



HARYANA STATE POLLUTION CONTROL BOARD
SCO No.55, SECTOR-25, HUDA, PANIPAT
Ph. - (0180) 2672037, Telefax - 2664951, E-mail: hspcbropr@gmail.com

No. HSPCB/PR/2021/ 8581

Dated 07/01/2021

To

The Registrar,
National Green Tribunal,
New Delhi.

Sub:

Restoration Plan in OA No.738 of 2018 Satpal Singh Sarpanch Gram Panchayat Singhpura Sithana, Panipat V/s Indian Oil Corporation Ltd., Panipat prepared by Joint Committee as per the direction of Hon'ble NGT order dated 25/07/2020.

Ref.

Hon'ble NGT order dated 25/07/2020

In this connection, it is submitted that in compliance of the orders of the Hon'ble NGT in the said case, Joint Committee has prepared the Restoration Plan for environment, public health and ground water around Panipat Refinery and circulated the same to the implementing agencies through Nodal Agency (HSPCB). The copy of the Restoration Plan is enclosed herewith with the request to place before the Hon'ble Bench.

Regional Officer
Panipat Region
(Nodal Agency)

Restoration Plan for Environment, Pubic health and Ground water around Panipat Refinery prepared by the Joint Committee, in compliance of the directions of Hon'ble NGT in the matter of O.A. No. 738/2018; Satpal Singh, Sarpanch, Gram Panchayat Singhpura Sithna, Panipat Versus Indian Oil Corporation Ltd. Panipat Refinery

1. Preamble:

In the above matter, Hon'ble NGT in its order dated 25/07/2020, observed as follows:

"This matter has been monitored in the last two years on the issue of continued violation of environmental norms by the Indian Oil Corporation Ltd. (IOCL), Panipat Refinery, Panipat. Violation of environmental norms was established from report dated 15.11.2018 by a joint team comprising Central Pollution Control Board (CPCB), Haryana State Pollution Control Board (HSPCB) and Deputy Commissioner, Panipat which found that the samples from the Effluent Treatment Plant (ETP) of the unit were found to be noncompliant. Ambient air quality was exceeding the norms. VOCs were 2 resulting in irritation to eyes and odour which was observed by the joint team during inspection. Untreated effluent was found to be discharged in the green belt areas. Unit was not complying with the conditions of recycling and reusing treated water. ETP was not being operated efficiently and was not adequate. Untreated effluents were being stored in open storage lagoon without VOC recovery system. The ground water samples were not complying with the norms."

"We find merit in the stand of the CPCB and the State PCB in view of independent joint Committee report showing continued discharge of pollution by the IOCL in water bodies. The IOCL has failed to take effective and adequate steps even during long interval available after the last hearing though such action was expected. It was on that expectation that requirement of paying assessed compensation was deferred. A PSU has to be model of compliance with the environmental norms which unfortunately is found lacking in the present case."

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It was directed by Hon'ble NGT as under:

"Accordingly, we direct the IOCL to take initiative on day to day basis and comply with all the observations of the joint Committee positively within six months. This will not debar the State PCB from initiating prosecution for violation of provision of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 against the Company and its senior officers who failed to prevent commission of crime, as per statutory mandate.

*We also direct the IOCL to deposit a further sum of Rs. 25 Crores with CPCB so that the amount earlier deposited with amount to be now deposited can be **spent on restoration of environment and public health by making a restoration plan by the CPCB, State PCB and the District Magistrate, Panipat. Such plan may be prepared within three months and same may be duly executed.** The deposit of the amount by the IOCL may be made within one month from today with the CPCB. Issue of final liability for compensation will be decided on next date in the light of progress in performance by IOCL. **The action plan may cover restoration activities to be undertaken outside the Company's premises for restitution of environment including public safety, health and hygiene.** It will be open to the Committee to get action plan executed through company itself or otherwise and ensure regular monitoring the process of implementation."*

2. Facts examined by the Joint Committee:

The meetings of the Joint Committee comprising the following members was held on 17.09.2020 & 27.10.2020 in the office of District Magistrate, Panipat to deliberate on the above issues, in order to prepare an restoration action plan.

- Sh. Dharmender Singh , IAS, District Magistrate, Panipat
- Dr. Narender Sharma, Additional Director, CPCB, Delhi
- Er. Kamaljit Singh, Regional Officer, HSPCB, Panipat

Er. Pardeep Singh AEE, HSPCB, Panipat has also attended the meeting.

The examination of the previous reports of the Joint Committee constituted in this matter revealed the following issues responsible for affecting the environment, surface water and public health around the Panipat Refinery:

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- Illegal and unregulated discharge of industrial effluent into the thirana drain.
- Open potential sources of VOCs emissions in effluent treatment plant, without recovery of VOCs.
- Ground water quality around Panipat refinery affecting safe drinking water supply to nearby villages.
- Storage of contaminated water in multiple earthen lagoons/ponds inside the refinery premises without lining, with high potential w.r.t. ground water contamination.
- Open storage of untreated industrial effluent in various lagoons/tanks, which are not components of ETP, leading to odour in nearby areas.
- No segregation of waste water drains from storm water drains, to prevent cross contamination of storm water.
- No effluent treatment plant (ETP) installed by IOCL for storm water contaminated with industrial waste water.
- Discharge of waste water in the drains in the name of storm water, without any consent to operate from State Pollution Control Board.

While re-occurrence of various environmental issues reported by the Joint Committee in the nearby villages, will mostly depend on the actions to be taken by IOCL within the premises, it is important to ensure that none of the non-compliances/actions of the IOCL within the plant premises remain unnoticed/unknown to the agencies responsible for ensuring the environmental and public health in the nearby villages. This becomes important and significant in view of the fact that the access to the activities of Panipat Refinery within the premises is highly restricted, even for the regulatory agencies, on account of security and other reasons.

In view of the above and the fact that the restoration of some of the components outside the premises may be initiated only once action on various points, is implemented within the refinery premises, it was also deliberated during the meeting of the joint committee that two types of Restoration plan may be required to address all the issues to the maximum possible extent i.e. **A) Short term Restoration Plan to provide immediate relief to the public in nearby villages, which is implementable within 3-6 months, B) Long term Restoration Plan to restore the affected components back**



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to the safe level, if not restored naturally after implementation of various measures within the refinery premises, as suggested by the Joint Committee

The members of the Joint Committee were of the view that in order to ensure healthy environment to the inhabitants in the vicinity of Panipat Refinery, an action plan is required, to both regulate and monitor the legal and illegal discharges from the Panipat refinery independent of the actions taken by the refinery within the premises. In view of this, the action plan was prepared involving regulatory, monitoring, preventive and corrective components for development of a restoration plan with monitorable and implementation targets along with responsibility matrix, as follows :

A. Action plan followed by the Joint Committee for preparation of Restoration Plan with regard to Oxygen Depletion.					
S.No.	Action Point	Responsibility	Target Date	Actual Date of Completion	Remarks
1	Preparation of Action Plan for Tree Plantation for restoration of Oxygen depleted.	Joint Committee of DM, CPCB and HSPCB	24/10/2020	27/10/2020	
2	Validation of Estimates and Preparation of Cost Estimates	Forest Department, Panipat	10/11/2020	05/11/2020	
B. Action plan followed by the Joint Committee for preparation of Restoration Plan with regard to Public Health					
S. No.	Action Point	Responsibility	Target date	Actual date of Completion	
1.	Preparation of plan to	HSPCB in consultation	10/11/2020	22.12.2020	

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	implement closed discharge system with provision of air venting, for discharge of permitted quantity of industrial effluent, in the thirana drain, upto the point where it merges into the Drain No2.	with irrigation Deptt. for designing and preparing estimate. Implementation by Panipat refinery from the Compensation already deposited by Panipat refinery		
2.	Estimate of Installation of Online Continuous Emission Monitoring System (OCEMS) in Thirana Drain with connectivity to HSPCB	HSPCB	31.12.2020	31.12.2020
3.	Estimate of Installation of Online Continuous Emission Monitoring System (OCEMS) in the drain used by Panipat refinery for discharge of Storm water, with connectivity to HSPCB	HSPCB	31/12/2020	31.12.2020
3.	Provision of Mobile Dispensary/Medical vans dedicated to First Aid and specifically Respiratory diseases related to Air Pollution w.r.t VOC emissions from refineries.	Details of the facilities required and estimates for operating and maintaining the facilities for the next 10 years: CMO, Panipat	25/11/2020	30.12.2020

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4.	Planning of Quarterly Medical Check up of inhabitants of nearby Villages, as preventive and monitoring measure.	District administration through CMO/Red Cross, Panipat	25.11.2020	30.12.2020
C: Action plan followed by the Joint Committee for preparation of Restoration Plan with regard to ground water quality				
S.No.	Action Point	Responsibility	Target Date	Actual Date of Completion
1	Submission of the proposal, for providing safe drinking water.	District Administration through Public Health	31/10/2020	24.12.2020
2	Consideration of the proposal by Joint Committee	Nodal Officer, HSPCB	5/11/2020	24.12.2020
3	Validation by CGWB	RO, HSPCB Through CGWB, RO, Chandigarh	10/12/2020	24.12.2020

5. RESTORATION PLAN:

The restoration plan has been prepared with regard to the following components:

- Damage caused to Environment through Oxygen depletion
- Damage caused to public health.
- Damage caused to ground water Quality

5.1. Short term Restoration Plan:

5.1.1. Restoration Plan w.r.t. Oxygen Depletion:

The Joint Committee constituted earlier in this matter was of the view that a part of the Environmental damage caused due to depletion of Oxygen may be restored by generating equivalent amount of oxygen through tree plantation. According the number of trees required to planted to restore the oxygen equivalent to the quantity estimated to be depleted by Panipat refinery, was calculated as follows:

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Total Amount of Oxygen depleted: **574419.98 Kg O₂**

Average amount of Oxygen generated by a fully grown tree/annum: 118 Kg

Total Number of Forest trees required to generate depleted Oxygen: $574419.98/118 = 4868$
Trees

Estimated survival rate of the Forest Trees: 60%

Total number of trees required after considering 60% survival rate : $100/60 \times 4868 = 8113$
Trees

Average Time required for maturity of Forest Trees: 10 years

Total Number of Trees considering maturity Period: i.e. $8113 \times 10 = 81130$ trees

The joint committee was of the view that the damaged caused by the Unit in four months should be restored in four months to ensure timely justice to the environment.

Number of Trees (6-8 Ft Forest Trees) required for Restoration of Damage in 4 months: $81130 \times 12/4 = 243390$ **Trees**

The joint committee also identified the local forest trees proposed to be planted along the entire length of thirana drain and the boundaries of the villages in the vicinity of Panipat refinery, as listed below:

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S. No	Scientific Name	Local Name	Family
1	Acacia nilotica	Kikar	Fabaceae
2	Acacia Senegal	Khairi	Leguminosae
3	Albizia lebbek	Kala siris	Leguminosae
4	Albizia procera	Safed siris	Leguminosae
5	Alstonia scholaris	Chatim	Apocyanaceae
6	Ailanthus excelsa	Aruna	Simarubiaceae
7	Azadiracta indica	Neem	Meliaceae
8	Banhinia purpurea	Kachnar	Leguminosae
9	Bomax ceiba	Simal	
10	Butea monosperma	Dhak	Leguminosae
11	Cassia fistula	Amaltas	Leguminosae
12	Cassia siamea	--	Leguminosae
13	Casuarina equisetifolia	Jau	Casuarinaceae
14	Callistemon speciosus	--	Myrfaceae
15	Crataeva nurvala	Barna	Capparidaceae
16	Dalbergia sissoo	Shisham	Leguminosae
17	Delonix regia	Gulmohar	Leguminosae
18	Diospyros cordifolia	Bistendu	Ebenaceae
19	Erythrina arborescens	Mother	Leguminosae
20	Eucalyptus globosus	--	Myrtaceae
21	Ficus bengalensis	Bargad	Urticaceae
22	Ficus religiosa	Pipal	Urticaceae
23	Ficus palmata	Anjir	Urticaceae
24	Ficus glomerata	Gullor	Urticaceae
25	Holoptelea integrifolia	Papri	Urticaceae
26	Inga dulcis	Wilayli Imli	Leguminosae
27	Leucaena leucocephala	Subabul	Leguminosae
28	Magnolia champaka	Champ	Magnoliaceae
29	Mangifera indica	Am	Anacardiaceae
30	Mimusops elengi	Bakul	Sapotaceae
31	Melia azedarach	Bakain	Meliaceae
32	Moringa oleifera	Sohanjana	Moringaceae
33	Morus alba	Toof	Urticaceae
34	Millingtonia hortensis	Akas neem	Bignoniaceae
35	Mitragyna parvifolia	Phaldu	Rubiaceae
36	Parkinsonia aculeata	--	Leguminosae
37	Phoenix sydyeshis	Khazoor	Palmae
38	Pongamia pinnata	Papri	Leguminosae
39	Prosopis juliflora	Mesquite	Leguminosae
40	Prosopis cineraria	Jand	Leguminosae

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41	Populus deltoides	Popular	Salicaceae
42	Polyalthia longifolia	Debdaru	Annonaceae
43	Putranjiva roxburghii	Retranjba	Euphorbiaceae
44	Salix tetrastomatica	Willow	Salicaceae
45	Syzygium cumini	Jamun	Myrtaceae
46	Tamarindus indica	Imli	Leguminosae
47	Tectona grandis	Sagun	Verbenaceae

The Joint Committee was of the opinion that the above calculations and estimates w.r.t. forest trees may be vetted/validated from Forest Department alongwith cost estimates for purchasing 6-8 feet forest trees and planting the same within next 4 months. Accordingly, the action plan proposed by the joint committee for restoration of the environment w.r.t. Oxygen depletion, was shared with the Forest Department and the comments received from the forest department are as follows:

S.No.	Action Point	Responsibility	Target Date	Feedback/Comments received from the Forest Department	Remarks																		
1.	Validation of Estimates and Preparation of Cost Estimates	Forest Department, Panipat	10/11/2020	DFO Panipat has submitted the Cost statement for plantation required in Restoration Plan in OA No.738 of 2018 on 05.11.2020 ,attached as Annexure -1 in response to the HSPCB Letter no. 4743-4747 dated 28.10.2020. which is as under: <table border="1" data-bbox="862 1366 1246 1680"> <thead> <tr> <th>Year of plantation</th> <th>Cost (in Rs.)</th> <th>Cost per plant</th> </tr> </thead> <tbody> <tr> <td>1st year</td> <td>203235</td> <td>406.47</td> </tr> <tr> <td>2nd year</td> <td>60151.00</td> <td>120.30</td> </tr> <tr> <td>3rd year</td> <td>39713.00</td> <td>79.43</td> </tr> <tr> <td>4th year</td> <td>5000.00</td> <td>10.00</td> </tr> <tr> <td>Total</td> <td>308099</td> <td>616.20</td> </tr> </tbody> </table>	Year of plantation	Cost (in Rs.)	Cost per plant	1 st year	203235	406.47	2 nd year	60151.00	120.30	3 rd year	39713.00	79.43	4 th year	5000.00	10.00	Total	308099	616.20	
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4 th year	5000.00	10.00																					
Total	308099	616.20																					

Further, the District Development & Panchayat Officer, Panipat has informed that 34 Acres land is available at Village Assan Kalan for the purpose of tree plantation.

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5.1.2. Restoration Plan w.r.t. damage caused to Public Health

As per report of the CSIR-NEERI, the damage caused to the public health by Panipat refinery is on account of various respiratory diseases. The main reason identified from various reports of the joint committee submitted earlier in NGT are:

- Illegal and unregulated discharge of industrial effluent into the open thirana drain (Now IOCL has obtained permission from Irrigation Department and HSPCB to discharge 255 m³/hr treated effluent in the thirana drain)
- Open potential sources of VOCs emissions in effluent treatment plant, without recovery of VOCs.
- Open storage of untreated industrial effluent in various lagoons/tanks, which are not components of ETP, leading to odour in nearby areas.
- No segregation of waste water drains from storm water drains, to prevent cross contamination of storm water.
- No effluent treatment plant (ETP) installed by IOCL for storm water contaminated with industrial waste water.
- Discharge of waste water in the drains in the name of storm water, without any consent to operate from State Pollution Control Board.

Any one or more factor from the above list may attribute to volatile air emissions and odour in nearby villages, leading to various respiratory diseases. The joint committee also considered the fact that the thirana drain carrying the industrial effluent of the refinery does not have any dilution till it combines with Drain No 2, ultimately leading to river Yamuna. Besides being an open drain and that too without any dilution, the VOC emissions during discharge may affect the nearby villages. Being an open drain and easily accessible, may lead to consumption of industrial waste water by the domestic animals of the nearby villages. Further, the refinery has been found to be discharging storm water contaminated with untreated industrial waste water in the drain No. 2, thus again posing the risk of release of VOC emissions from the untreated water, besides affecting the quality of surface water.

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The proposal to discharge the treated effluent through closed system, as received from Executive Engineer, Irrigation and Water Resource department is as follow:

S. No.	Action Point	Responsibility	Target date	Comments received w.r.t Estimation and Validation by the concerned agency
1.	To implement closed discharge system with provision of air venting, for discharge of permitted quantity of industrial effluent, in the thirana drain, upto the point where it merges into the Drain No2.	HSPCB in consultation with irrigation Deptt. for designing and preparing estimate. Implementation by Panipat refinery from the Compensation already deposited by Panipat refinery	31/01/2021	<p>Executive Engineer , Irrigation and Water Resource Department , Panipat has submitted the Cost estimates for implementation of closed discharge system for discharge of permitted quantity of industrial effluent, in the thirana drain, upto the Try drain no.1 on dated 22.12.2020, attached as Annexure- 2 in response to the HSPCB Letter no. 4743-4747 dated 28.10.2020, reminder letter no 4830-4835 dated 05.11.2020, letter no. 4943-4948 dated 16.11.2020, letter no. 4960-4965 dated 20.11.2020, Letter no. 7014-7019 dated 08.12.2020, Letter no. 8353-8355 dated 22.12.2020 , which is as below:</p> <p>The IOCL Panipat Refinery is discharging treated effluent of PX-PTA in to Thirana Drain (Capacity 61.5 Cusecs) at RD 0 i.e. origin point of Thirana Drain and then after flowing the distance of 30800 ft through the field area of villages Bal Jattan & Thirana etc., the effluent merge into the Try Drain No.1 (Capacity 318 Cusecs) at RD 51100/L which further merge in Nai Nallah Drain after flowing the distance of 51100 ft. through the field area of villages Bhalsi, Vaisser, Bhandari and other etc.</p> <p>It is further mentioned here that the Nohra Drain originate from village Nohra and after flowing the village of Shodapur, Jattal, Shondapur, Binjhol & Dahar merge into Try Drain No.4 which flows through the village Naultha, Balana, Mandi, Palri, Chamrara, Gawalra and Pugthala and merge into Distributary Drain No.8. Hence the Thirana Drain and Nohra Drain are pole apart and the country slope does not allowed to discharge the Thirana Drain i.e. PNCP treated waste into Nohra Drain.</p> <p>However, keeping in view the VOC emissions generated from the effluent of PX-PTA Plant, Panipat, project of laying of pipeline (for 50 Cusecs discharge) of 900mm dia NP-3 pipe along & on the bank of Thirana Drain upto Try. Drain No.1 and side lining of Thirana Drain from RD 0 to 30800 (Typical X-Section & line diagram are enclosed herewith) and Try. Drain No.1 from RD 51100 to 48635 i.e. upto Panipat-Assandh Road including other preliminary and auxiliaries works are prepared. The side lining, pipelines and other works are proposed as per specifications of Irrigation & WR Department. All the provisions i.e. <u>Contingency@0.50%</u>, <u>Quality Control@1%</u>, <u>Tender Premium@20%</u> & <u>Departmental Charge@10%</u> have also been incorporated in the Rough Cost Project estimate.</p> <p>Keeping in view the above facts, the total cost of the project is worked out to the tune of Rs.16.62 Crore (Copy enclosed) and the</p>

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			same is submitted to the Joint Committee of CPCB, HSPCB and Distt. Administration, Panipat through your good office for seen, consent and providing funds of Rs.16.62 Crore so that the detail estimate may be prepared and approved from the Competent Authority of I&WRD to execute the work at site.
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The joint committee proposed to implement the following mechanism to monitor quality of effluent discharged by IOCL for ETP and also for Storm water pond to take timely corrective action:

S. No.	Action Point	Responsibility	Target date	Estimation and Validation by the concerned agency
1.	Installation of Online Continuous Emission Monitoring System (OCEMS) in Thirana Drain with connectivity to HSPCB	HSPCB	.30.06.2021	Installation of installation of Online Continuous Emission Monitoring System (OCEMS) in Thirana Drain with connectivity to HSPCB will be done by IOCL.
2.	Installation of Online Continuous Emission Monitoring System (OCEMS) in the drain used by Panipat refinery for discharge of Storm water, with connectivity to HSPCB	HSPCB	30.06.2021	Installation of Online Continuous Emission Monitoring System (OCEMS) for VOCs in the drain used by Panipat refinery for discharge of Storm water, with connectivity to HSPCB will be done by IOCL.

The proposal submitted by CMO to address the issue of public health is as follows :

S. No.	Action Point	Responsibility	Target date	Estimation and Validation by the concerned agency
1.	Provision of Mobile Dispensary/Medical vans dedicated to First Aid and specifically Respiratory diseases related to Air Pollution w.r.t VOC emissions from refineries.	Details of the facilities required and estimates for operating and maintaining the facilities for the next 10 years: CMO, Panipat	25/11/2020	CMO Panipat has submitted the cost estimation and requirement of Medical vans dedicated to First Aid and specifically Respiratory diseases related to Air Pollution w.r.t VOC emissions from refineries. dated 29.12.2020, attached as Annexure- 3 , in response to the HSPCB Letter no. 4743-4747 dated 28.10.2020, reminder letter no 4830-4835 dated 05.11.2020, letter no. 4943-4948 dated 16.11.2020, letter no. 4960-4965 dated 20.11.2020, Letter no. 7014-7019 dated 08.12.2020, Letter no. 8353-8355 dated 22.12.2020 , which is as below:- Details of the facilities required and estimates for operating and

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Implementation: District Administration through	maintaining the facilities for the next 10 years are as below:																												
		Particulars	Rate	TDS	Total amount																								
	A	TATA Motors... Metro Motors Pvt. Ltd., 76/1, Mile Stone, G.T. Road, Bye Pass, Karnal 132001																											
	i	Tata Model Winger Ambulance Shell BS-6	1475000.00		1475000.00																								
	ii	Tata Model Winger Ambulance Shell BS-6 whole ambulance OEM fitted AC	2050000.00		2050000.00																								
	B	FORCE Motors... Keshav Auto Mobiles 119/6, Mile Stone, G.T. Road, Bye Pass, Karnal 132001																											
	i	Traveller T1 AMB3350FM2.6BSVI 9+D+P PS ABS AIS 125 B	1525897.00	11444.00 (0.75%)	1537341.00																								
	ii	Traveller TI AMB3350FM2.6CR BSVI (10+P) AC PS ABS AIS 125 TYPE 'D	2444869.00	18337.00 (0.75%)	2463206.00																								
	C	Essential Medical Equipments... M/s MGM Associates, # 209, Ansals Majestic Tower, G-Block, Vikash Puri, New Delhi-110018																											
	i	Ventilator-Meduvent	1600000.00	+Tax																									
	ii	Defibrillator-R-700																											
	iii	Monitor-Edan																											
	iv	Sucation-Accuvac Lite																											
	v	Emergency Kit																											
	vi	Extraction Kit																											
	<table border="1"> <thead> <tr> <th colspan="3">Medical equipments for first aid emergency management of respiratory diseases</th> </tr> <tr> <th>Sr. No.</th> <th>Name of Instruments & Equipments</th> <th>Amount in Rs.</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Pulse Oximeter</td> <td>3000</td> </tr> <tr> <td>2</td> <td>Computerised Spiro meter</td> <td>50000</td> </tr> <tr> <td>3</td> <td>Mini-Peak flow meter</td> <td>2000</td> </tr> <tr> <td>4</td> <td>Portable Chest X-ray</td> <td>400000</td> </tr> <tr> <td>5</td> <td>Bag & valve with silicon mask</td> <td>1600</td> </tr> <tr> <td>6</td> <td>Equipment for Endotracheal intubation</td> <td>2500</td> </tr> </tbody> </table>					Medical equipments for first aid emergency management of respiratory diseases			Sr. No.	Name of Instruments & Equipments	Amount in Rs.	1	Pulse Oximeter	3000	2	Computerised Spiro meter	50000	3	Mini-Peak flow meter	2000	4	Portable Chest X-ray	400000	5	Bag & valve with silicon mask	1600	6	Equipment for Endotracheal intubation	2500
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4	Portable Chest X-ray	400000																											
5	Bag & valve with silicon mask	1600																											
6	Equipment for Endotracheal intubation	2500																											

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				7	Portable Suction Unit	6000
				8	Nebulizer Device	2500
				9	High Flow Nasal Cannula (HF NC) Device with Accessories	300000
				10	Transport Ventilator with Accessories	400000
				11	Oxygen Source with Sufficient Supply to operate the ventilator/HF NC for the desired duration	1500000
				12	5-Oxygen cylinders	70000
					Total	27,37,600
2.	Quarterly Medical Check up of inhabitants of nearby Villages, as preventive and monitoring measure.	District administration through CMO/Red Cross, Panipat	25.11.2020	NA		

3.1.3. Restoration Plan w.r.t. Ground Water Quality

In view of the fact that Panipat Refinery has been directed by Hon'ble NGT, to implement various remedial measures as recommended by the earlier joint committees comprising of CPCB, NEERI, DC Panipat and CGWB in this matter, including lining of the all earthen lagoons inside the premises, segregation of storm water and waste water streams, implementation of Zero Liquid Discharge. Implementation of all these measures will have a direct impact on ground water quality and leaching of geogenic parameters. Ground water remediation exercise, ill be more effective, if implemented after execution of the above measures is completed by the refinery followed by monitoring of the impact for an adequate period and frequency, for deciding the level of remediation required. However, implementation of short term restoration plan is important, to ensure that availability of potable and safe drinking water, to inhabitants of the nearby villages.

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The joint committee constituted earlier had recommended that IOCL may be directed to provide safe drinking water to nearby villages affected by Drinking Water quality issues till the restoration of the ground water quality. Further, it was also informed by IOCL that District Administration, Panipat has been requested by IOCL, to provide a proposal with estimate of cost incurred for providing safe drinking water to nearby affected villages. In view of the above, the joint committee proposed a restoration plan(Table- 2), for ensuring the safe drinking water supply, to the inhabitants of the villages near Panipat refinery.

The conclusion drawn by CGWB with regard to the survey conducted and analysis performed (Table. 1) & recommendations made, are as follow:

“The results of chemical analysis of 20 ground water samples collected from tubewells operated by PHED, Govt of Haryana indicate that in general all the inorganic parameters are within the limit as prescribed by BIS, 2012 except at few places. The higher concentration more than prescribed limits are observed and **pH** values at Mahyudinpur (8.58), Mahamadpur (8.61) and Khora Kheri (9.87), **Fluoride** concentration at Dadlana (1.51) and Kutana (1.61 mg/l).

Further, the presence of heavy metals in ground water of tubewells around the refinery are also found within the permissible limit as prescribed by BIS, 2012 except in the case of **Iron** concentration at **Baduli (2.239 mg/l)** and **Babarpur (1.209 mg/l)** where iron concentration is more than the prescribed limit of 0.3 mg/l as BIS, 2012 and **Uranium** concentration at Asan Kalan (0.0320145 mg/l) are found more than the prescribed limit of 0.03 mg/l as per Atomic Energy Regulatory Board (AERB).

On the basis of the above, the following recommendations are proposed to minimise the health hazard to the peoples living around the Panipat Refinery:

- i. The ground water samples from the water supply tubewells located in and around the refinery should be collected and analysed regularly to ascertain the variation in chemical quality of ground water due to inorganic and heavy metals.

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- ii. The existing tubewells identified for showing high level of pH, Fluoride, Iron and Uranium should not be used for human consumption. PHED should make alternate arrangement for water supply to these areas.
- iii. Public awareness programme should be arranged to make the people and industry aware about the consequences/menace of ground water contamination”.

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Table 1: Hydrogeological data of sampling points around Panipat Refinery, Panipat

S.No.	District	Block	Location	Longitude (DMS)	Latitude (DMS)	Source	Depth (m)	Zone Tapped (m)	Zone thickness (m)
1	Panipat	Panipat	Asan Kalan	29°24'09"	76°52'29"	TW	N.A.	N.A.	N.A.
2	Panipat	Panipat	Khandra	29°26'34"	76°48'47"	TW	381	264.0-270.0	6
3	Panipat	Panipat	Mahyudinpur Thirana	29°25'07"	76°49'57"	TW	N.A.	N.A.	N.A.
4	Panipat	Panipat	Madlauda	29°24'32"	76°49'00"	TW	91	50.00-52.00 59.00-67.00 72.7-74.7 84.00-88.00	2 8 8 4
5	Panipat	Panipat	Dharangarh	29°27'36"	76°47'57"	TW	N.A.	N.A.	N.A.
6	Panipat	Panipat	Faridpur	29°26'09"	76°57'07"	TW	93	64.50-72.50 90.00-92.00	8 2
7	Panipat	Panipat	Mahmadpur	29°27'06"	76°55'06"	TW	240.30	130.0-135.0 186.5-190.5 235.3-237.3	5 4 2
8	Panipat	Panipat	Kachrauli	29°28'07"	76°56'58"	TW	N.A.	N.A.	N.A.
9	Panipat	Panipat	Razapur	29°27'29"	77°01'10"	TW	85	64.50-76.50 79.50-84.25	12 4.75
10	Panipat	Panipat	Dadlana	29°29'39"	76°53'33"	TW	N.A.	N.A.	N.A.
11	Panipat	Panipat	Begumpur	29°29'49"	76°54'33"	TW	N.A.	N.A.	N.A.
12	Panipat	Panipat	Ganjbar	29°28'20"	76°58'07"	TW	90	71.5-87.00	15.50
13	Panipat	Panipat	Badauli	29°28'04"	76°57'42"	TW	81	60.78-87.30	26.52
14	Panipat	Panipat	Babarpur	29°27'47"	76°57'10"	TW	N.A.	N.A.	N.A.
15	Panipat	Panipat	Sithana	29°27'01"	76°54'23"	TW	114	51.00-55.00 69.00-72.0 92.00-96.00 109.0-111.0	4 3 4 3
16	Panipat	Panipat	Kabri	29°25'55"	76°56'03"	TW	N.A.	N.A.	N.A.
17	Karnal	Ghraunda	Kohand	29°29'17"	76°58'09"	TW	N.A.	N.A.	N.A.
18	Karnal	Asaandh	Kutana	29°29'49"	76°52'56"	TW	N.A.	N.A.	N.A.
19	Karnal	Asaandh	Munak	29°31'42"	76°51'19"	TW	N.A.	N.A.	N.A.
20	Karnal	Ghraunda	Khora Kher	29°31'25"	76°54'26"	TW	N.A.	N.A.	N.A.

N.A.: Data not provided by PHED.

3.2. Long term Restoration Plan: The long term restoration plan may be proposed by the joint committee once various suggestions/recommendations of the Joint Committee constituted by Hon'ble NGT in this matter are implemented by IOCL and the impact on ground water is established by monitoring for an adequate period , in order to finalize the quantum of remediation required.

The Joint Committee propose action plan to provide Safe drinking water to nearby villagers as summarized in the following Table.2:

S. No.	Action Point	Responsibility	Target date
1.	Supply of safe drinking water to all the inhabitants of nearby villages of Panipat refinery and restrict the use of individual Borewells /Hand pumps extracting shallow water for drinking purpose.	<p>PHED will Mark and stop the supply of water from existing tubewells for drinking purpose which are not fit for drinking use as per details given below:</p> <p>The higher concentration more than prescribed limits are observed and pH values at Mahyudinpur (8.58), Mahamadpur (8.61) and Khora Kheri (9.87), Fluoride concentration at Dadlana (1.51) and Kutana (1.61 mg/l)</p> <p>Further, the presence of heavy metals in ground water of tubewells around the refinery are also found within the permissible limit as prescribed by BIS, 2012 except in the case of Iron concentration at Baduli (2.239 mg/l) and Babarpur (1.209 mg/l) where iron concentration is more than the prescribed limit of 0.3 mg/l as BIS, 2012 and Uranium concentration at Asan Kalan (0.0320145 mg/l) are found more than the prescribed limit of 0.03 mg/l as per Atomic Energy Regulatory Board (AERB).</p> <p>However , PHED will ensure the supply of safe drinking to all the inhabitants of nearby villages of Panipat refinery from the existing tubewells or install new tubewells if required and also restrict the use of individual Borewells /Hand pumps extracting shallow water for drinking purpose.</p> <p>PHED shall submit six monthly monitoring report of CGWB to joint committee for all the tube wells used to supply drinking water to nearby villages of Panipat refinery thereafter.</p>	30.06.2021

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The Summary of the Restoration Plan along with action points, Responsibility Matrix and Target dates, as finalized by the Joint Committee is as follows:

S. No.	Action Point	Responsibility	Target date	Remarks
1.	To implement closed discharge system with provision of air venting, for discharge of permitted quantity of industrial effluent, in the thirana drain, upto Try. Drain No.1	Irrigation & Water Resource Department	To be decided after receipt of compliance report from the another joint committee constituted for verification of the compliance status of the unit .	In view of the fact that Joint Committee has recommended the various suggestions/recommendations for collection of VOCs from the storage ponds of IOCL, it was recommended to consider the verification report of the compliance of these suggestions by IOCL, which is to be submitted by the another Joint Committee constituted in compliance of NGT order, in this matter
2.	Installation of Online Continuous Effluent Monitoring System (OCEMS) on discharge in to thirana drain in addition to the OCEMS installed inside the premises of the unit	IOCL have to install Online Continuous Effluent Monitoring System (OCEMS) on discharge in to thirana drain in addition to the OCEMS installed inside the premises of the unit	30.06.2021	
3.	Installation of Online Continuous Emission Monitoring System (OCEMS) for VOCs in the drain no. 2 used by Panipat refinery for discharge of Storm	IOCL have to install Online Continuous Emission Monitoring System (OCEMS) for VOCs in the drain no. 2 used by Panipat refinery for discharge of Storm water with connectivity to HSPCB	30.06.2021	

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	water, with connectivity to HSPCB			
4.	Provision of Mobile Dispensary/Medical vans dedicated to First Aid and specifically Respiratory diseases related to Air Pollution w.r.t VOC emissions from refineries.	CMO will arrange to get the proposal implemented at PHC Dadlana after following due procedure as prescribed by Government : 0. One Dedicated Ambulance with Oxygen support system for First Aid and specifically Respiratory diseases related to Air Pollution w.r.t VOC emissions from refineries. 1. Medical equipments for first aid emergency management and Treatment of respiratory diseases.	30.06.2021	
5.	One Time Medical Check up of all the inhabitants of nearby Villages for respiratory diseases as preventive and monitoring measure.	CMO will organise the for One Time Medical Check up of all the inhabitants of nearby Villages- Dadlana, Sithana, Kutana, Bholi, Begampur and Rairkalan for respiratory diseases as preventive and monitoring measure. And submit fortnightly report to the joint committee.	30.06.2021	
6.	Plantaion and maintenance of 243390 (6-8 feet) no of forest trees of local spices along the entire length of thirana drain and the boundaries of the villages in the vicinity of Panipat refinery in phased manner.	IOCL will plant , tag and maintain 243390 (6-8 feet) no of forest trees of local spices along the entire length of thirana drain and the boundaries of the villages in the vicinity of Panipat refinery or on the Land available in the nearest village of Refinery in phased manner and submit monthly report to DFO Panipat as well as Joint committee. DFO Panipat will verify the same and submit report to the joint committee on monthly basis.	31.12.2021	
7.	Supply of safe drinking water to all the inhabitants of nearby villages of Panipat	PHED will Mark and stop the supply of water from existing tubewells for drinking purpose which are not fit for drinking use as per details given below: The higher concentration more than prescribed limits are observed and pH values at Mahyudinpur (8.58), Mahamadpur (8.61) and Khora Kheri (9.87), Fluoride concentration at Dadlana (1.51) and Kutana (1.61	30.06.2021	

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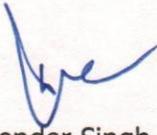
<p>refinery and restrict the use of individual Borewells /Hand pumps extracting shallow water for drinking purpose.</p>	<p>mg/l)</p> <p>Further, the presence of heavy metals in ground water of tubewells around the refinery are also found within the permissible limit as prescribed by BIS, 2012 except in the case of Iron concentration at Baduli (2.239 mg/l) and Babarpur (1.209 mg/l) where iron concentration is more than the prescribed limit of 0.3 mg/l as BIS, 2012 and Uranium concentration at Asan Kalan (0.0320145 mg/l) are found more than the prescribed limit of 0.03 mg/l as per Atomic Energy Regulatory Board (AERB).</p> <p>However , PHED will ensure the supply of safe drinking to all the inhabitants of nearby villages of Panipat refinery from the existing tubewells or install new tubewels if required and also restrict the use of individual Borewells /Hand pumps extracting shallow water for drinking purpose.</p> <p>PHED shall submit six monthly monitoring report of CGWB to joint committee for all the tube wells used to supply drinking water to nearby villages of Panipat refinery thereafter.</p>		
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The above restoration plan is to be circulated to all the agencies as per responsibility matrix, by nodal agency (HSPCB) for implementation in a time bound manner.

Since, the restoration plan is to be implemented in Distt. Panipat, it is proposed that a SOP is prepared by District Magistrate at District Level, for demand and regulation of funds, to be utilized for implementation of restoration plan.


Er. Kamaljit Singh
HSPCB , Panipat


Dr. Narender Sharma
CPCB, Delhi


Dharmender Singh , IAS,
DM, Panipat

Date: 06.01.2021

Endst. No. . 8555 - 8563

Dated: 06/01/2021

A copy of restoration plan is forwarded to the followings for information and necessary action please:

1. The District Magistrate, Panipat.
2. Member Secretary, Haryana State Pollution Control Board , Panchkula.
3. Dr. Narender Sharma , Additional Director, CPCB , New Delhi.
4. Sh. Bhupender Singh, S.E.E, HSPCB, Panchkula
5. Regional Officer , HSPCB , Panipat.
6. Chief Medical Officer, Panipat.
7. Divisional Forest Officer, Panipat.
8. Executive Engineer (Div 1 & 2), PHED, Panipat.
9. Executive Engineer, Irrigation & Water Resource Department, Panipat.

Regional Officer
Haryana State Pollution Control Board
Panipat Region, PANIPAT

06/01/21