

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
O.A. NO. 437 OF 2019

In The Matter Of:

Lakhwinder Singh

Applicant(S)

Versus

State Of Punjab

Respondent(S)

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(SUNEEL DAVE)

Scientist 'E'

Central Pollution Control Board

East Arjun Nagar

Delhi-110032

Dated: - 22.05.2020

Place: - Delhi

**INSPECTION AND MONITORING REPORT OF M/S. KRBL LIMITED,
VILLAGE - BHASOUR, TEHSIL - DHURI, DISTRICT SANGRUR,
PUNJAB**

[IN THE MATTER OF OA NO. 437 OF 2019, LAKHWINDER SINGH V/S STATE OF PUNJAB]

Background:

With reference to the above, Hon'ble NGT vide order, dated 05.02.2020 has directed as under:

“Let the CPCB and Punjab State Pollution Control Board jointly visit the site and give an independent report within two months by e-mail at judicial-ngt@gov.in. CPCB may be the nodal agency in the matter. CPCB may be at liberty to engage any other expert in this matter.

List again on 27.05.2020.”

In pursuant to the above, Central Pollution Control Board (CPCB) has engaged the services of Shri Nawal Kishore Verma, [Ex-Officer of CPCB] as Technical Expert in the matter.

The Joint Team, comprising Shri N. K. Verma, Technical Expert, Shri Harjeet Singh, Environmental Engineer, PPCB, Sangrur and Shri Suneel Dave, Regional Director, CPCB, Chandigarh has visited the industry and its vicinity during March, 18-19, 2020. Thus, the report.

The Industry:

M/s KRBL Ltd. is an integrated agro based industry engaged in production of Raw Paddy & Sella Paddy (2880 TPD), Rice Bran oil (250 TPD) and Furfural / Furfuryl Alcohol (10 TPD).

The industry has four lines of paddy milling @ 30 TPH to produce 2880 TPD paddy. Out of these, three lines are engaged for **raw** paddy (2160 TPD) and only one line is used for **sella** paddy (720 TPD). The brief description of production processes is as follows.

Rice Mills: Dry paddy is de-husked/milled to separate "Rice Husk" and "Brown Rice". Rice husk is sent to "Furfural Plant" and Cogen Power Plant. "Brown Rice" is polished to separate "Rice Bran" and "White Rice". "Rice Bran" is sent to solvent extraction plant to produce "Rice Bran Oil"

Parboiling Plant: Sella Paddy: Sella Paddy is produced from parboiling plant, where hydro-thermal process involved besides washing and soaking of paddy. In this process raw cleaned paddy is steamed then soaked in water for about 8 hours. After soaking, water is drained as wastewater and wet paddy is subjected to air dryers to reduce its moisture about 11 - 12% before sent for milling.

Solvent Extraction Plant: Rice Bran Oil: Rice bran is palletized and conveyed to extractor. During the movement of the material through

extractor, it is washed continuously with solvent through spray nozzles kept in line over the material bed. The final miscella from last hopper, which is concentrated, is taken off for distillation. After fresh solvent wash, the de-oiled bran is discharged into air tight conveyor, which conveys it into de-solventiser where it is dried under vacuum. After de-solventisation, the de-oiled bran goes for packing.

The final miscella (a solution of rice bran oil and solvent) from extractor is collected in a tank from where it is pumped into the distillation column where solvent is vaporized under vacuum and condensed which is re-cycled for extraction purpose.

The rice bran oil containing some residual solvent is fed into an evaporator operating under vacuum where the solvent is vaporized and recovered /recycled. **Rice bran oil** free from solvent is transferred to storage tanks for sale.

Furfural / Furfuryl Alcohol Plant: Rice husk is acidified with sulfuric acid. Pentosanes in the cellulose of rice husk are first converted into pentose and then to furfural. Steam is passed through rice husk to vaporize the furfural. Steam/furfural vapors are condensed/cooled and collected as furfural water. Residual rice husk is sent to power plant boilers for generation of steam.

Furfural water is fed into a column where zeotropic distillation is carried out using steam as heating medium. The overhead vapors of stripping column

are condensed/cooled and collected in a decanter. Furfural rich layer settles down and is separated as raw furfural (85% furfural). Aqueous layer containing about 10% furfural is decanted and passed through a purification column where low boiling impurities are separated. Purified aqueous layer containing about 10% furfural is recycled to the stripping column.

Raw furfural is further distilled under vacuum to produce pure furfural. Pure furfural thus produced is either sold as **Furfural** or is hydrogenated to produce **Furfuryl Alcohol**.

Besides, the industry has Cogeneration Power Plant 10.5 MW (steam generation capacity with two boilers of 35 TPH each and one boiler of 14 TPH) and a Demineralization Plant (making raw water fit for industrial utility) and also generate wastewater contributing inorganic load to effluent.

The wastewater generation in the above production is as follows:

Rice Mills	Nil
Parboiling Plant	600 KLD
Solvent Extraction Plant	30 KLD
Furfuryl Alcohol Plant	450 KLD
Cogeneration Power Plant & Demineralization Power Plant	320 KLD
Total (approx.)	1400

- 1 The industry has obtained consents (date of issue 31.03.2016) from Punjab Pollution Control Board (PPCB) to operate under the Water Act, 1974 and under the Air Act, 1981 for discharge of effluent and emission, respectively and both consents are valid up to 31.03.2021. The effluent and emission discharges are required to conform the Standards as notified by MoEF&CC/CPCB/PPCB.

- 2 The consent issued by PPCB under the Water Act, 1974 stipulates that effluent generated during the industrial production shall not be more than 1349 KLD and be treated before disposal on land for plantation using Karnal Technology. Further, the pollution control devices shall be interlocked with manufacturing/production process. Beside other conditions, it further stipulates:
 - (a) The industry shall provide electromagnetic flow meters at the source of water supply, at inlet/outlet of effluent treatment plant within one month and shall maintain the record of the daily reading and submit the same to the concerned Regional Office (of PPCB) by the 5th of the following month.

 - (b) The industry shall ensure that no water pollution problem is created in the area due to discharge of effluents from its industrial premises.

- (c) The industry shall submit a detailed plan showing therein the distribution system for conveying waste-water for application on land for irrigation along with the crop pattern for the year.
- 3. Similarly, the consent issued by PPCB under the Air Act, 1981 also stipulates:
 - (a) The industry shall ensure that no air pollution problem or public nuisance is created in the area due to the discharge of emission from the industry.
 - (b) The industry shall earmark a land within their premises for disposal of boiler ash in an environmentally sound manner, and /or make necessary arrangements for disposal of fuel ash in a scientific manner and shall maintain proper record for the same, if applicable.
- 4. The raw water requirement is met by abstracting it from ground to the tune of 2800 KLD using four tube wells. However, permission or no objection certificate to the effect of withdrawing has not been obtained from Central Ground Water Authority. The status, of application dated 25.10.2018 seeking permission of withdrawing ground water is as "referred back" as available on Central Ground Water Authority portal.

- 2 Effluent having high BOD, COD and TDS with low pH generated from production process i.e., Par-boiling Section, Furfural Section and Rice bran oil Section is received in Raw Water Sump subject to treatment by anaerobic digestion in the Anaerobic Hybrid Reactor (AHR). Effluent then flows to Equalization Tanks (two nos.). Thereafter, it is treated in two-stage aerobic biological treatment system followed by filter media system. Effluent so treated leads to Clear Water Tank., which also directly receives effluents (blow down) from Cooling Towers and reject from D. M. Plant having high TDS. The analysis data of samples is shown in **Table 1**.
- 3 It reveals from the above Table that the BOD of 4950 mg/l in raw effluent is brought down to 1270 mg/l by anaerobic treatment system. The corresponding COD reduction is from 7664 mg/l to 3904 mg/l. The initial low pH of 3.82 reached near neutral (pH 6.96) after anaerobic treatment. Here, Total Suspended Solids (TSS) increased from 234 mg/l to 5080 mg/l.
- 4 The Table further reveals that BOD is brought down to 355 mg/l and COD to 737 mg/l. This indicates that the aerobic biological system is not functioning to desired efficiency. Moreover, it was noticed that the flow in the 2nd stage aerobic treatment system was reduced substantially compared to first stage aerobic treatment. It means part of efficiency is getting by-passed and not reaching the final outlet.

Efforts were made to identify piping route but in absence of Piping and Instrumentation (P&I) diagram, by-pass line could not be found. It was also noted that at places, pipe connections were leading underground.

- 5 The effluent after anaerobic treatment goes to Equalization Tanks where industry is practicing recycling of bio-sludge from aerobic treatment system. It means equalization tanks are being used to function as aerobic treatment unit. Effluent then goes to first stage aerobic treatment system (two number aeration tanks followed by a clarifier). This is followed by second stage aerobic system (aeration tank containing plastic media followed by a separate clarifier) called SAFF reactor.
- 6 The treated effluent from aerobic system goes to filter media system, leading to Clear Water Tank. The BOD of this effluent is 39 mg/l and COD 89 mg/l. This reduction in BOD and COD is due to mixing of effluents pumped directly from Cooling Towers blow down and D.M. Plant rejects having BOD of 2 mg/l and COD of 10 mg/l with high TDS of 1500 mg/l.
- 7 The treated process effluent in ETP having BOD level of 355 mg/l and COD level of 737 mg/l when mixed with pumped effluent of Cooling Towers and D.M. rejects having BOD of 2 mg/l and COD of 10 mg/l brought down the final discharge at BOD level of 39 mg/l and COD of

89 mg/l. It means Cooling Tower blow down and D.M. reject effluents have diluted BOD and COD several times, which appears to be an attempt to achieve compliance of standards. There are no flow meters installed for these categories of effluents separately to know effluent quantity (totalizer) and instant flow (kl/hr.).

- 8 The treated trade effluent is disposed on land, as per the condition stipulated in the consent issued under the Water Act, 1974 adapting *Karnal Technology*. Eucalyptus plantation, in an area measuring about 30 acres is subject to 1440 KLD effluent utilization. No detailed scheme for treated effluent utilization seems to have been designed considering the land size, soil characteristics, effluent quality & quantity, annual weather and eva-transpiration rate. This has resulted in water (effluent) stagnation or over dosing and underutilization of land as well.
9. Further, in absence of properly designed pipe network, the effluent utilization on land remains far from satisfactory as no monitoring system could be in place. The ground water samples analysis (**Table:2**) is indicating presence of organic compounds in the tube wells of Mr. Jagtar Singh. Although out of eight ground water samples drawn from seven tube wells and one piezometer well, only three tube wells water exhibited traces of Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). This suggests that impact on ground water quality is emerging due to effluent disposal on land.

10 Ground Water samples (*Plate 1*) were taken from the tube well of the industry, which draws water for their use and from the tube wells of the farmers in the vicinity of industry premises (near land application) and also at longer distances, including one near petrol pump which is a farthest point from industry premises. The analysis of ground water samples is given in Table 2. The sample of tube well of industry has shown TDS of 495 mg/l and does not have any BOD and COD. Thus, it is fit for drinking purpose as TDS is below desired standards of less than 500 mg/l.

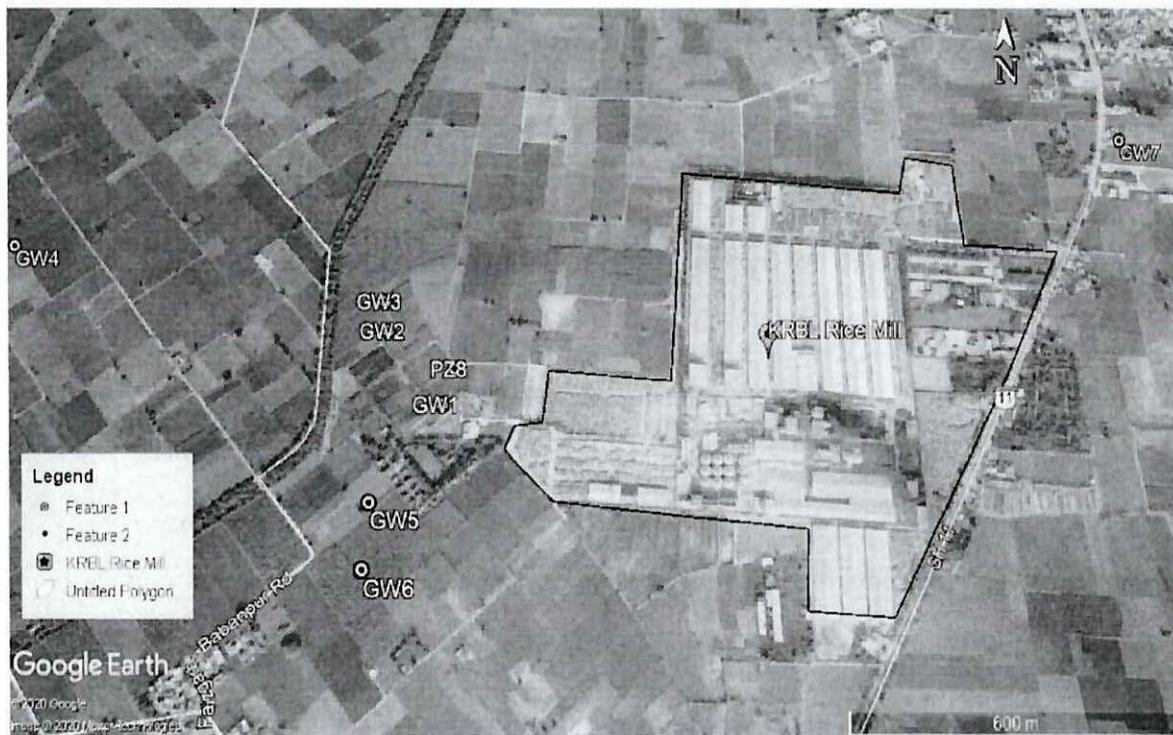


PLATE 1: GROUND WATER SAMPLING LOCATION IN VICINITY OF M/S KRBL LIMITED, SANGRUR, PUNJAB

11 This may also be referred the Central Ground Water Board report (2013) which finds mentioned of depleting water resources in the

district of Sangrur, Punjab. The report finds that groundwater is over exploited and depleting at 0.65 meter per annum (averaging over 10 years) in the region.

- 12 The analytical results of ground water samples, drawn from tube well installed at KRBL residential colony (being used for regular drinking water supply) and piezometer well installed at plantation area, (being used for disposal of effluent) are indicating concentration of Nitrate (as Nitrogen) of 0.5 mg/l to 3.5 mg/l respectively. The maximum Nitrate (as Nitrogen) concentration of 4.9 mg/l in ground water found at tube well of Mr. Jagtar Singh (near land application). The variation (BDL to 4.9 mg/l and averaging of 1.9 mg/l) in Nitrate concentration across ground water is estimated to be large given the geo distances among the tube wells and, also no other discharge in vicinity.
- 13 The analytical results of all seven ground water (tube wells) samples do not exhibit any linear relation between total alkalinity and total hardness. Three ground water samples found with total alkalinity higher than total hardness showing natural ground water formation but remaining four ground water samples have recorded concentration of total hardness higher than total alkalinity indicating Calcium and Magnesium carbonates formation and transportation of the same in ground water, probably due to effluent disposal on land. The Calcium (112 mg/l) and Magnesium (121 mg/l) in ground water

sample, drawn from tube well of Mr. Jagrail Singh are suggesting the same.

14. The water quality of tube wells of Mr. Jagar Singh and Mr. Jagtar Singh near the industry premises, have shown presence of BOD and /or COD, which indicate organic contamination and high level of TDS ranging between 804 mg/l and 844 mg/l, which is much above the desired standards of TDS. Other tube wells, which are at farther distance, owned by Mr. Maggher Singh, Mr. Amar Singh and near Petrol Pump do not contain BOD and COD and having TDS around 500 mg/l or less, thus fit for drinking purpose.
- 15 Further, concentration of Total Dissolved Solids (TDS) in ground water samples of tube wells of Mr. Jagtar Singh and Mr. Jagrail Singh found 604 mg/l to 1114 mg/l respectively and considerably higher than adjoining tube well samples where concentration of TDS lies below 500 mg/l. Although, the concentration of TDS in ground water found to be within the normal range of natural course yet impact of unscientific effluent disposal on land, resulted in percolation reaching ground water aquifer, could not be ruled out.

Recommendation:

- 1 The industry is required to operate and maintain its effluent treatment plant (ETP) scientifically by engaging skilled personnel and should follow standard operating practice/procedure as per the plant design. The ETP performance is a direct function of qualitative maintenance of each and every unit operation and much demanding in this case as the treated effluent is disposed on land.
- 2 A detailed scheme for treated effluent disposal on land is required to be developed and placed for effective utilization and its monitoring. A system with piped network with electromagnetic flow metering would be mandated to ensure effective utilization of treated effluent.
- 3 The industry is to obtain permission (or no objection certificate) from Central Ground Water Authority for abstracting 2880 KLD ground water. As the industry has not received the required permission from CGWA, therefore the industry is to explore possibility of drawing water from Babanpur canal flowing at a distance about 1.2 km. The canal is part of Hydro Electric Project (2x500 MW), owned and operated by Government of Punjab.
- 4 An Environmental Audit of the industry needs to be undertaken with an aim to suggest the minimal raw water requirement for the set of technology adapted in *production process vis-à-vis effluent treatment* and

would let also determine the efficacy and adequacy of effluent treatment and its disposal. The study may be got executed by an institution having expertise in the relevant field to evaluate water and chemical mass balance in the processes.

- 5 The Central Ground Water Board report (2013) mentioned that Sangrur district/region is situated in Ghaggar River Sub-basin and with Sirhind Canal as major physiographic unit. It also finds that hydro-geologically major water bearing formation is *sand* (loamy sand and sandy loam) as sub soil aquifer beneath which a confined to semiconfined aquifer lies. It, therefore demands the need of dismantling piezometer well (tubing depth more than 40 meters), located within planation area and becoming a possible source of ground water contamination reaching deep into aquifer. The industry has to provide, in lieu a minimum of *three* piezometer wells forming an appropriate triangle encircling planation area used for disposal of treated effluent. The location and depth of these piezometer wells be decided in consultation with both Central Ground Water Board (CGWB) and Punjab Pollution Control Board (PPCB).

- 6 *The stage of ground water development for the district is 264%. That means the net annual withdrawal is more than the net annual recharge, finds the report of Central Ground Water Board.* It becomes, therefore vital for the region that sub soil or shallow aquifer does not get affected due to disposal of treated effluent on land. Hence, it is

recommended that the industry should undertake regular monitoring of ground water in its vicinity through designing and establishing a network of tube wells, in consultation with CGWB and PPCB. The monitoring data so generated shall be regularly submitted to PPCB for data examination and analyzing to ascertain that ground water quality is not deteriorating further because of effluent disposal on land. The long term (time series) ground water monitoring data are essential for evaluating quality trend and for surveillance to take measures for preventing ground water from being deteriorated.

- 7 To prevent any chances of the ground water contamination due to industrial discharge and application of effluent containing residual BOD and COD with high TDS on land, it is necessary that industry should achieve zero liquid discharge. Therefore, industry should install ZLD system (R.O. and MEE) for both treated effluents from ETP as well as high TDS containing effluent discharged from Cooling Towers and rejects released from D.M. Plant.
- 8 As the aerobic system of ETP of industry is not adequately designed and not properly operated, the industry should engage a competent agency dealing in wastewater treatment, for improvement needed in ETP as well as to enable industry to follow Standard Operating Procedure. All effluent pipelines should be placed above ground and where it is not feasible, the same should be laid in an impervious channel to check leakage and seepage to the ground water.



- 9 The Electromagnetic Flow Meters are required to be installed for water consumption in each section of production process and utilities (steam generation, cooling towers and for chemical solution preparation) as well as to measure cooling water blow down and reject from D.M. Plant. The effluent should also be monitored stream wise and at inlet & outlet of ETP. The flow meter at pipeline should show total quantity in given time (cum) and instant flow (cum/hr). Such reading should be recorded periodically each day, to measure intermittent as well as continuous flow.

- 10 The scheme for improvement needed in ETP as well as to achieve Zero Liquid Discharge (ZLD) by incorporating Reverse Osmosis (R.O.) and Multiple Effect Evaporator (MEE), should be submitted by the Industry to Punjab State Pollution Control Board and Central Pollution Control Board.

- 11 As the industry uses Sulphuric Acid (hazardous chemical) in the production of Furfuryl alcohol, the same is required to be included in the raw material mentioned in the Consents issued by Punjab Pollution Control Board. The industry is also required to take all necessary measures in handling hazardous substances such as Sulphuric Acid, Hydrochloric Acid, Hexan and etc. in accordance to "The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 and as amended".

12. PPCB is to ensure installation of electromagnetic flow meters in the identified production processes and interlocking of production process with pollution control system in accordance to the condition stipulated in the consents.

N. K. Verma
Technical Expert
CPCB

Harjit Singh
Environmental Engineer
PPCB


Suneel Dave
Regional Director
CPCB

Table- 1(A): Effluent Sampling Analytical Results: M/s KRBL Ltd., Sangrur, Punjab (Date of Sampling: 18/03/2020)

Serial No.	Sample Code	Effluent Identification	pH	COD (mg/l)	BOD (mg/l)	TSS (mg/l)	TDS (mg/l)	FDS (mg/l)	Cl (mg/l)	Colour unit	SO ₄ (mg/l)	NO ₃ -N (mg/l)	PO ₄ -P (mg/l)
1	E7	Raw Water (effluent) Sump	3.82	7664	4950	234	996	748	210	46	40.8	13.42	7.21
2	E5	Clarifier outlet leading to equalization tank	6.96	3904	1270	5020	1684	1384	264	133	47.6	14.78	17.3
3	E4	Secondary clarifier-2 outlet leading to clear water tank	7.77	737	355	85	1340	1284	184	266	9.51	14.67	4.96
4	E1	Cooling water blow down + demineralization rejects reaching clear water tank	8.34	10	2	BDL (<10)	1500	1368	611	21	31.7	2.31	0.37
5	E2	Final discharge after filter media system leading clear water tank	7.72	98	34	36	1824	1736	728	43	51.2	2.35	0.76
6	E3	Final discharge leading plantation area	7.71	89	39	36	1872	1792	650	103	30.9	6.31	0.77
7	E8	Discharge at plantation area	7.8	122	48	53	1832	1716	699	55	32.3	11.06	2.18
8	E6	Recycled sludge from primary clarifier	6.92	4324	1345	4304	1640	1324	219	111	8.9	39.5	16.48

Table-1(B): Effluent Sampling Analytical Results: M/s KRBL Ltd., Sangrur, Punjab (Date of Sampling: 19/03/2020)

Serial No.	Sample Code	Effluent Identification	pH	COD (mg/l)	BOD (mg/l)	TSS (mg/l)	TDS (mg/l)	FDS (mg/l)	Cl (mg/l)	Colour unit	SO ₄ (mg/l)	NO ₃ -N (mg/l)	PO ₄ -P (mg/l)
1	E9	Rice bran extraction section (condensate water of distillation)	7.78	890	326	544	944	880	31	46	39.5	5.57	0.61
2	E10	Furfuryl section	11.62	15660	8620	959	14592	8920	5823	1198	**	2.33	**
3	E12	Parboiled section	7.68	74	24	83	376	284	16	BDL	19.1	2.23	0.18
4	E13	Cooling tower section	8.85	18	3.0	12	716	631	25	13	41.9	5.41	0.18
5	E14	Deminerlization Plant	7.68	13	2.0	13	1192	1076	74	BDL	21.7	5.88	0.05
6	E15	Inlet to sump water tank	4.84	4656	2015	450	2216	1432	155	189	43.3	**	9.97
7	E16	Secondary clarifier- 1	7.36	617	237	106	1576	832	155	192	**	**	14.42
8	E17	Secondary Clarifier-2	7.73	489	184	84	1840	520	184	192	**	**	8.09
9	E18	Clear water tank	8.31	26	5	24	1480	1168	544	17	38.4	0.72	0.38
10	E19	Final discharge after filter media	7.96	130	24	49	2552	1880	932	52	41.8	2.48	1.44
11	E11	Stagnant / flooded water in plantation area	8.01	90	28	30	1968	1840	155	36	31.4	6.42	1.27

** Not analyzed due to colour interference



Table-2: Analytical Results of Ground Water Samples in vicinity of M/s. KRBL Ltd., Sangrur, Punjab

Sampling Code	Groundwater sampling location	pH	COD	BOD	TDS	Total Hardness as CaCO ₃	Calcium as Ca	Magnesium as Mg	Total Alkalinity as CaCO ₃	Chloride	NO ₃ -N	PO ₄ -P	Sodium	Potassium
GW1	KRBL Residential colony borewell	8.1	BDL	BDL	498	492	158	23	456	85	3.5	BDL	61	8
GW2	Jagtar Singh borewell	8.3	28	1.4	812	424	106	38	517	238	0.9	BDL	131	39
GW3 (I)	Jagtar Singh borewell (stagnant water in tanks)	8.2	16	1.1	804	604	174	40	493	249	6.1	BDL	108	10
GW3 (II)	Jagtar Singh Borewell (borewell running water)	8.3	35	2.1	884	608	178	39	476	265	4.9	BDL	100	9
GW4	Jagrati Singh borewell	8.3	9	BDL	1114	784	112	121	667	396	4.7	BDL	148	10
GW5	Maghar Singh borewell	8.5	BDL	BDL	506	508	149	33	573	29	1.0	BDL	58	8
GW6	Amar Singh borewell	8.4	BDL	BDL	428	516	115	55	649	15	BDL	BDL	45	9
GW7	GW/HP petrol pump borewell	8.4	BDL	BDL	264	288	62	32	293	14	BDL	BDL	45	5
PZ8	GW/Piezometer well	8.3	BDL	BDL	304	180	32	24	302	7	0.5	BDL	60	4

All concentrations expressed in mg/l except pH.

5/22/2020

Gmail - NGT OA No. 437 / 2019 in the matter of Lakhvinder Singh vs State of Punjab

ANNEXURE - C



Suneel Dave <sdave.cpcb@gmail.com>

NGT OA No. 437 / 2019 in the matter of Lakhvinder Singh vs State of Punjab

N K Verma <nawalkishor.verma11@gmail.com>
To: Suneel Dave <sdave.cpcb@gmail.com>

Thu, May 21, 2020 at 7:26 PM

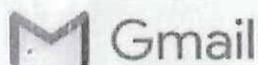
Dear Shri Dave Ji,

I provide my concurrence to the final report. I am also attaching Table 1 in two parts- Table 1(A) and Table 1(B) in sequence of effluent flow for the samples taken on 18th and 19th March, 2020, respectively.

With regards
N.K. Verma
[Quoted text hidden]

NK Verma
22/05/2020

 **KRBL Table1.docx**
28K



Suneel Dave <sdave.cpcb@gmail.com>

Draft Report to be file before in NGT in O.A no. 437 of 2019 in the matter of Lakhwinder Singh V/s State of Punjab.

1 message

ppcb Zop <ppcbzop2@ymail.com>

Fri, May 22, 2020 at 12:18 PM

Reply-To: ppcb Zop <ppcbzop2@ymail.com>

To: Suneel Dave <sdave.cpcb@gmail.com>

Cc: Msppcb <msppcb@gmail.com>, Chairman PPCB <chairmanppcb@yahoo.co.in>, Environmental Engineer <eerosangrur@gmail.com>

Respected Sir,

The draft report sent by you has been got approved from Competent Authority of PPCB and the approved draft report is attached herewith for your kind perusal and further necessary action, please.

Regards

Senior Environmental Engineer,
Zonal Office-II, Punjab Pollution Control Board, Patiala
0175-2306222

 improved KRBL report 22.05.2020.docx
1048K

K. Dave
22/05/20

Item No. 04

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Original Application No. 437/2019

(With report dated 30.01.2020)

Lakhwinder Singh

Applicant(s)

Versus

State of Punjab

Respondent(s)

Date of hearing: 05.02.2020

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE S.P WANGDI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER
HON'BLE MR. SIDDHANTA DAS, EXPERT MEMBER

ORDER

1. A report was sought from the Punjab State PCB with reference to the allegation of illegal injecting of effluents by way of a borewell into the land by M/s K.R.B.L. Ltd., Bhasaur, Tehsil Dhuri, District Sangrur, Punjab, adversely affecting the environment.
2. The matter was again considered on 23.10.2019 in the light of report dated 12.09.2019 filed by the State PCB as follows:

“ The report filed on 12.09.2019 shows that water samples had contamination. The State PCB has sought report from the Department of Soil Science which is awaited for further action.

In view of the above, let the State PCB furnish further action taken report before the next date.”

3. Accordingly, further report has been filed on 19.01.2020 that an expert opinion was sought and fresh samples were taken. The report furnished by the State PCB is as follows:

"In this regard, a meeting was fixed on 19.9.2019 in the office of Worthy Chairman of the Board, Patiala with Environmental Engineer, Regional Office, Sangrur, industry namely M/s KRBL Ltd., to discuss the further line of action in the matter. It was also decided to call Sh. Kirpal Singh, Dhuri, (Mobile no. 7889092942) and Sh. Harbans Singh Ladda (Mobile no. 9779897660), representative of BKU in the said meeting.

Accordingly, a meeting was held by the Worthy Chairman of the Board on 19/09/2019, with the complainants of different villages (Representative of BKU), existing in the vicinity of the industry namely M/S KRBL Ltd., Village Bhasaur, Tehsil Dhuri. It was decided as under: -

- 1. Dewatering from the tubewell under compliant be carried out for one week. The tubewell will be operated continuously with a break of half hour after every 4 hours.*
- 2. The sampling will be carried out during operations of tubewell for all the seven days as per time schedule below:*
 - i) First sample at Zero hour i.e. immediately after start of tubewell on the first day.*
 - ii) After every 4 hours of operation i.e. immediately before stopping for half hour break, after every 4 hours of operations, during first 3 days.*
 - iii) After every 8 hours of operation (4 hours operation + half hour break + 4 hours operation) for remaining 4 days.*
- 3. The samples shall be sent to state water lab. for analysis of various parameters to the trend of quality of water, over a period of time.*
- 4. For compliance as above. a committee was constituted to do the needful immediately in consultation with members:*
 - i. Sh. Harjeet Singh, Environmental Engineer. Regional Office, Sangrur*
 - ii. Sh. Maninder Singh, Asstt. Environmental Engineer, Regional Office, Sangrur. Sh. Khaleel Mohammad, Project Associate, Water Lab. Head Office, Patiala.*

- iii. Representative of the industry namely M/S KRBL Limited, Village Bhasaur Distt. Sangrur.
- iv. One representative of the complainants in consultation with Shi. Kirpal Singh, Dhuri and Sh. Harbans Singh Ladda.

The Ground water samples were collected from the tubewell owned by Sh. Jagtar Singh of Village Babbanpur, Tehsil Dhuri, Distt. Sangrur w.e.f. 24/09/2019 by the team constituted by the Board. Further, during the sampling dated 24/09/2019, the sample of piezometer installed in the plantation area of the industry (i.e. M/s KRBL Limited) was also collected. All the samples collected during the period 24/09/2019 to 29/09/2019 were sent to PBTI, Mohali for analysis of various parameters.

In the meanwhile, during the sampling on 28/09/2019, the residents of village (complainants) arrived at the site and stopped the team to continue with the running of tubewell and collection of water samples. Later on, Sh. Yadwinder Singh, member of BKU arrived at site and convinced the complainants to let the team to continue the study of the tubewell and accordingly, complainants agreed and sampling was again carried out by the team on 28/09/2019. Thereafter on 29/09/2019, the complainants again gathered at the site, (after collection of ground water samples of tubewell during morning time) and stopped the team to collect water samples from the tubewell. Sh. Jagtar Singh, owner of the tubewell, disconnected the power supply of the DG set, provided to the tubewell. Therefore, the water sample of the tubewell could not be collected thereafter on dated 29/09/2019. The analysis results of the Ground water samples are annexed at **Annexure-9**. The GCMS/MS Profiling of ground water samples (analysis provided by PBTI) collected from the tubewell of Sh. Jagtar Singh, Vill. Bhasur, Dhuri on 23/09/2019 to 29/09/2019 are annexed at **Annexure-10**.

It is pertinent to mention here that in the meeting taken by Worthy Chairman of the Board, with Shi. DK Benbi PAU, Ludhiana, Dr. Sarabjit Singh TIET, Patiala, Sh. Santosh Kumar PBTI and Sh. RK Sharma, COO representative of the industry (M/S KRBL limited) on 26/09/2019, it was decided that the PBTI will collect trade effluent samples from inlet as well as outlet of treatment facility provided in the furfural section and ETP installed by the industry

Accordingly, the matter was discussed with Sh. Santosh Kumar PBTI Mohali, by Regional Office and he informed that because of his busy schedule, the sampling could not be conducted by PBTI immediately. However, samples from the industrial premises were collected on 23/10/2019 and sent to PBTI, Lab for analysis of various

parameters. The analysis results of the said samples are annexed at **Annexure-11**. The GCMS/MS Profiling of samples (analysis provided by PBTI) collected from industry on 23/10/2019 is annexed at **Annexure-12**.

Thereafter, an expert opinion of Sh. Dinesh Benbi, National Prof. of PAU was obtained on the analysis results of samples analysed by PBTI. He was of the opinion that ground water samples from two other locations are required to be collected and get it analyzed from PBTI lab for different parameters. Accordingly, 02 no. samples were collected by the PBTI from Distt. Sangrur and Mohali and results are annexed at **Annexure-13**. The GCMS/MS Profiling of samples (analysis provided by PBTI) is annexed at **Annexure-14**. Now, Dr D. K. Benbi submitted his report which is as under:

Organic compounds

PBTI performed a qualitative analysis of water samples collected during September, 2019 from different process-sites within the KRBL premises and some locations outside the factory. In the analysis report, PBTI has indicated the presence of several organic compounds, though their concentrations have not been quantified. A comparison of analyses of various samples showed that some organic compounds were detected in almost all the samples though the number of compounds identified varied in a few samples as shown in Table-15 annexed at **Annexure-15**. While five organic compounds had been detected in the samples from inlet and outlet of ETP, the outlet of furfural section showed the presence of additional compounds as listed in **Table-15**. The source of these compounds is not apparent.

The sample from the plantation area and other sampling sites outside the factory also showed the presence of most of these compounds. In the tubewell water of Jagtar Singh, sampled on 23rd September a large number of organic compounds (25-30) including those found in the samples from within the factory premises were identified (Table 12). However, running the tubewell intermittently from Sept 23 to Sept 29, 2019 and regular monitoring of the water quality indicated that several compounds that were initially present could not be detected in the subsequent analyses.

After running the tubewell for 6 days, only 10 organic compounds were detected on 29th September, 2019 (Table 15) and these compounds were the same as detected in the samples from within and outside the factory premises. Furthermore, ground water samples collected from about 10 km on either side (north and south) of the factory as well as from Mohali (Table 14) also showed the presence of the same organic compounds as found in the tubewell water of Jagtar Singh, plantation area of KRBL and other locations within the factory premises.

The report on water analysis indicates greater spatial extent of the problem. However, specific source(s) of these organic compounds cannot be identified as these can result from a variety of surface activities including industrial effluents, use of agricultural chemicals (pesticides), leakage from fuel tanks and septic tanks etc. Because of lack of quantitative information, it is not possible to relate these analyses to some reference permissible limits.

Inorganic Components

The samples collected on 23.10.2019 from inlet and outlet of ETP were also analysed for several chemical parameters. The treated effluent showed high pH (9.14) and high concentration of total dissolved salts (TDS). Compared to untreated effluent, the treated effluent showed increase in pH (6.02 to 9.14), TDS (1080 to 2210 mg/l), Chloride (260 to 1300 mg/l), sulfate (54 to 120 mg/l), sodium (111 to 870 mg/l) and conductivity (201 to 4.29 dS/m). The analysis of aeration tank water showed high biochemical oxygen demand (BOD), chemical oxygen demand (COD), chloride, sulphate, sodium and potassium. The treated effluent outlet of parboiled section had low pH (5.22), high BOD and COD, TDS, phosphates, chloride, sulfate, phosphate, sodium and potassium and the values were generally higher than in untreated effluent from the same section. The treated effluent of Furfural section had very low pH (3.27) and high BOD, COD, TDS, chloride, sulphate and phosphates. All these analyses indicate that untreated effluents from DM plant, cooling tower etc. are directly added to the outlet of the main ETP disposed to plantation area. These effluents must be treated for minimizing the pollution hazard before mixing with the ETP outlet. Otherwise disposal of untreated water mixed with treated effluent from the ETP to land or surface bodies can have adverse impact on groundwater and soil health.

A meeting was held by the Chairman of the Board on 07.01.2020 with experts and industry to discuss the analysis report and identify the cause of contamination in the ground water. The representative of the industry informed that self-monitoring of the ETP is also being carried out regularly in the laboratory established by the industry. Accordingly, the industry was asked to supply the said data to the Board. It was also decided during meeting that the soil sample from plantation area of the industry, from area other than plantation from the industrial premises and from outside the industry be collected by the Environmental Engineer, Regional Office Sangrur along with PBTI lab Mohali and get it analyzed from PBTI for different parameters. After detailed deliberation, it was decided as under:

1. *The Environmental Engineer, Regional Office, Sangrur shall supply the list of pesticides being used by the farmers in District Sangrur to identify the cause of existence of different compounds in the ground water samples. Accordingly, the list has been sent by the Environmental Engineer, Regional Office, Sangrur and same is annexed at **Annexure-16**.*
2. *The industry has submitted the self-monitoring results of ETP and these are annexed at **Annexure-17**. The analysis is limited to only four parameters (pH, TDS, BOD, COD) and information on inorganic analysis is lacking, though the analysis of reported parameter is within the permissible limits.*
3. *The ground water samples of different districts including Bathinda, Fazlika, Gurudaspur, Hoshiarpur, Ludhiana and Amritsar be collected and get analysed from Board's lab as well as PBTI Lab for different parameters. Accordingly, samples from above mentioned districts are being collected by the scientific staff of Head Office, Laboratory.*
4. *Soil samples from the inside as well outside the industrial premises shall be collected by the PBTI lab in association with RO, Sangrur and to have preliminary indications about the status of soil health.*

Recommendation:

- i) *The periodic analysis of water and effluent samples from the factory premises as well as from outside indicates the presence of organic compounds in the groundwater. Though the tubewell water of Jagtar Singh initially showed the presence of some additional compounds yet continuous running of the tubewell for 6 days led to disappearance of these additional compounds suggesting that the problem is confined to that particular tubewell only. Presence of certain compounds in all the samples from different locations suggests a wider spread of the problem, may be on a regional scale, with respect to contamination with organic compounds. Apparently, the presence of these compounds could not be correlated with the effluents emanating from the industry. The analysis of samples collected from other districts in the state will further help in identifying the spatial extent, if any of the problem. A well designed study needs to be conducted to identify the source of these contaminants and their concentration.*
- ii) *The analysis of effluent from the industry showed elevated levels of inorganic salts particularly that of Na and chloride, high pH and conductivity. Disposal of treated waste water with high salts onto land for*

plantation can have detrimental effects on soil and groundwater. The industry should take appropriate measures for mitigation of the problem. Since such waste water is being added to the plantation area for more than 10 years, the industry should undertake a well-designed project. The industry may undertake two phase project for characterization, collation with industrial processes, impact analysis on ground and water resources in the region involving farmers' fields."

4. In view of the fact that illegal injection of effluents by the unit appears to have resulted in contamination of ground water, further independent examination is necessary.

5. Let the CPCB and the Punjab State Pollution Control Board jointly visit the site and give an independent report within two months by email at judicial-ngt@gov.in. CPCB may be the nodal agency in this matter. CPCB may be at liberty to engage any other expert in this matter.

List again on 27.05.2020.

Adarsh Kumar Goel, CP

S.P Wangdi, JM

Dr. Nagin Nanda, EM

Siddhanta Das, EM

February 05, 2020
Original Application No. 437/2019
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