ,4 g CDTA (Cyclohexane demine tetra acetic acid) was dissolved in a beaker by stirring and placed in a cool water bath . Then 125 ml of 6 N NaOH was added with stirring to get pH between 5 to 5.5.

### **Method**

10 ml of sample was taken in a beaker and 1 ml of TISAB 3rd was added in this sample.Fluoride concentration was directly read in the sample by dipping electrodes. Fluoride concentration in water samples were estimated by electronic method using expandable ion analyzer. For this, two electrodes reference electrode and fluoride sensing electrode were used. The electrodes were activated and instrument was calibrated with 1 ppm, 10 ppm, 100 ppm of known fluoride solution.

### **Estimation of Nitrate**

Nitrate was estimated in the water samples by Nitrate Electrode Method (APHA, 2005); Ref.4500 NO<sub>3</sub><sup>-</sup> (4-122).

### **Reagents**

- (i) Ionic strength adjuster (ISA): 17.32 g Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>.18H<sub>2</sub>O,3.43 g Ag<sub>2</sub>SO<sub>4</sub>,1.28 g H<sub>3</sub>BO<sub>4</sub>, 2.52g Sulphuric Acid and 105.69 g (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> was dissolved in 800 ml distilled water. pH of this solution was adjusted to 3.0 and then it was made up to 1 liter with distilled water. The solution was stored in brown bottle.
- (ii) Standard nitrate solution: Standard nitrate solution was prepared by dissolving 0.0721 g of dry KNO<sub>3</sub> in 1 liter distilled water. It was then diluted to make standard nitrate solution of variable concentration.

### **Method**

Nitrate concentration in water samples were estimated by electronic method using expendable ion analyzer. For this, two electrodes i.e reference and sensing were used. They are activated and attached to the analyzer. The instrument was calibrated with 1 ppm 10 ppm and 100 ppm of strength of known nitrate solution. For nitrate estimation, to each unknown sample ionic strength adjuster was added in the ratio of 100:2. Nitrate concentration in the sample was directly read by dipping the electrodes.

### **Estimation of Total Alkalinity**

Total Alkalinity was estimated in the water samples by Titration Method using methyl orange indicator (APHA, 2005); Ref. 2320 (2-27).

#### **Reagents**

- (i) Methyl orange: 500 mg methyl orange powder was dissolved in distilled water and made up to 1 liter.
- (ii) Sulphuric acid (0.02N): 200 ml (0.1 N)  $H_2SO_4$  was diluted to 1 liter.

$$1 \text{ ml } H_2SO_4 = 1 \text{ mg } CaCO_3$$

#### **Method**

100 ml water samples were taken in a conical flask. 2 drops of methyl orange indicator was added to get yellow colour. The water sample was then titrated with 0.02 N sulfuric acid. Volume of titrate was noted when yellow colour turned pink.

#### **Calculation**

$$\text{Total alkalinity} = \text{ml titrate normality of acid} \times 50000 / \text{ml sample}$$

### **Estimation of Sulphate**

Sulphate was estimated in the water samples by Standard Method (APHA, 2005); Ref.4500 SO<sub>4</sub><sup>2-</sup>(4-188).

### Reagents

- (i) Buffer: 30 mg MgCl<sub>2</sub>.6H<sub>2</sub>O, 5 g CH<sub>3</sub>COONa and 1 g KNO<sub>3</sub> was dissolved in 20 ml CH<sub>3</sub>COOH and made up to 1 liter with distilled water.
- (ii) Standard Sulphate Solution: Standard sulphate solution was prepared by dissolving 0.1479 g Na<sub>2</sub>SO<sub>4</sub> in 1 liter of distilled water.

### Method

Sulphate concentration in water sample was analyzed by UV-Visible Spectrophotometric method against distilled water as blank with 100% transmittance at 420 nm. To standardize/calibrate the instrument 0.5, 10,20,30,40, mg/ml of known sulphate solution were prepared. 50 ml sulphate solution of different concentration was taken and 10 ml of buffer was added to it followed by addition of BaCl<sub>2</sub> crystal and stirred. The reading was noted and standard curve for sulphate in water was plotted with concentration on y axis and absorbance on x axis.

### Calculation

$$\text{Sulphate (mg/g)} = \text{mgSO}_4 \times 1000 / \text{ml sample}$$

### Determination of Total Hardness

Total Hardness was determined by EDTA Titrimetric Method (APHA et al, 2005); Ref. 2340c (2-37).

### Reagents

- (i) Total hardness indicator tablet: This tablet was added the solution to get wine red colour.
- (ii) Buffer: 16.9 g NH<sub>4</sub>Cl+143ml NH<sub>4</sub>OH+ 780 mg MgSO<sub>4</sub>.7H<sub>2</sub>O was dissolved in 50 ml distilled water. It was then made up to 250 ml with distilled water and stored in plastic bottles.

(iii) Standard EDTA TITRANT (0.1M): 1 g CaCO<sub>3</sub>+1 ml HCl + 200 ml distilled water were mixed and boiled for few minutes to evaporate CO<sub>2</sub>. The solution was then cooled and few drops of methyl red were added to get orange colour.

### **Method**

10 ml water sample was taken and 1ml of buffer was added to it to get a pH of 10 ±0.1. In this total hardness indicator tablet was added to the solution to get wine red colour. It is then titrated with standard EDTA solution. Endpoint was noted when wine red colour turned blue.

### **Calculation**

$$\text{Total Hardness} = \text{ml sample} \times 1000 / \text{ml sample}$$

## **Heavy Metal Analysis**

### **Preparation of water samples for heavy metal analysis (APHA, 2005)**

One hundred (100 ml) ml of water sample was taken into 250 ml conical flask and 5.0 ml of Concentrated HNO<sub>3</sub> was added in it. Covered the conical flask with glass cover and heated gently in open. Further, added some amount of HNO<sub>3</sub> till the completion of digestion. It was then filtered and transferred into 10.0 ml volumetric flask. The volume was made up to 10.0 ml with water. The samples were then analysed on ICP (Inductively Coupled Plasma) Spectrophotometer.

### **Preparation of soil samples for heavy metal analysis (USPA method 3051, 2007)**

One gram (1 g) of soil sample was transferred into reaction vessel and 5 ml HNO<sub>3</sub> was added to it. Covered the vessel properly and placed it into Microwave Reaction System. The solution was filtered after digestion and transferred into 10.0 ml volumetric flask. The volume was made up to 10.0 ml with water. The samples were then analysed on ICP (Inductively Coupled Plasma) Spectroscopy.

## **Total Organic Carbon Analysis**

The quantification of Total organic carbon in water samples were done by Shimadzu TOC-5000A (Japan) .This analyser measures total carbon (TC), and inorganic carbon (IC). The operation of TOC analyser is based on combustion/ non-dispersive infrared gas analysis.

### **Preparation of TC standard solution (1000 mg/L)**

For the preparation of the TC standard solution, 2.125 g of Potassium hydrogen phthalate was dissolved in 1 litre zero water.

### **Preparation of IC standard solution (1000 mg/l.)**

IC standard solution was prepared by dissolving 3.5 g of Sodium hydrogen carbonate and 4.41 g of Sodium carbonate (which was heated for 1 hour at 285 deg. C and cooled in desiccators) in 1 litre zero water.

### **Calibration of the instrument**

The instrument was calibrated by using the above standard solution.

### **Measurement of TOC**

The value of total organic carbon is obtained by subtracting the value of inorganic carbon from the total carbon (TOC= TC-IC).

## **Pesticide Analysis**

### **Preparation of water samples for analysis of HCH (Hexachloro cyclohexane)**

Preparation of water samples for Hexachloro cyclohexane analysis are shown in Flow sheet-1

### **Requirements**

1000 ml. water, 300 ml n-hexane, 15 ml saturated NaCl, Separating funnel (2000 ml), Rotavapour, Conical flask (500 ml), Volumetric flask (10 ml).

**Procedure ( APHA, 2005); Ref. 6630 A&B (6-100 to 6-114)**

1 liter water was added in 2000 ml separating funnel.



Added 100 ml n-Hexane and 15 ml NaCl into separating funnel



Shake for 10 minutes



Layer of n-Hexane and water was separated



Poured water into beaker and n-Hexane into another conical flask



Again pour the remaining H<sub>2</sub>O in separating funnel and add 100 ml n-Hexane.

Shake for 10 minutes



Collect the n-Hexane in same conical flask and water into beaker



Again transfer the H<sub>2</sub>O into separating funnel and add 100 ml n-Hexane.

Shake for 10 minutes



Collect the n-Hexane in conical flask and discard the water

(Total volume of the n-Hexane = 300 ml)



The n-Hexane portion was passed through Funnel plucked with glass wool

and filled up with Na<sub>2</sub>SO<sub>4</sub>



Collect n-Hexane, passed through this funnel in a conical flask



Evaporate to dryness in rotavapour



Make up to 5 ml with n-Hexane



Analysed on Gas chromatography

**Flow Sheet 1.** Procedure for analysis of Hexachloro cyclohexane in water

**Preparation of Soil samples for analysis of HCH (Hexachloro cyclohexane)**

Preparation of soil samples for Hexachloro cyclohexane analysis are shown in Flow sheet-2

**Requirements**

10 g soil, 300 ml n-hexane, 300 ml Acetone, Dichloromethane, Florisil, Soxhlet Apparatus, Rotavapour, Conical flask (500 ml), Volumetric flask (10 ml).

**Procedure (EPA, 1 B, 1986); Ref. 3540,3550,3600,8080**

10 g freeze dried soil sample, extracted in Soxhlet with acetone and n –hexane (1:1 v/v)



Concentrated the extract



Cleaned up with Florisil



Concentrated the eluent up to 1 ml



Made the volume up to 10 ml



Analysed the sample in GLC

**Flow Sheet-2.** Procedure for analysis of Hexachloro cyclohexane in soil

The extracts of soil and water were subjected to gas chromatographic analysis on a Varian CP-3800. A 30 m x 0.25mm x 0.25 μm capillary column was used. Conditions (all

temperature in  $^{\circ}\text{C}$ ): injector 300, column 210, detector 325; carrier gas nitrogen; flow rate 2ml/min. Electron capture detector  $^{63}\text{Ni}$  was used

**Standards:**

- (i)  $\alpha$ - HCH 5 pg/  $\mu\text{l}$
- (ii)  $\beta$ - HCH 20 pg/ $\mu\text{l}$
- (iii)  $\gamma$ -HCH 5pg/ $\mu\text{l}$
- (iv)  $\delta$ - HCH 10  $\mu\text{g/l}$

**Calculation:**

$$\text{Concentration of compound } (\alpha, \beta, \gamma, \delta) = \frac{\text{Area of sample} \times \text{wt. of std.} \times \text{Vol. extracted}}{\text{Area of std.} \times \text{Vol. of original sample} \times \text{Vol injected}}$$

**Result:** pg/ $\mu\text{l}$  or ppm

Wt. Of Standard= Concentration of Std. Compound x volume injected

**Bacteriological analysis of water samples (APHA, 2005; BIS, 2003; WHO, 2004)**

**Water Sample Collection**

Water samples on the site were collected in sterilized glass bottles and transported under cold condition ( $<10^{\circ}\text{C}$ ) to laboratory for analysis.

**Requirements**

Sterilized Glassware; Glass stoppered bottles (125 ml), Micropipettes (10 ml, 1ml and 0.1ml)

Culture media: MacConkey's broth, Brilliant Green Bile broth and Peptone water.

**Reagents:** Kovac's Reagent

**Equipments:** Autoclave, Hot air oven, Incubator ( $37^{\circ}\text{C}$ ) and Incubator ( $44^{\circ}\text{C}$ )

**Miscellaneous:** Cotton wool, Distilled water, Nichrome wire and Durham's tube

### **Enumeration of Coliforms in water samples**

Bacteriological analysis of water samples was done by multiple (three) tube fermentation method which is based on the law of probability and multiple dilutions to extinction. Bacterial contamination was estimated as most probable number (MPN)/100ml of water sample.

In this method, fermentation tubes with double strength MacConkey's broth of 10 ml volumes while single strength culture broth for 5 ml volume with inverted vials (Durham's tube) was prepared and autoclaved. First set of three fermentation tubes with 10 ml of medium were inoculated with 10 ml of sample, while second and third sets were inoculated with 1.0 and 0.1 ml of samples, respectively. Inoculated sets of tubes were incubated at 37 °C.

After 48 hours fermentation tubes were observed for production of gas in Durham's tube with or without acid indicated by colour change of medium from red to orange. MPN of PRESUMPTIVE COLIFORM / 100 ml of sample was worked out by consulting probability table (McCrady, 1918). To determine MPN of CONFIRMED COLIFORM/100 ml of sample, all the positive tubes of presumptive coliform test were subcultured with inoculation loop (Nichrome wire) in test tubes containing 5 ml of single strength MacConkey's broth with an inverted Durham's tube incubated at 37 °C. After 48 hours number of positive tubes showing acid and gas production confirm the presence of coliform by consulting same probability table.

### **Enumeration of Faecal coliforms in water samples**

For this, all positive tubes of confirmed coliform test were subcultured with inoculation loop from each positive tube into 5 ml of brilliant green bile (BGB) broth with an inverted Durham's tube and 5 ml of peptone water tubes. The subcultured tubes are incubated at 44 °C. After 24-48 hours BGB broth tubes with growth and gas production were counted to determine the MPN of PRESUMPTIVE FAECAL COLIFORM/100 ml of sample. 4-5 drops of Kovac's reagent was added in peptone water tubes paired with positive BGB broth tubes. The positive peptone water tubes showing red layer on surface were counted to determine MPN of CONFIRMED FAECAL COLIFORM (*Escherichia coli*) 100 ml of sample by consulting the same probability table.

## \Reporting

Samples showing >10 coliform and /or >1 faecal coliform (*Escherichia coli*)/ 100 ml were considered contaminated and not recommended for drinking (WHO, 2004)

## Results

### Site: Nauraiya Kheda

#### Water:

Out of 32 water samples collected from the area, only two had higher pH (10.00 & 11.50) and 12 samples showed higher fluoride levels (1.1- 2.1 ppm), whereas 24 samples showed higher sulphate levels (210 to 701 ppm), three samples showed higher nitrate levels (47.8, 55.5 & 57.4 ppm) and two showed higher chloride levels (270 & 320) with respect to standard desirable limits for drinking water (data given in Table 6).

Three samples out of 32 were contaminated with coliform and 2 with fecal coliform (data given in Table 7). Nine samples showed higher concentration of chromium (0.06 to 1.66 ppm). Three samples had higher level of iron (0.40, 0.47 & 0.89 ppm) and five samples had higher manganese levels (0.13 to 0.44 ppm). These levels were higher when compared to the standard desirable limits for drinking water (data given in Table 8). Distribution of chromium in water samples are shown in Fig.2.

#### Soil:

44 samples of soil collected from various depths (0 to 40 feet at 5 feet interval) of five sites were analysed for cadmium, cobalt, chromium, copper, Iron, manganese, nickel, lead and zinc. The samples collected from different locations of the site revealed the significant presence of the above metals although no definite trend could be observed in the increase or decrease of the concentrations of these metals with depth. (data given in Table 9). When average values of the five sites for the same depth were calculated, it was found that the

concentration of chromium, lead and zinc was higher in the top strata as compared to the lower strata (data given in Table 33). Distribution of chromium in the soil samples from (0-40 feet) is shown in Fig. (1a-1i).

#### **Site: Juhi Baburahiya (Rakhi Mandi)**

##### **Water:**

Out of 13 water samples collected from the area, only three samples showed higher nitrate levels (48.9, 52.1 & 52.5 ppm), one sample showed higher sulphate level (292 ppm), with respect to standard desirable limits for drinking water (data given in Table 10).

One sample out of 13 was contaminated with coliform and one with fecal coliform (data given in Table 11). Nine samples showed higher concentration of chromium (0.07 to 4.59 ppm), two had higher copper levels (0.06 & 0.20). Ten samples had higher level of iron (0.31 to 1.63 ppm) and eight samples had higher manganese levels (0.12 to 0.63 ppm). Four samples had higher nickel levels (0.04 to 0.06 ppm). These levels were higher when compared to the standard desirable limits for drinking water (data given in Table 12). Distribution of chromium in the water samples are shown in Fig. 2.

##### **Soil:**

26 samples of soil collected from various depths (0 to 40 feet at 5 feet interval) of three sites were analysed for cadmium, cobalt, chromium, copper, Iron, manganese, nickel, lead and zinc. The samples collected from different locations of the site revealed the significant presence of the above metals although no definite trend could be observed in the increase or decrease of the concentrations of these metals with depth. (data given in Table 13). When average values of the three sites for the same depth were calculated, it was found that the concentration of all the metals were higher in the lower strata as compared to the top strata (data given in Table 34). Distribution of chromium in soil samples from (0-40 feet) is shown in Fig. (1a-1i).

## \ Site: Panki Industrial Area (Duncan's)

### Water:

Out of 28 water samples collected from the area, six samples had higher pH (10.5 to 11.51), twelve samples had higher fluoride levels (1.1 to 2.0 ppm), one sample showed higher nitrate (66.8 ppm), seventeen samples had higher sulphate levels (223 to 966 ppm) and three samples had higher chloride levels (320, 373 and 482 ppm) with respect to standard desirable limits for drinking water (data given in Table 14).

Three samples out of 28 were contaminated with coliform and one with fecal coliform (data given in Table 15). Two samples showed higher concentration of chromium (0.17 to 10.42 ppm), one had higher copper levels (0.10 ppm). Nine samples had higher level of iron (0.32 to 1.09 ppm) and seven samples had higher manganese levels (0.11 to 0.27 ppm). Only one sample had higher nickel levels (0.03 ppm). These levels were higher when compared to the standard desirable limits for drinking water (data given in Table 16). Distribution of chromium in the water samples are shown in Fig. 2.

### Soil:

43 samples of soil collected from various depths (0 to 40 feet at 5 feet interval) of five sites were analysed for cadmium, cobalt, chromium, copper, Iron, manganese, nickel, lead and zinc. The samples collected from two active sites showed very high levels of metals especially chromium, iron, manganese, lead and zinc at the top layers and also at 25-35 feet levels (data given in Table 17). The metal levels in other depths of soil were not as high as compared to the 25-35 feet levels. When average values of the five sites for the same depth were calculated, it was found that the concentration of all the metals were higher in the lower strata as compared to the top strata (data given in Table 35). Distribution of chromium in soil samples from (0-40 feet) is shown in Fig. (1a-1i).

## **\ Site: Rania**

### **Water:**

Out of 13 water samples collected from the area, only one had higher pH (8.69) and one sample showed higher fluoride level (4.4 ppm), whereas two samples showed higher TDS (523 & 526 ppm) and another three samples showed higher sulphate levels (210, 224 & 252 ppm) with respect to standard desirable limits for drinking water (data given in Table 18).

Eight samples out of 13 were contaminated with coliform and 9 with fecal coliform (data given in Table 19). Three samples showed higher concentration of chromium (0.10, 1.12 & 2.72 ppm). Only one sample had higher level of iron (2.33 ppm) and two samples had higher manganese levels (0.22 & 0.37). These levels were higher when compared to the standard desirable limits for drinking water (data given in Table 20). Distribution of chromium in the water samples are shown in Fig. 2.

### **Soil:**

27 samples of soil collected from various depths (0 to 40 feet at 5 feet interval) of three sites were analysed for cadmium, cobalt, chromium, copper, Iron, manganese, nickel, lead and zinc. The data revealed the significant presence of these metals in various depths of soil although no trend could be observed in the increase or decrease of the concentrations of these metals with depth. (data given in Table 21 & 36). Distribution of chromium in soil samples from (0-40 feet) is shown in Fig. (1a-1i).

## **Site: Dewa Road, Lucknow**

### **Water:**

Eight samples were collected from the area. Physico-chemical parameters in all the samples were within the desirable limits for drinking water (data given in Table 22). Three were contaminated with coliform and two with fecal coliform (data given in Table 23). Most of the











VM-W-22	Devaraj Pal Ka Hotel Nauraiya Kheda	Shallow Pump	4	<3
VM-W-23	Puja Provision & General Store, 11-A	Mark II	<3	<3
VM-W-24	-	Shallow	<3	<3
VM-W-25	-	Mark II	<3	<3
VM-W-26	Annapurna Electricals 59(1)	Mark II	<3	<3
VM-W-27	Susheel House No. 54	Submersible 130'	<3	<3
VM-W-28	-	Mark II	<3	<3
VM-W-29	-	Mark II	<3	<3
VM-W-30	Radhey Shyam Venue, H.No.95	Shallow	<3	<3
VM-W-31	Rajendra Singh. H.No.83	Shallow	<3	<3
VM-W-32	Divya Enterprises,Dumping area active site Reported Site (Earlier)	Submersible	<3	<3

BIS standard for drinking water

<10 Coliform/100ml

<1 Faecal Coliform or E.  
Coli/100ml (Absent)

<3 = 0

Note: Values in bold depicts the drinking water samples contaminated with **Coliform and Faecal Coliform Bacteria**

Table: 8 Concentration of metals (mg/L) in water samples collected from Nauraiya Kheda (Kanpur)

code	Description of place	Source	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-W-1	Tulsa Ashram	30-35' Shallow HP	BDL	BDL	0.00	0.00	0.30	0.02	0.01	BDL	0.24
VM-W-2	Jhuggi (Shiv Mandir)	Shallow 35-40'	BDL	BDL	0.00	0.00	0.13	0.01	0.01	BDL	0.26
VM-W-3	Techno Pharm Pvt. Ltd.	150' Boring well	BDL	BDL	0.05	0.00	0.15	0.01	0.01	BDL	0.07
VM-W-4	Sivaram Packers	100-125' Boring	BDL	BDL	<b>0.06</b>	0.02	0.17	0.07	0.01	BDL	0.05
VM-W-5	Geeta Vidya Mandir Primary School	Mark II 120'	BDL	BDL	0.05	0.02	0.08	0.02	0.01	BDL	0.23
VM-W-6	-do-	120' Deep Boring	BDL	BDL	0.02	0.00	0.12	<b>0.44</b>	0.01	BDL	0.38
VM-W-7	Monica Sweets	120' Deep Boring	BDL	BDL	0.01	0.00	0.12	<b>0.27</b>	0.01	BDL	0.73
VM-W-8	Shiv Mandir	Mark II	BDL	BDL	0.01	0.00	<b>0.43</b>	<b>1.12</b>	0.01	BDL	0.10
VM-W-9	-	50-60 Shallow	BDL	BDL	0.02	0.00	BDL	0.00	0.01	BDL	0.09
VM-W-10	Opposite Mama Provision Store	Mark II	BDL	BDL	0.01	0.00	0.16	0.02	0.01	BDL	0.14
VM-W-11	-	Mark II	BDL	BDL	0.01	0.02	0.07	0.04	0.01	BDL	1.38
VM-W-12	-	Mark II	BDL	BDL	0.01	0.00	0.13	0.02	0.01	BDL	0.17
VM-W-13	Sri Bhagwan Singh, H.N.-157C	Shallow 560'	BDL	BDL	0.01	0.00	<b>0.89</b>	0.07	0.01	BDL	0.26
VM-W-14	Yellow water	Submersible	BDL	BDL	<b>1.66</b>	0.00	0.09	0.02	0.01	BDL	0.53
VM-W-15	Afaq Beg	130'	BDL	BDL	<b>0.43</b>	0.00	0.10	0.05	0.01	BDL	0.06
VM-W-16	-	Mark II	BDL	BDL	<b>0.34</b>	0.00	0.12	0.05	0.01	BDL	0.09
VM-W-17	-	Submersible	BDL	BDL	<b>0.45</b>	0.00	0.25	0.05	0.01	BDL	0.08
VM-W-18	-	Mark II	BDL	BDL	<b>0.31</b>	0.00	0.24	0.07	0.01	BDL	0.30
VM-W-19	Ganesh Stationary & General Store	Shallow 55'	BDL	BDL	0.02	0.00	<b>0.18</b>	<b>0.15</b>	0.01	BDL	0.21
VM-W-20	Behind the road	Submersible	BDL	BDL	0.01	0.00	0.11	0.01	0.01	BDL	0.01

VM-W-21	Munna Ka Godam, 22-A, Nauraiya Kheda Dyingwork	Jet Pump	BDL	BDL	0.01	0.01	0.13	0.02	0.01	BDL	0.02
VM-W-22	Devraj Pal Ka Hotel Nauraiya Kheda	Shallow Pump	BDL	BDL	0.01	0.02	<b>0.47</b>	0.02	0.01	BDL	0.09
VM-W-23	Puja Provision & General Store, 11-A	Mark II	BDL	BDL	0.01	0.01	0.25	0.03	0.01	BDL	0.21
VM-W-24	-	Shallow	BDL	BDL	0.01	0.01	<b>0.40</b>	<b>0.13</b>	0.01	BDL	0.15
VM-W-25	-	Mark II	BDL	BDL	0.01	0.01	0.11	0.06	0.01	BDL	0.17
VM-W-26	Annapurna Electricals 59(1)	Mark II	BDL	BDL	<b>0.06</b>	0.01	0.24	0.05	0.01	BDL	0.02
VM-W-27	Susheel House No. 54	Submersible 130'	BDL	BDL	0.05	0.03	0.16	0.08	0.01	BDL	0.20
VM-W-28	-	Mark II	BDL	BDL	<b>0.06</b>	0.02	0.28	0.04	0.01	BDL	0.90
VM-W-29	-	Mark II	BDL	BDL	0.03	0.01	0.13	0.03	0.01	BDL	0.33
VM-W-30	Radhey Shyam Venue, H.No.95	Shallow	BDL	BDL	<b>0.06</b>	0.01	0.30	0.03	0.01	BDL	0.64
VM-W-31	Rajendra Singh, H.No.83	Shallow	BDL	BDL	0.04	0.12	<b>0.40</b>	<b>0.35</b>	0.01	BDL	0.58
VM-W-32	Divya Enterprises,Dumping area active site Reported Site (Earlier)	Submersible	BDL	BDL	0.05	0.02	0.05	0.22	0.01	BDL	0.04

BIS Desirable Limit for Drinking Water

Note: Values in bold depicts the values above the desirable limits for drinking water

**0.01**      **0.05**      **0.3**      **0.1**      **0.02**      **0.05**      **5.0**

Table 9: Concentration of metals (mg/Kg) in soil samples collected at different depth from Nauraia Kheda (Kanpur)

code	Description of place	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-SOIL-S-1	Field behind Tulsia Ashram Near Nahariya (Canal) 0 feet	0.11	5.94	49.19	29.24	2352	247.20	17.61	14.09	37.32
VM-SOIL-S-2	5 feet	0.12	9.59	55.85	44.94	2759	289	28.41	16.96	53.10
VM-SOIL-S-3	10 feet	0.08	8.19	40.45	31.28	2572	253.80	21.25	12.30	47.21
VM-SOIL-S-4	15 feet	0.04	6.88	26.54	20.18	2417	266.10	18.22	9.06	41.58
VM-SOIL-S-5	20 feet	0.26	11.65	59.77	47.80	2954	343.90	29.96	27.84	126.60
VM-SOIL-S-6	25 feet	0.19	9.43	58.11	36.08	2649	268.50	24.15	33.70	266.90
VM-SOIL-S-7	30 feet	0.17	8.33	61.45	28.56	2557	281.90	19.95	32.45	247.20
VM-SOIL-S-8	35 feet	0.29	14.22	75.04	62.54	2938	350.80	40.88	22.86	160.40
VM-SOIL-S-9	40 feet	0.25	12.40	49.88	55.82	2870	237.50	37.33	15.18	84.45
VM-SOIL-S-10	Mama Provision store 0 feet	0.15	4.94	81.00	78.96	2107	251.90	15.20	162.80	143.30
VM-SOIL-S-11	5 feet	0.20	9.94	52.39	49.30	2819	316.50	23.06	20.75	65.40
VM-SOIL-S-12	10 feet	0.28	12.70	39.90	65.06	2823	327.40	27.56	15.36	72.74
VM-SOIL-S-13	15 feet	0.44	15.53	57.67	62.62	2942	339.80	40.04	18.67	110.20
VM-SOIL-S-14	20 feet	0.22	11.25	38.06	45.00	2724	289.80	25.07	24.46	330.40
VM-SOIL-S-15	25 feet	0.25	12.03	44.86	58.68	2730	494	29.44	16.55	102.80
VM-SOIL-S-16	30 feet	0.21	10.89	37.49	45.12	2669	270.30	24.17	16.45	139.70
VM-SOIL-S-17	35 feet	0.38	14.53	45.76	69.14	2816	494.30	28.96	21.29	114.50
VM-SOIL-S-18	40 feet	0.17	8.13	66.66	71.28	2505	253.30	22.02	104.50	121.50
VM-SOIL-S-19	Behind Shiv Mandir (Late Ganga Narain Shukla,123, N.Kheda) 0 feet	0.26	11.28	65.83	109.96	2546	256.40	32.32	65.33	225.10
VM-SOIL-S-20	5 feet	0.45	16.84	89.19	116.12	3029	287.80	45.59	21.76	161.60

VM-SOIL-S-21	10 feet	0.09	48.95	72.88	101.60	3101	257.90	35.87	16.49	139.30
VM-SOIL-S-22	15 feet	BDL	12.40	57.37	77.02	2980	285.30	30.75	19.31	118.30
VM-SOIL-S-23	20 feet	BDL	11.09	24.92	21.58	2396	228.90	14.53	10.09	72.96
VM-SOIL-S-24	25 feet	BDL	5.43	45.84	57.84	2785	234.70	23.64	22.98	393.50
VM-SOIL-S-25	30 feet	BDL	8.77	48.34	67.28	2733	260.40	21.48	29.32	394.30
VM-SOIL-S-26	35 feet	BDL	10.48	44.50	54.94	2988	236.70	26.00	16.21	120.60
VM-SOIL-S-27	40 feet	BDL	11.47	50.14	57.56	2958	243.50	26.78	22.20	281.20
VM-SOIL-S-28	Near Active Site	0.33	12.06	97.97	134.28	2858	270.80	26.18	264.70	306.90
	0 feet									
VM-SOIL-S-29	5 feet	BDL	9.26	61.56	68.92	2897	267.90	24.60	24.32	148.60
VM-SOIL-S-30	10 feet	BDL	9.24	63.63	42.46	2946	239.60	30.26	12.82	80.65
VM-SOIL-S-31	15 feet	BDL	11.09	36.21	25.64	2722	202.30	21.37	7.87	61.35
VM-SOIL-S-32	20 feet	BDL	0.60	47.87	13.69	2599	297.10	14.56	7.23	75.46
VM-SOIL-S-33	25 feet	0.01	5.11	61.55	75.12	3070	261.60	31.62	17.84	81.24
VM-SOIL-S-34	30 feet	BDL	14.65	58.04	42.78	2941	235.40	31.04	10.84	66.39
VM-SOIL-S-35	35 feet	BDL	11.88	44.09	30.60	2706	218.30	16.36	25.64	218.30
VM-SOIL-S-36	40 feet	0.13	8.30	51.12	57.60	2953	319.2	25.86	38.62	283.70
VM-SOIL-S-37	Site-5	0.10	12.82	115.60	159.16	2991	282	28.07	202.70	394.00
	0 feet									
VM-SOIL-S-38	5 feet	0.20	10.60	94.00	100.82	3145	396.70	36.04	633.10	240.70
VM-SOIL-S-39	10 feet	0.10	15.25	77.99	60.12	3100	458.60	42.25	18.01	220.40
VM-SOIL-S-40	15 feet	BDL	16.37	34.13	22.20	2586	216.90	18.15	22.40	264.50
VM-SOIL-S-41	20 feet	0.14	7.67	63.71	117.92	2738	240.30	16.84	208.90	345.60
VM-SOIL-S-42	25 feet	0.23	5.97	79.81	92.36	3000	347.00	24.38	226.60	757.10
VM-SOIL-S-43	30 feet	0.61	11.39	119.60	261.60	2934	294.30	30.70	302.40	206.30
VM-SOIL-S-44	35 feet	0.10	7.21	70.10	56.38	2956	603.40	37.01	30.41	111.50

Table 10 : Physicochemical parameters of water sample collected from Juhu Baburaiya (Kanpur)

code	Source	pH	EC(µs)	TDS(ppm)	Fluoride (ppm)	Nitrate (ppm)	Sulphate (ppm)	Hardness (ppm)	Alkalinity (ppm)	Chloride (ppm)	TOC (ppm)
VM-W-61	Shallow HP	6.43	295	143	0.1	32.1	133	142	14	140	75.95
VM-W-62	Mark II HP	6.90	366	180	0.2	<b>52.1</b>	96	118	16	110	150.3
VM-W-63	Do	6.90	194	96	0.1	17.2	56	74	8	100	54.2
VM-W-64	Deep Bore/ Public toilets	6.99	116	64	0.04	25.5	157	44	38	140	54.38
VM-W-65	Mark II Behind quarters	6.86	132	79	0.1	28.2	98	26	20	46	54.84
VM-W-66	Mark II in the park	6.84	208	112	0.1	25.1	112	88	46	120	58.36
VM-W-67	Mark-II Near Temple	6.96	326	171	0.02	<b>48.9</b>	168	112	20	200	93.23
VM-W-68	Mark II into lane (Near road)	7.27	807	424	0.2	18.2	56	162	28	130	50.85
VM-W-69	Deepbore Public Toilet Rakhi mandi	7.04	204	109	0.5	20.5	<b>292</b>	86	34	200	57.09
VM-W-70	Mark -II	7.83	119	59	0.2	26.2	57	34	6	190	66.9
VM-W-71	Do	7.82	198	100	0.1	43.3	46.2	96	42	170	85.48
VM-W-72	Do	7.33	116	61	0.2	<b>52.5</b>	54.6	24	18	210	74.13
VM-W-73	Do	7.92	122	64	1.0	16.8	182	86	12	140	67.16

BIS Desirable Limit for Drinking water   **6.5-8.5**500           1           **45**           200**250**

Note: Values in bold depicts the values above the desirable limits for drinking water

Table 11: Bacterial contamination level in water sample collected from Juhu Baburaiya (Kanpur)

code	Source	Coli/100 ml	E. Coli/100 ml
VM-W-61	Shallow HP	<3	<3
VM-W-62	Mark II HP	<3	<3
VM-W-63	Do	<3	<3
VM-W-64	Deep Bore/ Public toilets	4	<3
VM-W-65	Mark II Behind quarters	<3	<3
VM-W-66	Mark II in the park	<3	<3
VM-W-67	Mark-II Near Temple	<3	<3
VM-W-68	Mark II into lane (Near road)	<3	<3
VM-W-69	Deepbore Public Toilet Rakhi mandi	>1100	4
VM-W-70	Mark -II	<3	<3
VM-W-71	Do	<3	<3
VM-W-72	Do	<3	<3
VM-W-73	Do	<3	<3

Note: BIS standard for drinking water

<10 Coliform/100ml

<1 Faecal Coliform or

E. Coli/100ml (Absent)

<3=0

Note: Values in bold depicts the drinking water samples contaminated with Coliform and Faecal Coliform Bacteria

Table 12: Concentration of metals (mg/L) in water Samples collected from Juhi Babraiva (Kapur)

code	Source	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VMI-W-61	Shallow HP	BDL	0.01	2.79	0.02	1.63	0.38	0.06	0.02	0.07
VMI-W-62	Mark II HP	BDL	0.01	4.59	0.03	0.44	0.23	0.06	0.02	0.09
VMI-W-63	Do	BDL	0.03	0.07	0.05	0.53	0.15	0.04	0.03	0.05
VMI-W-64	Deep Bore/ Public toilets	BDL	0.03	0.04	0.04	1.26	0.27	0.04	0.03	0.17
VMI-W-65	Mark II Behind quarters	BDL	0.01	0.03	0.02	0.36	0.04	0.02	0.02	0.12
VMI-W-66	Mark II in the park	BDL	0.02	0.06	0.02	0.35	0.10	0.02	0.01	0.05
VMI-W-67	Mark-II Near Temple	BDL	0.02	1.67	0.02	0.34	0.63	0.02	0.02	0.51
VMI-W-68	Mark II into lane (Near road)	BDL	0.01	0.10	0.02	0.25	0.06	0.02	0.02	0.08
VMI-W-69	Deepbore Public Toilet Rakhi mandi	BDL	0.02	0.71	0.02	0.22	0.35	0.02	0.02	0.04
VMI-W-70	Mark -II	BDL	0.02	0.99	0.02	0.32	0.19	0.02	0.02	0.03
VMI-W-71	Do	BDL	0.01	0.02	0.06	1.16	0.07	0.02	0.03	0.17
VMI-W-72	Do	BDL	0.01	0.12	0.20	0.21	0.07	0.02	0.02	0.05
VMI-W-73	Do	BDL	0.02	0.05	0.03	0.31	0.12	0.02	0.02	0.29

BIS Desirable Limit for Drinking Water 0.01

Note: Values in bold depicts the values above the desirable limits for drinking water

Table 13: Concentration of metals (mg/Kg) in soil samples collected at different depth from Juhu Baburaiya (Kanpur)

code	Description of place	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-SOIL-88	Juhu site 1 0 feet	0.36	2.95	36.97	10.70	8829	256.19	6.21	2.86	21.63
VM-SOIL-89	5 feet	1.16	8.29	140.74	39.25	19251	438.67	36.82	8.32	184.93
VM-SOIL-90	10 feet	0.63	7.91	36.85	28.43	11479	286.15	26.90	8.87	87.76
VM-SOIL-91	15 feet	0.81	6.56	72.59	33.35	15849	286.76	20.24	7.99	70.30
VM-SOIL-92	20 feet	0.52	4.13	46.77	12.94	10916	201.56	11.19	5.73	132.60
VM-SOIL-93	25 feet	0.11	5.34	3.77	19.68	753	123.68	19.58	6.99	99.72
VM-SOIL-94	30 feet	0.72	5.93	88.56	24.57	14465	341.80	18.35	8.01	265.70
VM-SOIL-95	35 feet	0.94	7.12	87.99	38.91	16907	350.12	24.98	6.97	173.38
VM-SOIL-96	40 feet	0.97	7.48	85.43	37.73	17105	350.73	20.43	38.37	522.91
VM-SOIL-97	Juhu site 2 0 feet	0.43	5.02	28.24	12.56	7180	353.37	12.28	5.68	27.95
VM-SOIL-98	5 feet	0.44	2.94	27.60	17.03	8034	185.01	9.09	6.43	46.18
VM-SOIL-99	10 feet	0.53	6.80	40.07	18.43	11845	418.46	13.15	8.17	35.75
VM-SOIL-100	15 feet	1.08	8.19	71.77	45.98	17511	527.68	16.80	20.89	338.94
VM-SOIL-101	20 feet	0.49	4.30	33.67	18.74	10152	236.26	12.60	6.82	60.45
VM-SOIL-102	25 feet	0.25	2.21	17.40	7.55	5719	92.22	5.65	3.69	67.35
VM-SOIL-103	30 feet	0.24	2.05	49.44	8.79	5279	78.40	5.85	3.32	22.83
VM-SOIL-104	35 feet	0.36	3.27	27.04	11.43	7809	150.77	10.44	5.06	64.24
VM-SOIL-105	Juhu site 3 0 feet	0.24	1.97	15.16	12.32	4757	127.34	4.32	8.14	46.35
VM-SOIL-106	5 feet	0.53	4.53	38.42	27.63	9485	279.24	14.32	9.57	57.13
VM-SOIL-107	10 feet	0.79	6.57	47.30	32.28	12572	411.50	16.84	12.14	56.02
VM-SOIL-108	15 feet	0.57	4.88	34.61	24.10	9764	244.46	12.62	9.27	55.36
VM-SOIL-109	20 feet	0.96	8.62	58.71	42.69	14921	454.24	18.36	16.22	67.98
VM-SOIL-110	25 feet	0.89	8.56	58.06	43.90	14662	403.27	22.98	14.08	78.30
VM-SOIL-111	30 feet	0.91	7.95	49.37	38.39	13814	506.59	19.87	14.21	63.18
VM-SOIL-112	35 feet	0.36	3.94	BDL	10.91	8395	179.95	11.25	5.16	39.05
VM-SOIL-113	40 feet	0.63	5.58	43.05	27.79	11433	350.56	16.03	12.01	342.64

Table 14 : Physicochemical parameters of water sample collected from Duncan's Site Kanpur Panki

code	Description of place	Source	pH	EC ( $\mu$ s)	TDS (ppm)	Fluoride (ppm)	Nitrate (ppm)	Sulphate (ppm)	Hardness (ppm)	Alkalinity (ppm)	Chloride (ppm)	TOC (ppm)
VM-W-33	Shallow hand pump on dumping Site Near Banyan Tree	40' deep	7.23	271	131	0.5	52.50	356	15.8	14	160	52.4
VM-W-34	Near Site 33 with banana trees Shallow HP	35' deep	7.40	540	211	0.5	12.10	458	8.6	22	190	74.0
VM-W-35	In the Jhuggi Near the slums	35'	7.79	785	395	1.6	10.20	357	7.4	4	106	58.8
VM-W-36	Slums	35'	7.52	726	370	1.2	21.00	966	8.4	2	180	60.5
VM-W-37	25-KDA Plot (small factories)	Submersible	7.38	736	373	0.6	38.60	101	7.2	6	160	53.1
VM-W-38	Track parts of Loading Gate*(Very tasty used by most of the people)	35-40'	7.49	826	416	0.8	22.60	671	8.4	14	130	40.4
VM-W-39	Slums	35-40'	7.14	316	151	0.9	17.40	406	11.4	8	100	47.4
VM-W-40	Slums	35-40'	7.44	291	140	0.9	28.90	297	6.2	32	250	37.6
VM-W-41	Slums (open area near to dump)	Shallow pump 35'	10.50	594	274	1.3	21.80	549	12.6	16	130	69.1
VM-W-42	Open area near peepal tree	Shallow pump	6.83	255	122	0.3	9.03	382	8.4	4	90	40.1
VM-W-43	Factory Site (Complex) G-16, Panki Site I	Deep Booring	7.67	926	476	0.8	12.10	361	7.8	2	170	33.4
VM-W-44	Sri Tulsi Detergents G-17, Panki Site-I	Bore well 125' dump	7.67	764	386	1.2	16.30	248	10.6	6	210	50.6
VM-W-45	C-33,B Panki Site-I	Bore well	7.47	895	460	0.8	22.40	170	9.8	8	170	55.5

VM-W-46	G-20 Panki Site-I	130' deep bore	7.84	649	331	0.8	7.58	122	7.4	12	110	39.6
VM-W-47	G-25 BS Tin Ltd.	deep bore 60-65'	7.45	822	421	0.6	44.40	160	12.2	14	210	47.6
VM-W-48	E.MA India, C-37, Panki Site I	Bore well	7.57	630	322	0.7	8.740	124	8.6	16	70	39.7
VM-W-49	Near Duncan's Gate Hand Pump	Shallow HP	7.68	986	459	1.4	27.30	158	10.2	6	130	71.3
VM-W-50	do	Shallow HP	7.81	536	271	1.6	8.49	143	11.4	12	40	50.8
VM-W-51	I-A KDA Industrial area, Chandell Engineers Pvt. Ltd.	Shallow HP 70'	7.66	669	344	0.6	12.90	127	7.8	24	180	42.
VM-W-52	do		7.76	320	162	1.1	4.85	233	9.4	2	482	38..
VM-W-53	Opposite Reckitt Benckiser Ltd., Plot No.-8	Mark II	7.74	323	163	1.2	4.35	413	11.8	18	373	39.2
VM-W-54	Reckitt Benckiser Site	Submersible	7.81	406	212	1.1	22.80	520	7.6	6	130	33.7
VM-W-55	Uprorn Estate Panki Site I	Boring 160'	7.15	379	186	1.1	28.10	136	7.4	16	120	48.4
VM-W-56	Bank of Baroda on main road	Mark II	<b>10.56</b>	426	216	<b>2.0</b>	<b>66.80</b>	<b>845</b>	16.2	10	150	37.3
VM-W-57	Other site of railway line, Near Mazar	Shallow HP	10.73	253	123	1.0	26.90	223	10.6	14	320	62.3
VM-W-58	The side of railway line Tanker Workshop	Jet Pump	11.34	632	321	<b>1.3</b>	34.70	223	5.8	6	170	43.2
VM-W-59	Near flyover (newly constitution site)	Shallow Hand Pump	11.51	469	237	1.0	27.20	104	9.4	2	60	27.8
VM-W-60	Near Rly. Gate	Mark II	11.51	493	250	0.7	24.50	174	8.2	8	170	25.6
BIS Desirable Limit for Drinking water			<b>6.5-8.5</b>	500	1.0	<b>45</b>	<b>200</b>					<b>250</b>

Note: Values in bold depicts the values above the desirable limits for drinking water

Table 15 : Bacterial contamination level in water sample collected from Duncan's Site Kanpur Panki

code	Description of place	Source	Coliform/100 ml	<i>E. Coli</i> /100 ml
VM-W-33	Shallow hand pump on dumping Site Near Banyan Tree	40' deep	<3	<3
VM-W-34	Near Site 33 with banana trees Shallow HP	35' deep	<3	<3
VM-W-35	In the Jhuggi Near the slums	35'	<3	<3
VM-W-36	Slums	35'	<3	<3
VM-W-37	25-KDA Plot (small factories) track parts or Loading Gate (Very tasty used by most of the people)	Submersible	<3	<3
VM-W-38	Slums	35-40'	<3	<3
VM-W-39	Slums	35-40'	<3	<3
VM-W-40	Slums	35-40'	<3	<3
VM-W-41	Slums (open area near to dump)	Shallow pump 35'	150	<3
VM-W-42	Open area near peepal tree	Shallow pump	4	<3
VM-W-43	Factory Site (Complex) G-16, Panki Site I	Deep Boring	43	4
VM-W-44	Sri Tulsi Detergents G-17, Panki Site-I	Bore well 125' dump	<3	<3
VM-W-45	C-33.B Panki Site-I	Bore well	<3	<3
VM-W-46	G-20 Panki Site-I	130' deep bore	120	<3
VM-W-47	G-25 BS Tin Ltd.	deep bore 60-65'	9	<3
VM-W-48	EMA India, C-37, Panki Site I	Bore well	4	<3
VM-W-49	Near Duncan's Gate Hand Pump	Shallow HP	<3	<3
VM-W-50	do	Shallow HP	<3	<3

VM-W-51	I-A KDA Industrial area, Chandel Engineers Pvt. Ltd.	Shallow HP 70'	<3	<3
VM-W-52	do		4	<3
VM-W-53	<b>Opposite Reckitt Benckiser Ltd., Plot No.-8</b>	<b>Mark II</b>	<b>7</b>	<3
VM-W-54	Reckitt Benckiser Site	Submersible	<3	<3
VM-W-55	Uptown Estate Panki Site I	Boring 160'	4	<3
VM-W-56	Bank of Baroda on main road  Other site of railway line, Near Mazar	Mark II	9	<3
VM-W-57	The side of railway line Tanker Workshop	Shallow HP	<3	<3
VM-W-58	Near flyover (newly constitution site)	Jet Pump	<3	<3
VM-W-59	Near Rly. Gate	Shallow Hand Pump	<3	<3
VM-W-60		Mark II	<3	<3

Note: BIS Standard for drinking water

<10 coliform/100 ml

<1 Faecal Coliform or E. Coli/100 ml (Absent)

<3 = 0

Note: Values in bold depicts the drinking water samples contaminated with Coliform and Faecal Coliform  
Bacteria

Table 16 : Concentration of metals (mg/L) in water sample collected from Duncan's Panki site (Kanpur)

code	Description of place	Source	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-W-33	Shallow hand pump on dumping Site Near Banyan Tree	40' deep	BDL	BDL	0.05	0.01	0.12	<b>0.15</b>	0.01	BDL	0.22
VM-W-34	Near Site 33 with banana trees Shallow HP	35' deep	BDL	BDL	<b>10.42</b>	0.01	<b>0.46</b>	<b>0.23</b>	0.01	BDL	0.14
VM-W-35	In the Jhuggi Near the slums	35'	BDL	BDL	0.02	0.01	<b>0.50</b>	0.10	0.01	BDL	0.01
VM-W-36	Slums	35'	BDL	BDL	0.04	0.02	0.27	0.01	0.01	BDL	0.04
VM-W-37	25-KDA Plot (small factories)	Submersible	BDL	BDL	0.04	0.01	0.27	0.07	0.01	BDL	0.62
VM-W-38	Track parts of Loading Gate* (Very tasty used by most of the people)	35-40'	BDL	BDL	0.04	0.01	<b>0.39</b>	0.00	0.01	BDL	0.09
VM-W-39	Slums	35-40'	BDL	BDL	0.03	0.01	<b>0.37</b>	0.08	0.01	BDL	0.10
VM-W-40	Slums	35-40'	BDL	BDL	0.02	0.02	<b>0.73</b>	<b>0.27</b>	0.01	BDL	0.52
VM-W-41	Slums (open area near to dump)	Shallow pump 35'	BDL	BDL	0.03	0.02	<b>1.09</b>	<b>0.18</b>	0.01	BDL	0.14
VM-W-42	Open area near peepal tree	Shallow pump	BDL	BDL	0.04	0.01	<b>0.82</b>	<b>0.18</b>	0.01	BDL	0.12
VM-W-43	Factory Site (Complex) G-16, Panki Site I	Deep Boring	BDL	BDL	0.04	0.01	0.10	0.03	0.01	BDL	0.13
VM-W-44	Sri Tulsi Detergents G-17, Panki Site-I	Bore well 125' dump	BDL	BDL	0.05	0.02	0.11	0.02	0.01	BDL	1.05
VM-W-45	C-33.B Panki Site-I	Bore well	BDL	BDL	0.04	0.04	0.28	0.05	0.01	BDL	2.03
VM-W-46	G-20 Panki Site-I	130' deep bore	BDL	BDL	0.24	0.01	0.03	0.02	0.00	BDL	0.16
VM-W-47	G-25 BS Tin Ltd.	deep bore 60-65'	BDL	BDL	0.04	0.02	0.11	0.07	0.01	BDL	0.56
VM-W-48	EMA India, C-37, Panki Site I	Bore well	BDL	BDL	0.04	0.01	0.03	0.01	0.00	BDL	0.11
VM-W-49	Near Duncan's Gate Hand Pump	Shallow HP	BDL	BDL	0.04	0.01	0.25	0.03	0.00	BDL	0.11
VM-W-50	do	Shallow HP	BDL	BDL	0.05	0.01	<b>0.40</b>	<b>0.09</b>	0.01	BDL	0.01

VM-W-51	I-A KDA Industrial area, Chandel Engineers Pvt. Ltd.	Shallow HP 70'	BDL	BDL	0.04	0.03	0.19	0.00	0.00	BDL	0.10
VM-W-52	do		BDL	BDL	0.04	0.01	0.14	0.05	0.01	BDL	1.43
VM-W-53	Opposite Reckitt Benckiser Ltd., Plot No.-8	Mark II	BDL	BDL	0.05	0.02	0.25	0.29	<b>0.03</b>	BDL	0.17
VM-W-54	Reckitt Benckiser Site	Submersible	BDL	BDL	0.05	0.01	0.02	0.04	0.00	BDL	0.02
VM-W-55	Uptiron Estate Panki Site I	Boring 160'	BDL	BDL	0.04	0.01	0.10	<b>0.11</b>	0.01	BDL	0.15
VM-W-56	Bank of Baroda on main road	Mark II	BDL	BDL	0.02	0.10	<b>0.32</b>	0.01	0.00	BDL	0.08
VM-W-57	Other site of railway line, Near Mazar	Shallow HP	BDL	BDL	0.04	0.01	<b>0.64</b>	0.06	0.01	BDL	0.24
VM-W-58	The side of railway line Tanker Workshop	Jet Pump	BDL	BDL	<b>0.17</b>	0.01	0.27	<b>0.19</b>	0.02	BDL	0.11
VM-W-59	Near flyover (newly constitution site)	Shallow Hand Pump	BDL	BDL	0.05	0.02	0.17	0.01	0.00	BDL	0.03
VM-W-60	Near Rlv. Gate	Mark II	BDL	BDL	0.03	0.02	0.26	0.03	0.00	BDL	1.03

**BIS Desirable Limit for Drinking Water**

Note: Values in bold depicts the values above the desirable limits for drinking water

**0.01      0.05      0.05      0.3      0.1      0.02      0.05      5.0**

**Table 17: Concentration of metals (mg/Kg) in soil samples collected at different depth from Duncan's Panki Site (Kanpur)**

code	Description of place	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-SOIL-45	Near Banayan tree 0 feet	0.75	10.00	39.28	70.12	11941	263.11	23.51	16.17	128.45
VNI-SOIL-46	5 feet	0.48	6.37	28.92	51.09	9754	212.04	14.53	13.95	223.39
VM-SOIL-47	10 feet	0.69	9.12	34.41	63.30	11693	267.76	19.20	22.17	214.31
VM-SOIL-48	15 feet	0.45	6.62	27.91	41.62	9575	191.92	15.24	14.37	210.54
VNI-SOIL-49	20 feet	0.70	8.83	39.90	60.15	11522	247.55	26.99	21.04	243.27
VM-SOIL-50	25 feet	0.68	9.00	41.62	60.28	11394	230.87	29.17	18.72	167.01
VM-SOIL-51	30 feet	0.60	7.97	40.21	53.88	11001	237.06	22.26	24.11	97.26
VNI-SOIL-52	35 feet	0.48	6.54	66.92	87.69	9857	235.51	16.47	139.46	96.40
VM-SOIL-53	40 feet	0.54	7.48	31.28	52.17	11018	222.79	18.60	12.36	80.70
VM-SOIL-54	Near Jeevan Singh Hutment 0 feet	0.77	10.74	37.46	75.76	11906	312.12	23.68	19.79	76.31
VNI-SOIL-55	5 feet	0.69	9.05	34.28	63.10	11309	272.74	20.56	14.82	65.37
VM-SOIL-56	10 feet	0.65	8.40	48.33	58.89	11027	219.00	19.32	20.67	156.81
VNI-SOIL-57	15 feet	0.77	11.44	50.01	69.34	10332	917.98	28.02	31.02	182.07
VM-SOIL-58	20 feet	0.76	9.12	45.25	67.27	10332	353.97	25.22	21.28	184.11
VM-SOIL-59	25 feet	0.71	8.06	136.00	76.44	10161	282.60	22.95	83.00	254.28
VM-SOIL-60	30 feet	0.57	7.44	45.48	54.77	9491	265.38	18.06	21.26	143.85
VM-SOIL-61	35 feet	1.03	8.49	3106.37	199.47	10934	240.33	25.35	121.71	344.66
VM-SOIL-62	40 feet	0.58	7.81	179.18	60.93	10123	201.99	18.15	15.78	74.28
VM-SOIL-63	Active site 0 feet	0.91	9.15	2659.80	168.88	10250	281.58	19.56	666.46	248.66
VM-SOIL-64	5 feet	0.19	3.95	228.81	29.66	6413	114.49	6.09	34.79	60.45
VM-SOIL-65	10 feet	0.44	6.41	117.16	47.89	8859	185.87	15.22	20.37	53.24
VM-SOIL-66	15 feet	0.42	6.64	185.81	49.50	8948	201.91	19.95	31.92	56.34
VM-SOIL-67	20 feet	0.56	7.89	89.38	56.97	9566	255.99	21.31	22.51	58.49
VM-SOIL-68	25 feet	0.57	5.33	2091.44	105.15	9310	212.75	10.25	257.27	371.38
VM-SOIL-69	30 feet	0.89	7.50	2801.40	167.71	9526	249.35	16.64	516.62	293.05
VM-SOIL-70	35 feet	5.11	3.87	185.38	393.69	6783	154.77	5.23	229.32	127.66

VM-SOIL-71	40 feet	1.79	5.75	411.76	98.11	8698	214.75	12.37	85.41	104.72
VM-SOIL-72	Before railway line 0 feet	0.41	4.57	46.42	40.10	7996	194.83	7.53	14.50	80.18
VM-SOIL-73	5 feet	0.41	3.88	31.50	41.55	7273	155.01	6.75	13.77	197.12
VM-SOIL-74	10 feet	4.08	8.25	51.60	90.57	9547	208.67	19.97	39.98	127.18
VM-SOIL-75	15 feet	0.50	6.40	27.64	47.64	8566	185.68	15.94	10.61	84.65
VM-SOIL-76	20 feet	3.16	4.97	158.88	212.99	7836	176.07	10.79	103.52	304.24
VM-SOIL-77	25 feet	1.53	6.25	86.50	106.24	8712	307.24	12.34	49.25	303.04
VM-SOIL-78	30 feet	1.94	7.07	116.72	175.11	9004	237.20	15.44	64.96	214.71
VM-SOIL-79	35 feet	0.92	8.96	70.24	78.01	10298	282.18	22.61	63.01	151.64
VM-SOIL-80	40 feet	0.82	9.76	42.74	72.13	10138	277.56	22.03	13.91	101.60
VM-SOIL-81	Active site 0 feet	0.59	8.34	29.13	59.54	9513	242.05	13.74	15.80	67.60
VM-SOIL-82	5 feet	0.90	10.27	38.41	80.41	9596	277.47	20.43	18.40	74.48
VM-SOIL-83	10 feet	0.64	8.61	32.53	62.08	9312	237.75	19.19	12.87	59.72
VM-SOIL-84	15 feet	0.80	9.69	44.06	76.59	9908	263.83	23.35	17.23	73.12
VM-SOIL-85	20 feet	0.67	8.53	47.32	64.99	9943	235.57	23.19	17.32	67.69
VM-SOIL-86	25 feet	0.93	8.70	45.87	70.33	9860	265.34	18.82	28.26	305.73
VM-SOIL-87	30 feet	0.06	6.96	2.50	20.08	679	65.38	18.80	11.94	196.03

Table 18 : Physicochemical parameters of water sample collected from Kanpur Village,Rania (Kanpur Dehat)

Code	Source	pH	EC(µs)	TDS(ppm)	Fluoride (ppm)	Nitrate (ppm)	Sulphate (ppm)	Hardness (ppm)	Alkalinity (ppm)	Chloride (ppm)	TOC (ppm)
VM-W-74	Mark II	7.87	722	379	0.4	6.98	140	88	26	180	81.57
VM-W-75	Hand pump Durga Mandir	7.35	649	341	0.6	6.34	172	106	28	23	77.23
VM-W-76	Tube well in field	6.60	110	56	0.6	6.15	81.2	66	6	130	68.63
VM-W-77	Hand Pump	7.83	774	407	0.6	19.2	112	70	30	110	86.93
VM-W-78	Tube well (Head)	8.24	151	79	0.2	16	210	32	58	210	200.5
VM-W-79	Chandni Chemicals (Borewell)	7.58	703	367	4.4	4.46	224	26	8	20	73.13
VM-W-80	Hand Pump (rice mill)	<b>8.69</b>	97	48	0.4	7.62	110	34	12	170	109.54
VM-W-81	Bore well (Rubal chemicals)	7.37	694	363	0.3	8.2	149	112	22	140	73
VM-W-82	Hand Pump(dosed need factory)	7.81	1002	523	0.7	0.43	57.3	61	6	230	76.11
VM-W-83	Popular Dharam Kanta, Main road, Hand pump Behind (83) in fields.	7.73	1005	<b>526</b>	0.9	6.44	98	19	38	110	106.42
VM-W-84	Tube well	8.17	831	434	0.4	7.99	252	40	14	32	92.98
VM-W-85	Uma Kant Industries Main Kanpur Road	7.52	708	370	0.5	6.42	140	65	8	190	71.2
VM-W-86	HP Main Road	7.24	830	434	0.4	6.08	126	70	32	160	86.98

|BIS Desirable Limit for Drinking water

**6.5-8.5**

**500**

**1.0**

**45**

**200**

Note: Values in bold depicts the values above the desirable limits for drinking water

Table 19: Bacterial contamination level in water sample collected from Kanpur Village, Rania  
(Kanpur Dehat)

Code	Source	Coli/100 ml	E. Coli/100 ml
VM-W-74	Mank II	<3	<3
VM-W-75	Hand pump Durga Mandir	<b>460</b>	<b>150</b>
VM-W-76	Tube well in field	>1100	>1100
VM-W-77	Hand Pump	<3	<3
VM-W-78	Tube well (Head) Chandni Chemicals	>1100	<b>24</b>
VM-W-79	Chandni Chemicals (Borewell)	<b>150</b>	<b>150</b>
VM-W-80	Hand Pump (rice mill)	<b>9</b>	<b>4</b>
VM-W-81	Bore well (Rubal chemicals)	<b>15</b>	<b>7</b>
VM-W-82	Hand Pump(dosed neel factory)	<3	<3
VM-W-83	Popular Dharam Kanta, Main road, Hand pump Behind (83) in fields, Tube well	<b>1100</b>	<b>3</b>
VM-W-84	Uma Kant Industries Main Kanpur Road	<b>1100</b>	<b>64</b>
VM-W-86	HP Main Road	<b>21</b>	<b>21</b>

BIS standard for drinking water  
<10 Coliform/100ml

<1 Faecal Coliform  
or E. Coli/100ml  
(Absent)

Note: Values in bold depicts the drinking water samples contaminated with Coliform and Faecal Coliform Bacteria

Table 20 : Concentration of metals (mg/L) in water samples collected from Kanpur Village,Rania (Kanpur Dehat)

code	Source	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-W-74	Mark II	BDL	0.01	0.01	0.02	0.23	0.04	0.02	0.02	0.23
VM-W-75	Hand pump Durga Mandir	BDL	0.01	0.01	0.02	0.22	0.02	0.01	0.03	0.23
VM-W-76	Tube well in field	BDL	0.01	0.01	0.01	0.25	0.10	0.01	0.02	0.09
VM-W-77	Hand Pump	BDL	0.01	0.01	0.01	0.04	0.01	0.01	0.01	0.01
VM-W-78	Tube well(Head)	BDL	0.01	0.01	0.01	0.26	0.09	0.01	0.02	0.01
VM-W-79	Chandni Chemicals (Borewell)	BDL	0.01	0.02	0.02	2.33	0.37	0.02	0.02	0.06
VM-W-80	Hand Pump (rice mill)	BDL	0.01	0.05	0.02	0.25	0.02	0.01	0.03	0.30
VM-W-81	Bore well(Rubai chemicals)	BDL	0.01	1.12	0.02	0.06	0.04	0.01	0.01	0.03
VM-W-82	Hand Pump(dosed neel factory)	BDL	0.01	0.03	0.01	0.17	0.22	0.01	0.01	0.02
VM-W-83	Popular Dharam Kanta, Main road, Hand pump	BDL	0.01	0.02	0.02	0.17	0.05	0.01	0.02	0.06
VM-W-84	Behind (83) in fields. Tube well	BDL	0.01	2.72	0.02	0.12	0.01	0.01	0.02	0.02
VM-W-85	Uma Kant Industries Main Kanpur Road	BDL	0.01	0.10	0.02	0.08	0.00	0.01	0.02	0.27
VM-W-86	HP Main Road	BDL	0.01	0.02	0.02	0.16	0.02	0.01	0.03	0.03
					0.05	0.05	0.3	0.1	0.02	5.0

BIS Desirable Limit for Drinking Water

0.01  
Note: Values in bold depicts the values above the desirable limits for drinking water

Table 21: Concentration of metals (mg/Kg) in soil samples collected at different depth from Rania Village.Kanpur Dehat)

Code	Description of place	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-SOIL-114	Rania site 1 0 feet	0.59	5.45	39.92	24.13	10728	238.90	15.45	9.28	55.95
VM-SOIL-115	5 feet	0.60	5.27	235.91	22.29	11699	214.85	14.23	6.43	46.34
VM-SOIL-116	10 feet	0.73	7.33	89.94	21.44	13724	488.28	21.49	6.71	50.61
VM-SOIL-117	15 feet	0.56	5.68	44.07	21.03	10790	292.06	10.77	8.94	39.93
VM-SOIL-118	20 feet	0.42	3.96	33.58	17.71	8054	270.36	8.99	6.53	26.26
VM-SOIL-119	25 feet	0.53	4.67	32.83	21.55	9701	287.02	9.53	8.73	39.70
VM-SOIL-120	30 feet	0.38	4.44	28.44	18.49	7927	251.69	15.14	4.15	28.16
VM-SOIL-121	35 feet	0.59	5.93	120.74	26.96	11870	344.68	21.32	4.97	47.01
VM-SOIL-122	40 feet	0.48	5.78	39.58	17.77	9701	364.63	16.50	7.18	29.44
VM-SOIL-123	Rania site 2 0 feet	0.24	2.67	181.34	12.93	5395	119.26	6.23	3.84	15.93
VM-SOIL-124	5 feet	0.50	4.80	70.56	16.54	9035	259.29	9.76	6.94	27.58
VM-SOIL-125	10 feet	0.47	4.15	42.25	14.96	8134	267.44	9.17	7.03	34.06
VM-SOIL-126	15 feet	0.77	6.44	51.08	27.17	12509	357.40	12.85	10.76	48.85
VM-SOIL-127	20 feet	0.49	4.03	41.47	18.88	8987	249.68	9.31	7.05	29.08
VM-SOIL-128	25 feet	0.51	4.42	33.74	15.55	9782	199.16	8.51	6.35	30.64
VM-SOIL-129	30 feet	0.57	6.59	148.63	28.12	10691	468.61	23.26	5.29	39.32
VM-SOIL-130	35 feet	0.56	4.78	48.19	20.75	10052	210.69	17.05	5.92	33.10
VM-SOIL-131	40 feet	0.49	7.28	37.46	18.76	8041	0.00	14.01	8.31	25.48
VM-SOIL-132	Rania site 3 0 feet	0.34	4.35	0.00	17.64	8571	111.57	11.74	4.82	47.65
VM-SOIL-133	5 feet	0.63	5.30	55.53	21.19	12158	276.50	11.60	10.97	38.85
VM-SOIL-134	10 feet	0.37	2.84	27.08	13.46	7017	128.68	6.36	5.12	22.80
VM-SOIL-126	15 feet	0.77	6.44	51.08	27.17	12509	357.40	12.85	10.76	48.85
VM-SOIL-136	20 feet	0.79	6.74	58.20	31.26	13508	300.20	15.91	10.12	53.32
VM-SOIL-137	25 feet	0.89	8.20	72.16	34.88	13868	680.40	24.91	8.83	55.39
VM-SOIL-138	30 feet	0.40	4.22	27.00	17.63	7757	249.22	13.43	5.19	23.45
VM-SOIL-139	35 feet	0.50	4.81	37.60	21.93	9926	179.30	18.71	6.79	36.98
VM-SOIL-140	40 feet	0.37	3.29	26.92	13.37	7084	131.16	10.91	5.58	21.89

Table 22: Physicochemical parameters of water sample collected from IPL Site, Lucknow

Code	Description of place	Source	pH	EC(µs)	TDS(ppm)	Fluoride (ppm)	Nitrate (ppm)	Sulphate (ppm)	Hardness (ppm)	Alkalinity (ppm)	Chloride (ppm)	TOC (ppm)
VM-W-87	Gram Umri, Deva Road, Barabanki	Shallow Hand pump	7.25	178	89	0.2	23.2	179	104	8	180	44.37
VM-W-88		Surface water	6.98	643	325	0.2	8.07	198	69	14	210	31.01
VM-W-89		do	7.39	266	137	0.5	14.5	201	26	22	140	70.71
VM-W-90	Goyal's farm & resort	Shallow Hand pump	7.27	103	56	0.3	10.3	149	14	18	190	46.46
VM-W-91	Link Road to Umri Village	Shallow Hand pump	7.3	130	65	0.2	9.4	131	12	20	170	37.84
VM-W-92	Umri Village	Mark-II	7.31	826	421	0.1	8.17	123	17	61	160	32.83
VM-W-93	do	Mark-II	7.34	283	145	0.1	7.18	112	15	33	170	27.68
VM-W-94	do	Shallow Hand pump	7.33	103	55	0.1	10.3	191	10	13	110	32.8

BIS Desirable Limit for Drinking water

Note: Values in bold depicts the values above the desirable limits for drinking water

**500**      **1.0**      **45**      **200**      **250**

Table 23 : Bacterial contamination level in water sample collected from IPL Site, Lucknow

Code	Description of place	Source	Coli/100 ml	E. Coli/100 ml
<b>VM-W-87</b>	Gram Umri, Deva Road, Barabanki	Shallow Hand pump	<b>91</b>	<3
<b>VM-W-88</b>		Surface water	<3	<3
<b>VM-W-89</b>		do	<3	<3
<b>VM-W-90</b>	Goyal's farm & resort	Shallow Hand pump	<3	<3
<b>VM-W-91</b>	Link Road to Umri Village	Shallow Hand pump	<b>150</b>	<b>150</b>
<b>VM-W-92</b>	Umri Village	Mark-II	<3	<3
<b>VM-W-93</b>	do	Mark-II	>3	<3
<b>VM-W-94</b>	do	Shallow Hand pump	<b>120</b>	<b>43</b>

BIS standard for drinking water

Coliform Bacteria      <10 Coliform/100ml

<1 Faecal Coliform or E.  
Coli/100ml (Absent)

<3 = 0

Note: Values in bold depicts the drinking water samples contaminated with Coliform and Faecal

Table 24: Pesticide (hexachlorocyclohexane isomers) in water samples (in ppb) collected from IPL Site, Lucknow

Code	Description of place	Source	$\alpha$ -HCH	$\beta$ -HCH	$\gamma$ -HCH	$\delta$ -HCH
VM-W-87	Gram Umri, Deva Road, Barabanki	Shallow Hand pump	0.355	4.083	0.016	0.308
VM-W-88	Surface water		1.768	6.675	0.051	0.373
VM-W-89	do		0.037	0.116	0.001	5.669
VM-W-90	Goyal's farm & resort	Shallow Hand pump	0.505	0.274	ND	0.145
VM-W-91	Link Road to Umri Village	Shallow Hand pump	0.662	0.352	ND	1.311
VM-W-92	Umri Village	Mark-II	0.584	0.345	ND	0.746
VM-W-93	do	Mark-II	1.152	0.614	ND	1.234
VM-W-94	do	Shallow Hand pump	0.455	0.309	ND	0.409

Table 25: Pesticides (hexachlorocyclohexane isomers) in soil sample (in ppm) collected from IPL Site, Lucknow

Code	Description of place	$\alpha$ -HCH	$\beta$ -HCH	$\gamma$ -HCH	$\delta$ -HCH
Site-1	0 feet	0.00048x10 <sup>3</sup>	0.0051x10 <sup>3</sup>	0.0007x10 <sup>3</sup>	0.0002x10 <sup>3</sup>
	5 feet	ND	2.631x10 <sup>3</sup>	0.014x10 <sup>3</sup>	0.009x10 <sup>3</sup>
	10 feet	ND	5.397x10 <sup>3</sup>	0.255x10 <sup>3</sup>	0.135x10 <sup>3</sup>
	15 feet	2.115x10 <sup>3</sup>	2.048x10 <sup>3</sup>	0.017x10 <sup>3</sup>	0.012x10 <sup>3</sup>
	20 feet	1.657x10 <sup>3</sup>	7.744x10 <sup>3</sup>	0.018x10 <sup>3</sup>	0.044x10 <sup>3</sup>
	25 feet	2.128x10 <sup>3</sup>	7.300x10 <sup>3</sup>	0.026x10 <sup>3</sup>	0.025x10 <sup>3</sup>
	30 feet	2.571x10 <sup>3</sup>	8.848x10 <sup>3</sup>	0.054x10 <sup>3</sup>	0.065x10 <sup>3</sup>
	35 feet	3.689x10 <sup>3</sup>	16.812x10 <sup>3</sup>	0.036x10 <sup>3</sup>	0.042x10 <sup>3</sup>
	40 feet	6.366x10 <sup>3</sup>	21.087x10 <sup>3</sup>	0.097x10 <sup>3</sup>	0.197x10 <sup>3</sup>
	0 feet	ND	11.748x10 <sup>3</sup>	0.127x10 <sup>3</sup>	0.138x10 <sup>3</sup>
Site-2	5 feet	ND	4.966x10 <sup>3</sup>	ND	1.476x10 <sup>3</sup>
	10 feet	7.441x10 <sup>3</sup>	1.465x10 <sup>3</sup>	0.720x10 <sup>3</sup>	0.283x10 <sup>3</sup>
	15 feet	5.023x10 <sup>3</sup>	2.538x10 <sup>3</sup>	0.045x10 <sup>3</sup>	0.050x10 <sup>3</sup>
	20 feet	5.468x10 <sup>3</sup>	4.289x10 <sup>3</sup>	0.099x10 <sup>3</sup>	0.048x10 <sup>3</sup>
	25 feet	37.734x10 <sup>3</sup>	1.541x10 <sup>3</sup>	0.459x10 <sup>3</sup>	0.169x10 <sup>3</sup>
	30 feet	0.587x10 <sup>3</sup>	0.685x10 <sup>3</sup>	0.010x10 <sup>3</sup>	0.033x10 <sup>3</sup>
	35 feet	0.352x10 <sup>3</sup>	0.703x10 <sup>3</sup>	ND	ND
	40 feet	ND	2.625x10 <sup>3</sup>	0.357x10 <sup>3</sup>	0.332x10 <sup>3</sup>
	0 feet	2.443x10 <sup>3</sup>	3.997x10 <sup>3</sup>	0.018x10 <sup>3</sup>	0.023x10 <sup>3</sup>
	5 feet	0.405x10 <sup>3</sup>	3.804x10 <sup>3</sup>	0.002x10 <sup>3</sup>	ND
Site-3	10 feet	0.642x10 <sup>3</sup>	4.910x10 <sup>3</sup>	0.004x10 <sup>3</sup>	ND
	15 feet	0.979x10 <sup>3</sup>	3.233x10 <sup>3</sup>	0.006x10 <sup>3</sup>	ND
	20 feet	1.313x10 <sup>3</sup>	12.260x10 <sup>3</sup>	0.026x10 <sup>3</sup>	0.044x10 <sup>3</sup>

	25 feet	$0.503 \times 10^3$	$-4.754 \times 10^3$	$0.0022 \times 10^3$	$0.0088 \times 10^3$
	30 feet	$0.655 \times 10^3$	$11.716 \times 10^3$	$0.0088 \times 10^3$	$0.105 \times 10^3$
	35 feet	$0.0888 \times 10^3$	$0.776 \times 10^3$	$0.0066 \times 10^3$	ND
	40 feet	$0.446 \times 10^3$	$0.485 \times 10^3$	$0.005 \times 10^3$	ND
<b>Site-4</b>	<b>0 feet</b>	$3.405 \times 10^3$	$7.721 \times 10^3$	$0.075 \times 10^3$	ND
	5 feet	$2.186 \times 10^3$	$5.595 \times 10^3$	$0.020 \times 10^3$	$0.030 \times 10^3$
	10 feet	$2.718 \times 10^3$	$11.079 \times 10^3$	$0.061 \times 10^3$	$0.235 \times 10^3$
	15 feet	$3.016 \times 10^3$	$12.463 \times 10^3$	$0.125 \times 10^3$	$0.252 \times 10^3$
	20 feet	$0.941 \times 10^3$	$0.354 \times 10^3$	$0.005 \times 10^3$	ND
	25 feet	$2.028 \times 10^3$	$1.344 \times 10^3$	$0.011 \times 10^3$	ND
	30 feet	$0.797 \times 10^3$	$9.598 \times 10^3$	$0.004 \times 10^3$	$0.011 \times 10^3$
	35 feet	$3.262 \times 10^3$	$14.070 \times 10^3$	$0.026 \times 10^3$	$0.051 \times 10^3$
	40 feet	$1.192 \times 10^3$	$2.206 \times 10^3$	$0.003 \times 10^3$	ND

Table 26 : Physicochemical parameters of water sample collected from Ghaziabad

code	Description of place	pH	EC(µs)	TDS(ppm)	Fluoride (ppm)	Nitrate (ppm)	Sulphate (ppm)	Hardness (ppm)	Alkalinity (ppm)	Chloride (ppm)	TOC (ppm)
VM-W-95	India Mark II, Sector-14, Back of Sangh Mitra Budha Vihar, Kaushambi	7.47	223	120	0.2	27.2	128	7	540	150	38.13
VM-W-96	Submersible 120' A-206 Kaushambi	7.52	225	116	0.2	11	247	13	17	130	54.25
VM-W-97	Bore well Neelam Colony	7.39	282	145	1.0	13.3	357	19	14	210	91.55
VM-W-98	Bore well C-14 Sector 14 Kaushambi	7.69	540	250	0.1	9.4	410	15	8	190	22.95
VM-W-99	C-17 Submersible Kaushambi	7.51	267	138	0.1	10.3	290	2	32	300	53.24
VM-W-100	Submersible Market	7.66	253	130	0.2	17.2	170	17	24	170	55.37
VM-W-101	Hallow HP Slum Colony	7.65	261	135	0.1	11.1	655	14	19	100	59.99
VM-W-102	Submersible opp. Gram Seva Public School	7.65	310	160	0.3	19.1	318	21	21	133	65.53
VM-W-103	Asha Pushpa Vihar Sector-14 Submersible Pump	7.76	278	143	0.0	24.2	215	23	13	173	59.07
VM-W-104	Submersible Seemant Vihar Colony Sector-14	7.99	253	130	0.0	27	130	25	9	190	54.33
VM-W-105	Shiv Mandir Near Shooping Complex & Road	7.8	288	149	1.0	21	180	9	5	140	62.17
BIS Desirable Limit for Drinking water		<b>6.5-8.5</b>		<b>500</b>	<b>1.0</b>	<b>45</b>	<b>200</b>			<b>250</b>	

Note: Values in bold depicts the values above the desirable limits for drinking water

Table 27: Bacterial contamination level in water sample collected from Ghaziabad

code	Description of place	Coli/100 ml	E. Coli/100 ml
VM-W-95	India Mark II, Sector-14, Back of Sangh Mitra Budha Vihar, Kaushambhi	<3	<3
VM-W-96	Submersible 120' A-206 Kaushambhi	<3	<3
VM-W-97	Bore well Neelam Vihar Colony	<3	<3
VM-W-98	Bore well C-14 Sector 14 Kaushambhi	1100	72
VM-W-99	C-17 Submersible Kaushambhi	240	43
VM-W-100	Submersible Market	1100	<3
VM-W-101	Hallow HP Slum Colony	460	43
VM-W-102	Submersible opp. Gram Seva Public School	27	<3
VM-W-103	Asha Pushpa Vihar Sector-14 Submersible Pump	<3	<3
VM-W-104	Submersible Seeman Vihar Colony Sector-14 Shiv Mandir Near Shopping Complex	11	<3
VM-W-105	& Road	15	91

Note:

BIS standard for drinking water

&lt;10 Coliform/100ml

&lt;1 Faecal Coliform or E. Coli/100ml (Absent)

&lt;3 = 0

Note: Values in bold depicts the drinking water samples contaminated with Coliform and Faecal Coliform Bacteria

Table 28: Concentration of metals (mg/L) in water samples collected from Ghaziabad

code	Description of place	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
VM-W-95	India Market II Sector-14 Back of Sangh Mitra Budha Vihar, Kaushambhi	BDL	BDL	BDL	0.02	<b>2.72</b>	0.12	0.01	BDL	0.31
VM-W-96	Submersible 120' A-206 Kaushambhi	BDL	BDL	0.01	0.02	0.00	BDL	<b>0.05</b>	BDL	0.02
VM-W-97	Bore well Neelam Vihar Colony	BDL	BDL	BDL	0.02	0.00	0.07	<b>0.04</b>	BDL	0.18
VM-W-98	Bore well C-14 Sector 14 Kaushambhi	BDL	BDL	BDL	0.02	0.00	BDL	0.02	BDL	BDL
VM-W-99	Kaushambhi	BDL	BDL	<b>0.44</b>	0.02	0.00	BDL	<b>0.05</b>	BDL	0.00
VM-W-100	Submersible Market	BDL	BDL	BDL	0.02	0.21	BDL	0.02	BDL	0.00
VM-W-101	Hallow HP Slum Colony	BDL	BDL	BDL	0.00	0.02	BDL	<b>0.03</b>	BDL	0.01
VM-W-102	Submersible opp. Gram Seva Public School	BDL	BDL	BDL	0.02	<b>2.48</b>	0.11	0.00	BDL	0.60
VM-W-103	Asha Pushpa Vihar Sector-14 Submersible Pump	BDL	BDL	BDL	0.02	0.20	0.01	0.02	BDL	0.03
VM-W-104	Submersible Seemant Vihar Colony Sector-14	BDL	BDL	0.05	0.02	<b>0.44</b>	0.00	0.02	BDL	0.13
VM-W-105	Shiv Mandir Near Shooping Complex & Road	BDL	BDL	BDL	0.02	<b>0.79</b>	0.05	0.00	BDL	0.00
BIS Desirable Limit for Drinking Water		<b>0.01</b>	<b>0.05</b>	<b>0.3</b>	<b>0.1</b>	<b>0.02</b>	<b>0.05</b>	<b>5.0</b>		
Note: Values in bold depicts the values above the desirable limits for drinking water										

Table 29: Concentration of metals (mg/Kg) in soil samples collected at different depth from Bhowapur, Kausambhi (Ghaziabad)

code	Description of place	Cd	Co	Cr	Cu	Fe	Mn	Ni	Pb	Zn
Site-1	0 feet	4.06	17.46	37.16	62.77	8442	392.61	BDL	24.46	105.36
	5 feet	5.34	20.57	45.39	61.04	8444	367.91	BDL	21.15	118.81
	10 feet	0.95	5.98	12.68	15.38	7797	212.04	BDL	5.36	52.89
	15 feet	2.79	15.41	25.15	25.12	8770	322.37	BDL	12.94	93.72
	20 feet	1.96	11.07	15.90	20.86	7912	331.98	BDL	10.68	74.22
	25 feet	2.15	9.11	17.47	20.12	8581	265.38	BDL	6.42	76.80
	30 feet	4.62	22.28	54.87	68.95	8528	358.40	BDL	11.36	100.58
	35 feet	1.77	13.00	33.10	39.70	8594	353.24	BDL	10.33	60.88
Site-2	0 feet	3.45	15.30	36.89	52.98	8305	366.19	BDL	19.93	105.17
	5 feet	2.08	14.69	25.90	45.39	7835	393.93	BDL	30.48	77.31
	10 feet	1.72	10.07	20.51	22.48	8044	266.40	BDL	0.45	73.68
	15 feet	2.44	10.59	21.04	23.69	7938	255.77	BDL	5.64	246.88
	20 feet	1.28	7.34	13.87	16.79	7662	213.46	BDL	BDL	174.56
	25 feet	3.48	13.16	26.54	30.71	8202	310.32	BDL	13.40	347.66
	30 feet	8.66	30.06	82.77	93.93	7286	334.01	BDL	BDL	256.82
	35 feet	5.50	20.95	59.43	66.70	7510	375.40	BDL	BDL	99.51

**Table 30: Summary of physicochemical parameters of water samples**

Sites & No. of samples	pH	EC(µs)	TDS (ppm)	Fluoride (ppm)	Nitrate (ppm)	Sulphate (ppm)	Hardness (ppm)	Alkalinity (ppm)	Chloride (ppm)	TOC (ppm)
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Nauraiya Kheda (32)	6.45	11.50	104	601	56	294	0.2	2.1	2.06	57.4
Duncan's, Panki (28)	6.83	<b>11.51</b>	255	986	122	<b>476</b>	0.3	<b>2.0</b>	4.35	66.8
Jubi Baburaiya (13)	6.43	7.92	116	807	59	424	0.02	1.00	16.8	52.5
Khampur Village, Rania (13)	6.60	<b>8.69</b>	97	1005	48	<b>526</b>	0.2	<b>4.4</b>	0.43	19.2
IPL Deva Road (8)	6.98	7.39	103	826	55	421	0.1	0.5	7.18	23.2
Bhowapur Kausha-mbhi, Ghaziabad (11)	7.39	7.99	223	540	116	250	0.0	1.0	9.4	27.2

Note: Values in bold depicts the values above the desirable limits for drinking water

**Table 31: Summary of concentration of metals (mg/L) in water samples (Kanpur & Kanpur Dehat) and Ghaziabad:**

Sites & No. of samples	Cr	Fe	Mn	Ni	Cd	C <sub>o</sub>	Pb	Zn
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Nauraiya Kheda(32)	0	1.66	BDL	<b>0.89</b>	0	1.12	0	0.01
Duncan's Site(28)	0.02	<b>10.42</b>	0.02	<b>1.09</b>	0	0.29	0	<b>0.03</b>
Juhu Baburaiya (13)	0.02	4.59	0.21	<b>1.63</b>	0.04	<b>0.63</b>	0.02	<b>0.06</b>
Rania(13)	0.01	2.72	0.04	<b>2.33</b>	0	<b>0.37</b>	0.01	<b>0.02</b>
Bhowapur, Kaushambi, Ghaziabad (11)	BDL	0.44	0	<b>2.72</b>	BDL	0.12	0	<b>0.05</b>

Note: Values in bold depicts the values above the desirable limits for drinking water

**Table 32: Summary of concentration of pesticides (in ppb) in water samples  
(Lucknow Site)**

HCH isomers	$\alpha$		$\beta$		$\gamma$		$\delta$	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	0.037	1.768	0.116	0.145	0.001	0.051	0.145	5.669

**Note:** Values in bold depicts the values above the desirable limits for drinking water

**Table 33: Summary of concentration of metals (mg/kg) at different depths of soil at Nauraiya Kheda**

Metals	Concentration of metals at different depth of Soil (mg/kg)								
	0 ft.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.			
Cd	0.19 0.11-0.33	0.24 0-0.4	0.14 0.08-0.28	0.24 0-0.44	0.21 0-0.26	0.17 0-0.25	0.33 0-0.61	0.25 0-0.38	0.19 0-0.25
Co	9.41 4.94-12.82	11.24 9.26-16.84	18.87 8.19-48.95	12.45 6.88-16.37	8.45 0.6-11.65	7.60 5.11-12.03	10.81 8.33-14.65	11.66 7.21-14.53	10.08 8.13-12.4
Cr	81.92 49.19-11.5.6	70.60 52.39-9.4	58.97 39.9-72.99	42.38 26.54-57.67	46.87 24.92-63.71	58.03 44.86-79.81	64.98 37.49-119.6	55.90 44.09-75.04	54.45 49.88-66.66
Cu	102.32 29.24-159.16	76.02 44.94-116.12	60.10 31.28-101.6	41.53 20.18-77.02	49.20 13.69-117.92	64.02 36.08-92.36	89.07 28.56-261.6	54.72 30.6-64.14	60.57 55.82-71.28
Fe	2570.80 2107.2991	2929.80 2759-3145	2908.40 2572-3101	2729.40 2417-2980	2682.20 2396-2954	2846.80 2649-3070	2766.80 2557-2941	2880.80 2706-2956	2821.50 2505-2958
Mn	261.66 247.20-287	311.58 267.90-396.7	307.46 239.6-458.6	262.08 202.30-339.8	280.00 228.9-343.9	321.16 234.7-494	268.46 235.4-294.3	384.70 237.7-603.4	263.38 237.5-319.2
Ni	23.88 15.20-32.32	31.54 23.06-45.59	31.44 21.23-42.25	25.71 18.15-40.04	20.19 14.53-29.96	26.65 23.64-31.62	25.47 19.95-31.04	29.84 16.36-40.88	28.00 22.02-37.33
Pb	141.92 14.09-264.70	143.38 16.96-633.10	15.00 12.3-18.01	15.46 7.87-22.4	55.70 7.23-208.9	63.53 16.55-226.6	78.29 10.84-302.4	23.28 16.21-30.41	45.13 15.18-104.5
Zn	221.32 37.32-394.0	133.88 53.1-240.70	112.06 47.21-220.4	119.19 41.58-264.5	190.20 72.96-345.6	320.31 81.24-757.1	210.78 66.39-394.3	149.06 111.5-238.3	192.71 84.45-283.7

**Note:** Permissible level of metals in soil is not reported in literature.

Values in blue are the minimum and maximum values.

Values in bold are average values.

**Table 34: Summary of concentration of metals (mg/kg) at different depths of soil at Juhi Baburaiya (Rakhi Mandi)**

Metals	Concentration of metals at different depth of Soil (mg/kg)								
	0 ft.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.			
Cd	0.34 0.24-0.36	0.71 0.44-1.16	0.65 0.53-0.79	0.82 0.57-1.08	0.66 0.49-0.96	0.42 0.11-0.89	0.63 0.24-0.91	0.55 0.36-0.94	0.80 0.63-0.97
Co	3.31 1.97-5.02	5.25 2.94-8.29	7.09 6.57-7.91	6.54 4.88-8.19	5.68 4.13-8.62	5.37 2.21-8.56	5.31 2.05-7.91	4.78 3.27-7.12	6.53 5.58-7.48
Cr	26.79 15.16-36.9	68.92 27.6-140.74	41.40 36.85-47.3	59.66 34.61-72.5	46.38 33.67-58.71	26.41 3.77-58.06	62.45 49.37-88.56	57.52 0-87.99	64.24 43.05-85.43
Cu	11.86 10.70-12.56	27.97 17.03-39.25	26.38 18.43-82.28	34.48 24.1-45.98	24.79 12.94-42.69	23.71 7.55-43.9	23.92 8.79-38.39	20.42 10.91-38.91	32.76 27.79-37.93
Fe	6922 4757-8829	12257 8034-19251	11965 11479-12572	14375 9764-17511	11996 101.52-14921	7045 753-14662	11186 5279-14465	11037 7801-16907	14269 11433-17105
Mn	245.63 127.34-353.37	300.97 185.01-438.67	372.04 286.15-418.46	352.97 244.46-527.68	297.35 201.56-454.24	206.39 92.22-403.27	308.93 78.4-506.59	226.95 150.77-350.12	350.64 350.56-350.73
Ni	7.60 4.32-12.28	20.08 9.01-36.82	18.96 13.15-26.9	16.56 12.62-20.24	14.05 11.19-18.36	16.07 5.65-22.98	14.69 5.85-19.87	15.56 10.44-24.98	18.23 16.03-20.43
Pb	5.56 2.86-8.14	8.11 6.43-9.57	9.73 8.17-12.14	12.72 7.99-20.89	9.59 5.73-16.22	8.25 3.69-14.08	8.51 3.32-14.21	5.73 5.06-6.97	25.19 12.01-38.37
Zn	31.98 21.63-46.35	96.08 46.18-184.93	59.84 35.75-87.7	154.87 55.36-338.94	87.01 60.45-132.60	81.79 67.35-99.72	117.23 22.83-265.7	92.22 39.95-173.38	432.77 342.64-522.91

**Note:** Permissible level of metals in soil is not reported in literature.

Values in blue are the minimum and maximum values.

Values in bold are average values.

**Table 35: Summary of concentration of metals (mg/kg) at different depths of soil at Panki Industrial Area:**

Metals	Concentration of metals at different depth of Soil (mg/kg)								
	0 ft.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.			
Cd	<b>0.69</b> 0.41-0.91	<b>.54</b> 0.19-0.9	<b>1.30</b> 0.44-4.08	<b>0.59</b> 0.42-0.8	<b>1.17</b> 0.56-3.16	<b>0.89</b> 0.57-1.53	<b>0.81</b> 0.06-1.94	<b>1.89</b> 0.48-5.11	<b>0.93</b> 0.54-1.79
Co	<b>8.56</b> 4.57-10.74	<b>6.70</b> 3.88-10.72	<b>8.16</b> 6.41-9.12	<b>8.16</b> 6.41-11.44	<b>7.88</b> 4.97-9.12	<b>7.47</b> 5.33-9	<b>7.39</b> 6.96-7.97	<b>6.97</b> 3.87-8.96	<b>7.70</b> 5.75-9.76
Cr	<b>562.42</b> 29.13-2659.80	<b>72.45</b> 28.92-228.81	<b>56.81</b> 32.53-117.16	<b>67.09</b> 27.91-185.81	<b>76.14</b> 39.9-158.88	<b>480.36</b> 41.62-2091.44	<b>601.26</b> 2.5-2801.4	<b>857.23</b> 66.92-3106.37	<b>166.49</b> 31.28-411.76
Cu	<b>82.88</b> 40.1-168.88	<b>53.16</b> 29.66-80.41	<b>64.54</b> 47.89-90.57	<b>56.94</b> 41.62-76.59	<b>92.47</b> 60.15-212.99	<b>83.69</b> 60.28-106.24	<b>94.31</b> 20.08-175.11	<b>189.71</b> 78.01-393.69	<b>70.84</b> 52.17-98.11
Fe	<b>10321</b> 7996-11941	<b>8869</b> 6413-11309	<b>10087</b> 8859-11693	<b>9466</b> 8566-10332	<b>9840</b> 7836-11522	<b>9887</b> 8712-11394	<b>7940</b> 679-11001	<b>9468</b> 6783-10934	<b>9994</b> 8698-11018
Mn	<b>258.74</b> 194.83-312.12	<b>206.35</b> 114.49-277.47	<b>223.81</b> 185.87-267.76	<b>352.26</b> 185.68-917.98	<b>253.83</b> 176.07-353.97	<b>259.76</b> 217.75-307.24	<b>210.87</b> 65.38-265.38	<b>228.20</b> 154.77-288.18	<b>229.27</b> 201.99-277.56
Ni	<b>17.61</b> 7.53-23.68	<b>13.67</b> 6.09-20.56	<b>18.58</b> 15.22-19.97	<b>20.50</b> 15.24-28.02	<b>21.50</b> 10.79-26.99	<b>18.71</b> 10.25-29.17	<b>18.24</b> 15.44-22.26	<b>17.42</b> 5.23-25.35	<b>17.79</b> 12.37-22.03
Pb	<b>146.54</b> 14.5-666.46	<b>19.15</b> 13.77-34.79	<b>23.21</b> 12.87-39.98	<b>21.03</b> 10.6-31.92	<b>37.13</b> 17.32-103.52	<b>87.30</b> 18.72-252.27	<b>127.78</b> 11.94-516.62	<b>138.38</b> 63.01-229.32	<b>31.86</b> 12.36-85.41
Zn	<b>120.24</b> 67.60-258.66	<b>124.16</b> 60.45-223.39	<b>122.25</b> 53.24-214.31	<b>121.34</b> 56.34-210.54	<b>171.56</b> 58.49-304.24	<b>280.29</b> 167.01-371.38	<b>188.98</b> 97.26-293.05	<b>180.09</b> 96.4-344.66	<b>90.32</b> 74.28-104.72

**Note:** Permissible level of metals in soil is not reported in literature.

Values in blue are the minimum and maximum values.

Values in bold are average values.

**Table 36: Summary of concentration of metals (mg/kg) at different depths of soil at Khanpur Village, Rania (Kanpur Dehat):**

Metals	Concentration of metals at different depth of Soil (mg/kg)								
	0 ft.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.			
Cd	0.39 0.24-0.59	0.58 0.5-0.63	0.52 0.37-0.73	0.70 0.56-0.77	0.56 0.42-0.79	0.64 0.51-0.89	0.45 0.38-0.57	0.55 0.5-0.59	0.45 0.37-0.49
Co	4.16 2.67-5.45	5.12 2.84-7.33	4.77 2.84-7.33	6.18 5.68-6.44	4.91 3.96-6.74	5.77 4.42-8.20	5.08 4.22-6.59	5.17 4.78-5.93	5.45 3.29-7.28
Cr	73.75 0-181.34	120.67 27.08-89.94	53.09 27.08-89.94	48.75 44.07-51.08	44.42 33.58-58.20	46.24 32.83-72.16	68.02 27-148.63	68.84 37.63-120.74	34.65 26.92-39.58
Cu	18.23 12.93-24.13	20.01 13.46-21.44	16.62 13.46-21.44	25.12 21.03-27.17	22.62 17.71-31.26	23.99 15.55-34.88	21.41 17.63-28.12	23.21 20.75-26.96	16.63 13.37-18.76
Fe	8231 5395-10728	10964 7017-13724	9625 7017-13724	11936 10790-12509	10183 8054-13508	11117 9701-13868	8792 7757-10691	10616 9926-11870	8275 7084-9701
Mn	156.58 111.57-238.9	256.88 128.68-488.28	294.80 128.68-488.28	335.62 292.06-357.4	273.42 249.68-300.2	388.86 199.16-680.4	323.17 249.22-486.61	244.89 179.3-344.68	165.26 0-364.63
Ni	11.14 6.23-15.45	11.86 6.36-21.49	12.34 6.36-21.49	12.16 10.77-12.85	11.40 8.99-15.91	14.32 8.51-24.91	17.28 13.43-23.26	19.03 17.05-21.32	13.81 10.91-16.5
Pb	5.98 3.84-9.28	8.11 5.12-7.03	6.29 5.12-7.03	10.15 8.94-10.76	7.90 6.57-10.12	7.97 6.35-8.83	4.88 4.15-5.29	5.89 4.97-6.79	7.02 5.58-8.31
Zn	39.84 15.93-55.95	37.59 22.8-50.61	35.82 22.80-50.61	45.87 39.93-48.85	36.22 26.26-53.32	41.91 30.64-55.39	30.31 23.45-39.32	39.03 33.1-47.01	25.60 21.89-29.44

**Note:** Permissible level of metals in soil is not reported in literature.

Values in blue are the minimum and maximum values.

Values in bold are average values.

**Table 37: Summary of concentration of metals (mg/kg) at different depths of soil at Ghaziabad**

Metals	Concentration of metals at different depth of Soil (mg/kg)					
	0 ft.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.
Cd	3.76 3.45-4.06	3.71 2.08-5.34	1.34 0.95-1.72	2.61 2.44-2.79	1.62 1.28-1.96	2.82 2.15-3.48
Co	16.38 15.3-17.46	17.63 14.69-20.57	8.03 5.98-10.07	13.00 10.59-15.41	9.20 7.94-11.07	11.14 9.11-13.16
Cr	37.03 36.89-37.16	35.65 25.9-45.39	16.60 12.68-20.51	23.10 20.04-25.15	14.89 13.87-15.9	22.01 17.47-26.54
Cu	57.87 52.98-62.77	53.21 45.39-61.04	18.93 15.38-22.48	24.40 23.69-25.1	18.82 16.79-20.86	25.42 20.12-30.71
Fe	8374 8305-8442	8139 7835-8444	7921 7797-8044	8354 7938-8770	7787 7602-7912	8392 8202-8581
Mn	379.40 366.19-392.61	380.92 367.91-393.93	239.22 212.04-266.40	289.07 255.7-322.27	272.72 213.46-331.98	287.85 265.38-310.32
Ni	BDL 0	BDL 0	BDL 0	BDL 0	BDL 0	BDL 0
Pb	22.20 19.93-24.46	25.81 21.15-30.48	2.90 0.45-5.36	9.29 5.64-12.94	10.68 0-10.68	9.91 6.42-13.4
Zn	105.26 105.17-105.36	98.06 77.31-118.81	63.29 52.89-73.68	170.30 93.75-246.88	124.39 74.22-174.56	212.23 76.8-347.66

**Note:** Permissible level of metals in soil is not reported in literature.

Values in blue are the minimum and maximum values.

Values in bold are average values.

Table 38: Summary of concentration of pesticides (in ppm) at different depths of soil at Lucknow Site

HCH isomers	Concentration of Pesticides at different depth of Soil (in ppm)					
	0 ft.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.
$\alpha$ 0-3.405	1.217 0-2.186	1.296 0-7.441	3.600 0.979 -5.023	2.783 0.941 -5.468	2.335 0.503 -37.734	10.598 0.587 -2.571
$\beta$	5.868 0.005-11.748	4.249 2.631 -5.595	5.713 1.465 -10.074	5.071 2.048 -12.463	6.162 0.354 -12.26	3.735 1.344 -7.3
$\gamma$	0.055 0.0007-0.127	0.012 0-0.020	0.260 0.004 -0.720	0.048 0.006-0.125	0.037 0.005 -0.099	0.125 0.002 -0.459
$\delta$	0.537 0-0.138	0.505 0-1.476	0.218 0-0.283	0.105 0-0.252	0.045 0-0.048	0.067 0-0.169
						0.054 0.011 -0.105
						0.047 0-0.051
						0.26 0-0.332

Note: Permissible level of pesticides in soil is not reported in literature.

Values in blue are the minimum and maximum values.

Values in bold are average values.

All the V values are multiplied by  $10^3$

Table 38: Summary of concentration of pesticides (in ppm) at different depths of soil at Lucknow Site

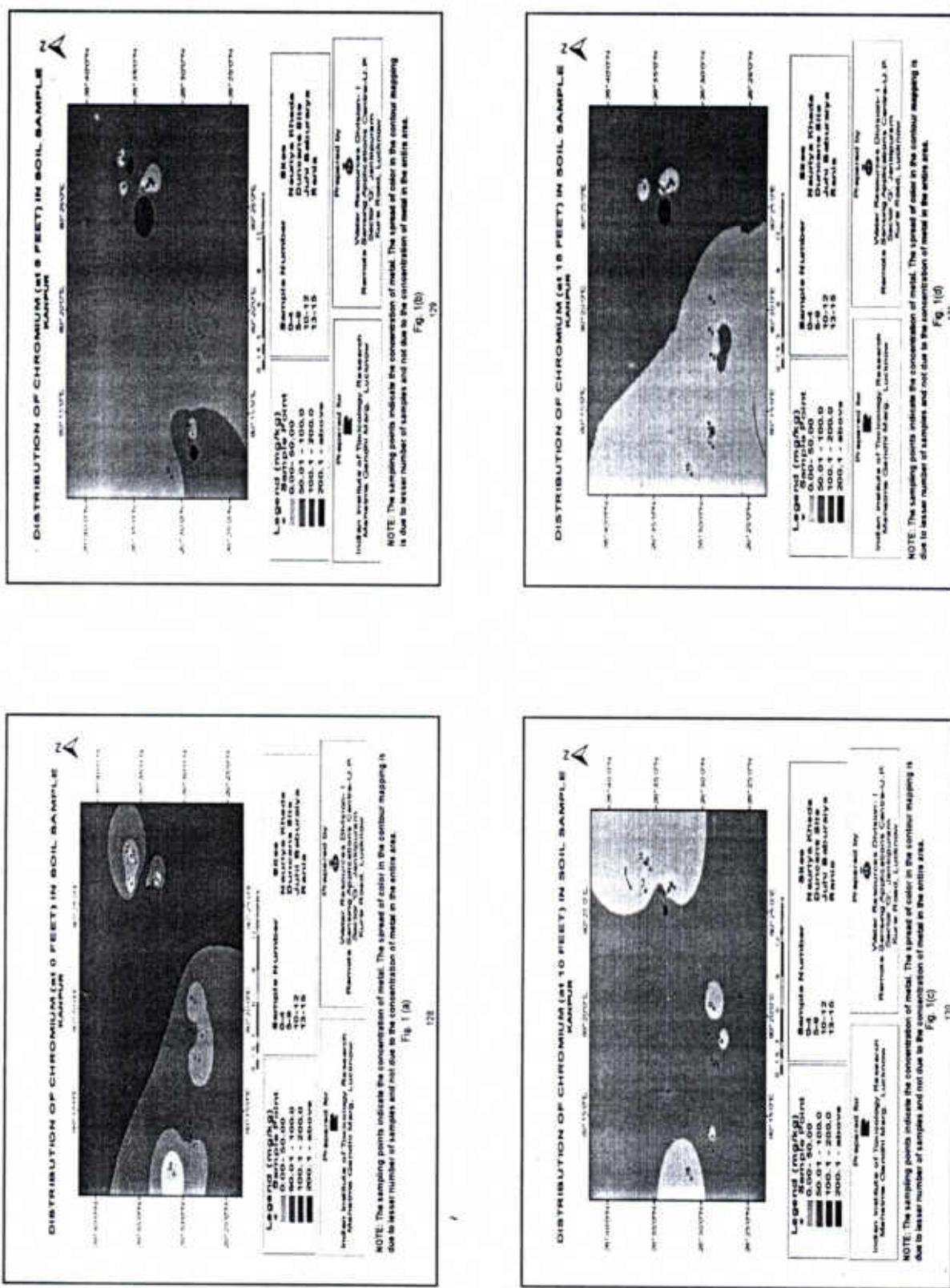
HCH isomers	Concentration of Pesticides at different depth of Soil (in ppm)					
	0 ft.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.
$\alpha$ 0-3.405	1.217 1.296 0-2.186	3.600 0-7.441	2.783 0.979 -5.023	2.335 0.941 -5.468	10.598 0.503 -37.734	1.153 0.587 -2.571
$\beta$ 0.005-11.748	5.868 4.249 2.631 -5.595	5.713 1.465 -10.074	5.071 2.048 -12.463	6.162 0.354 -12.26	3.735 1.344 -7.3	7.712 0.685 -11.716
$\gamma$ 0.0007-0.127	0.055 0.012 0-0.020	0.260 0.004 -0.720	0.048 0.006-0.125	0.037 0.005 -0.099	0.125 0.002 -0.459	0.019 0.004 -0.054
$\delta$ 0-0.138	0.537 0.505 0-1.476	0.218 0-0.283	0.105 0-0.252	0.045 0-0.048	0.067 0-0.169	0.054 0.011 -0.105
						0.047 0-0.051
						0.26 0-0.332

Note: Permissible level of pesticides in soil is not reported in literature.

Values in blue are the minimum and maximum values.

Values in bold are average values.

All the Values are multiplied by  $10^3$



NOTE: The sampling points indicate the concentration of metal. The spread of color in the contour mapping is due to lesser number of samples and not due to the concentration of metal in the entire area.

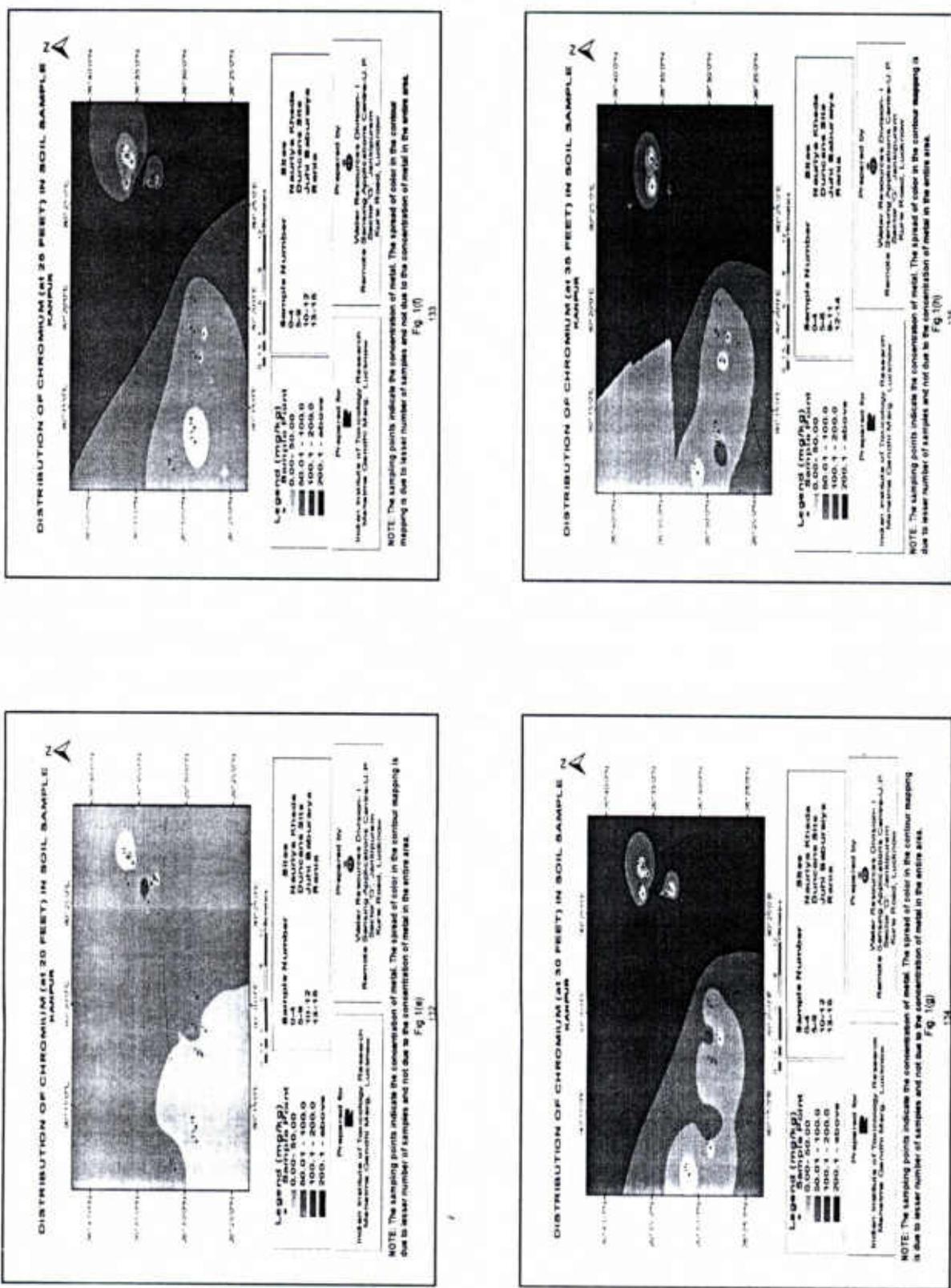
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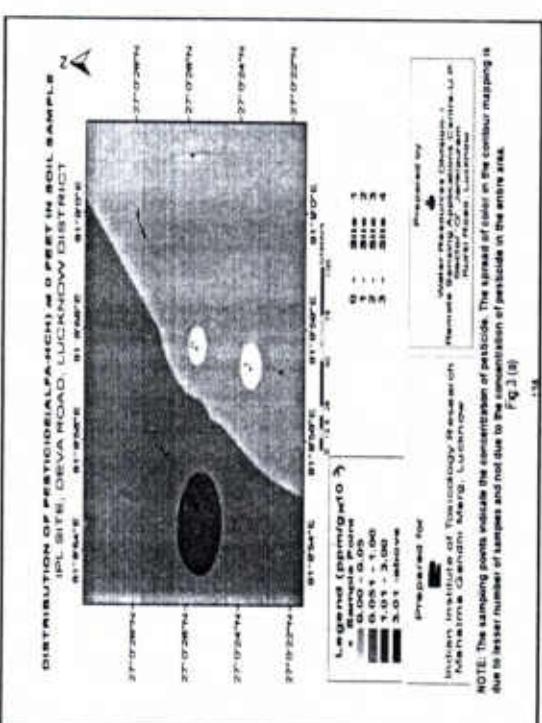
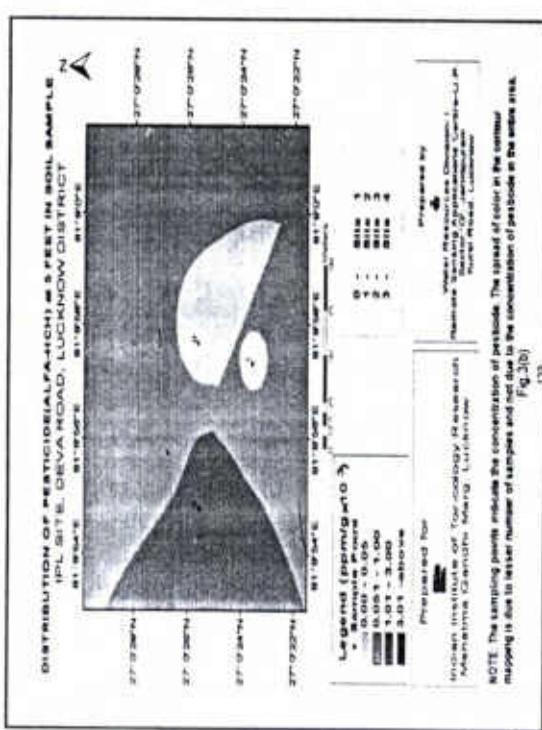
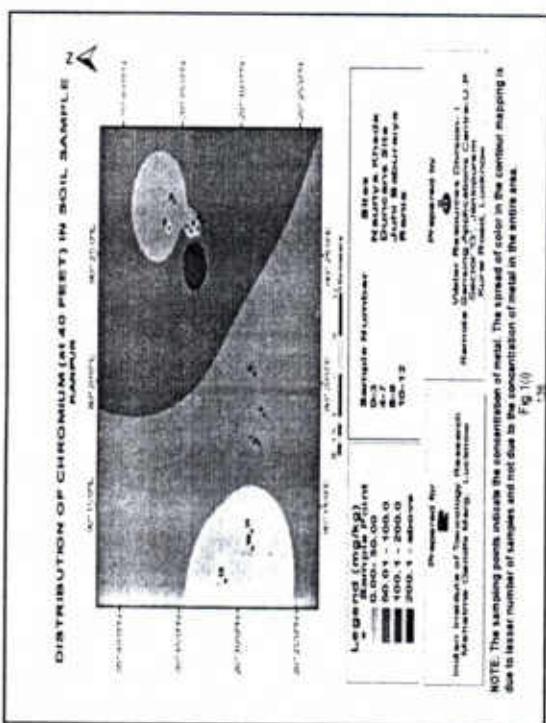
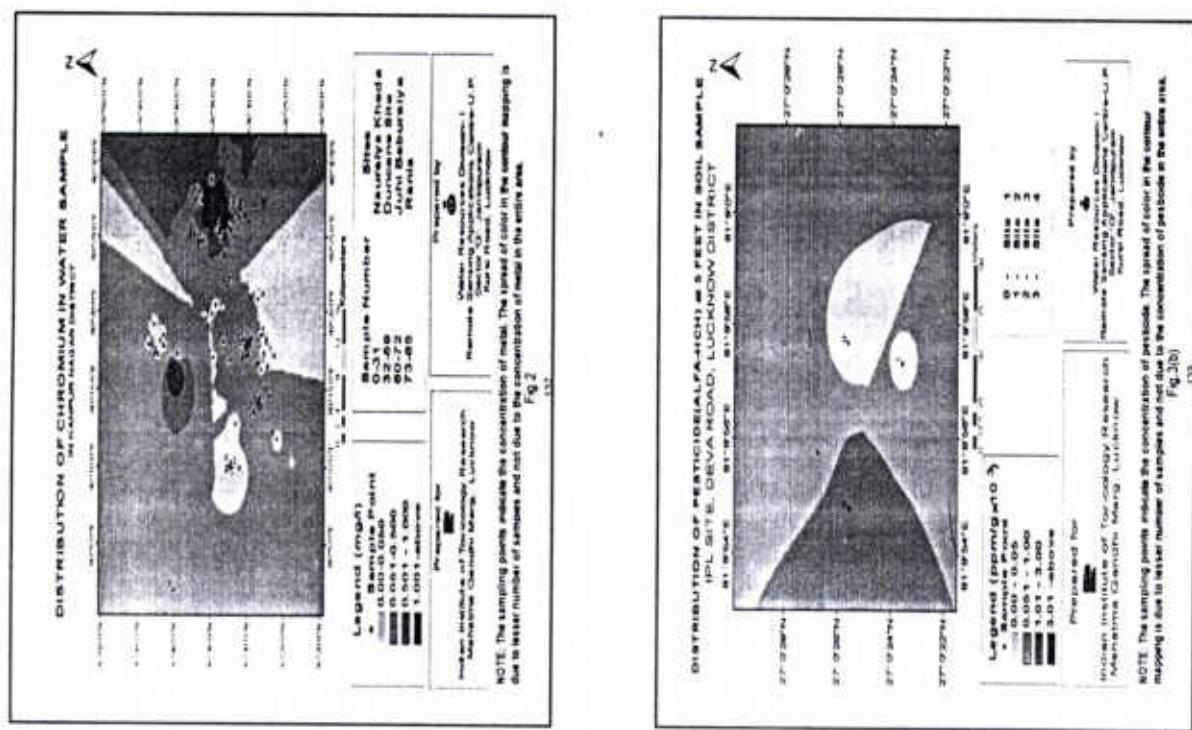
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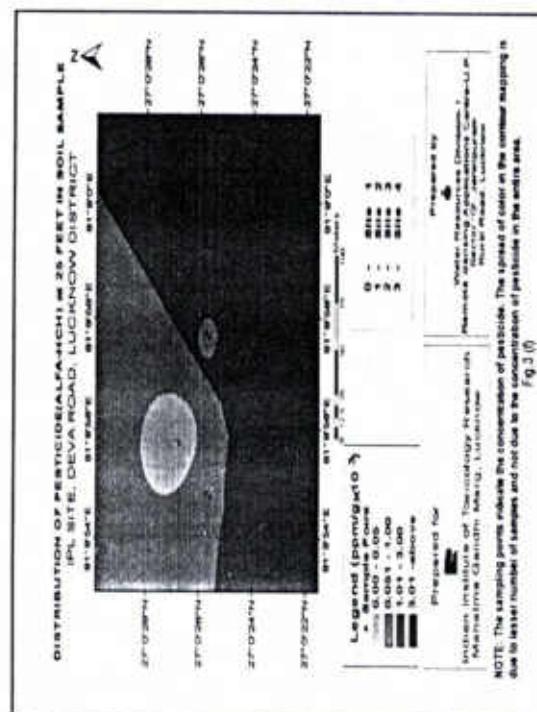
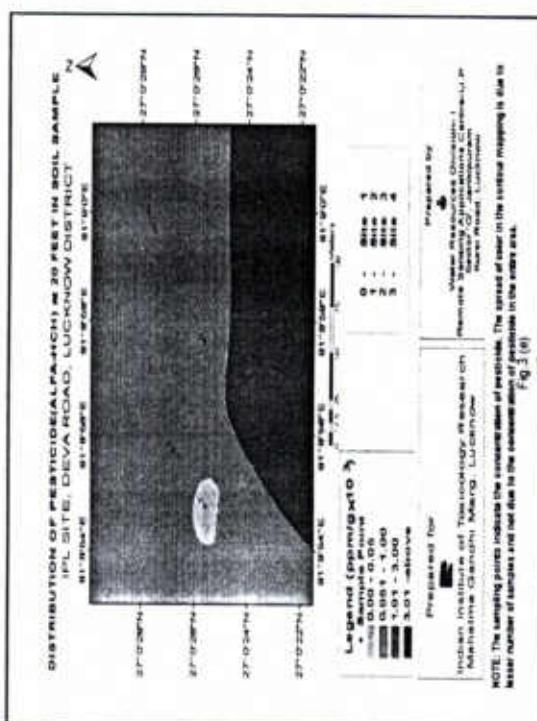
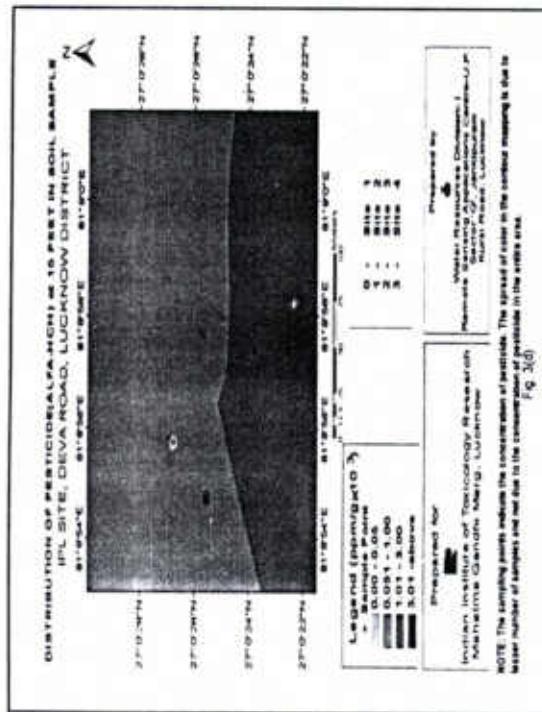
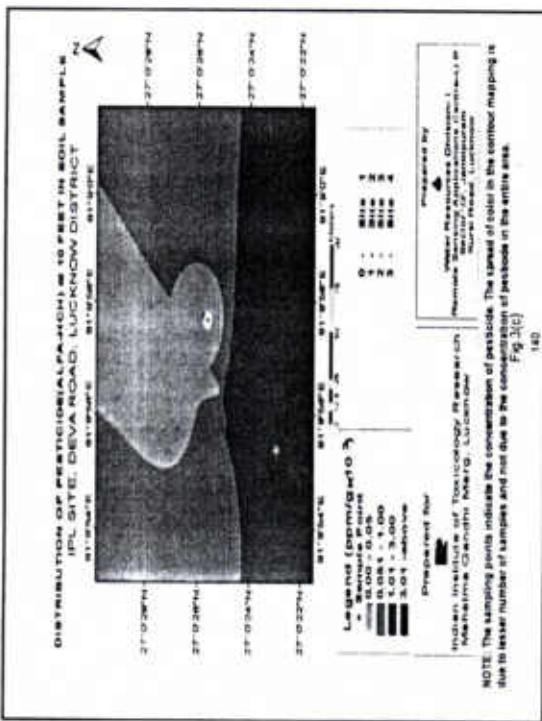
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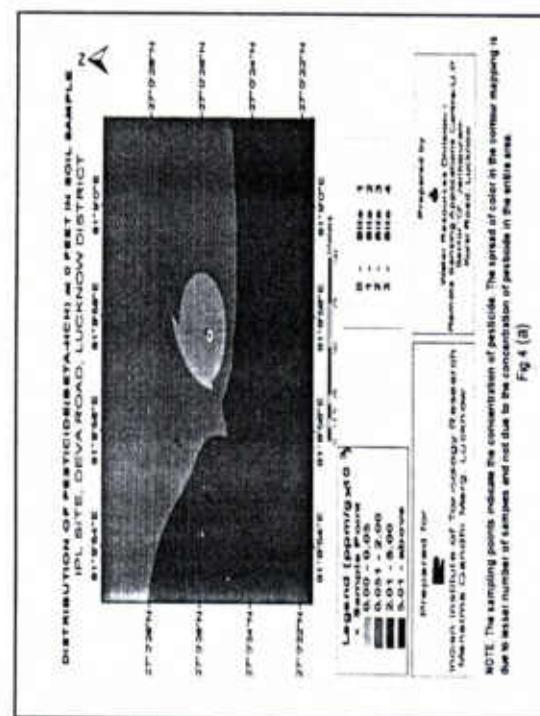
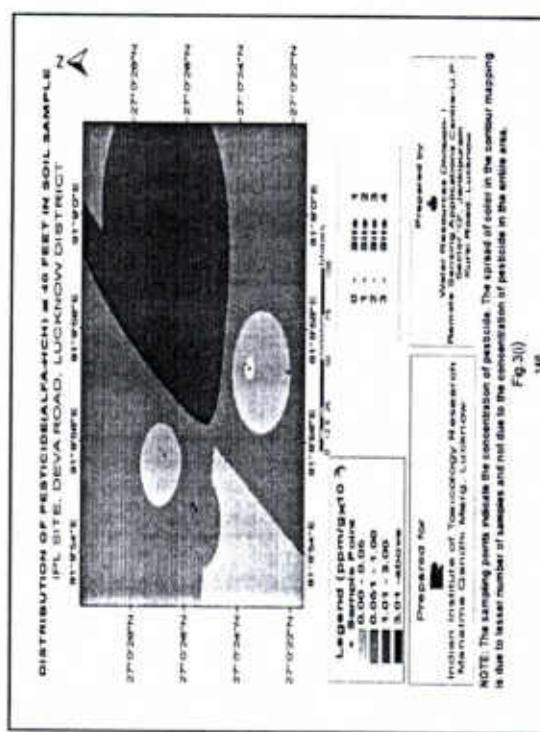
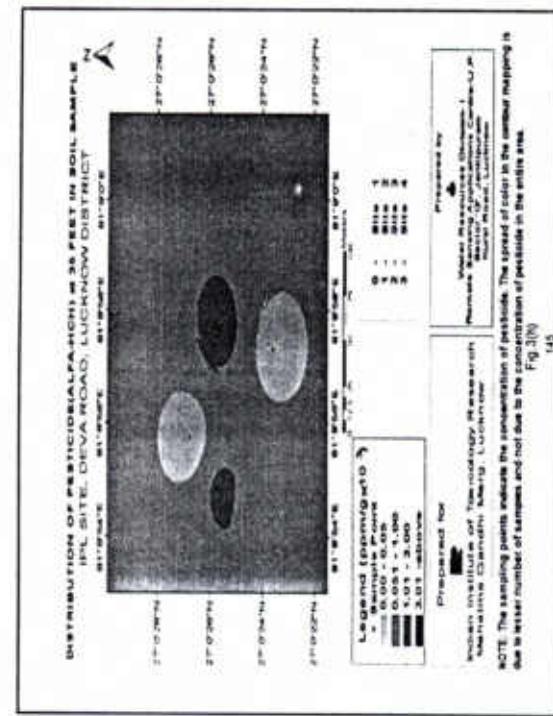
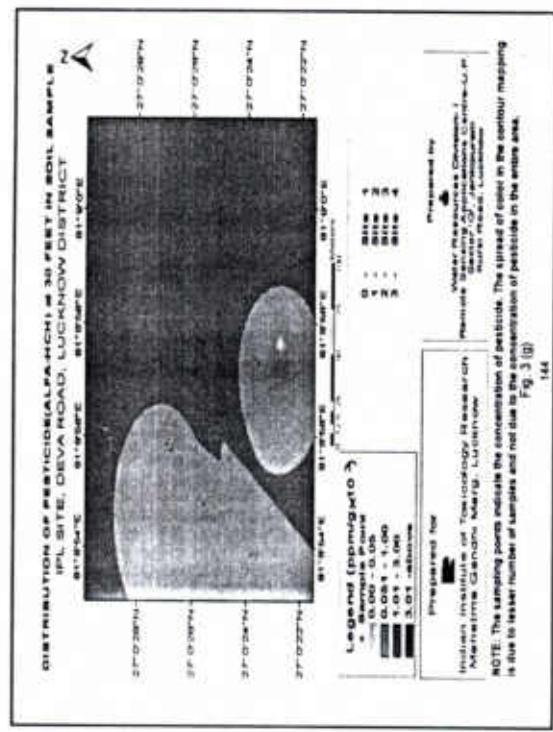
NOTE: The sampling points indicate the concentration of metal. The spread of color in the contour mapping is due to lesser number of samples and not due to the concentration of metal in the entire area.

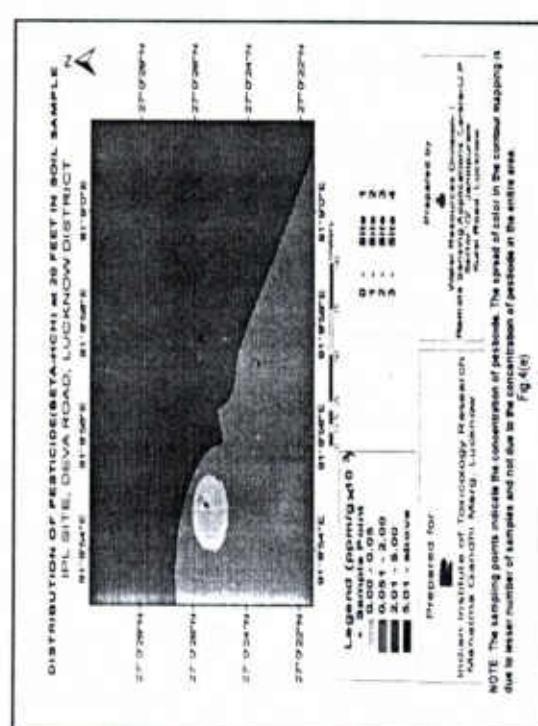
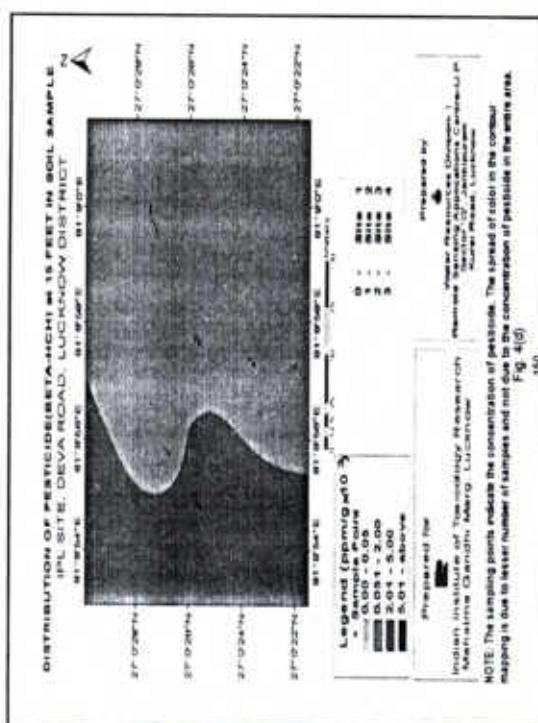
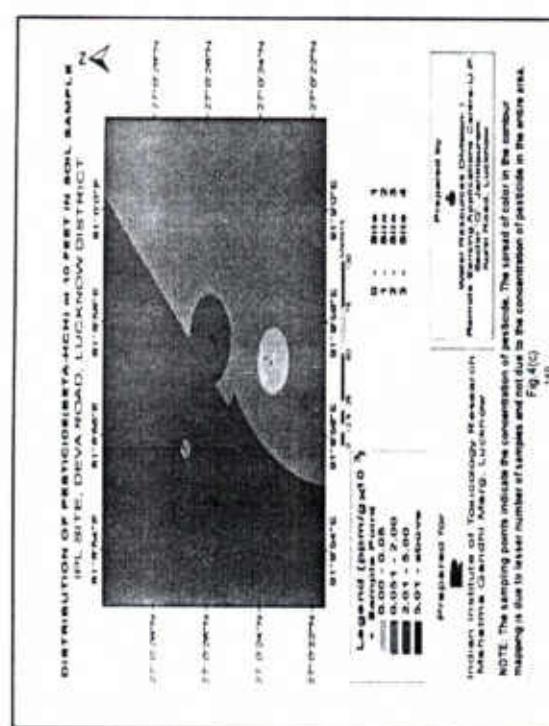
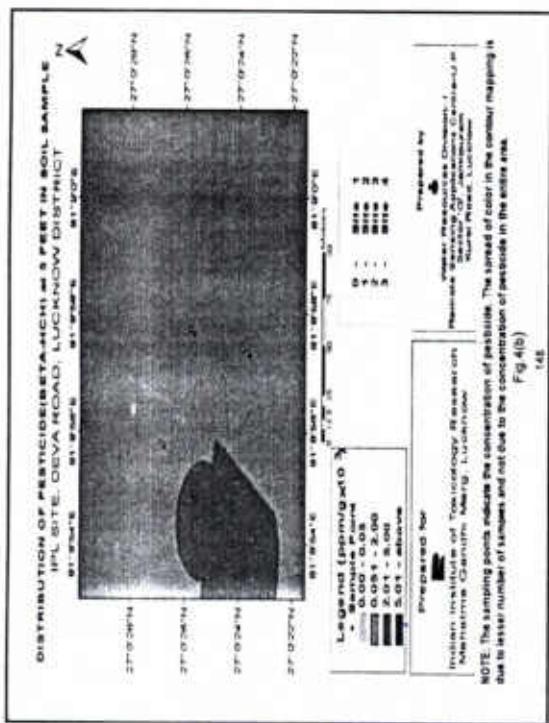
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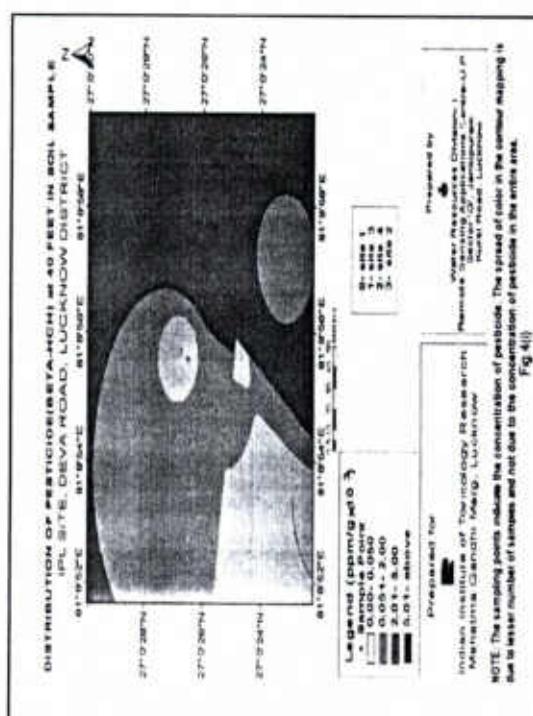
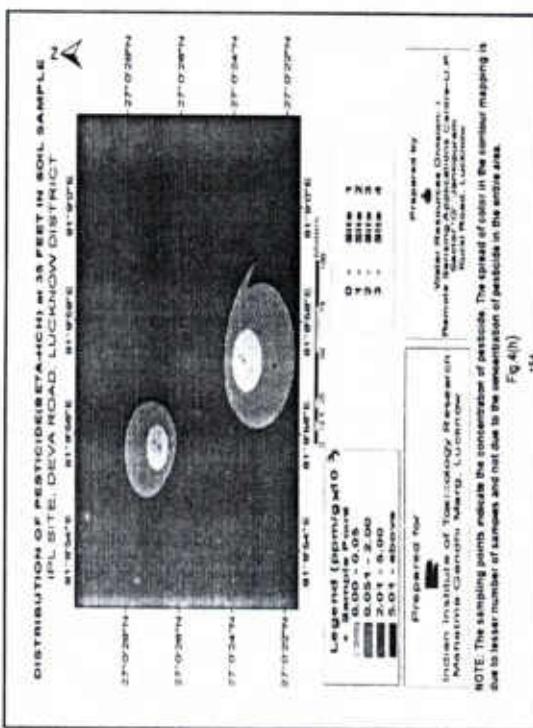
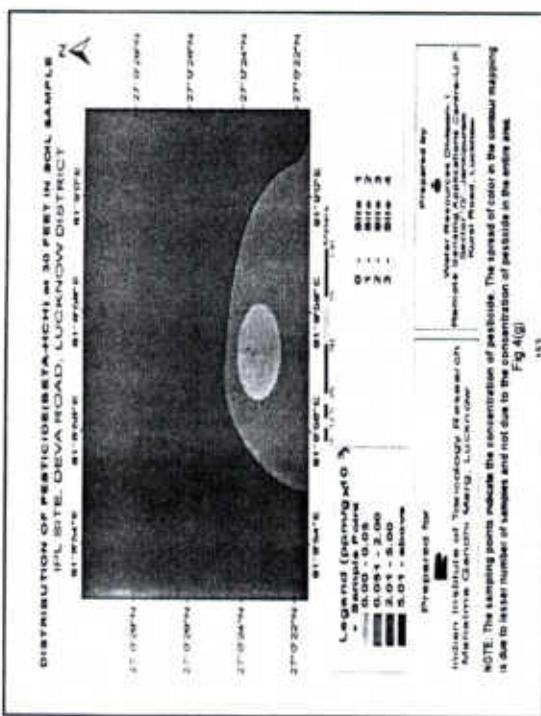
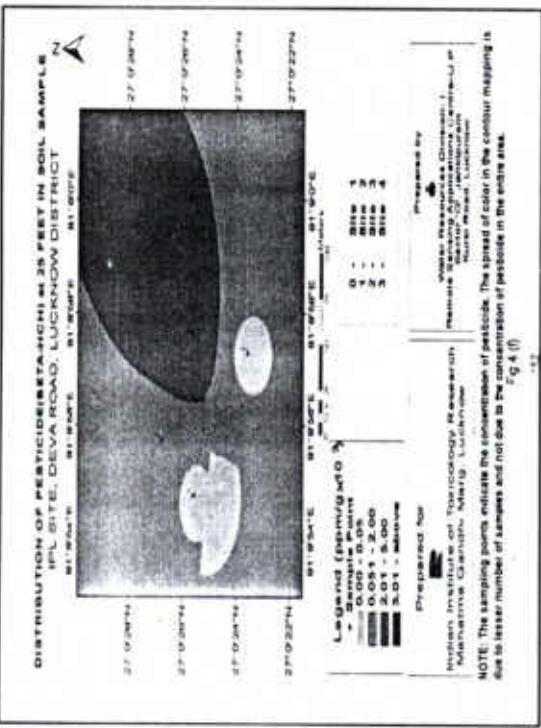


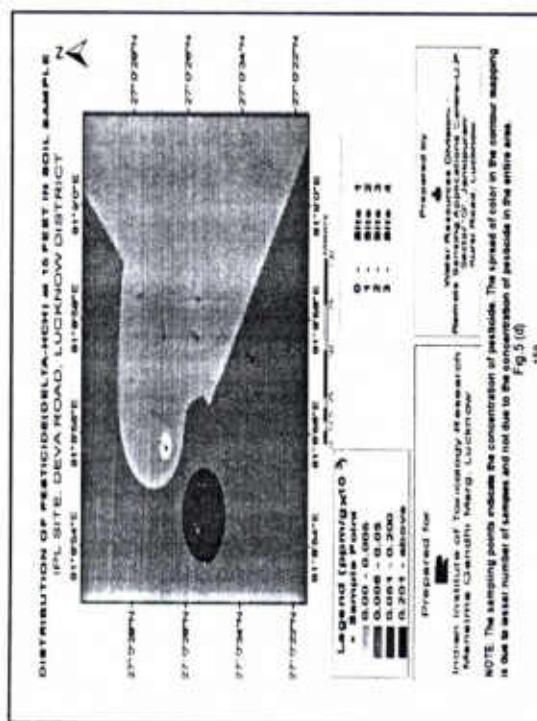
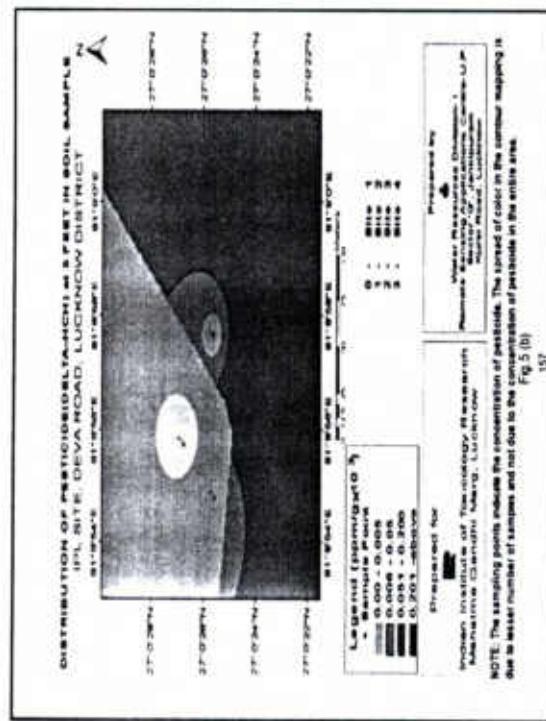
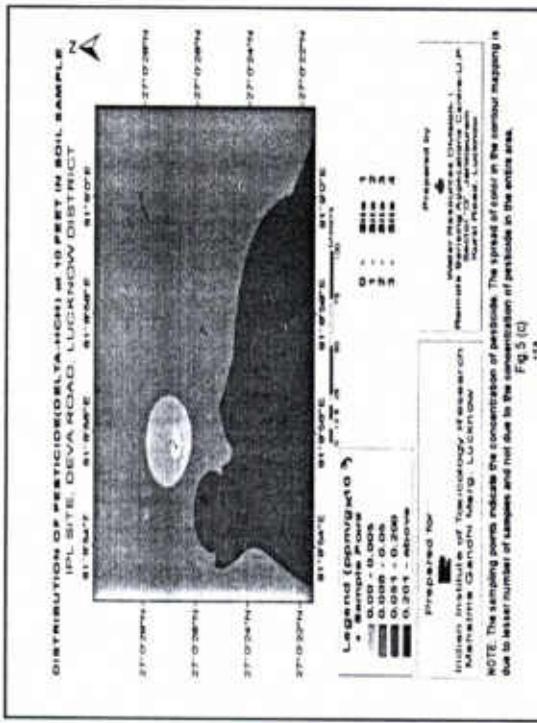
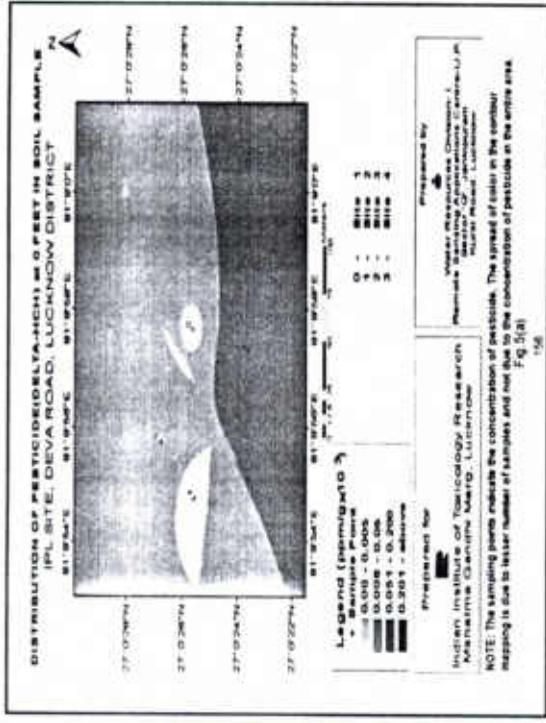


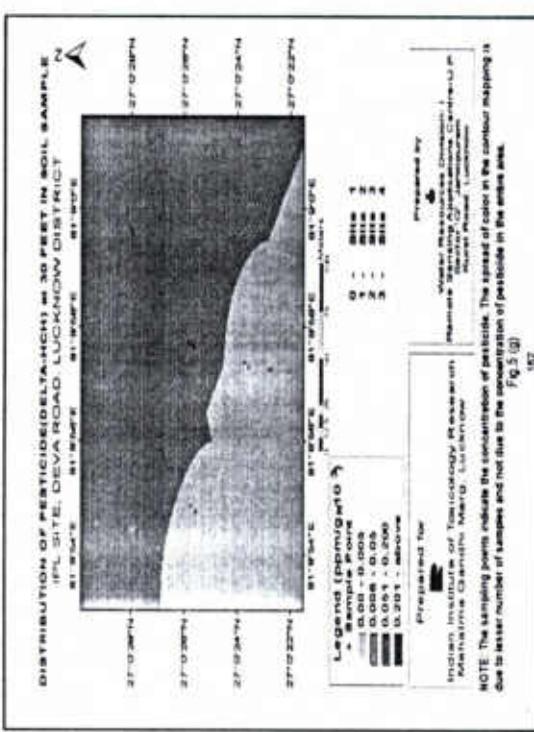
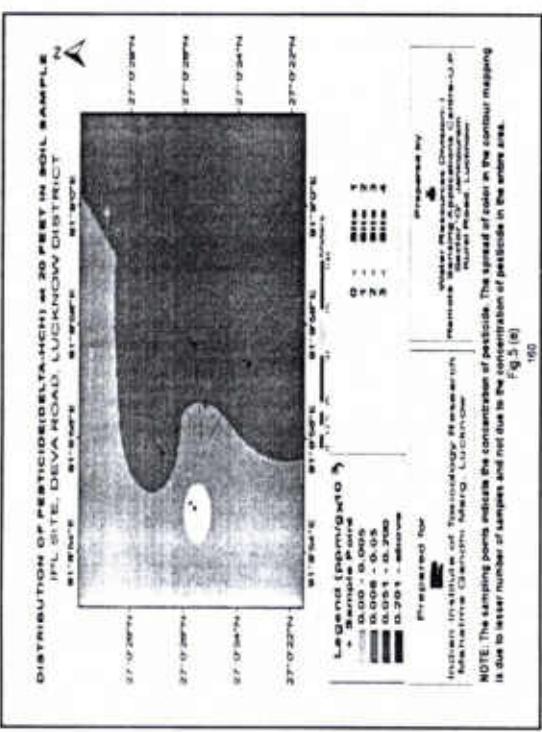
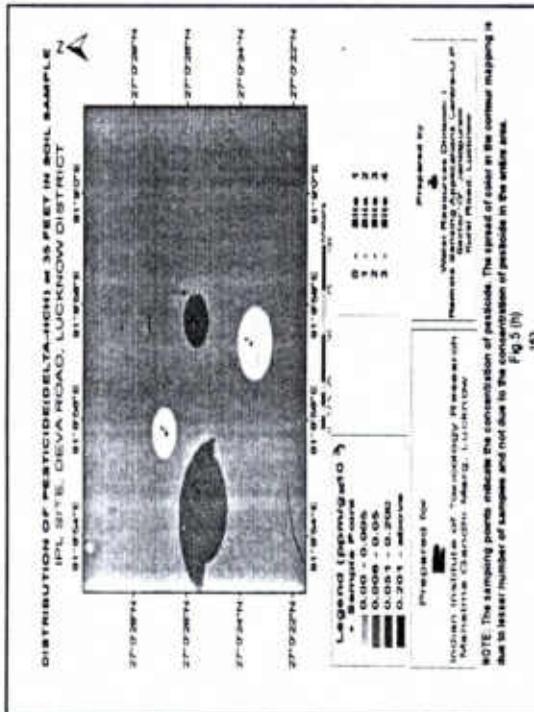
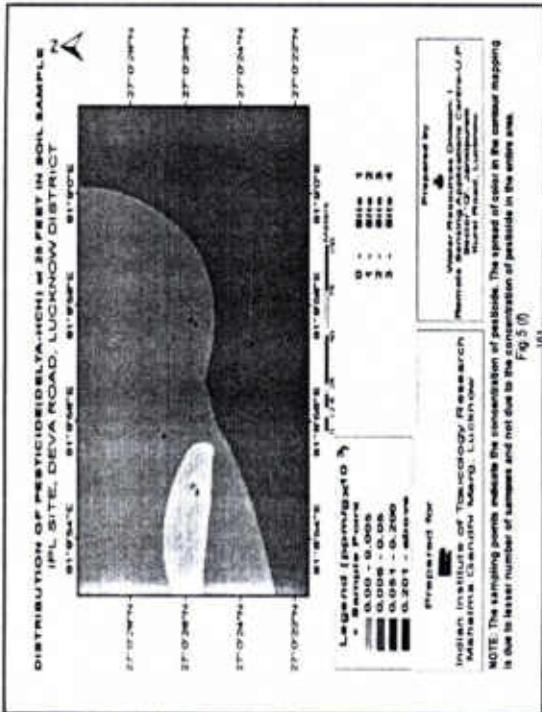


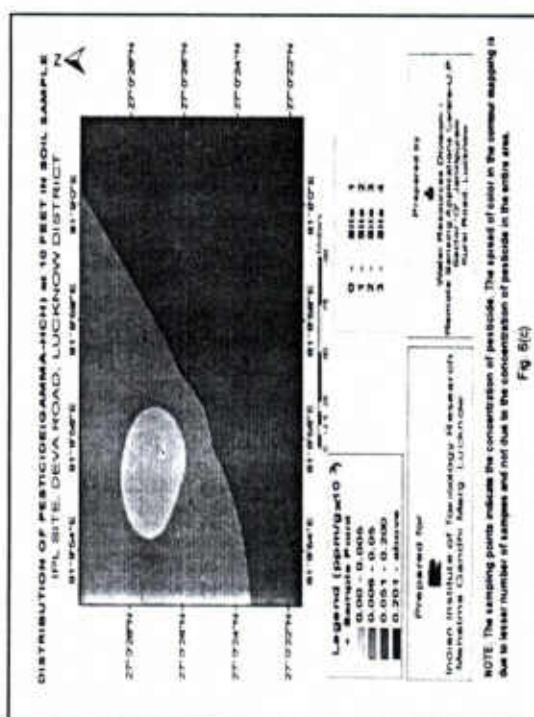
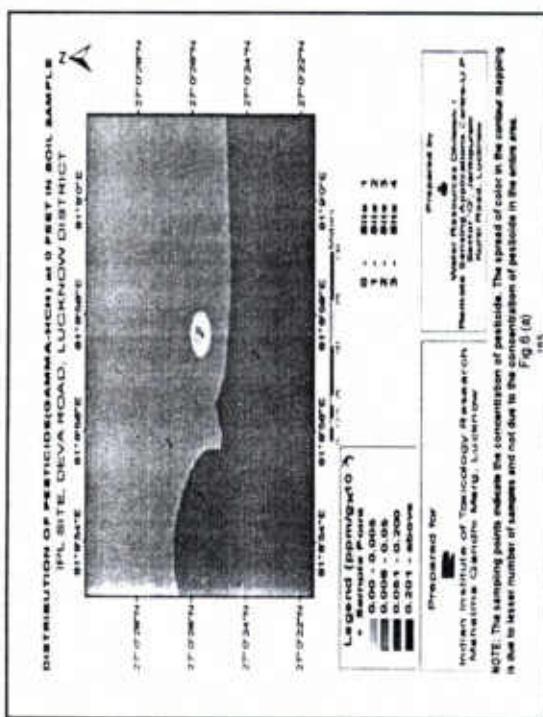
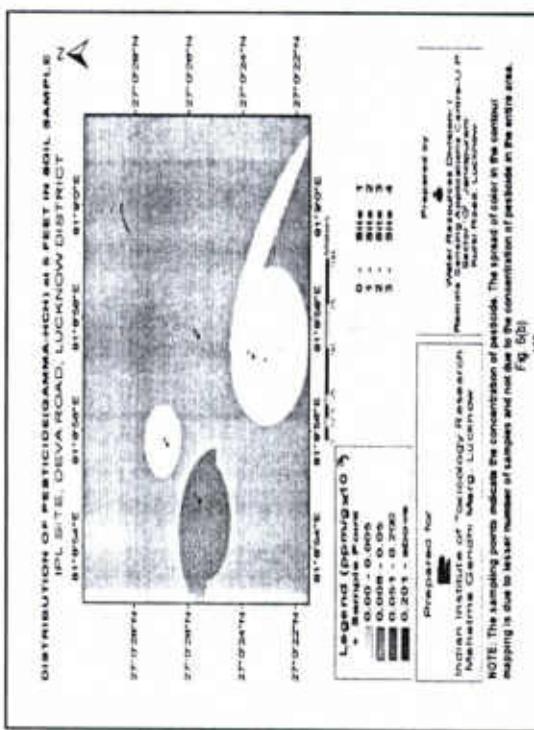
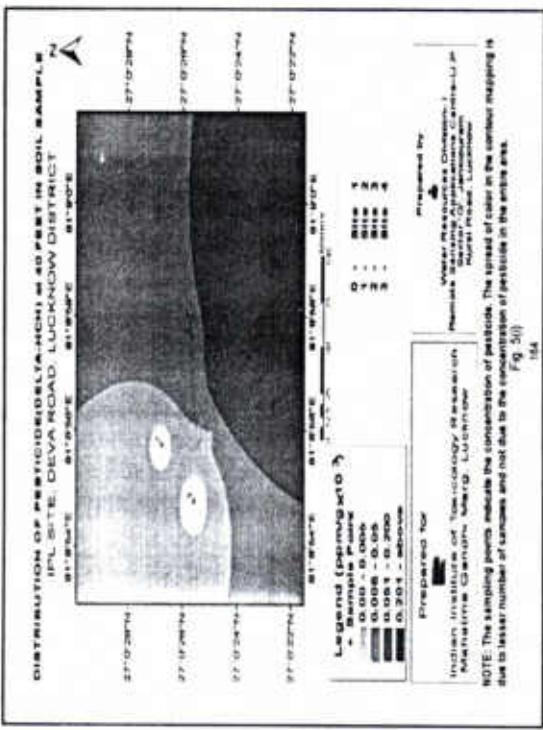


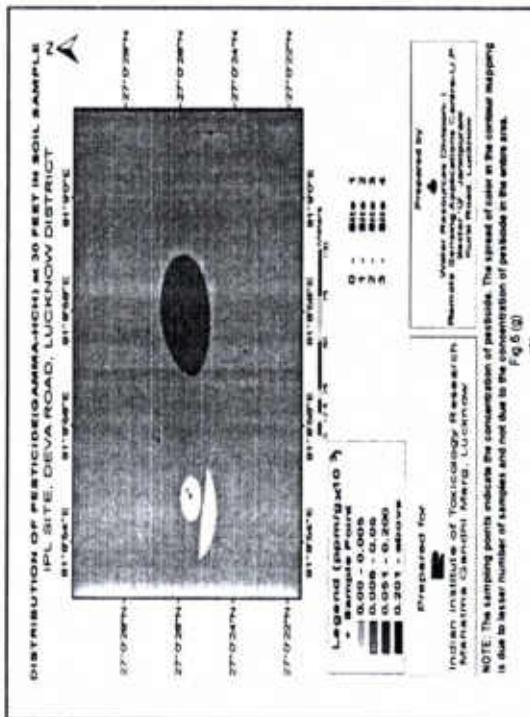
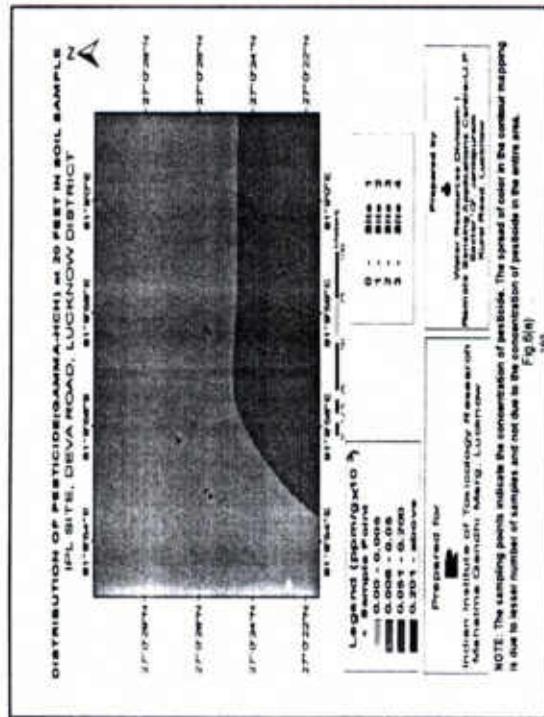
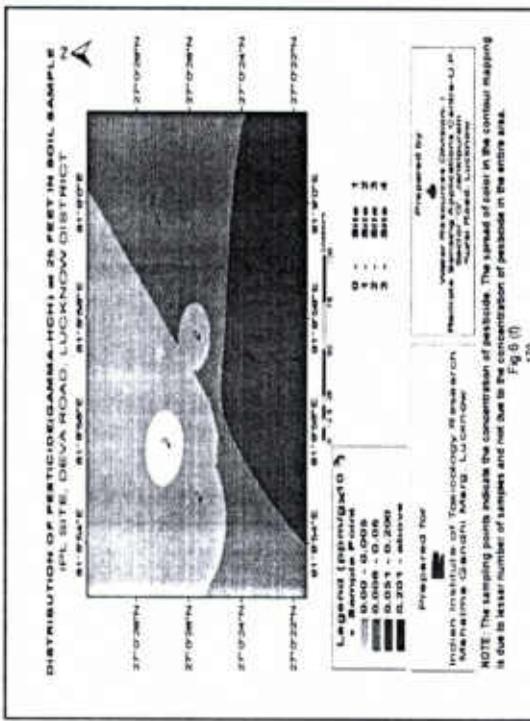
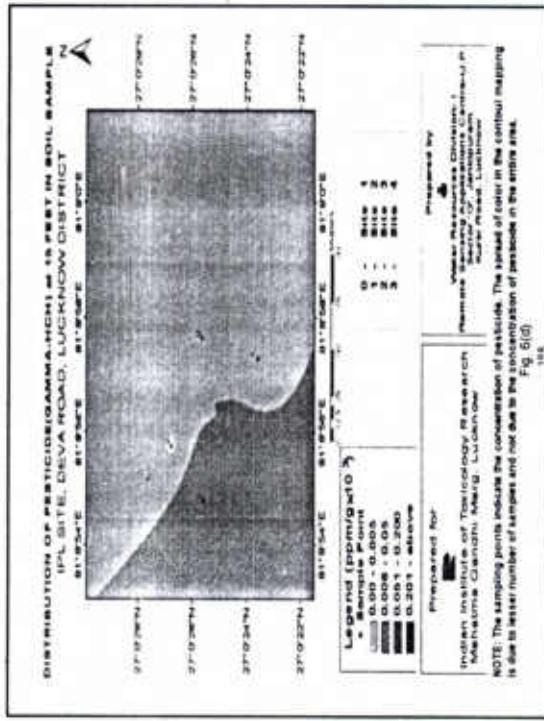


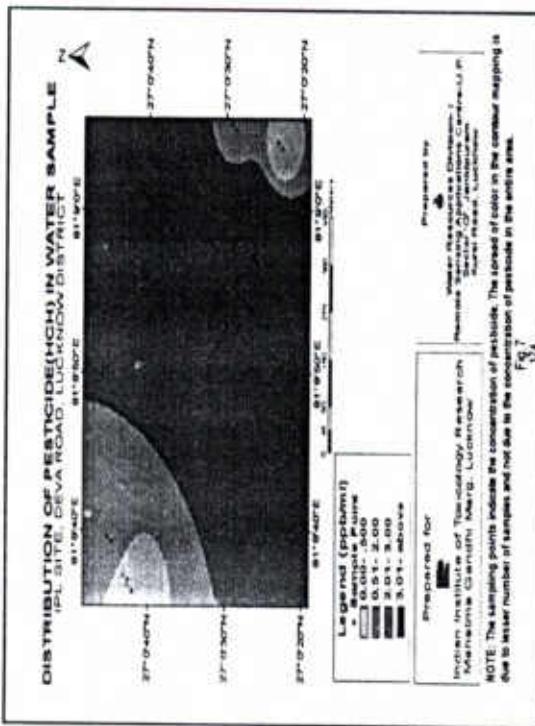
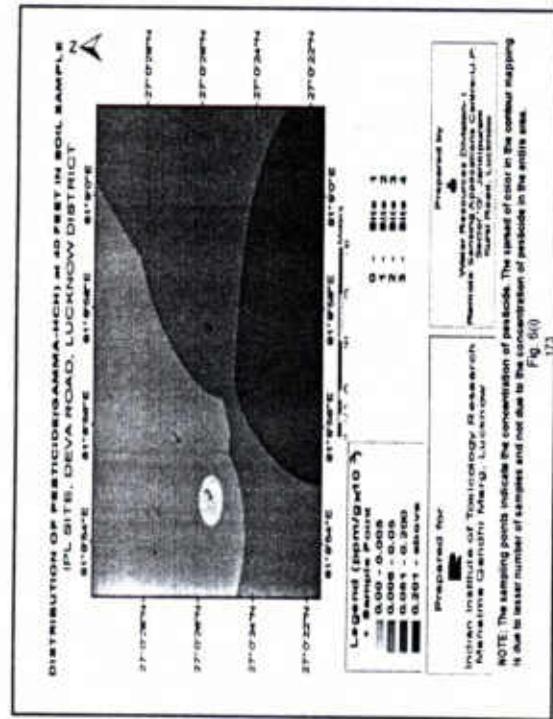
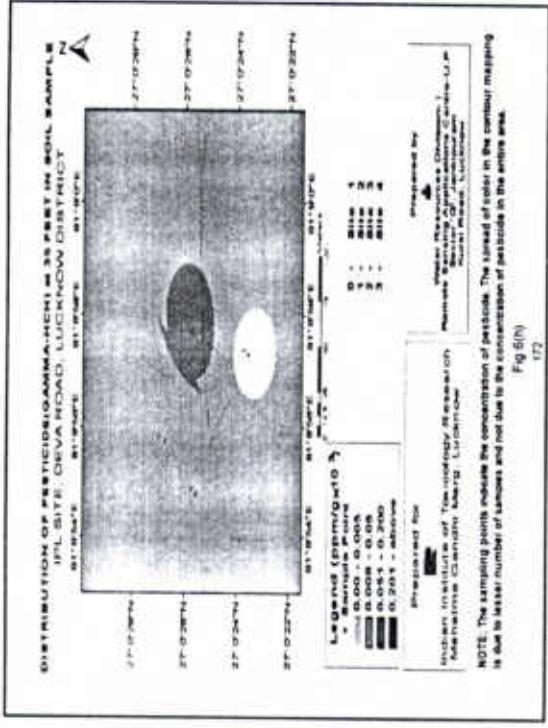












- 3. Recommendation on clean up measures and environmental improvement of the sites such as safe disposal of hazardous wastes, suggestion of suitable methods of treatment and disposal.**

**Remediation measures taken by UPPCB**

1. Closer order issued to six BCS factories which were responsible for throwing BCS waste at Khanpur village.
2. District Magistrate/local Municipal Corporations have been asked to see that no more waste is thrown on these dumps.
3. Ghaziabad development authority has been asked not to allow construction of residential colony on illegal dumpsite.
4. Notice Boards have been put up at illegal dump sites "not to dispose any hazardous waste". Further it is planned to fence the dumpsites, if possible.

**Remediation measures suggested**

1. Transfer of BCS waste and other industrial wastes from Panki (Duncan's Site) and Khanpur Village (Rania) to nearby secured landfill site.
2. Remediation of waste dumpsite with selected technology such as to stabilize or immobilize the hazardous waste at the present site itself.
3. Remediation of Ground Water in and around the site using appropriate technologies.

## **Site Specific Recommendations**

**Site: Rania**

- First and foremost recommendation for this area is to get the entire waste dump removed and shifted to a secured landfill.
- Based on the survey and analysis report it is recommended that the water in the area is not contaminated to the extent warranting immediate concern. Because of

the significant presence of metals in soil at various depths, there is always a possibility of leaching of heavy metals from the soil (Cr Min. 0 ppm at zero feet; Max. 235.9 ppm at 5 feet) to the aquifer. Therefore regular monitoring of water in the area is desirable.

- After removing the waste from the area, it is recommended that the top soil to a depth of 2 feet be removed, the area capped and fenced to prevent further dumping and also to prevent further leaching of the metals from the soil to the ground water.

#### **Site: Nauraiya Kheda**

- Some of the physico-chemical values of the water samples of the area are not meeting the desired criteria of drinking water in terms of pH, sulphate, fluoride, nitrate and are contaminated with coliform and fecal coliform along with of heavy metals (Cr Max. level 1.66 ppm).
- Under these circumstances, it is recommended that alternate reliable sources of drinking water be provided to the residents.
- The concentration of chromium in the soil ranges from 24.92 ppm at 20 feet to 119.60 ppm at 30 feet depth. Because of construction and densely populated area, the scope of remediation of the site is very limited.

#### **Site: Juhi Baburahiya (Rakhi Mandi)**

- Nitrate and sulphate levels in some of the water samples of the area are not meeting the desired criteria of drinking water. Few samples are contaminated with coliform and fecal coliform along with heavy metals especially chromium.
- Under these circumstances, it is recommended that alternate/reliable sources of drinking water be provided to the residents.

- The concentration of chromium in the soil ranges from 0 ppm at 35 feet to 140.74 ppm at 5 feet depth. Because of construction and densely populated area, the scope of remediation of the site is very limited.

#### **Site: Panki Industrial Area (Duncan's)**

- Physico-chemical parameters in some of the water samples of the area are not meeting the desired criteria for drinking water quality. Few samples are contaminated with coliform and fecal coliform along with heavy metals especially Chromium (Min. 0.02 ppm; Max. 10.42 ppm).
- There is urgent need to stop the practice of dumping of miscellaneous solid waste in the area. The area should be protected with fencing so that no human/animal activities take place.
- To get the entire waste dump removed and shifted to a secured landfill.
- After removing the waste from the area, it is recommended that the top soil to a depth of 2 feet be removed, the area capped to prevent further leaching of the metals from the soil to the ground water.
- Based on the survey and analysis report it is recommended that the soil and water in the area is heavily contaminated. Because of the heavy contamination of soil at various depths with metals like chromium (Min. 2.50 ppm; Max. 3106 ppm), iron (Min. 679 ppm; Max. 11941 ppm), manganese (Min. 65.38 ppm; Max. 918. ppm), lead (Min. 10.6 ppm; Max. 666 ppm) and zinc (Min. 53.24 ppm; Max. 371.38 ppm), there is always a possibility of leaching of heavy metals from the soil to the aquifer. Therefore regular monitoring of water in the area is desirable. Further there is urgent need of remediation of contaminated soil with latest technology available in the country. It is also recommended that the water from the existing sources in the site should not be used even for the purpose of irrigation and other recreational activities.
- Under these circumstances, it is recommended that alternate reliable sources of drinking water be provided to the residents.

### **Site: Dewa Road, Lucknow**

- The alarming levels of pesticides (HCH) in soil ( $\alpha$  HCH Min. 0 ; Max.  $6.366 \times 10^3$  ppm at 40 feet); ( $\beta$  HCH Min.  $0.0051 \times 10^3$  at 0 feet; Max.  $21.089 \times 10^3$  ppm at 40 feet); ( $\gamma$  HCH Min. 0 at 5 feet; Max.  $0.720 \times 10^3$  ppm); ( $\delta$  HCH Min. 0; Max.  $1.476 \times 10^3$  at 5 feet) and water ( $\alpha$  HCH Min. 0.037; Max. 1.768 ppb); ( $\beta$  HCH Min. 0.116; Max. 0.145 ppb); ( $\gamma$  HCH Min. 0.001; Max. 0.051 ppb); ( $\delta$  HCH Min. 0.145; Max. 5.669 ppb) warrants immediate removal of HCH muck from the site to a secured landfill.
- The area should be strictly prohibited for accessibility. After removing the waste from the area, the top soil to a depth of 2 feet be removed, it should be capped to prevent further leaching of the pesticides from the soil to the ground water.
- It is also recommended that the water from the existing sources in the site should not be used even for the purpose of irrigation and other recreational activities.
- Under these circumstances, it is recommended that alternate reliable sources of drinking water be provided to the residents.
- Further, remediation of the soil with latest technologies is recommended.

### **Site: Bhowapur, Kaushambi (Ghaziabad)**

- The situation at the illegal dumping site at Ghaziabad is peculiar because of the mixed dumping of municipal waste along with the industrial solid waste. The analysis of soil from the area at various depths reveals the presence of considerable amounts of metals. Chromium (Min. 12.68 ppm; Max. 82.77 ppm); Iron (Min. 7286 ppm; Max. 8770 ppm), Manganese (Min. 212 ppm; Max. 393 ppm), Lead (Min. 0 ppm; Max. 30.48 ppm) and Zinc (Min. 52.89 ppm; Max. 347.66 ppm), Therefore, there is a possibility of leaching of these metals to the aquifer.
- During study of the site in November,2007 it was noticed that all the waste has been removed from the site and a 35 feet deep excavation has been done to make way for the construction of a hotel.

- It is recommended that the waste removed from the site before November, 2007 be traced and should be shifted to the secured landfill.
- Attention should be paid while designing of sewage treatment plant (STP) and rain water harvesting system during the process of building construction in this area.
- As chromium concentration in some of the water samples is higher than the permissible limits, alternative source for drinking water may be identified.

**References:**

- APHA, AWWA, WEF (2005). Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup>. Editions, Washington, DC.
- BIS (2003) Indian Standard: Drinking water Specification. First Revision IS 10500:1991 Bureau of Indian Standards, New Delhi.
- McCrady, M.H. (1918). Table for rapid interpretation of fermentation tube results. The Public Health Journal, Canada, 9,201.
- WHO (2004). Guidelines for drinking water 3<sup>rd</sup> edn. World Health Organization, Geneva.
- EPA (2007). Method 3051 A. Microwave assisted acid digestion of sediments, sludges, soils and oils.