IN THE NATIONAL GREEN TRIBUNAL (PRINCIPAL BENCH)
AT NEW DELHI

OA NO. 682 OF 2019

IN THE MATTER OF:

Beant Singh Bajwa **..Applicant**

Versus

The State of Punjab **...Respondent(s)**

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Note:

1. Next date of hearing is 04.01.2022

Chandigarh
Date: 29.12.2021

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Reply / Compliance Report on behalf of M/s Trident Ltd to the notice issued to the Industry dated 03.08.2021 in terms of order passed by this Hon'ble Tribunal on 29.07.2021.

Most Respectfully showeth:

1. That the answering industry, M/s Trident Limited, is a Public Limited Company duly registered under the Companies Act, 1956, having its registered office at Trident Group Sanghera-148101.

2. That the answering industry viz. the Trident Group constitutes a USD 1 billion Indian business conglomerate and global player. Headquartered in Ludhiana, Punjab, Trident is the largest terry towel and wheat straw based paper manufacturer in the world. With the establishment of state-of-the-art manufacturing processes and systems coupled with appropriate human capital and credentials, Trident has frequently received accolades from its patrons in recognition for delivering high

quality standards and for its customer-centric approach. The Company operates in two major business segments i.e. textiles and paper Trident's customer base spans more than 75 countries across 6 continents and comprises of global retail brands.

3. That Trident Group embraces sustainability as a core business vertical paving the way in order to secure a safe & healthy work environment in true spirits from developing environment-friendly products like paper from agricultural/waste/residue, producing organic yarn, managing non-utilized resources, thus fast moving towards green manufacturing for a cleaner environment.

4. The Paper & Chemical Division (PCD) of the Industry is contributing significantly in terms of growth and development of the regional economy procuring the agro - residues (wheat straw), eucalyptus and poplar from the local farmers as well as providing direct and indirect employment to the local people. The management commitment for environmental compliance and sustainability is reflected by the adoption of various state of art cleaner technologies for improving product quality, reduction in fresh water consumption and consequently waste water discharge and pollution load , maximum utilization of treated effluent back into the process and for land application , availability of Electrostatic Precipitators at all stacks ; availability of CPCB's OCEMS (Online Continuous Emission Monitoring System) at Final Discharge Outlet and ESP outlet for 24X7 monitoring of quality of treated effluent discharged into the drain and utilized for irrigation as well as level of particulates emitted from the boilers.

5. The approach of segregation the effluent streams into high pollution load stream and low pollution load stream and treating the former through anaerobic treatment followed by post treatment through conventional aerobic treatment based on activated sludge process has significantly contributed to satisfactory performance of ETP in terms of reduction in pollution load and achieving environmental compliance.

6. The industry has installed an effluent treatment for its dyeing waste water containing screen, biological reactors based on activated sludge process, secondary clarifier and filtration system since 2004 in HTD division.

7. The mill has provided flow meters at all the major pipelines, bore-well, final discharge etc. which helps in monitoring and optimizing the fresh water consumption. The ground water quality at the selected locations is also satisfactory in context of the specified norms indicating that no adverse impact of mill on ground water quality. The quality of treated effluent has been found in compliance with the prescribed discharge norms.

8. The steps taken by the Industry towards an effective control of the polluting factors, if any, have been appreciated at various levels, and the Industry has been awarded the National Award for Excellence in Water Management by Confederation of Indian Industry and Trident has recently won joint first prize in "Industrial Water Use Efficiency" in 2020 organised by Federation of Indian Chamber of Commerce and Industry (FICCI) & National Award for Water Efficiency organized by

Asia Pacific HRM Congress in October 2021 after audit of PCD and HTD Division

9. The Industry has also continuously worked on the recommendations and the decisions of the personal hearings as well as recommendations/directions of this Hon'ble Tribunal, conveyed through the Joint Committee, to every extent possible, and is, at this point in time, to justifiably state that the company has been meeting all parameters as prescribed from time to time. Over 2.65 lakh trees have been planted at Dhaula premises. The company is also in receipt of various awards and accolades for its initiatives and actions in promoting sustainability and environmental norms. Utilization of biogas has been undertaken. A continuous and focused monitoring and reduction of the carbon footprint, for the scope of improvement, has been a constant motivation for the industry.

The Industry further submits that the efforts being made have been appreciated by the National Institutes. Further, the Industry PCD Divisions has noted and started working on all the recommendations given in Environment Audit conducted by CPPRI, Saharanpur for PCD Divisions and Recommendations given by NIT Jallandhar for HTD Division.

It is respectfully submitted that the Joint Committee constituted by NGT as well as both auditors namely NIT, Jallandhar & CPPRI, Saharanpur have not found any non-compliance by the Company but had suggested improvements only.

List of Projects/Improvement Completed in Past on Environment Management :

S.No	Project Description	Year of Installation	Capex Value (In Lacs) Per Year	Opex Value (In Lacs) Per Year
1	Water & Effluent Treatment Plant – Paper	1998	1200	2737
2	Water & Effluent Treatment Plant – Towel	2004	1600	1453
3.	Installation of Disc filter at Paper Machine No.2	2008	754	4.8
4	Installation of Twin wire press at Paper ETP	2009	65	16
5	Construction of equalization tank at HTD-ETP	2010	65	
6	Installation of LOX system at Paper ETP	2011	25	22.5
7	Installation of 2500 KLD Reverse Osmosis plant at HTD	2013	2000	
8	Installation of 550 KLD MEE plant at HTD	2013	1300	
9	Installation of STP plant for domestic water treatment	2013	200	
10	Construction of clarifier for Wet Washing water-PCD	2016	200	9.7
11	Installation of Disc filter at Paper Machine No. 1	2018	25	3.5
12	Installation of Digitalized Ground Water level monitoring system	2019	5.16	NA
13	Construction of Central Water Reservoir for the use of surface water	2019	1157	NA
14	Installation of DAF & Screw press at Paper ETP	2020	820	115
15	Installation of advanced aerators at Paper ETP	2020	209	25
16	Installation of ESP in Energy -2 Stack	2007	350	9
17	Installation of ESP in Energy -3 Stack	2008	400	8.5

18	Installation of ESP in Recovery-1 (Replacement)	2018	170	23.37
19	Installation of ESP in Recovery-2	2008	700	35.06
20	Land Procurement Cost for Plantation	2021	1530	
	Total (INR Lacs)		12775.2	4462.4

10. That M/s Trident Ltd (hereinafter Industry) received a notice dated 03.08.2021 from the National Green Tribunal as to why the Tribunal should not take coercive measures in the matter for continuing failure. The show cause notice was issued to the Industry in Original Application No. 682 of 2019 filed by the applicant alleging pollution on various counts at the instance of the answering industry.

11. That upon receipt of the above referred notice issued through order dated 29.7.2021, and having perused the previous orders passed by this Hon'ble Tribunal in the present Original Application from time to time, it appears that the pertinent issue for consideration before this Hon'ble Tribunal is the remedial action for alleged violations of environmental norms by the Trident Factory, situated at Village Dhaula, Mansa Road, Barnala, Punjab.

12. That on 04.12.2019, in light of the report furnished by the Punjab State Pollution Control Board ("State PCB") this Hon'ble Tribunal directed a fresh inspection and report by a Joint Committee comprising of officials from the Central Pollution Control Board ("CPCB"), State PCB, and the District Magistrate, Barnala.

13. Accordingly, a report was filed on 29.02.2020 by the State PCB on behalf of the Joint Committee recording its findings and making the following recommendations:

I. "An in-depth study for Environmental Audit may be undertaken particularly in respect for Captive Power Plant, Paper & Towel Division to assess the status for compliance of environment norms/standards. The finding(s) and recommendation (s) of study may be incorporated in the consents issued by PPCB for effective compliance. This study on Environment Audit be undertaken in consultation with CPCB either by PPCB or through an institute/ consultant having technical expertise in the relevant field.

II. a) M/s Trident Limited shall submit a detailed action plan for compliance of condition stipulated by PPCB through its consent orders dated 10.02.2012 and 30.05.2013, wherein the industry was to install Reverse Osmosis System followed by Multiple Effect Evaporator in its H.T.D. This should be accomplished before 30th June 2020; as mandated by PPCB. The industry shall also submit time bound action plan by 15th March 2020 for installation of Agitated Thin Film Dryer (ATFD) for the effective handling of MEE reject.

b) M/s Trident Ltd (PCD) shall also gradually reduce water consumption and thus effluent generation. The entire treated effluent to be properly utilize on land for plantation / irrigation purpose. The Industry should adopt scientific method for

utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex. An action plan in this regard shall also be submitted by M/s Trident Ltd. to PPCB on or before June 2020 detailing pipe network, land use, watering depth and type / age of plants etc. Having implemented the above, further two years from now i.e. by June 2022. M/s Trident Ltd. shall get its treated water utilized to nearby farmers for irrigation purpose.

III. M/s Trident Ltd shall undertake a performance study of ETPs provided for its PCD. The Industry shall undertake necessary project on its raw material washing stream which nearly contributes to 30% of the total ETP Load. The Industry shall also submit a time bound action plan to PPCB on or before 15th March 2020 for removal of non-biodegradable COD. The Industry will also submit time bound action plan by 30th April 2020 for removing of color from its treated effluent going into the drain.

IV. The trend analysis of historical data, recorded from OCEMS exhibits that the discharge from M/s Trident Limited remains within compliance zone. If such is the case then M/s Trident Limited shall make all efforts to reuse treated effluent back to production process, resulting in conservation of water owing to less withdrawal of ground water or canal water. Besides, the reuse of treated effluent into the production process will affect efficiency of ETP as the treatment system would receive high concentration of BOD and COD. An action plan in order to reuse

its treated water not impacting the TDS of the final treated effluent to be shared with PPCB by 30th June 2020.

V. The Industry has provided pipe network for distribution of treated trade effluent on the plantation area; however, it was observed that certain patches of plantation was flooded with water and some patches were found completely dry because the Industry is uniformly distributing treated trade effluent to all cells of plantation area irrespective of the age of plants in that cell. The Industry, therefore, is required to provide proper irrigation network for optimum utilization of treated wastewater. The Industry shall also provide electromagnetic flow meter at the outlet of each cell of plantation making more effective utilization of treated effluent.

VI. The Industry is not achieving the emission standards of 75 mg/Nm3 from the stack of Chemical Recovery Plant (II) and Energy Section. However, the Industry was given opportunity of personal hearing before Hon'ble Chairman of PPCB on 07.01.2020, wherein one of the decisions was that the Industry shall submit the detailed proposal w.r.t. upgradation of its existing APCDs (Air Pollutiion Control Devices) to achieve the stack emission standard of 75 mg/Nm3 within 3 months along with PERT chart for installation and commissioning of the same.

VII. The Industry (M/s Trident Ltd) will conduct detailed study for monitoring the ground water quality across the Dhanaula Drain

in order to evaluate the impact of its treated water discharge onto Drain and submit the report by 30th April, 2020.

VIII. The concept of 'Zero Liquid Discharged' be considered as minimal discharge of effluent, particularly from the industrial sectors reported upon. According to mechanics of fluids (more precisely thermodynamics) that a continuous operation is bound to generate 'rejects', and / or 'blowdown' and / or bleed due to process entropy, despite of whatever technology adopted. Punjab Pollution Control Board, therefore, has to examine what minimal disposal of effluent be permitted to M/s Trident Limited considering the production technology, scale of operation and utilization capacity."

It would thus be noticed from the afore-reproduced recommendations of the Joint Committee constituting of officials of the CPCB, PPCB and the District Magistrate, Barnala, that the Industry was substantially complying with all environmental norms. Through the above recommendations, only certain improvements had been suggested for increasing efficiency, reduction of water consumption, etc.

14. The matter was then considered on 24.06.2020 in the light of further report of the State PCB on behalf of the joint Committee filed on 29.02.2020. The recommendations were accepted and directions issued for remedial action, which was to be ensured by the State PCB.

15. That on 29.07.2021, this Hon'ble Tribunal passed an order directing the State PCB to put the industrial unit to notice of proceedings

before the Tribunal so that it has an opportunity to show cause before the Tribunal as to why the Tribunal should not take coercive measures in the matter for its continuing failure to comply with the recommendations made over the period of time the matter had been pending before this Hon'ble Tribunal. The Industry upon receipt of the show cause notice dated 24.09.2021 sent by the State Pollution Control Board, submitted a detailed reply dated 18.11.2021 reporting the compliance status and also enumerating in detail the steps undertaken as per the recommendations given by the Joint Committee comprising Central Pollution Control Board ("CPCB"), State PCB, and the District Magistrate, Barnala, vide its report dated 29.02.2020, as submitted before this Hon'ble Tribunal. A copy of the notice received, and reply sent are annexed as **Annexures R-1 and R-2,** respectively.

16. That being a compliance oriented Industry in respect of the statutorily prescribed standards; the company has always worked towards a complete adherence to all applicable norms/standards under the Environment Act, the Water/Air Acts, etc,.

17. The Joint Committee which was constituted by National Green Tribunal comprising of CPCB, PPCB and District Administration as members had recommended 8 suggestions towards improvement after their visit and one such recommendation being appointment of auditors namely NIT, Jallandhar & CPPRI, Saharanpur to conduct the detailed Environment Audit of the Site .

18. The report of the Joint Committee comprised of CPCB , PPCB & District Administration Barnala after their visit and the report of the National Institute of Technology – Jalandhar & Central Pulp & Paper

Research Institute Saharanpur reveals that the industry is complying with all the applicable Environment Norms .

19. Further , the Industry would also like to submit that out of total 8 recommendations of improvements as suggested by Joint committee vide its report it has complied with 7 of the 8 recommendations of improvement.

20. On the last partial completed recommendation, company was advised to achieve target stack value of 75 mg/Nm3 (against present applicable norm of 150 mg/Nm3) for 2 of its boilers namely Energy Boiler & Chemical Recovery Boiler 2. The Copy of present applicable norm of 150 mg/Nm3 is attached as Annexure R-18.

21. The Industry has already completed the APCD upgradation work for its Energy Boiler to achieve the recommended revised Stack Value of 75 mg/Nm3. The results of the samples taken by the Punjab Pollution Control Board dated 7th December 2021 reveals that the industry has achieved the stack value < 75 mg/m3 for its Energy Boiler after upgradation.

22. For the second boiler, the Industry has executed contract with M/s Hamon Research (Belgium Company) for the upgradation of ESP, which will be completed by 30th September 2022. This activity was supposed to be completed by September 21 which got delayed by 1 year due to prevailing pandemic & restrictions for movement imposed by State, National & International Governments.

23. The National Institute of Technology has recommended 3 points of further improvement which has been completed and verified by the State Pollution Control Board.

24. The Industry has already submitted action plan along with time lines for pending improvements and will ensure that it implement all the said recommendations of the audit study.

25. That since this Hon'ble Tribunal has periodically been apprised of the developments by the PPCB and various recommendation made and improvements implemented, the industry would reiterate some of the significant submissions made to the PPCB. The progress and compliance has also been noticed by this Hon'ble Tribunal in its order dated 29.7.2021, while recommending certain more improvements. An up to date compliance report with respect to the observations of this Hon'ble Tribunal and various recommendations made by the Joint Committee and enumerated in Para 4 of the reply are being provided below:

The compliance for both divisions of the Industry i.e. the paper division (PCD) as well as the towel division (HTD) is being submitted jointly.

In light of the aforesaid recommendations, while submitting the compliance of the recommendation, Seven of the eight recommendations already stand complied with and Eighth Recommendation is partially completed as has been verified and stated by the PPCB

From the mentioned status report on recommendations of Joint Committee (Pg 18/920), it is evident that the industry is compliant with all of the recommendations.

I. Recommendation No. 1 –

I.A. An in-depth study for Environmental Audit has duly been conducted for the Towel Division of the Industry (HTD) by the National Institute of Technology, Jalandhar, and in respect of the Pulp & Paper Division (PCD) of the Industry by the Central Pulp & Paper Institute, Saharanpur in April 2021. The report has since been submitted to the Board, and which fact also finds mention in the order dated 29.7.2021 passed by the Hon'ble NGT, New Delhi.

I.B. The Industry has already started working on the recommendations of the Audit report and has prepared a time bound action plan for the same which is attached as **Annexure R-3.**

I.C. A perusal of the Audit Report would reveal that the Industry is complying with the prescribed Environmental norms.

I.D. The Audit report reveals the adoption of different clean technologies resulting in significant contribution in reducing the environment foot print including the water foot print of the plant.

I.E. All suggestions have additionally been made which are not mandatorily or statutorily required and are only suggested for further improvement.

It is submitted that the Industry has duly complied with the recommendation and also incurred a cost of Rs. 11.5 Lakh (PCD) and Rs. 7.5 Lakh (HTD) to ensure the compliance.

II. Recommendation No. 2 –

II.A. The Industry has installed RO plant followed by MEE plant in year 2014 for waste water recycling with total expenditure of INR 33 crores (OEM RO- Euromec-10.84 crores , OEM MEE Ketav Consultant- 5.88 crores).

II.B. The Industry had faced the technology failure after 1 year of the plant commissioning & apprise the status to the board. After inputs taken from the NEERI & Environmental consultant Mr Silvano Stroti recommendation was considered to upgrade the existing plant with improved technology i.e. MBR technology.

II.C. The Industry placed the order for the new technology MBR plant as proposed by consultant having cost of 2.94 crores (The plant was delivered at site in March 2020).

II.D. The industry (HTD) had informed the Board vide Letter No. Trident/2020/24 dated 31.03.2020 that the industry would not be in a position to complete the project to install Reverse Osmosis System followed by Multiple Effect Evaporator in its towel division. within the given timelines due to the lock down and other restraints and restrictions imposed by the Central Government and the State government in order to curtail the spread of COVID-19 and had sought support of the Board to keep the project in abeyance till the situation becomes conducive to the upgradation.

II.E. In addition to above , as per CPCB guidelines dated Sep 2019 regarding utilization of treated water for irrigation as alternate to ZLD , the industry has purchased additional land of 51.5 Acres out of which 32 acres has been developed for plantation for diversion of treated trade effluent from drain to said plantation area. As per the recommendation in the Environment Audit carried by National Institute of Technology , Jalandhar as suggested by Joint Committee , the company started purchasing additional adequate land for diverting the existing treated water going in drain onto this new plantation area.

II.F. At Present , the production of the unit is 77.3 TPD and the total discharge of 5365 KLD is generated from said production against consented discharge of 9702 KLD out of which 3014 KLD is already been utilized for plantation & 2313 KLD is going to drain.

II.G. For the remaining effluent of 2313 KLD , the industry has already developed the adequate land of 32 Acres to divert the existing discharge onto drain.

II.H. The Pipe line laying work has been completed and the Industry has already diverted its treated water onto this newly developed land and there is no discharge of treated water onto drain since 15 November 2021. This aspect has since been physically verified by the officials of the PPCB on 07 December 2021.

Hence, there is zero discharge in the drain from the textile unit.

II.I. The industry has already developed the adequate land to handle 7280 KLD treated water catering to a production of 100.4 TPD.

II.J. The Industry is also in process of further developing plantation area of 19.5 Acres which has already been purchased by the industry . This activity will be completed before 31 December 2021 to ensure the compliance of the recommendations made for achieving this goal of an effective use of treated effluent and for saving scarce ground water resources.

Recommendation No. 2 A -

II.K. The Industry (PCD/paper) has gradually reduced its water consumption and the effluent generation through an improved production system. The Industry had already achieved the water consumption long term objective given by CPCB for Pulp & Paper Industry of 50 m3/T. The Industry is presently running at a water consumption of 46 m3/T by adopting several water conservation measures. Copy of Water Charter Target & List of Measures are attached as **Annexure R-4**.

II.L. The Industry has adopted scientific methods for utilization of its treated water onto plantation within its premises to maximize the utilization of treated water within the complex. The Industry has done a detailed structuring of its complete plantation area. After the assessment, the Industry has laid additional pipeline network for utilization of its treated water on its plantation area. The Industry has also procured dedicated infrastructure including tractor/ harrow/ Rota water for regular maintenance of its plantation area. The Implemented scheme showing detailed pipe network, land use, watering depth and type / age of plants etc. has been annexed as **Annexure R-5**.

II.M. The Industry has already submitted the action plan for the utilization of its treated water by farmers by June 2022 attached as **Annexure R-6**

III. Recommendation No. 3 :

III.A. The Industry (PCD) has already undertaken the performance study of its ETP of PCD from Thapar Institute of Technology, Patiala. The report has since been submitted to the Board vide letter no. Trident/PCD/2020/66 dated 08.12.2020 along with a timely action plan for all the proposed recommendations. All the recommendations given in the study conducted by the Thapar Institute have been duly implemented and are given in the annexed report, **Annexure R-7.**

III.B. The Industry has also completed the project on its raw material washing stream which contributed to nearly 30% of the total effluent load by adopting the latest Dissolved Air Flotation (DAF) and screw press technologies with a total investment of nearly INR 10.50 crores. The Industry has already commissioned the project for the removal of non-biodegradable COD & this target has been successfully implemented. Pictures of the project area along with the supporting data is annexed as **Annexure R-8.**

III.C. The Industry has collaborated with the Department of Energy and Environment at Thapar Institute to conduct a pilot study for the removal of all color. The Institute has undertaken the project for achieving the purpose and will share the feasibility report by December 2021 and which shall also be submitted with the State Pollution Control Board. A copy of the MOU entered into with Thapar Institute for the purpose along with the interim report received is annexed as **Annexure R-9.**

It is further submitted that the recommendations, as made, have been complied with at a cost of Rs. 10.5 crores for the installation of equipment (PCD/paper division) with an additional annual running cost of Rs. 2 crore. The said system has been put into operation by the Industry.

IV. **Recommendation No. 4** The Industry has conducted the assessment for the reuse of existing treated water back to production process.

IV.A. The reuse of existing treated water will increase the concentration cycle and will increase the Total Dissolved Solids of the final treated water . (TDS of present mill water is 300 ppm and ETP treated water is 1800-1900 ppm) & will also impact the quality of product.

IV.B. However , the industry is utilizing its treated water/ rejects for following purposes which do not have/negligible impact on the TDS of the treated water . List of projects completed for the utilization of treated water not impacting TDS is attached as **Annexure R-10.**

The recommendation has thus been complied with and a cost of Rs. 22.5 Lakhs (PCD) has been incurred by the Industry.

V. **Recommendation No. 5** - The Industry has improved distribution of treated trade effluent on the plantation area and started utilizing treated trade effluent as per the implemented schedule/roster prepared for its zone wise distribution attached

as **Annexure R-11** . Further, the Industry would like to submit that it has already installed the Electromagnetic flow meter at the outlet of each cell of plantation. Pictures of the additional Meters installed for the submetering along with a copy of the purchase order are annexed as **Annexure R-12.**

The recommendation has been complied with at a cost of Rs. 4.51 Lakhs (PCD/paper) and Rs. 4.32 Lakhs (HTD/towel).

VI. Recommendation No. 6 –

VI.A. The Industry (PCD/paper) has consistently been achieving the existing prescribed standards of 150 mg/Nm3, as stipulated by the Punjab Pollution Control Board in the consents. The latest available test report dated 11.05.2021 depicts the results. Copy of the latest test report dated 11.5.2021 as carried out by PPCB is annexed as **Annexure R-13 A.** The sampling was conducted on 21 September 2021 the report of which also reveals that the parameters are within the prescribed norms of 150 mg/Nm3. Copy of report is annexed as **Annexure R-13 B** . These standards of emission conform to the prescribed standards specified and stipulated in the consents granted to the Industry from time to time.

VI.B. However, since a recommendation has been made to reduce the said emission to a maximum limit of 75 mg/Nm3, the Industry had submitted the action plan and time lines for the achievement of stack emission standard of 75 mg/Nm3 by Sep 2021.

S No.	Boiler	Parameter	Result	EC Norm	Time Line
1	Recovery 2	SPM	80	<75	Sep 21
2	Captive Boiler	SPM	98	<75	May 21

VI.C. The project was unavoidably delayed on account of the pandemic scenario in the year 2020-21, which had resulted in a complete shut down and slowing of all Industries during this period.

The Industry has now sought time till September 2022 for the achieving the revised standards as per below details :

S No.	Boiler	Parameter	Result	EC Norm	Time Line
1	Recovery 2	SPM	80	<75	Sep 2022
2	Captive Boiler	SPM	98	<75	25 November 21

That the compliance of less than 75 mg/Nm3 of the captive boiler has been achieved through the installation of additional equipment. This aspect has also been verified by the officials of the PPCB.

VI.D. The Industry has already installed the new HF Controller to reduce the emissions of its thermal power plant stack to achieve the new recommended value of 75 mg/Nm3. The commissioning of the same has been completed on 24 Nov 21 .

Copy of the new Controller Pictures along with its present SPM trend is annexed as Annexure R-14. The results of the samples taken by the Punjab Pollution Control Board dated 7th December 2021 reveals that the industry has achieved the stack value < 75 mg/m3 for its Energy Boiler after upgradation.

VI.E. The Industry has also awarded the contract to M/s Hamon Research (Belgium Company) for the supply of new ESP amount Rs 6.4 crore for reducing the emissions to less than 75 mg/Nm3 for Recovery Boiler 2 . The copy of the agreement for the supply of new ESP is attached as **Annexure R-15.** The new delivery period of the ESP is 7 months and the installation and commission of the same will be completed by August 2022 .

VI.F. The recommendation is likely to be completed before September 2022 as per above table and a cost of Rs. 33.47 Lakhs (PCD) has already been incurred by the Industry & a cost of 900 Lacs will be done on Recovery Boiler new ESP for achieving the given purpose .

VII. Recommendation No. 7 –The Industry has conducted the detailed study for the monitoring of the ground water quality across the Dhanaula Drain in Dec 2019 from M/s Chola Manadalam and the conclusion from the study is as under:

VII.A. The pH in the ground water samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS

10500:2012. Whereas the pH in soil was found to be more alkaline in the entire region.

VII.B. TDS in the samples collected from the existing borewells were recorded to be in the range of 524 to 1276 mg/l. The TDS levels in groundwater from the samples collected is a regional phenomenon and is in line with the published regional level data. The groundwater's Salinity as NaCl is in line with TDS which contributes to 50% to 60%.

VII.C. Total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l.

VII.D. Minor traces of nutrients and heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.

As per conclusion drawn by Agency, there is no adverse impact of its treated water discharge onto drain. Copy of the report is attached as **Annexure R-16.**

The Industry has complied with the recommendation and incurred a cost of Rs. 16.17 Lakhs (PCD/paper).

VIII. **Recommendation No. 8** - The Industry is continuously working for minimum discharge of effluent and is continuously reducing its discharge.

VIII.A. In Paper , The Industry was granted CTO under water Act by Board to discharge its treated trade effluent @ 8700 KLD onto drain & 12800 KLD onto plantation while the actual effluent discharge onto drain is 6214 KLD.

VIII.B. The Industry has reduced its water consumption from 52 m3/Ton to 46 m3/Ton (CPCB Long term Objective : 50 m3/Ton) and as per report submitted by CPPRI Saharanpur , the industry further has potential to reduce to 42 m3/Ton.

VIII.C. While in Textile division against granted permission for total generation of 9702 KLD , the industry is only generating 5365 KLD of effluent out of which 3014 KLD is already utilized onto plantation area.

VIII.D. The Industry is also working on maximum utilization of its treated water onto plantation area and reducing its effluent disposal through alternate routes of Zero Liquid Discharge also as suggested by CPCB. Guidelines of CPCB for alternate routes other than ZLD through utilization onto plantation/irrigation is attached as **Annexure R-17.**

VIII.E. The Punjab Pollution Control Board has been requested to advise the industry on methods of achieving minimal disposal of effluent considering the production technology, scale of operation and utilization capacity.

The recommendation has been complied with.

26. That it is a well known fact that any export oriented undertaking such as the answering Industry is subjected to strict quality control measures not only by the statutory authorities like the PPCB, but also by the international buyers, who, in their own manner, conduct a full inspection of all environmental and pollution control measures before awarding such contracts or placing orders. Highest standards of quality in every respect including pollution control are mandatorily followed to sustain its reputation and stature in the market.

27. Besides all the above compliances as detailed by the Respondent Industry, there are other numerous surprise visits of CPCB, PPCB officials where they have not found any violations nor have any advisories been issued and hence are not recorded. The PPCB officials continue visit the Industry at odd hours and adopt constant monitoring through CCTV cameras.

In view of the above it is submitted that the answering Industry is complying with all requisite statutory parameters as are prescribed by law and, therefore, the present application deserves to be dismissed as against the answering industry, in the interest of justice.

Chandigarh
Date: 29.12.2021

(Suvineet Sharma) (Vaibhav Sharma)

(Viraj Gandhi) (Adarsh Dubey)

Advocates for the M/s Trident Ltd

27

IN THE NATIONAL GREEN TRIBUNAL (PRINCIPAL BENCH)
AT NEW DELHI

OA NO. 682 OF 2019

IN THE MATTER OF:

Beant Singh Bajwa **..Applicant**

Versus

The State of Punjab **...Respondent(s)**

Affidavit of Anubhav Nayyar S/o Sh. Varinder Kumar Nayyar, Authorised Representative of M/s Trident Limited having its registered office at Trident Complex, Sanghera-148101, Barnala Punjab and Corporate office at E-212, Kitchlu Nagar, Ludhiana. I, the above named deponent do hereby solemnly affirm and declare as under:

1. That the accompanying reply to OA No. 682 of 2019 is being filed through Mr. Anubhav Nayyar who is the authorised representative of the Company M/s Trident Limited duly authorised vide its Board resolution dated 12.08.2021.

4295
29/12/2021

2. That the deponent is well acquainted and conversant with the facts and circumstances of the above matter and is able to depose the same.

NOTARY
Rajinder Singh
Ludhiana (Pb.)
Regd. No.
2915
GOVT. OF INDIA

3. That the accompanying reply has been drafted and prepared by my counsel on my instructions. I have gone through the accompanying reply and affirm that the contents of the reply are true and correct. No part of it is false and nothing has been kept concealed therefrom.

PLACE: Ludhiana
Dated:29.12.2021

Certified that the affidavit SPA/GPA has been read over & explained to the deponent/ executant who seemed correctly to under stand the same at the time making above there of

DEPONENT

Verified that the contents of my affidavit are true and correct to best of my knowledge as per the official records and nothing has been concealed or mis-stated therein.

Attested As Identified

NOTARY PUBLIC
LUDHIANA (PUNJAB)

29 DEC 2021

PLACE: Ludhiana
Dated:29.12.2021

DEPONENT

ANNEXURE R-1 28

Show cause notice 05.02.2021 (Autosaved)

ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ
PUNJAB POLLUTION CONTROL BOARD

No. 3295 **REGISTERED** Dated: 24-9-2021

To

M/s Trident Ltd. (HTD),
Trident Complex,VillageDhaula,
Tehsil &Distt. Barnala.

Sub: Violation of provisions of Water (Prevention & Control of Pollution) Act, 1974.

Whereas a complaint was filed in the Hon'ble NGT by Sh. Beant Singh Bajwa, President, National Anti-corruption Council against M/s Trident Unit in which it was mentioned that chemical water is being discharged in the drain by the said unit. The Hon'ble NGT had directed the Board to look into the matter, take appropriate action in accordance with law and furnish a factual and action taken report to this Tribunal.

And whereas, a report was filed by the Board in the Hon'ble NGT.The Hon'ble NGT on04.12.2019 passed the following orders:

"A report has been furnished by the State PCB finding certain deficiencies and also finding unit compliant in certain respects. There is, however, nothing mentioned about extraction of ground water. We are of the view that a fresh independent and comprehensive inspection is necessary to ascertain the actual situation, as the report furnished is not adequate in all the relevant facts which need to be studied.

Accordingly, we direct fresh inspection by joint Committee of CPCB, State PCB and District Magistrate, Barnala be carried out. The State PCB will be the Nodal Agency for coordination and compliance. The report may be furnished by 31.01.2020, by e-mail. The next date of hearing was *fixed 03.03.2020."*

And whereas, in compliance to Hon'ble NGT order, the joint committee had undertaken inspection and monitoring of the Complex during 21-23 Feb, 2020 and a report was filed on 29.02.2020 by the joint Committee recording certain recommendations as below:

1. An in-depth study for Environmental Audit may be undertaken particularly in respect for Captive Power Plant, Paper & Towel Division to assess the status for compliance of environment norms/standards. The finding(s) and recommendation (s) of study may be incorporated in the consents issued by PPCB for effectively compliance. This study on Environment Audit be undertaken in consultation with CPCB either by PPCB or through an institute/ consultant having technical expertise in the relevant field.

2. M/s Trident Ltd shall submit a detailed action plan for compliance of condition stipulated by PPCB through its consent orders, dated 10/02/2012 and 30/05/2013, wherein the industry was to install Reverse Osmosis System followed by Multiple Effect Evaporator in its H.T.D. This should be accomplished before 30th June 2020; as mandated by PPCB. The industry shall also submit time bound action plan by 15th March, 2020 for installation of Agitated Thin Film Dryer (ATFD) for the effective handling of MEE reject.
   M/s Trident Ltd (PCD) shall also gradually reduce water consumption and thus effluent generation.The entire treated effluent to be properly utilize on land for plantation / irrigation purpose. The industry should adopt scientific method for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex. An action plan in this regard shall also be submitted by M/s Trident Ltd. to PPCB on or before June 2020 detailing pipe network, land use, watering depth and type / age of plants etc.

Having implemented the above, further two years from now i.e. by June 2022. M/s Trident Ltd. shall get its treated water utilized to nearby farmers for irrigations purpose.

3. M/s Trident Ltd shall undertake a performance study of ETPs provided for its PCD. The industry shall undertake necessary project on its raw material washing stream which nearly contributes to 30% of the total ETP Load. The industry shall also submit a time bound action plan to PPCB on or before 15th March 2020 for removal of non-biodegradable COD. The industry will also submit time bound action plan by 30th April, 2020 for removing of colour from its treated effluent going into the drain.
4. The trend analysis of historically data, recorded from OCEMS exhibits that the discharge from M/s Trident Ltd. remains within compliance zone. If such Is the case then let M/s Trident Ltd. shall make all efforts to reuse treated effluent back to production process, resulting in conservation of water owing to less withdrawal of ground water or canal water. Besides, the reuse of treated effluent into the production process will affect efficiency of ETP as the treatment system would receive high concentration of BOD and COD. An action plan in order to reuse its treated water not impacting the TDS of the final treated effluent to be shared with PPCB, by 30th June, 2020.
5. The industry has provided pipe network for distribution of treated trade effluent on the plantation area, however, it was observed that certain patches of plantation was flooded with water and some patches were found completely dry because, the industry is uniformly distributing treated trade effluent to all cells of plantation area irrespective of the age of plants in that cell. The industry, therefore, is required to provide proper irrigation network for optimum utilization of treated wastewater. The industry shall also provide electromagnetic flow meter at the outlet of each cell of plantation making more effective utilization of treated effluent.
6. The industry is not achieving the emission standards of 75 mg/Nm3 from the stack of Chemical Recovery Plant (II) and Energy Section. However, the industry was given opportunity of personal hearing before Hon'ble Chairman of PPCB on 07.01.2020, wherein one of the decision of that the industry shall submit the detailed proposal w.r.t. up gradation of its existing APCDs to achieve the stack emission standard of 75 mg/Nm3 within 03 months along with PERT chart for installation and commissioning of the same.
7. The industry (M/s Trident Ltd) will conduct detailed study for monitoring the ground water quality across the Dhanaula Drain in order to evaluate the impact of its treated water discharge onto Drain and submit the report by 30th April, 2020.
8. The concept of 'Zero Liquid Discharge' be considered as minimal discharge of effluent, particularly from the industrial sectors reported upon. According to mechanics of fluids (more precisely thermodynamics) that a continuous operation bound to generate 'rejects', and / or 'blowdown' and / or bleed due to process entropy, despite of whatever technology adopted. Punjab Pollution Control Board, therefore, has to examine what minimal disposal of effluent be permitted to M/s Trident Ltd. considering the production technology, scale of operation and utilization capacity.

And whereas, the Hon'ble NGT vide orders dated 24.06.2020 had directed as under:

> *"We are of the view that recommendations need to be acted upon, if not already done, as the timelines suggested have already expired and further action is not known. Necessary studies may be got conducted. The State PCB may ensure further remedial action by the industry in the light of the observations quoted above. The joint Committee may verify compliance by coordinating with such other institution as may be found necessary and further compliance report may be filed in the matter by the joint Committee which may be coordinated by the State PCB within three months from today by e-mail at judicial-ngt@gov.in (preferably in the form of searchable/OCR*

PDF and not image PDF. The matter was listed for further consideration on 03.12.2020, which was further adjourned to 08.02.2021."

And whereas, on 29.07.2021 the Hon'ble National Green Tribunal has passed the orders.The operative part of the said orders is reproduced as under:

"Faced with the above, further time is sought for ensuring compliance. In view of long unexplained delay on the part of the State PCB in complying with the orders of this Tribunal, we impose cost of Rs. 1 lakh which may be deposited with CPCB within one month which will be personal responsibility of the Member Secretary, PCB. State PCB is free to recover the same from the erring officers. We further direct the State PCB to now ensure compliance and file compliance report. The industry may achieve suggested water consumption/ minimisation steps, reduction in generation of effluents, following proper ferti-irrigation plan, to be duly monitored and compliant with emission standards. SPCB may also clarify on dual mode of disposal system consented - on land and in Dhanaula drain and mechanism for monitoring standards with two different systems of disposal. The PCB may assess compensation for violations till required pollution control devices are set up and ensure that no environmental degradation takes place. The State PCB to put the industrial unit to notice of proceedings before the Tribunal so that it has an opportunity to show cause before the Tribunal as to why the Tribunal should not take coercive measures in the matter for its continuing failure. The registry may also send notice by email to the said unit".

And whereas, the industry M/s Trident Ltd. (HTD) was constantly pursued by the Board to achieve ZLD and was served notices with opportunities of hearing before Chairman of the Board.

And whereas, the industry M/s Trident Ltd. (HTD) was given hearing before the Chairman of the Board on 27.06.2018, wherein the industry represented as under:-

That since the installation of the first module of RO system of 2500 KLD alongwith MEE in April 2014, the industry is facing technical problem in stabilizing the plant. However, inspite of working continuously with the original equipment manufacturer M/s Euromech, Italy to stabilize the plant, the problem could not be resolved. Further, with the guidance of NEERI, Nagpur, the industry has taken offers from 5 manufacturers for the installation of RO system. The industry has now decided to replace UF technology with MBR technology as pre-treatment of RO. Further, instead of installing 3 modules of 2500 KLD each separately, the industry has now decided to install RO system of total capacity of 7500 KLD in one go and the same shall be installed and commissioned by 30.06.2019. In view of the above, the industry has requested to extend the date for installation of RO system from 30.06.2018 to 30.06.2019. The industry has also requested that the existing ETP and RO system shall be operated and maintained properly till that time, so as to meet with the prescribed standards.

After hearing the representatives of the industry and officer of the Board, it was decided as under:

1. The industry shall install RO system alongwith MEE of the remaining total capacity of 7500 KLD based on MBR technology, instead of installing 3 modules of 2500 KLD each separately, and shall commission the same by 30.06.2019.
2. The industry shall operate and maintain the existing ETP effectively and efficiently, so as to achieve the prescribed standards at all times.
3. The industry will take all necessary steps to ensure that the treated trade effluent discharged onto land for plantation is properly and uniformly distributed in the entire plantation area through proper distribution system.

4. The industry shall take up 10 villages as CSR activities for providing greenery and improving highgiene with the rehabilitation of village ponds on the model of Seechewal. Sh. Balwinder Singh Lakehwali, plantation expert shall assist them in designing the green plant.
5. Environmental Engineer, Regional Office, Sangrur shall monitor the progress made by the industry regarding the above decisions from time to time and submit report.

And whereas, the industry M/s Trident Ltd. (HTD) was given hearing before the Chairman of the Board on 13.02.2019, wherein the industry represented as under:-

a) The industry is continuously working on the reduction of fresh water consumption and succeeded in reducing about 25% consumption of fresh water.
b) The industry has hired Mr. SilanoStorti having expertise in this field and has entered into a contract with M/ Innovation Water Treatment and Recovery Services Pvt. Ltd. for preparation of technical comparative statement of quotation among all the offers received by the industry. He assured that after the installation of above project, no effluent shall be discharged into drain.
c) The industry is regularly and properly operating its effluent treatment plant and the prescribed parameters are analyzed by it on daily basis and indicating conc. of prescribed parameter is within permissible limits.
d) The industry has already taken all necessary steps to ensure that treated trade effluent is discharged onto land for plantation uniformly.
e) The industry has completed plantation in 5 villages as per decision of the hearing.

Industry requested to grant time upto 31.12.2019 for installation of RO plant followed by MEE.

After hearing the officers of the Board and representative of the industry, the Chairman of the Board decided as under:-

1. The industry shall submit PERT Chart regarding proposed RO followed by MEE, within 15 days and install the same by 31.12.2019.
2. The industry shall regularly operate and maintain its effluent treatment plant so as to achieve effluent standards for such discharges and shall ensure the compliance of conditions of consent at all times.
3. Environmental Engineer, Regional Office, Sangur shall regularly submit progress report regarding installation of RO followed by MEE by the industry.

And whereas, the industry M/s Trident Ltd. (HTD) was again given hearing before the Chairman of the Board on 07.01.2020, wherein the industry represented as under:-

> "That it has already placed purchase order to M/s Hydrotech Engineering SRL, CRPVIA DEL LAVORO 8, BASTIA DI ROVOLON 35030, Italy for MBR project, delivery of the all the equipments is expected by 31.03.2020. The said equipmentswill be erected by 20.05.2020 and commissioning of the plant will be completed by 30.06.2020. During hearing, it was also informed that the operation of existing plant has been made off and this will be started after technology upgradation with some common infrastructure to be used. The Effluent Treatment Plant is being operated regularly and effectively by the industry to achieve the prescribed standards laid down by the Board."

After hearing, the following decisions were taken:-

1. The industry shall install and commission MBR project to achieve ZLD by 30.06.2020.
2. The industry shall operate and maintain its Effluent Treatment Plant so as to achieve effluent standards for such discharges and shall ensure the compliance of conditions of consent all the times.
3. Environmental Engineer, Regional Office, SGR shall regularly submit the progress report regarding installation of MBR project by the industry.

In the meanwhile, the CTO of the industry under Water Act,1974 was renewed subject to following special conditions:-

1. The industry shall comply with the recommendations of Joint Committee.

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2. The industry shall submit the action plan within timelines for implementation of each recommendation of the joint committee and decisions of personal hearing given by the Chairman of the Board within 7 days to the Board and ensure the implementations of the same within two months from the date of orders. Further, the industry shall submit the weekly compliance of the recommendations of the joint committee to the Board.

And whereas, the industry vide letter dated 04.07.2020 received on 27.07.2020 represented that due to lockdown and other restrictions imposed by Central and State Governments to avoid Spread of COVID 19 it was not be able to implement the recommendations immediately and sought extension in timelines. The industry further informed that it has already made payment of Rs. 2.94 Crores for the delivery of said project and has already received the equipment partially.

And whereas, due to non-compliances of decisions of personal hearings given to the industry from time to time, M/s Trident Limited (HTD) was issued show cause notice under Water Act, 1974 vide Board's letter no. 1574 dated 12/04/2021 along with opportunity of personal hearing before the Chairman of the Board on 30/04/2021.

The hearing was attended by representative of the industry and stated that the industry has now plan to utilize 100 % of treated waste water onto land for plantation and work will be completed in next 6-9 months. Total discharge from ETP outlet of HTD is 9702 KLD out of which 3000 KLD is being utilized onto land for plantation and remaining 6702 KLD is discharging into Dhanula Drain. The total land requirement for utilizing entire treated trade effluent of 9702 KLD as per the soil study and loading of 91 m3/Acre/day works out to be 106.6 Acres. The industry has already 48.5 Acre developed plantation area, an additional 19.5 Acre has been purchased outside the premises and industry is in process for the procurement of additional 38.6 Acre land. No effluent shall be discharged into Dhanula Drain from the Home Textile Division after completion of work in next 6 months to utilize 100 % of treated waste water onto plantation. The industry further assured that it will continuously work on the recommendations of Joint Committee with full commitment for improvement.

After hearing the officers of the Board, representatives of the industry, Chairman of the Board as decided that:

1. Consent to Operate under Water Act, 1974 be renewed to the industry for a short period of 6 months (i.e.upto 31.10.2021) subject to following special condition:

   "The CTO will be reviewed based on the recommendations of the Joint Committee constituted by NGT in the matter of OA No. 682/2019 filed by Sh. Beant Singh Bajwa, President, National Anti-corruption Council as well as the order passed by the Hon'ble NGT in the said case."

2. The Environmental Engineer, Regional Office, Sangrur shall carry out monitoring of the industry as per protocol, ensure compliances to be made by the industry and submit monthly progress to the Head Office by the 5th of every following month.

And whereas, from the above, it is evident that the industry has failed to comply with the decision of the personal hearing given by the Chairman of the Board from time to time regarding installation and commissioning of MBR project to achieve ZLDand also not complying with all the recommendations of joint committee constituted by the Hon'ble NGT in the matter of O.A. no. 682 of 2019.

And whereas, it has now been proposed to initiate action against the industry due to failure on its part to comply with the recommendations of the Joint Committee and decisions of various personal hearings held before Chairman of the Board from time to time as detailed above.

And whereas, the proposed action to be taken against the industry for non-compliances as detailed above includes imposition of Environmental Compensation for environmental degradation caused due to operations of the industry without making compliances as detailed above and revocation/cancellation of Consent to Operate and restraining the operations of the industry by issuance of directionsu/s 33-A of the Water (Prevention & Control of Pollution) Act, 1974.

And whereas, the industry is hereby afforded an opportunity to file reply within 15 days from issuance of this notice either in writing or in person before Chairman of the Board in his office at

VatavaranBhawan, Nabha Road, Patiala as to why proposed actions may not be taken against the industry for the violations/non compliances as detailed above.

And also whereas, as directed by Hon'ble Green Tribunal vide order dated 29.7.2021, the industry is hereby put to notice of the proceedings before Hon'ble National Green Tribunal affording an opportunity of show cause before the Hon'ble National Green Tribunal as to why the Hon'ble National Green Tribunal should not take coercive measures in the matter for its continuing failure.

29/9/2021

Environmental Engineer (ZP-II)
For & on behalf of Chairman

Endst. No._____ **Dated _____**

A copy of the above is forwarded to the Environmental Engineer, *Punjab Pollution Control Board, Regional Office, Sangrur* for information and necessary action.

Environmental Engineer (ZP-II)
For & on behalf of Chairman

TRUE COPY

Advocate

TRUE COPY

Advocate

ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ
PUNJAB POLLUTION CONTROL BOARD

No. 3293 **REGISTERED** Dated: 24-9-2021

To

M/s Trident Ltd. (PCD),
Trident Complex,Village Dhaula,
Tehsil &Distt. Barnala.

Sub: Violation of provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981.

Whereas a complaint was filed in the Hon'ble NGT by Sh. Beant Singh Bajwa, President, National Anti-corruption Council against M/s Trident Unit in which it was mentioned that chemical water is being discharged in the drain by the said unit. The Hon'ble NGT had directed the Board to look into the matter, take appropriate action in accordance with law and furnish a factual and action taken report to this Tribunal.

And whereas, a report was filed by the Board in the Hon'ble NGT. The Hon'ble NGT on04.12.2019 passed the following orders:

"A report has been furnished by the State PCB finding certain deficiencies and also finding unit compliant in certain respects. There is, however, nothing mentioned about extraction of ground water. We are of the view that a fresh independent and comprehensive inspection is necessary to ascertain the actual situation, as the report furnished is not adequate in all the relevant facts which need to be studied.

Accordingly, we direct fresh inspection by joint Committee of CPCB, State PCB and District Magistrate, Barnala be carried out. The State PCB will be the Nodal Agency for coordination and compliance. The report may be furnished by 31.01.2020, by e-mail. The next date of hearing was fixed 03.03.2020."

And whereas, in compliance to Hon'ble NGT order, the joint committee had undertaken inspection and monitoring of the Complex during 21-23 Feb, 2020 and a report was filed on 29.02.2020 by the joint Committee recording certain recommendations as below:

1. An in-depth study for Environmental Audit may be undertaken particularly in respect for Captive Power Plant, Paper & Towel Division to assess the status for compliance of environment norms/standards. The finding(s) and recommendation (s) of study may be incorporated in the consents issued by PPCB for effectively compliance. This study on Environment Audit be undertaken in consultation with CPCB either by PPCB or through an institute/ consultant having technical expertise in the relevant field.
2. M/s Trident Ltd shall submit a detailed action plan for compliance of condition stipulated by PPCB through its consent orders, dated 10/02/2012 and 30/05/2013, wherein the industry was to install Reverse Osmosis System followed by Multiple Effect Evaporator in its H.T.D. This should be accomplished before 30th June 2020; as mandated by PPCB. The industry shall also submit time bound action plan by 15th March, 2020 for installation of Agitated Thin Film Dryer (ATFD) for the effective handling of MEE reject.
   M/s Trident Ltd (PCD) shall also gradually reduce water consumption and thus effluent generation.The entire treated effluent to be properly utilize on land for plantation / irrigation purpose. The industry should adopt scientific method for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex. An action plan in this regard shall also be submitted by M/s Trident Ltd. to PPCB on or before June 2020 detailing pipe network, land use, watering depth and type / age of plants etc.

Having implemented the above, further two years from now i.e. by June 2022. M/s Trident Ltd. shall get its treated water utilized to nearby farmers for irrigations purpose.

3. M/s Trident Ltd shall undertake a performance study of ETPs provided for its PCD. The industry shall undertake necessary project on its raw material washing stream which nearly contributes to 30% of the total ETP Load. The industry shall also submit a time bound action plan to PPCB on or before 15th March 2020 for removal of non-biodegradable COD. The industry will also submit time bound action plan by 30th April, 2020 for removing of colour from its treated effluent going into the drain.
4. The trend analysis of historically data, recorded from OCEMS exhibits that the discharge from M/s Trident Ltd. remains within compliance zone. If such is the case then let M/s Trident Ltd. shall make all efforts to reuse treated effluent back to production process, resulting in conservation of water owing to less withdrawal of ground water or canal water. Besides, the reuse of treated effluent into the production process will affect efficiency of ETP as the treatment system would receive high concentration of BOD and COD. An action plan in order to reuse its treated water not impacting the TDS of the final treated effluent to be shared with PPCB, by 30th June, 2020.
5. The industry has provided pipe network for distribution of treated trade effluent on the plantation area, however, it was observed that certain patches of plantation was flooded with water and some patches were found completely dry because, the industry is uniformly distributing treated trade effluent to all cells of plantation area irrespective of the age of plants in that cell. The industry, therefore, is required to provide proper irrigation network for optimum utilization of treated wastewater. The industry shall also provide electromagnetic flow meter at the outlet of each cell of plantation making more effective utilization of treated effluent.
6. The industry is not achieving the emission standards of 75 mg/Nm3 from the stack of Chemical Recovery Plant (II) and Energy Section. However, the industry was given opportunity of personal hearing before Hon'ble Chairman of PPCB on 07.01.2020, wherein one of the decision of that the industry shall submit the detailed proposal w.r.t. up gradation of its existing APCDs to achieve the stack emission standard of 75 mg/Nm3 within 03 months along with PERT chart for installation and commissioning of the same.
7. The industry (M/s Trident Ltd) will conduct detailed study for monitoring the ground water quality across the Dhanaula Drain in order to evaluate the impact of its treated water discharge onto Drain and submit the report by 30th April, 2020.
8. The concept of 'Zero Liquid Discharge' be considered as minimal discharge of effluent, particularly from the industrial sectors reported upon. According to mechanics of fluids (more precisely thermodynamics) that a continuous operation bound to generate 'rejects', and / or 'blowdown' and / or bleed due to process entropy, despite of whatever technology adopted. Punjab Pollution Control Board, therefore, has to examine what minimal disposal of effluent be permitted to M/s Trident Ltd. considering the production technology, scale of operation and utilization capacity.

And thereafter, the Hon'ble NGT vide orders dated 24.06.2020 had directed as under:

> *"We are of the view that recommendations need to be acted upon, if not already done, as the timelines suggested have already expired and further action is not known. Necessary studies may be got conducted. The State PCB may ensure further remedial action by the industry in the light of the observations quoted above. The joint Committee may verify compliance by coordinating with such other institution as may be found necessary and further compliance report may be filed in the matter by the joint Committee which may be coordinated by the State PCB within three months from today by e-mail at judicial-ngt@gov.in (preferably in the form of searchable/OCR*

PDF and not image PDF. The matter was listed for further consideration on 03.12.2020, which was further adjourned to 08.02.2021."

And whereas, on 29.07.2021 the Hon'ble National Green Tribunal has passed the orders.The operative part of the said orders is reproduced as under:

"Faced with the above, further time is sought for ensuring compliance. In view of long unexplained delay on the part of the State PCB in complying with the orders of this Tribunal, we impose cost of Rs. 1 lakh which may be deposited with CPCB within one month which will be personal responsibility of the Member Secretary, PCB. State PCB is free to recover the same from the erring officers. We further direct the State PCB to now ensure compliance and file compliance report. The industry may achieve suggested water consumption/ minimisation steps, reduction in generation of effluents, following proper ferti-irrigation plan, to be duly monitored and compliant with emission standards. SPCB may also clarify on dual mode of disposal system consented - on land and in Dhanaula drain and mechanism for monitoring standards with two different systems of disposal. The PCB may assess compensation for violations till required pollution control devices are set up and ensure that no environmental degradation takes place. The State PCB to put the industrial unit to notice of proceedings before the Tribunal so that it has an opportunity to show cause before the Tribunal as to why the Tribunal should not take coercive measures in the matter for its continuing failure. The registry may also send notice by email to the said unit".

And whereas, the industry M/s Trident Ltd. (PCD)was granted Environment Clearance (EC) by MoEF vide letter dated 15.11.2002 and vide dated 07.11.2005 subject to certain conditions as mentioned therein. The perusal of said EC granted to the industry reveals that the industry was granted EC with the condition that the treated effluent shall be used for irrigation purpose. Further, a condition was also imposed by MoEF in the EC granted to the industry vide letter dated 07.11.2005 that the industry shall achieve a particulate emission standard of 75 mg/Nm^3 for emissions generated from co-generation power plant and recovery boiler.

And whereas, the Board has continuously pursued the industry M/s Trident Ltd. (PCD)to reduce the discharge of treated trade effluent into Dhanaula Drain. The industry was given personal hearing before the Chairman of the Board on 22.06.2010, wherein, it was decided that the industry will develop total 200 acres of land as per Karnal Technology for discharge of treated waste water onto land for plantation by 31.07.2010.

And whereas, the industry M/s Trident Ltd. (PCD) was pursued from time to time by the Board to develop additional plantation area. As on today, the industry has developed plantation in an area of 165 acres to utilize its treated trade effluent of 12800 KLD onto land for plantation and remaining treated trade effluent of quantity of 8700 KLD is being discharged into Dhanaula Drain. Further, the industry had been pursued by the Board for diversion of its effluent from drain to onto land for irrigation/plantation purpose along with time schedule. The discharge of treated trade effluent into Dhanaula Drain is required to be divertedonto land for plantation purpose as per the status report submitted by the PPCB in the Hon'ble.Punjab & Haryana High Court in CWP no. 9858 of 2011.

And whereas, samples of the trade effluent being discharged by the industry M/s Trident Ltd. (PCD)were collected by the Officers of the Board on 25.05.2018 and analysis results of samples from outlet of ETP partly leading to plantation are and partly leading to drain as well as from the outlet into drain beyond the limits as prescribed for such discharges.

And whereas, the industry M/s Trident Ltd. (PCD) was given hearing before the Chairman of the Board on 27.06.2018, wherein, the industry represented as under:-

The representatives of the industry submitted that the industry has got the environmental clearance for expansion of its production capacity from 135000 TPA to 2,10,000 TPA and increase in

captive co-generation from 49.4 MW to 90.9 MW from MoEF on 22/08/2016 and NOC for expansion was issued by the Board on 14/03/2017. The industry has not yet made the proposed expansion. However, the quantity of treated trade effluent discharged into the drain will remain the same i.e. 8700 KLD only and the remaining treated trade effluent shall be used for plantation purposes. The industry is having permission to discharge its treated trade effluent into the drain from the Drainage Department. Further, the industry is monitoring the ground water quality in an around the plantation area on its own. The water consumption in the industry is 50.4 m^3 /ton of paper produced, which is 0.8% higher than the benchmark and the industry shall achieve the benchmark by process optimization of existing technology. Regarding non-achievement of trade effluent standards, the industry has submitted that it has made upgradation in the aeration tank by installing two floating aerators for better efficiency and to achieve the prescribed standards. The industry has requested for resampling of the treated trade effluent in view of the above upgradation.

After hearing, the representatives of the industry and officer of the Board, Chairman of the Board decided as under:

1. The industry shall operate the ETP effectively and efficiently, so as to achieve the prescribed standards at all times.
2. The industry will take all necessary steps to ensure that the treated trade effluent discharged onto land for plantation is properly and uniformly distributed in the entire plantation area through proper distribution system.
3. The industry shall submit scheme for laying of piping network to make arrangements for use of remaining treated trade effluent for irrigation purposes by the farmers of the surrounding areas.
4. The industry shall take the services of any expert in the paper industry, for the reduction in the waste water generation from the unit.
5. The industry shall adopt 10 villages as CSR activities for providing greenery and improving highgiene with the rehabilitation of village ponds on the model of Seechewal. The industry shall also depute any plantation expert for designing the green plants.
6. Environmental Engineer, Regional Office, Sangrur shall monitor the progress made by the industry regarding the above decisions from time to time, carry out sampling of the industry again and submit report / recommendations in the matter accordingly.

And whereas, to review the progress made by the industry with regard to the hearing decisions held on 27/06/2018 as well as compliance of environmental clearance granted to the industry vide letter dated 7/11/2005 the industry M/s Trident Ltd. (PCD) was given hearing before the Chairman of the Board on 07.01.2020.

And whereas, during the hearing the representative of the industry M/s Trident Ltd. (PCD) submitted a written reply and represented as under:-

The industry is already utilizing 61 % treated trade effluent onto land for plantation in an area of 165 Acres. In addition to this, the industry is also in the process of development of additional plantation area of approx.. 9.5 Acres.

a) A study pertaining to quality of ground water in and around the project has already been got conducted from NABL approved Laboratory. The industry has also engaged M/s CholaMandalam Risk Services Ltd. to conduct a detailed ground water study across the drain. The study of the same has been completed.

b) The industry has entered into an agreement with the farmers for the use of treated trade effluent for irrigation purpose in the surrounded area. The industry has also submitted a request letter to the drainage deptt. for approval of laying piping network for the use of remaining treated trade effluent for irrigation purpose.

c) The industry has also taken the services of expert Mr. SilvanoStorti to reduce its fresh water consumption / wastewater generation in the manufacturing process.

d) The industry has adopted 10 villages under CSR activities for providing greenery and has completed plantation dry in 5 villages.

After hearing the officers of the Board, representative of the industry, the Chairman of the Board decided as under:

1. The industry shall submit the detailed proposal w.r.t upgradation of its existing APCDs to achieve the stack emission standard of 75 mg/Nm^3 within 3 months alongwith PERT chart for installation and commissioning of the same.
2. The industry shall submit the report of study carried out w.r.t the quality of ground water in and around the project by 30.01.2020.
3. The industry shall submit the report w.r.t the work carried out in five villages under the CSR activities to the Board within 7 days and also carry out the work in remaining villages.
4. The industry shall submit the proposal to reduce its fresh water consumption / wastewater generation in the manufacturing process to the Board.
5. The industry shall start giving its treated trade effluent for irrigation purpose in the surrounded area and also expedite the process of laying piping network for the use of remaining treated trade effluent for irrigation purpose and submit final timelines for the same.

And whereas, due to non-compliances of decisions of personal hearings given to the industry from time to time, M/s Trident Limited (PCD) was issued show cause notice under Water Act, 1974 vide Board's letter no. 1574 dated 12/04/2021 along with opportunity of personal hearing before the Chairman of the Board on 30/04/2021.

The representatives of the industry attended the hearing and submitted written reply, which was taken on record. He further stated that the industry is achieving water consumption @ 46m3/Ton with the implementation of various water conservation initiatives. The production, water consumption and effluent generation is being done fulfilling the norms prescribed by the Board.The Industry has achieved water consumption level of 46 m3/Ton of paper by adopting various water conservation projects against the prescribed limit 50 m3/Ton of paper and has already complied the long term objective for water consumption for Pulp & Paper Industry. Regarding upgradation of APCD the representative of the industry informed that the industry has received technical offer from three suppliers but the progress has been hampered due to prevailing Pandemic scenario. The representative requested to extend the target time lines to September, 2022. The Industry further assured that it will continuously work on the recommendations of Joint Committee with full commitment for improvement.

Regarding utilization of entire treated wastewater onto land for irrigation, the industry informed that it has already started work to get utilized its treated trade effluent for plantation area. Industry has submitted the letter to Drainage department seeking permission to utilize the treated trade effluent outside the premises on the newly procured land nearly 21 acres. Industry is waiting the confirmation from the drainage department on the same. The industry further submitted that by June, 2022, whole of the treated water will be utilized onto land for plantation and no treated / untreated effluent will be discharged into drain.

After hearing the officers of the Board, representatives of the industry, Chairman of the Board decided that:

i. Consents to Operate be renewed to the industry for a short period of 6 months (i.e.upto 31.10.2021) subject to following special conditions:

   a) The CTOs will be reviewed based on the recommendations of the Joint Committee constituted by NGT in the matter of OA No. 682/2019 filed by Sh. Beant Singh Bajwa,

President, National Anti-corruption Council as well as the order passed by the Hon'ble NGT in the said case.

b) The industry shall strictly comply with the decisions of personal hearing taken by the Chairman of the Board held on 17.12.2013 regarding production capacity i.e. the production capacity for manufacturing of paper will be restricted to 415TPD if no purchased bleached pulp is used and additional production of paper @ 35 TPD from the purchased bleached pulp, the requirement of which is about 24 TPD. The record shall be submitted by the industry to the Board on monthly basis.

ii. The industry shall follow the procedure as prescribed in MoEF& CC notification No. S.O.980(E) dated 2.3.2021 regarding no increase in pollution load in case the industry wants to go for change in production of paper beyond the quantities allowed as per environmental clearance granted to the industry by MoEF& CC vide No. J-11011/52/2005 IA-II (I) dated 7.11.2005.

iii. The Environmental Engineer, Regional Office, Sangrur shall carry out monitoring of the industry as per protocol, ensure compliances to be made by the industry and submit monthly progress to the Head Office by the 5th of every following month.

And whereas, regarding undertaking performance study of ETP provided for its PCD, the industry informed that it has already undertaken the performance study of its ETP of PCD from Thapar Institute, Patiala. The industry has also submitted that it has already implemented recommendations of Thapar Institute in its report.

The industry has informed that it has already taken the project on its raw material washing stream which nearly contributes to 30% of the total ETP Load by adopting the latest DAF and screw press technology with the total investment of nearly INR 10.50 crore.

The industry has further informed that it has awarded the project to the Department of Energy and Environment at Thapar Institute to conduct a pilot study for the removal of color. The industry has also submitted that final report w.r.t. removal of colour will be submitted by Thapar Institute by November, 2021 and thereafter, same will be submitted to the Board, immediately.

And whereas, the industry has not submitted any action plan to reuse its treated water not impacting TDS of the final treated effluent which has to be shared with PPCB by 30th June, 2020. The industry submitted that TDS value at this concentration is nearly 2100 ppm which is within the permissible limit for discharge standard. Any recycling of this water back to the process house will increase concentration cycle and will eventually increase the TDS of final treated water. The industry has explored & implemented project for the reducing the water consumption not impacted the TDS. The recovery of RO plant in its energy divisionhas been increased from 76 % to 84.5% thereby reducing water consumption of 300-350 m^3/day. The reply submitted by the industry is not accompanied by any study from institute of report and is not satisfactory.

And whereas, the industry has not submitted any action plan detailing pipe network, land use, water depth and types/age of plants etc. which it was required to submit to PPCB on or before June, 2020 for proper and scientific method utilization of its treated waste water onto land plantation within its premises to maximize the utilization of treated waste water within the complex.

And whereas, the industry has not submitted any detailed irrigation network scheme for optimum utilization of treated waste water. The industry has only informed that it has improved [illegible] on the plantation area and provided proper irrigation network for optimum utilization of treated wastewater.

And whereas, the industry has already been directed by the Board to upgrade its existing APCD so as to achieve the norm of 75 mg/Nm^3. In this regard, the industry had earlier submitted proposal along with timelines for the up gradation of existing APCDs as tabulated below:

Sr. No.	Name of the Unit/Section	Proposed timelines
1.	Recovery I	30.09.2021
2.	Recovery II	30.11.2021
3.	Cogeneration Plant 2 & 3	15.05.2021

The industry vide letter dated 27.4.2021 has informed that technical offers from 3 suppliers on the Electro Stating Precipitator (ESP) upgradation have been received and the progress has been hampered due to the prevailing pandemic scenario. The industry has requested to extend the target timelines to September, 2022.The Industry has failed to upgrade its APCD to achieve the prescribed emission standards of 75 mg/Nm^3.

And whereas, from the above, it is evident that the industry has failed to comply with the decision of the personal hearing given by the Chairman of the Board from time to time w.r.t. utilization of treated trade effluent onto land for plantation by developing additional plantation area, to divert the discharge of treated trade effluent onto land for plantation from Drain as per the status report filed by the Board in the Hon'ble Punjab & Haryana High Court in CWP no. 9858 of 2010, to achieve the stack emission standard of 75 mg/Nm^3 as per EC condition, utilization of treated trade effluentfor irrigation purpose in the surrounding areas by the farmers by providing piping network and also not complying with all the recommendations of joint committee constituted by the Hon'ble NGT in the matter of O.A. no. 682 of 2019.

And whereas, it has now been proposed to initiate action against the industry due to failure on its part to comply with the recommendations of the Joint Committee and decisions of various personal hearings held before Chairman of the Board from time to time as detailed above.

And whereas, the proposed action to be taken against the industry for non-compliances as detailed above includes imposition of Environmental Compensation for environmental degradation caused due to operations of the industry without making compliances as detailed above and revocation/cancellation of Consents to Operate and restraining the operations of the industry by issuance of directions u/s 33-A of the Water (Prevention & Control of Pollution) Act, 1974 and 31-A of the Air (Prevention & Control of Pollution) Act, 1981.

And whereas, the industry is hereby afforded an opportunity to file reply within 15 days from issuance of this notice either in writing or in person before Chairman of the Board in his office at VatavaranBhawan, Nabha Road, Patiala as to why proposed actions may not be taken against the industry for the violations/non compliances as detailed above.

And also whereas, as directed by Hon'ble Green Tribunal vide order dated 29.7.2021, the industry is hereby put to notice of the proceedings before Hon'ble National Green Tribunal affording an opportunity of show cause before the Hon'ble National Green Tribunal as to why the Hon'ble National Green Tribunal should not take coercive measures in the matter for its continuing failure.

24.9.2021

Environmental Engineer (ZP-II)
For & on behalf of Chairman

Endst. No._____ **Dated _____**

A copy of the above is forwarded to the Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur for information and necessary action.

Environmental Engineer (ZP-II)
For & on behalf of Chairman

TRUE COPY

Advocate

TRUE COPY

Advocate

ANNEXURE R-2 (41)

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TRIDENT/2021/05
09 11 2021

To,

The Senior Environmental Engineer,
Punjab Pollution Control Board,
Zonal Office-2, Nabha Road,
Patiala

Subject: Reply to the Show Cause Notice Dated 24 Sep 2021 via Letter No. 3295 regarding the Violation of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981, received on 30.9.2021.

Respected Sir,

This is in reference to the subject Show Cause Notice dated 24 Sep 2021 via Letter No. 3295 regarding the alleged Violations of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 which was received by our company/industry on 30.09.2021.

We wish to submit that being a Compliance Oriented Industry, the company has always worked towards a complete adherence to all applicable norms/standards under the Environment Act, the Water/Air Acts, etc. The industry has also continuously worked on the recommendations and the decisions of the personal hearings as well as recommendations/directions of the National Green Tribunal Joint Committee to every extent possible, and is, at this point in time, to justifiably state that the company has been meeting all parameters as prescribed.

The industry hereunder providing the status and the reply in respect to the points mentioned in the notice as following:

Sr No	Point	Reply and Compliance of Industry
1	Installation & commissioning of MBR project to achieve ZLD by 30 June 2020	a. The Industry has installed RO plant followed by MEE plant in year 2014 for waste water recycling with total expenditure of INR 33 crores (OEM RO- Euromec-10.84 crores, OEM MEE Ketav Consultant- 5.88 crores). b. Industry had faced the technology failure after 1 year of the plant commissioning & apprise the status to the board. After inputs taken from the NEERI & Environmental consultant Mr Silvano Stroli recommendation was considered to upgrade the existing plant with improved technology i.e. MBR technology

09/11/2021

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c. The industry placed the order for the new technology MBR plant as proposed by consultant having cost of 2.94 crores (The plant was delivered at site in March 2020).

d. The industry (HTD) had informed the Board vide Letter No. Trident/2020/24 dated 31.03.2020 that the industry would not be in a position to complete the project to install Reverse Osmosis System followed by Multiple Effect Evaporator in its towel division within the given timelines due to the lock down and other restraints and restrictions imposed by the Central Government and the State government in order to curtail the spread of COVID-19 and had sought support of the Board to keep the project in abeyance till the situation becomes conducive to the upgradation.

e. In addition to above, as per CPCB guidelines dated Sep 2019 regarding utilization of treated water for irrigation as alternate to ZLD , the industry has purchased additional land of 51.5 Acres out of which 32 acres has been developed for plantation for diversion of treated trade effluent from drain to said plantation area .

- Production of Last 5 years: 77.3 TPD (Consented: 120 TPD)
- Effluent Onto Drain: 2313 KLD (Consented: 6702 KLD)
- Additional Plantation Area Requirement to stop Effluent onto drain: 26 Acres

*Irrigation Loading considered as per MOEF Gazette of India dated 14 Jan 2016 (treated water irrigation protocol)
At Present, the production of the unit is 77.3 TPD and the total discharge of 5365 KLD is generated from said production against consented discharge of 9702 KLD out of which 3014 KLD is already been utilized for plantation & 2313 KLD is going to drain . For the remaining effluent of 2313 KLD, the industry has already developed the adequate land of 32 Acres to divert the existing discharge onto drain. The Pipeline laying work is under progress which will be completed by 20 Nov and after that no effluent will be discharged onto Dhanaula Drain.
The industry is also in process of further developing plantation area of 19.5 Acres which has already been purchased by the industry. This activity will be completed before 31 Dec 21.
Further, the Industry hereby undertake that industry will not increase its production capacity beyond 77.3 TPD before obtaining permission from Board and subsequent development of additional plantation area to utilize 100 % treated trade effluent onto plantation area & no discharge onto Dhanaula Drain.

The industry further submits that the efforts being done were appreciated by the National Institutes. Further, the industry has noted and started working on all the

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recommendations given in Environment Audit conducted by NIT Jalandhar. The progress of the same is attached as below:

S No.	Recommendation	Compliance of Industry
1.	Despite the fact that the treated effluent is complying the regulations of the statutory body, the discharge of the coloured effluent may cause aesthetical unpleasantness. Moreover, it is highly objectionable to the general public. So,in the current scenario, the emphasis should be given to develop more efficient microbial mass for de-colorization of effluent in the activated sludge process. A further study may be conducted from the Central/State government institutes of national importance such as IITS, NITS etc. to assess the application of microbial consortia/dedicated pure culture/tertiary treatment for de-colorization of the effluent.	**Completed** .The collaboration with National Institute for the colour study has been done . The Collaboration copy with the institute is attached as Annexure 1.
2.	The raw water requirement of the HTD is mainly met from the withdrawal of groundwater. As per test reports of the groundwater, it contains a high level of TDS(900-1000 mg/l). The high level of TDS in raw water would ultimately lead to higher TDS in the treated effluent affecting its quality for plantation and drainage. The replacement of the source of water from groundwater to other source with better quality of water (such as surface water) could help in further reduction of pollutant load of the treated effluent.	**Completed** . The Industry has developed the infrastructure for the utilization of surface water in its process and started using surface water instead of ground water.

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3	In the absence of RO &amp, MEE system, the other safe ways of disposal of effluent should be explored. The HTD is currently disposing only 3000 KLD of its treated effluent onto 48.5 acres of land for plantation. The industry should look into the possibility of enhancement of the plantation area (land requirement, type of plant, piping network, watering depth etc.) for more utilization of the treated effluent for plantation in an effective manner to eventually achieve zero liquid discharge (ZLD) to the drain. The option of providing some portion of the treated effluent to nearby farmers for irrigation of the cash crops should also be given a thought. Further, a detailed hydrogeological study of the area around the industry should be conducted from the Central/State government institutes of national importance such as IITS, NITS and NIH etc. on yearly basis to know the impact and footprints of the industrial effluent (used for plantation) onto the groundwater and soil of the locality. The hydrogeological study would also suggest effective remedial measures to meet any adverse impact of the use of the industrial effluent on the aquifers and soil, if any.	**Under Progress** . The industry has purchased additional land of 51.5 Acres out of which 32 acres has been developed for plantation for diversion of treated trade effluent from drain to said plantation area . At Present , the production of the unit is 77.3 TPD , and the total discharge of 5365 KLD is generated from said production out of which 3014 KLD is already been utilized for plantation . For the remaining effluent of 2313 KLD , the industry has already developed the adequate land of 32 Acres to utilize the existing discharge onto drain . The Pipe line laying work is under progress which will be completed by 20 Nov and after that no effluent will be discharged onto Dhanaula Drain . The Industry is also in process of further developing plantation area of 19.5 Acres which has already been purchased by the industry. This activity will be completed before 31 Dec 21. Further , the Industry hereby undertake that industry will not increase its production capacity beyond 77.3 TPD before obtaining permission from Board and subsequent development of additional plantation area to utilize 100 % treated trade effluent onto plantation area & no discharge onto Dhanaula Drain . The Industry has also completed hydrogeological study of the area around the Industry dated Dec 2019 from M/s Chola Mandalam which depicts there is no any adverse impact of the use of the industrial effluent on the aquifers and soil.

The industry can assure a complete and effective compliance of all the recommendations, as per the experts and to the extent feasible, that it shall comply with any other suggestions for further improvement.

You are requested to kindly withdraw the subject show cause notice in the light of the sincere efforts and ongoing upgradation, as submitted above, and the compliances already made by the industry.

Thanking you,

Yours faithfully
For Trident Limited

LOVELISH GOYAL
Digitally signed by LOVELISH GOYAL
Date: 2021.11.09 12:18:00 +05'30'

[Lovelish Goyal]
Factory Manager

Encl: AS above

09/11/2021

TL/2021/016164

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TRIDENT/2021/05
09.11.2021

To,

The Senior Environmental Engineer,
Punjab Pollution Control Board,
Zonal Office-2, Nabha Road,
Patiala.

18/19
9-11-2021

Subject: Reply to the Show Cause Notice Dated 24 Sep 2021 via Letter No. 3293 regarding the Violation of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981, received on 30.9.2021.

Respected Sir,

This is in reference to the subject Show Cause Notice dated 24 Sep 2021 via Letter No. 3293 regarding the alleged Violations of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 which was received by our company/industry on 30.09.2021.

We wish to submit that being a Compliance Oriented Industry, the company has always worked towards a complete adherence to all applicable norms/standards under the Environment Act, the Water/Air Acts, etc. The industry has also continuously worked on the recommendations and the decisions of the personal hearings as well as recommendations/directions of the National Green Tribunal Joint Committee to every extent possible, and is, at this point in time, to justifiably state that the company has been meeting all parameters as prescribed.

The industry hereunder providing the status and reply in respect of the points mentioned in the Notice .

1. **Utilization of treated trade effluent onto land for plantation by developing additional plantation area; to divert the discharge of treated effluent onto land for plantation from drains.**

Trident Paper is utilizing its 63% of treated water into existing developed plantation land and discharge only less than 37% treated water into permitted drain.

Sr No	Month	Total Water	Water in Drain	Water in plantation
		KLD	KLD	KLD
Consented		<21500	<8700	<13200
1	CY 2018	19924	7560	12364
2	CY 2019	17040	7165	9875

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3	CY 2020	14608	4833	9775
4	CY 2021	15684	5299	10385
	Average	16814	6214	10600

Land required for utilization of 6214 KLD treated water onto plantation is 68.2 acres.

Land required for utilization of 8700 KLD treated water onto plantation 95 acres.

Action Plan for utilization of 100 % treated water onto irrigation by farmers/additional land for the existing running capacity :

Sr. No.	Activity Description	UOM	Sep 21	Jan-22	Mar-22	May-22	Jun-22
1	Submission of Drawing of Pipe & Application for crossing pipe over existing drain .						
2	Approval from Drain Department for laying pipe over existing drain for utilization of treated water for irrigation . **Permission Copy Enclosed .**						
3	Agreement with farmers and laying of pipe & ordering of pipeline	Acre		21	20.2		27
4	Approval from drain department for laying the pipe parallel to the drain						
5	Laying of pipeline to additional land/farmers land and agreement with farmers						

The Industry would further like to mention that the total effluent discharge is in the tune of 6000-6500 KLD against the consented allowed discharge of 8700 KLD.

The Industry will only increase its effluent generation further after the increase in land allotment for the corresponding increased effluent .

2. **To achieve the stack emission standard of 75 mg/Nm3 as per EC condition.**

As per CPCB guidelines , the stack emission standard applicable to Boiler is 150 mg/Nm3 . As per monitoring carried out by Board and audit agency , the industry is achieving a standard of 80 mg/Nm3 for recovery 2 and 98 mg/Nm3 for Captive

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Boiler against standard of 150 mg/Nm3 .However , a standard of 75 mg/Nm3 has been imposed in one condition of EC .

The Industry has earlier submitted time lines to upgrade its existing APCD to achieve the revised standard which are as under :

S NO.	Boiler	Parameter	Result	EC Norm	Time Line
1	Recovery 1	SPM	82	<150	Complied
2	Recovery 2	SPM	80	<75	Sep 21
3	Captive Boiler	SPM	98	<75	May 21

However , due to covid in the country , the Industry was unable to upgrade its APCD and now the Industry has ensured to upgrade the APCD to achieve the revised standard as per below time lines .

S NO.	Boiler	Parameter	Result	EC Norm	Time Line
1	Recovery 1	SPM	82	<150	Complied
2	Recovery 2	SPM	80	<75	30 Sep 22
3	Captive Boiler	SPM	98	<75	28 Dec 21

The Industry has placed an order for APCD upgradation for its Captive Power Plant Boiler and the installation will be completed before 28 Dec 21 .The order copy for the same is attached as **Annexure 1 .**

For the Recovery 2 Boiler , the Industry has finalized the technology suppliers and has conducted industrial visit in Oct 21 to validate the performance of the new ESP and has seek time till Sep 2022 considering the delivery of new ESP as 9-10 months

Comparative Statement of the technology suppliers is attached as **Annexure 2.**

The order for the new ESP will be placed before 30 Nov 21 .

The Industry is located outside the MC limit of Barnala & there is no residential area surrounding.

3. **Utilization of treated trade effluent for irrigation purpose in the surrounding areas by the farmers by providing piping network.**

a. In order to give its treated water to farmers, the industry has got the permission from the Drainage Department for laying of pipe network across the drain . Permission Copy of the same is attached as **Annexure 3.**

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b. The Industry has been granted permission from the Board to discharge 8700 KLD of treated trade effluent onto drain , however average value of treated water onto drain is 6214 KLD .

c. The Industry in order to utilize the said treated water by farmers attach an action plan as **Annexure 4.**

The Industry further submit that the efforts being done were appreciated by the National Institutes. Further, the industry has noted and started working on all the recommendations given in Environment Audit conducted by CPPRI, Saharanpur.

The Industry can assure a complete and effective compliance of all the recommendations, as per the experts and to the extent feasible, that it shall comply with any other suggestions for further improvement.

You are requested to kindly withdraw the subject show cause notice in the light of the sincere efforts and ongoing upgradation, as submitted above, and the compliances already made by the industry.

Thanking you,

Yours faithfully
For Trident Limited

SARVJEET SINGH Digitally signed by SARVJEET SINGH
Date: 2021.11.09 12:00:59 +05'30'

[Sarvjeet Singh]
Factory Manager

Encl: AS above

TRUE COPY
Advocate

TRUE COPY
Advocate

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ANNEXURE R-3

49

Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY JALANDHAR
G T Road Bye Pass, Jalandhar-144011, Punjab (India)
(An Institute of National Importance under Ministry of Education, Govt. of India)

NITJ/CH/21/1012 Dt. 03-11-2021

To
Mr Rajat Monga
M/s Trident Ltd.
Barnala, Punjab

Subject: Acceptance of offer for conduct of research study on Color Reduction of Effluent from ETP of Dyeing Unit of M/s Trident Ltd, Barnala.

Dear Sir,
This is in reference to your offer for conduct of research study on color reduction of effluent of dyeing unit as per details given below:-

Type of Project	**Research & Development**
Topic of Project	**Color Reduction of Effluent from ETP of Dyeing Unit**
Investigating Team	**Dr Jatinder Kumar Ratan (Principal Investigators)** **Dr Nitin Pandhare (Co-PI)** **Dr Nikhil G N (Co-PI)** **Dr Sumer Meena (Co-PI)**
Duration	**02 years**
Cost	**4.5 Lacs**
Deliverable	**Outcome of the research study in the form of report**

We are pleased to accept your offer to conduct the above-mentioned study at our Institute. The detailed proposal for the study is also attached herewith for your ready reference. You are requested to deposit the sanctioned amount to the institute account so that the study be started as soon as possible.

Best Regards,

Dr Jatinder Kumar Ratan
Associate Professor in Chemical Engineering &
Associate Dean (Faculty Welfare)

RECOMMENDATIONS OF NIT AFTER ENVIRONMENT AUDIT – TOWEL DIVISION

S No.	RECOMMENDATION	COMPLIANCE BY INDUSTRY
1	Despite the fact that the treated effluent is complying the regulations of the statutory body, the discharge of the coloured effluent may cause aesthetical unpleasantness. Moreover, it is highly objectionable to the general public. So,in the current scenario, the emphasis should be given to develop more efficient microbial mass for de-colorization of effluent in the activated sludge process. A further study may be conducted from the Central/State government institutes of national importance such as IITS, NITS etc. to assess the application of microbial consortia/dedicated pure culture/tertiary treatment for de-colorization of the effluent.	**Completed** .The collaboration with National Institute for the colour study has been done .
2	The raw water requirement of the HTD is mainly met from the withdrawal of groundwater. As per test reports of the groundwater, it contains a high level of TDS(900-1000 mg/l). The high level of TDS in raw water would ultimately lead to higher TDS in the treated effluent affecting its quality for plantation and drainage. The replacement of the source of water from groundwater to other source with better quality of water (such as surface water) could help in further reduction of pollutant load of the treated effluent.	**Completed** . The Industry has developed the infrastructure and started using surface water instead of ground water in its textile business .

RECOMMENDATIONS OF NIT AFTER ENVIRONMENT AUDIT – TOWEL DIVISION

S No.	RECOMMENDATION	COMPLIANCE BY INDUSTRY
3	In the absence of RO & MEE system, the other safe ways of disposal of effluent should be explored. The HTD is currently disposing only 3000 KLD of its treated effluent onto 48.5 acres of land for plantation. The industry should look into the possibility of enhancement of the plantation area (land requirement, type of plant, piping network, watering depth etc.) for more utilization of the treated effluent for plantation in an effective manner to eventually achieve zero liquid discharge (ZLD) to the drain. The option of providing some portion of the treated effluent to nearby farmers for irrigation of the cash crops should also be given a thought. Further, a detailed hydrogeological study of the area around the industry should be conducted from the Central/State government institutes of national importance such as IITS, NITS and NIH etc. on yearly basis to know the impact and footprints of the industrial effluent (used for plantation) onto the groundwater and soil of the locality. The hydrogeological study would also suggest effective remedial measures to meet any adverse impact of the use of the industrial effluent on the aquifers and soil, if any.	**Completed .** The industry has purchased additional land of 51.5 Acres out of which 32 acres has been developed for plantation for diversion of treated trade effluent from drain to said plantation area . At Present , the production of the unit is 77.3 TPD , and the total discharge of 5365 KLD is generated from said production, the industry has already developed the adequate additional land of 32 Acres to utilize the existing discharge onto plantation. The Industry has diverted all its treated trade effluent onto plantation area and there is no discharge of treated water onto Dhanaula Drain since 15 Nov 21 . The Industry is also in process of further developing plantation area of 19.5 Acres which has already been purchased by the industry . This activity will be completed before 31 Dec 21. Further , the Industry hereby undertake that industry will not increase its production capacity beyond 100.4 TPD before obtaining permission from Board and subsequent development of additional plantation area to utilize 100 % treated trade effluent onto plantation area & no discharge onto Dhanaula Drain . The Industry has also completed hydrogeological study of the area around the Industry dated Dec 2019 from M/s Chola Mandalam which depicts there is no any adverse impact of the use of the industrial effluent on the aquifers and soil .

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

S No.	RECOMMENDATION	ACTION PLAN	TIME LINE	COMPLIANCE BY INDUSTRY
1	The mill has adopted several water conservation strategies to reduce the freshwater consumption. The level of mill's freshwater consumption is similar to contemporary agro based writing and printing paper mills. However, looking into the reported freshwater consumption benchmarks, the mill has still a scope to reduce freshwater consumption by further 3-4 m^3/t paper and mill may explore areas for the same, for example 100% utilization of foul condensate in pulp mill can help in reducing water consumption by 1m^3/t paper while installation of disc filter at PM1 can facilitate reduction in freshwater consumption by 1.5 -2.0 m^3/t paper	Utilization of foul condensate in Pulp Mill & more back water in Pulp Mill .	28-Dec-21	Completed. Utilization of Recovery Condensate in Wet Washing has been started . Water Saving : 0.91 m3/T
2	The mill is advised to have sub monitoring of its treated effluent being utilized in its plantation area to have proper water balance.	Completed	Completed	Completed .
3	The mill may explore installation of appropriate technology for the recovery of white rejects (centri cleaner rejects) coming from paper machine for further improving performance of the ETP.	Installation of 2 No. Disc Filters against existing Vibratory Screens to increase the capture Suspended Solids efficiency from existing 40 % to > 80 %	10-Nov-21	Completed. Installation of 2 disc filters has been completed . TSS reduction has improved from 40 % to 81 %.

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

S No.	RECOMMENDATION	ACTION PLAN	TIME LINE	COMPLIANCE BY INDUSTRY
4	The mill needs to immediately upgrade / retrofit the existing UASB reactor as the mill is not able to utilize the biogas generated as the gas collection and distribution system have corroded developing leakages. This is resulting in an estimated loss of Rs 60-70 lakhs/ annum.	Purchase order will be placed by 20 Dec 21 .The new system will be made functional by 28 Aug 2022	28-Aug-22	Under Progress . The Industry has awarded Agreement to Paques Environment Technology – Netherland for new system for recovery of biogas . Commissioning Time : 7 Months
5	The mill may should reduce the suspended soild level in primary clarifier overflow through use of coagulants and flocculants to further improve the performance of existing ETP.	Usage of cogulants and floculants	20-Oct-21	Completed . Usage of PAC & Lime as coagulant & Polymer as Flocculant has been started .
6	The mill may install a coagulation and flocculation system before primary clarifier to improve its performance.	Installation of Coagulation-flocculation Project	15-Dec-21	Completed

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

S No.	RECOMMENDATION	ACTION PLAN	TIME LINE	COMPLIANCE BY INDUSTRY
7	The mill is advised to make a proper boundary of existing equalization tank and make provision of air supply for homogenizing the effluent.	The industry will take necessary steps for proper boundary by 20 Feb 22 and provision of air supply system in equalization tank by 20 Jun 2022.	20-Feb-22 & 20 Jun-22	Under Progress . Project has been approved and civil work will be started from 18 Dec 21.
8	The mill is advised to install poly disc filter (PDF) at Paper Machine 1 also for increased fibre recovery and reuse/ recycled of paper machine backwater.	The industry will explore the recycling technology for the paper machine -1 effluent for the recovery and reuse of paper machine backwater this will be complted by 30 Oct'22.	30-Oct-22	Under Progress The Industry has floated enquiries to get the techno commercial offers for the reuse of paper machine back water .
9	The treated effluent quality meets the stipulated norms. However, the mill needs to adopt appropriate technology to reduce the colour.	Collaboration with Thapar has been done . Study will be completed in Dec 21.	30 Dec 21	Under Progress . Report from Thapar is expected by 25 Dec 21 .
10	The mill is advised to get the OCEMS at final discharge and ESP outlet calibrated on periodical basis.	Same will be implemented on immediate basis and report will be shared by 30 Oct 2021	Completed	Completed

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

S No.	RECOMMENDATION	ACTION PLAN	TIME LINE	COMPLIANCE BY INDUSTRY
11	The SPM level in the stack emissions are lower than stipulated norms of 150 mg/Nm³. However, in context of the EC norms of 75 mg / Nm³ for SPM, the mill need to look into optimization of its boiler operation / ESP operation or Upgrade ESPs to comply with the new norms.	Commercial negotiation is under progress. New ESP will be installed for Rec 2 by 30 Sept 2022. Delivery Period of New ESP is 10 months . For energy ESP, we will install HF controller to reduce its SPM levels to 75 mg/Nm3 by 30 Nov 2021.	30-Nov-21 30-Sep-22	Under Progress Cogeneration Boiler : Installation of HF Controller Completed . Commissioning & Stabilization Completed . Recovery Boiler 2 : Agreement with Hamon for supply of new ESP has been done .
12	Though the mill has appropriate facilities and trained & experienced manpower for environmental monitoring and analysis the mill may get quarterly / half yearly/ yearly environmental monitoring done from a third party / independent institution.	Yearly monitoring will be implemented before 30 Nov'21	30 Nov'21	Under Progress : The proposal for Environment Monitoring has been received on 29 Nov 21 . Yearly Monitoring will be carried out.

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ANNEXURE R-4

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STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS :	WATER REDUCTION MEASURES AND DATA				

Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries

(Specific to Ganga River Basin States)

A.K.Vidyarthi
Additional Director
Central Pollution Control Board
Delhi

April, 2015

PREPARED BY	DOCUMENT NO	PAGE 1 OF 7
RAM ASHISH	SUS/PB/SW -02	
APPROVED BY	ISSUE DATE	REVISION NO./ REVISION DATE
RAJAT MONGA	30/09/2021	-

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS :	WATER REDUCTION MEASURES AND DATA				

Fresh Water Consumption Norms (m^3/t of product)

Category	Short Term Objectives	Long Term Goals
A1: Wood Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint	60	50
A2: Wood Based Pulp & Paper Mills producing unbleached grades of chemical pulps, papers and paperboards	40	25
B1: Agro Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint	60	50
B2: Agro Based Pulp & Paper Mills producing unbleached grades of papers and paperboards	40	25
C1: RCF & Market Pulp Based Paper Mills producing bleached grades of papers, paperboards & newsprint	20	15
C2: RCF & Market Pulp Based Paper Mills producing unbleached grades of papers and paperboards	15	10
D : RCF & Market Pulp Based Specialty Paper Mills#	60	50

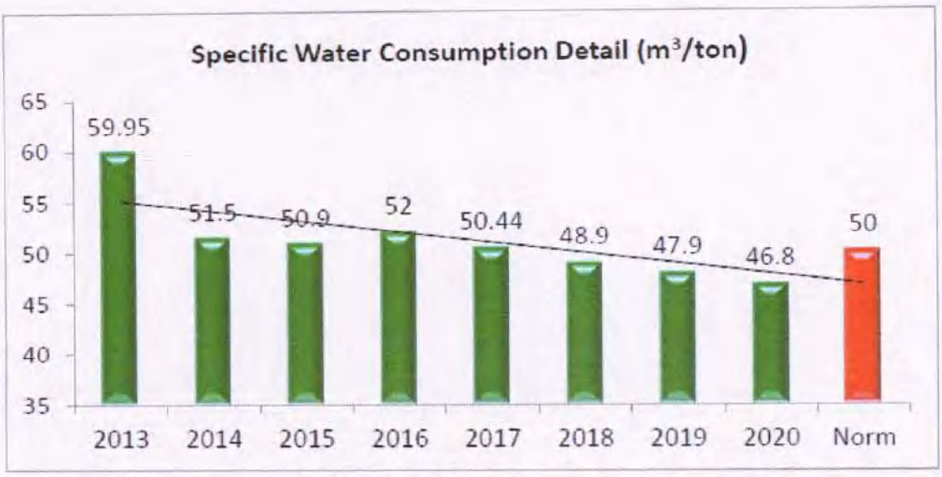
Notes:

1. Short and Long Term norms become applicable 1yr, and 2 yrs respectively, from the date of notification of Charter. Long Term norms will be reviewed after 18 months.
2. "#" applies to mills that manufacture **only** specialty papers
3. "tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper.
4. Not applicable to mills at ZLD

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS :	WATER REDUCTION MEASURES AND DATA				

Paper Business

Trident Paper division has already achieved its long-term target of specific water consumption in Paper business of 50 m3 /T by executing different projects.



Sr. No.	Year	Water Consumption	Paper Production	Specific Water Consumption
	UOM	KLD	TPD	Ltr/Kg
1	CY-2017	21054	417	50.4
2	CY-2018	20384	417	48.9
3	CY-2019	19963	417	47.9
4	CY-2020	16942	362	46.8

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WATER CONSUMPTION
PROCESS :	WATER REDUCTION MEASURES AND DATA				

Month wise Water consumption Data for calendar year 2020 is attached as follows:

Month	Water Consumption	Production	Specific Water
UOM	KLD	TPD	Ltr/Kg
January-20	19787	409	48.4
February-20	18272	413	44.2
March-20	14686	316	46.5
April-20	5727	60	94.8
May-20	17234	339	50.8
June-20	17567	406	43.2
July-20	17582	399	44.0
August-20	19854	392	50.7
Sept-20	19289	405	47.7
October-20	18575	406	45.8
November-20	17836	395	45.1
December-20	16899	404	41.8
Average	**16942**	**362**	**46.8**

The industry has further taken projects to reduce its water consumption which is attached as follows:

The mill has adopted certain water conservation measures namely:

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS :	WATER REDUCTION MEASURES AND DATA				

- **Automation of water treatment plant for optimum water consumption in various process operations.**
- **Installation of flow meter in various distribution pipelines as well as secondary clarifier outlet.**
- **Installation of Wet Wash Clarifier to reuse the clarified wet washings to maximum extent.**
- **Carrying out of straw fibre line operations at high consistency (less water consumption)**
- **Adoption of twin roll press for reduced water consumption in pulp washing.**
- **Adoption of poly disc filter for reuse / recycling of paper machine back water into paper machine.**
- **Optimisation of shower nozzle diameter on paper machine.**
- **Utilisation of black liquor secondary condensate from chemical recovery in raw material washing in SFL and lime mud washing.**
- **Utilisation of treated effluent for irrigation / land application.**

The plant has implemented additional measures for water conservation during 2020-21 which has further reduced the freshwater consumption.

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS :	WATER REDUCTION MEASURES AND DATA				

S. No.	Water Conservation Measures	Impact on Fresh water Consumption
1	Reuse of sealing water in wet wash in SFL	Reduction in fresh water consumption from 17.98 m^3/ t of bleached pulp to 16.18m^3 /t of bleached pulp in SFL Total Saving : 400 m^3 /day
2	Reduction of number of water showers in press section	
3	Use of Treated Effluent for preparation of Lime Slurry at ETP	Total Saving : 50 m^3 /day
4	Reuse of sealing water for bleaching, digester and washing area in WFL	Reduction in fresh water consumption from 7.6 m^3/ t of bleached pulp to 7.2 m^3/t of bleached pulp in WFL Total Saving : 50 m^3 /day
5	Replacement of RO Membranes in Power House	Total Saving : 270 m^3 /day
6	Increase in Cycle of Concentration (CoC) based upon hardness values.	Reduction in fresh water consumption by 75 m^3 /day in cooling tower of cogeneration plant
	Total Fresh Water Saving	**875 m^3 / day**

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS :	WATER REDUCTION MEASURES AND DATA				

Due to its continuous efforts, the industry was also rewarded in water and waste management company within the Excellence Reward in Paper Business by Confederation of Indian Industry.

PREPARED BY	DOCUMENT NO	PAGE 7 OF 7
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ANNEXURE R-5

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

Annexure -3 – Action plan detailing pipe network, land use, watering depth and type / age of plants etc

WASTE WATER MANAGEMENT IRRIGATION PLAN

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AJAY KUMAR	SUS/PB/IRRIGATION -01	
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STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

INDEX

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

PLANTATION LAYOUT

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

ZONE WISE PLANTATION AREA

PAPER PLANTATION AREA (ACRES)

ZONE	TOTAL
ZONE 1	5
ZONE 2	40
ZONE 3	16
ZONE 4	5
ZONE 5	10
ZONE 6	15
ZONE 7	6
ZONE 8	2
ZONE 9	2
ZONE 10	2
ZONE 11	4
ZONE 12	2
ZONE 13	2
ZONE 14	3
ZONE 15	2
ZONE 16	3
ZONE 17	5
ZONE 18	9
ZONE 19	32
TOTAL AREA	165

TOWEL PLANTATION AREA (ACRES)

ZONE	TOTAL
ZONE 1	4
ZONE 2	14
ZONE 3	3
ZONE 4	1.5
ZONE 5	3
ZONE 6	12
ZONE 7	2.5
ZONE 8	2.5
ZONE 9	6
ZONE 10	14
ZONE 11	8
ZONE 12	10
TOTAL AREA	80.5

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

ZONE WISE PLANTATION AGE

PAPER PLANTATION AREA (YEAR)

ZONE	TOTAL	AGE (YEARS)	Water Flow(m3/acre)
ZONE 1	2020	1	60
ZONE 2	2019	2	70
ZONE 3	2010	11	80
ZONE 4	2008	13	80
ZONE 5	2021	0.9	60
ZONE 6	2010	11	80
ZONE 7	2020	1	60
ZONE 8	2010	11	80
ZONE 9	2020	1	60
ZONE 10	2010	11	80
ZONE 11	2009	12	80
ZONE 12	2020	1	55
ZONE 13	2010	11	80
ZONE 14	2010	11	80
ZONE 15	2010	11	80
ZONE 16	2012	9	80
ZONE 17	2021	0.9	60
ZONE 18	2019	2	70
ZONE 19	2021	0.2	55

TOWEL PLANTATION AREA (YEAR)

ZONE	TOTAL	AGE (YEARS)	Water Flow(m3/acre)
ZONE 1	2021	0.8	55
ZONE 2	2010	11	80
ZONE 3	2021	0.8	60
ZONE 4	2021	0.8	60
ZONE 5	2020	1	60
ZONE 6	2019	2	70
ZONE 7	2009	12	80
ZONE 8	2014	1	60
ZONE 9	2021	0.8	60
ZONE 10	2021	0.8	60
ZONE 11	2019	2	70
ZONE 12	2020	1.2	80

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

ZONE WISE IRRIGATION PLAN

PAPER PLANTATION AREA (AREA-WISE)

ZONE	TOTAL	AREA (ACRES)	TOTAL	WATER FLOW
AREA 1	ZONE 2A	20	46	3680
	ZONE 4	5		
	ZONE 8	2		
	ZONE 10	2		
	ZONE 16	3		
	ZONE 17	5		
	ZONE 18	9		
AREA 2	ZONE 1	5	13	1040
	ZONE 7	6		
	ZONE 15	2		
AREA 3	ZONE 14	3	35	2800
	ZONE 19	32		
AREA 4	ZONE 2B	20	55	4400
	ZONE 3	16		
	ZONE 6	15		
	ZONE 12	2		
	ZONE 13	2		
AREA 5	ZONE 11	4	4	320
AREA 6	ZONE 5	10	12	960
	ZONE 9	2		
TOTAL			165	10400

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

ZONE WISE IRRIGATION PLAN

TOWEL PLANTATION AREA (AREA-WISE)

ZONE	TOTAL	AREA (ACRES)	TOTAL	WATER FLOW
AREA 1	ZONE 1	4	31	2170
	ZONE 2	14		
	ZONE 3	3		
	ZONE 4	1.5		
	ZONE 7	2.5		
	ZONE 9	6		
	ZONE 5	3		
AREA 2	ZONE 6	12	47	3290
	ZONE 10	14		
	ZONE 11	8		
	ZONE 12	10		
AREA 3	ZONE 8	2.5	2.5	175
TOTAL		80.5	80.5	5635

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

ELECTROMAGNETIC FLOW METERS MEASURMENT

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

PCD Plantation Zone Wise Roster

Description	Zone No.	Area (Acres)	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
AREA 1	ZONE 2A	20							
	ZONE 4	5							
	ZONE 8	2							
	ZONE 10	2							
	ZONE 16	3							
	ZONE 17	5							
	ZONE 18	9							
AREA 2	ZONE 1	5							
	ZONE 7	6							
	ZONE 15	2							
AREA 3	ZONE 14	3							
	ZONE 19	32							
AREA 4	ZONE 2B	20							
	ZONE 3	16							
	ZONE 6	15							
	ZONE 12	2							
AREA 5	ZONE 13	2							
	ZONE 11	4							
AREA 6	ZONE 5	10							
	ZONE 9	2							

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

HTD Plantation Zone Wise Roster

Description	Zone No.	Area (Acres)	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
AREA 1	ZONE 1	4							
	ZONE 2	14							
	ZONE 3	3							
	ZONE 4	1.5							
	ZONE 7	2.5							
	ZONE 9	6							
	ZONE 5	3							
AREA 2	ZONE 6	12							
	ZONE 10	14							
	ZONE 11	8							
	ZONE 12	10							
AREA 3	ZONE 8	2.5							

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

INFRASTRUCTURE AVAILABLE

S.NO.	DESCRIPTION	UOM	QUANTITY
1	TRACTOR	NOS	2
2	TROLLEY	NOS	1
3	HARROW	NOS	2
4	ROTAVATOR	NOS	1
5	TOOLKIT	NOS	10
6	SPRAYER PUMP	NOS	4

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

Name:
Salary Code:

IRRIGATION CHECKLIST

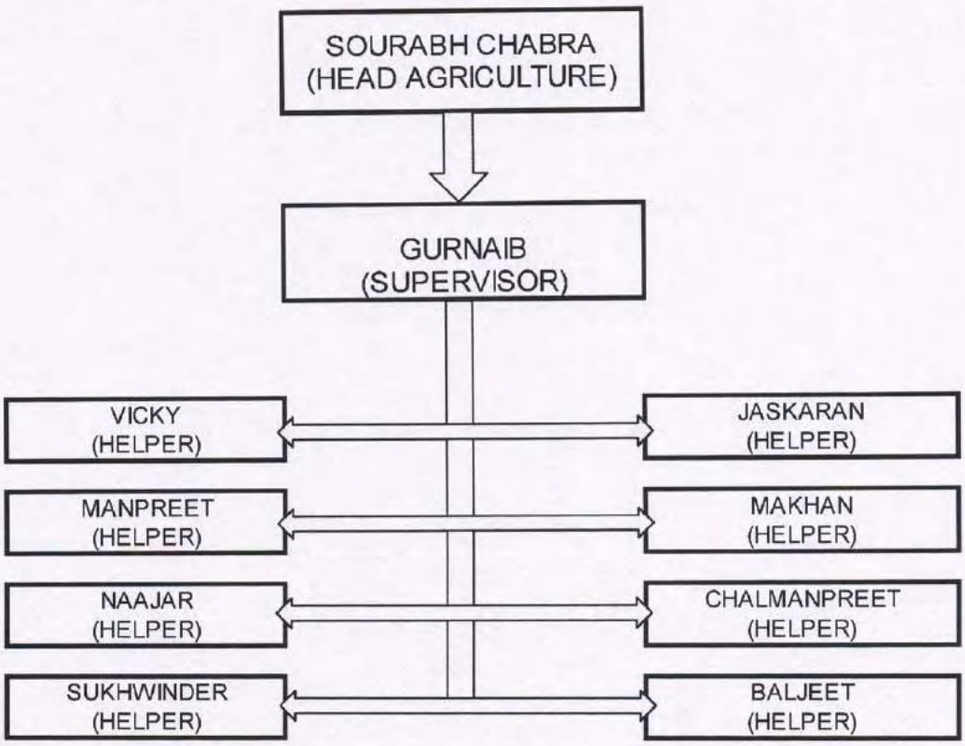
Deptt:
Month:

POINTS OF CONCERN/ ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ZONE WISE INSPECTION FOR PLANTATION																
ZONE WISE WATER DISTRIBUTION MANPOWER DEPLOYED AS PER ROSTER WILD GROWTH/GRASS REMOVAL																
CHECKING FOR THE FLOODING/WATER ACCUMLATION																
CHECKING FOR THE MACHINERY																
TOOL KIT AVAILABILITY																
SUPERVISOR SIGNATURE																

POINTS OF CONCERN/ ACTIVITIES	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ZONE WISE INSPECTION FOR PLANTATION ZONE WISE WATER DISTRIBUTION															
MANPOWER DEPLOYED AS PER ROSTER															
WILD GROWTH/GRASS REMOVAL															
CHECKING FOR THE FLOODING/WATER ACCUMLATION															
CHECKING FOR THE MACHINERY TOOL KIT AVAILABILITY SUPERVISOR SIGNATURE															

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

TEAM MATRIX



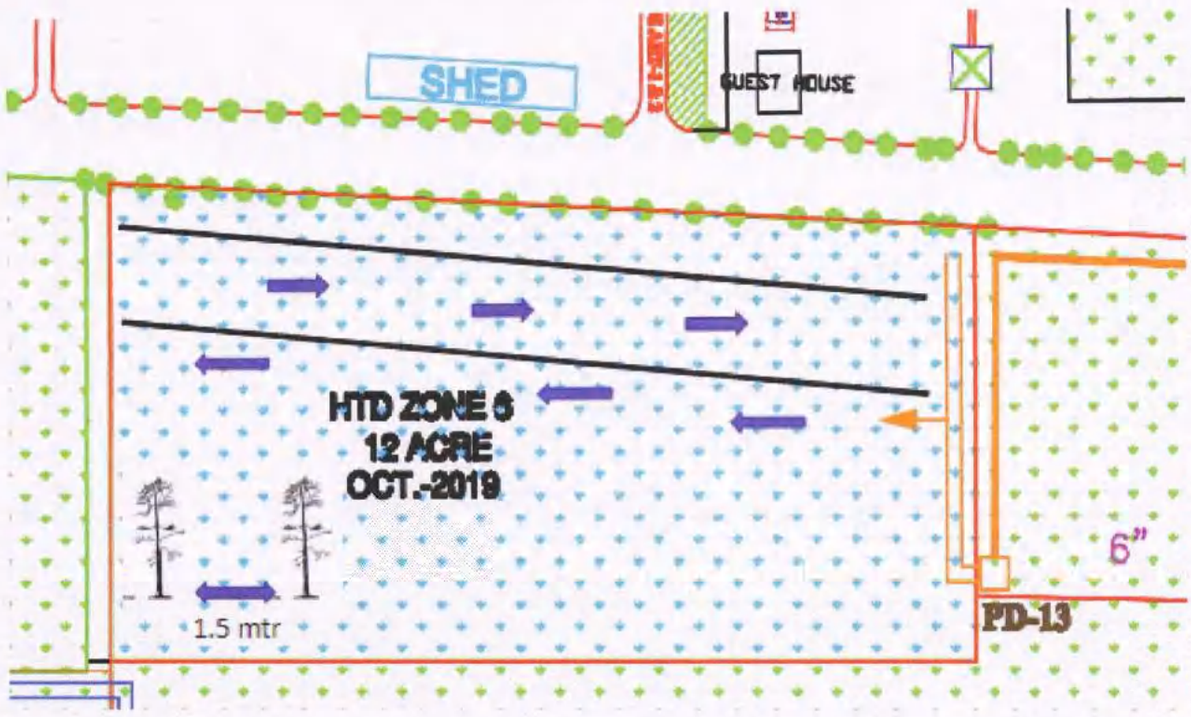
STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

GLIMPSE OF PLANTATION AREA

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

IRRIGATION PROCESS



Ridges	
Wide	1 meter
High	50 cm

Furrow	
Wide	2 meter

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

EFFLUENT GENERATION & PROPSED CONSUMPTION PLAN

PROPOSED SCENARIO

S.NO.	DESCRIPTION	UOM	HTD	PCD	TOTAL
1	EFFLUENT ONTO DRAIN	KLD	2361	6214	8575
2	ADDITIONAL PLANTATION AREA REQUIRED AT CURRENT UTILIZATION	ACRE	26	68	94

ANNEXURE R-6

80

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER DRAIN
PROCESS :	TREATED WATER UTILIZATION 100% BY FARMERS				

ACTION PLAN FOR UTILIZATION OF ALL TREATED WATER BY FARMERS BY JUNE 2022

Trident Paper is utilizing its 63% of treated water into existing developed plantation land and discharge only less than 37% treated water into permitted drain.

Land required for utilization of 6214 KLD treated water onto plantation is 68.2 acres.

Land required for utilization of 8700 KLD treated water onto plantation 95 acres.

Action Plan for utilization of 100 % treated water onto irrigation by farmers for the existing running capacity :

Sr. No.	Activity Description	UOM	Sep 21	Jan-22	Mar-22	May-22	Jun-22
1	Submission of Drawing of Pipe & Application for crossing pipe over existing drain .						
2	Approval from Drain Department for laying pipe over existing drain for utilization of treated water for irrigation . **Permission Copy Enclosed .**						
3	Agreement with farmers and laying of pipe & ordering of pipeline	Acre		21	20.2		27
4	Approval from drain department for laying the pipe parallel to the drain						
5	Laying of pipeline to additional land/farmers land and agreement with farmers						

The Industry would further like to mention that the total effluent discharge is in the tune of 6000-6500 KLD against the consented allowed discharge of 8700 KLD .

The Industry will only increase its effluent generation further after the increase in land allotment for the corresponding increased effluent .

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TRUE COPY

Advocate

ANNEXURE R-7

Sophisticated Analytical Instruments Laboratories Society *(Registered as Society with Registrar of Firms & Societies, Punjab, Chandigarh)*
Thapar Technology Campus, Bhadson Road, Patiala-147 004 (India)
TC-5631

Performance Study of ETP Plant of Paper Chemical Division (PCD) Trident Limited, Barnala, Punjab

Prepared by:
Dr. Raj Kumar Gupta
Professor, Department of Chemical Engineering, TIET, Patiala
On behalf of:
Sophisticated Analytical Instrument Laboratories
Thapar Technology Campus, Patiala, Punjab

Recommendations

Based on the above study the following action point are recommended to be undertaken to improve the performance of the waste water treatment plant:

1. BOD to COD ratio at USBR inlet is 0.2, which is on lower side. This ratio may be improved by reducing the COD, i.e., the COD caused by suspended particles. It is recommended to install a suitable unit operation for the removal of this COD. This will help in improving the efficiency of the USBR. Also, the sludge that will be generated in the separation system may be sold or burned as boiler fuel.
2. Food to Biomass (F/M) ratio in the aeration tank 1 (AT1) is 0.56, which is on the higher side. It should be kept less than 0.4. It is recommended that the total inlet flow be split into two parts. One part of the flow should be sent to AT1 and the other part be sent to AT2.
3. Oxygen being supplied in AT1 based on the current F/M ratio is less. After the flow diversion to AT2, the quantity of oxygen supplied will become adequate.
4. Food to Biomass (F/M) ratio in the aeration tank 2 (AT2) is 0.06, which is on the lower side. For better performance of the system, it is recommended to keep this ratio above 0.1. The action suggested at point no. 3, would also help in improving the F/M ratio of AT2.
5. The recommendation for action point 4 would lead to higher demand of oxygen in AT2. A suitable system for the increased oxygen demand should be put in place in AT2.
6. It is further recommended that a suitable arrangement for the online measurement of the dissolved oxygen (DO) should be installed for continuous monitoring of oxygen levels in AT1 and AT2.

15/12/2020
Dr. R. K. GUPTA
Professor
Department of Chemical Engineering
Thapar Institute of Engineering

Back

S No.	Recommendations of Thapar Study to improve ETP performance	Action Point	Status
1.	BOD to COD Ratio at USBR inlet is 0.2 , which is on lower side . This ratio may be improved by reducing the COD, i.e., the COD caused by suspended particles. It is recommended to install a suitable unit operation for the removal of this COD. This will help in improving the efficiency of the USBR. Also, the sludge that will be generated in the separation system may be sold or burned as boiler fuel.	The industry has just recently installed and commissioned suitable technology including DAF and Screw Press for the removal of COD caused by suspended particles to improve the efficiency of USBR. This was also a joint committee recommendation point which has been completed . The biomass generated from this system is being utilized in boiler as a biomass fuel also resulting in carbon foot print reduction .	Complied
2	Food to Biomass (F/M) ratio in the aeration tank 1 (AT1) is 0.56, which is on the higher side. It should be kept less that 0.4. It is recommended that the total inlet flow be split into two parts. One part of the flow should be sent to AT1 and the other part be sent to AT2.	The industry will install a pipeline along with valves to divert the inlet flow into Aeration Tank 2 to reduce the ratio from 0.56 to < 0.4 . This will be completed by 5 Feb 2021.	Complied
3	Oxygen being supplied in AT1 based on the current F/M ratio is less. After the flow diversion to AT2, the quantity of oxygen supply will become adequate.	This point will be closed after the completion of action of S No. 2	Complied

S No.	Recommendations of Thapar Study to improve ETP performance	Action Point	Status
4	Food to Biomass (F/M) ratio in the aeration tank 2 (AT2) is 0.06, which is on the lower side. For better performance of the system, it is recommended to keep the ration above 0.1. The action suggested at point no. 3, would also help in improving the F/M ratio of AT2.	This point will be closed after the completion of action of S No. 2	Complied
5	The recommendation of action point 4 would lead to higher demand of oxygen in AT2. A suitable system for the increased oxygen demand should be put in place in AT2.	The industry will install new advanced aerators with high oxygen transfer efficiency (2.2 Kg/kwh from existing 1.0 Kg/Kwh) . The total investment of the project is 248 Lacs and this will be installed , commissioned and stabilized by 20 Feb .	Complied.
6	It is further recommended that a suitable arrangement for the online measurement of the dissolved oxygen (DO) should be installed for continuous monitoring of oxygen levels in AT1 and AT2.	The industry will install online measurement of the dissolved oxygen for continuous monitoring of oxygen levels in AT1 and AT2 .	Complied

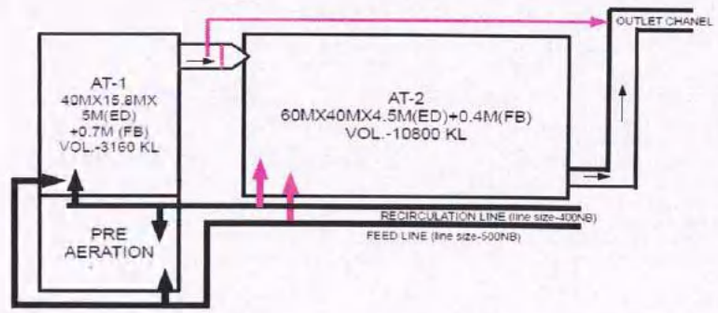
REMOVAL OF NON DEGRADABLE COD

DAF

Screw Press

Wet Wash load reduction details By Installation of DAF				
	Month	UASB inlet COD (Before Installation of DAF) (in PPM)	Month	UASB inlet COD (After Installation of DAF) (in PPM)
	May-20	5087	Nov-20	3627
	Jun-20	5604	Dec-20	3846
	Jul-20	5769	Jan-21	3876
	Aug-20	6065	Feb-21	3914
	Sep-20	5896	Mar-21	4539
	Average	5684	Average	3960.4
	Reduction of COD load		%	30.3

3. AERATION TANK OPERATION FROM SERIES TO PARALLEL



INSTALLATION OF ADVANCED AERATORS

4. INSTALLATION OF ONLINE D.O SENSOR

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ANNEXURE R-8

85

STORY OF INNOVATIVE PROJECTS AT ETP

In the journey of innovative projects we recently did the projects in area of ETP with the below main objectives:

- To reduce the ETP inlet load by recovery of biomass from washing effluent through adoption of DAF & Screw Press technology.

The above projects were implemented in collaboration with Krofta India, Bellmer Germany.

The projects were completed by the hard efforts of all respective team members including civil, process, electrical, mechanical, instrumentation and administration.

The implementations of projects have given following advantages:

a) Reduction in load to ETP.
b) Recovery of Biomass and usage as co incineration fuel.
c) Reduction in GHG Emissions (Carbon foot print).

The implantation of above projects has motivated the team.
Pictures of DAF & Screw press is as follows

Wet Wash load reduction details By Installation of DAF				
Sr. No.	Month	UASB inlet COD (Before Installation of DAF) (in PPM)	Month	UASB inlet COD (After Installation of DAF) (in PPM)
1	05/20	5087	11/20	3627
2	06/20	5604	12/20	3846
3	07/20	5769	01/21	3876
4	08/20	6065	02/21	3914
5	09/20	5896	03/21	4539
6	Average	5684	Average	3960.4
7	Reduction of COD load		%	30.3

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Advocate

ANNEXURE R-9

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Feasibility of using Advanced Oxidation Processes (AOPs) as pre or post treatment option for treating industry waste water: An approach towards reuse of treated trade effluent for the industry

Submitted by:

Dr. Anoop Verma

Associate Professor and Head

School of Energy and Environment

Thapar Institute of Engineering and Technology, Patiala.

1. Scope of work:

There is wider demand and scope for industries to approach Zero Liquid Discharge (ZLD) using appropriate technologies. Accordingly, ZLD industries will need to develop a technology which can treat their own wastewater so as to recycle and reuse the same. Especially when we talk about Pulp and Paper (P&P) industry a fastest growing sector around the world which highly demands freshwater utilization for their processes. P&P industry using best technologies for treating their waste water but presence of colour in their wastewater even after secondary treatment restrict any further applications. The methods used for colour removal, as per the technology available so far, are quite expensive and less efficient. Hence certain technological interventions need to be successfully implemented in different stages of industrial treatment system for colour removal.

2. Proposed technology:

With deliberation to the industry, Thapar team proposes the technology to remove the colour from various possible sections of the industry.

To cover the former mentioned drawbacks our study will try to incorporate two processes i.e. advance treatment techniques as dual technology to efficiently overcome the problem of industry, and the plus point of our technology is zero sludge or waste generation as it converts the organic contaminants to simple water and carbon dioxide. Best efforts would be made to integrate the in-situ dual effect (photocatalysis and photo-Fenton) at various stages of the selected pulp and paper making industry. Photocatalysis is considered an effective system for the mineralization of many organics through the generation of HO• and $O_2^{\bullet-}$ radical, reducing the organic load of effluents as this technology converts the harmful substances to water and carbon dioxide which are non-toxic. The principle of photocatalysis involves the initial absorption of photons with energy equal to or greater than the bandgap energy of the semiconductor, leading to the formation of electrons and holes (Sujatha et. al., 2020). In photo-Fenton when the system is irradiated with UV or visible light, the photo-reduction of ferric to ferrous ions is promoted concomitantly with the generation of additional HO• (Romero et. al., 2016). These two technologies have shown their proficiency in removing colour or treating wastewater of the P&P (Kumar et. al., 2011) industry as well as the textile industry (Tian et. al., 2020). The proposed study attempts to incorporate the in-situ dual processes (Photocatalysis and photo-Fenton) in fixed-mode to visualize its feasibility to

treat different streams of P&P industry. The study also incorporates the idea of circular economy by using waste materials in fabrication of composite to make it more cost effective.

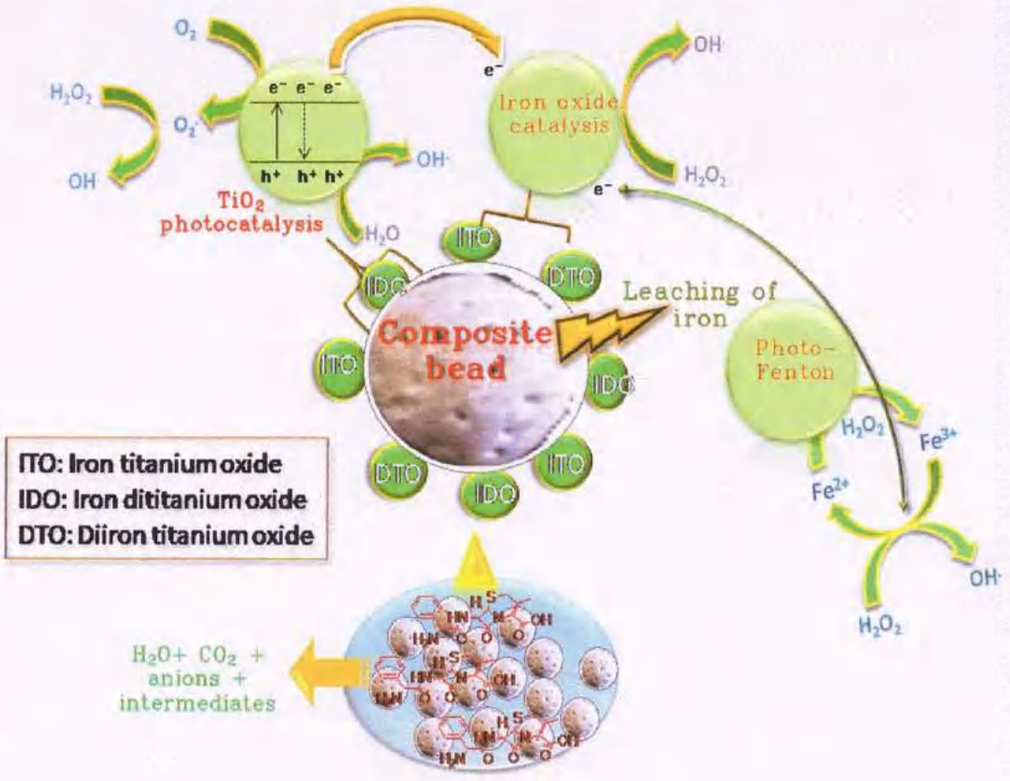

Fig. 1 Concept of in-situ dual effect of both photocatalysis and photo-Fenton.

Fig. 2 shows targeted streams to be worked upon. To start with, we have worked on the final stream i.e. O/L. Presently we have optimized the batch scale study and came up with some delightful outcome as results of colour removal. Fig. 3 depicts the graph of % colour from the selected stream. Fig. 4 shows initial and final absorbance of the untreated and treated sample using UV-vis spectrophotometer. The decrement in UV region of final sample shows the effective removal of the colour of final stream which is also clearly visible in the solutions in testubes.

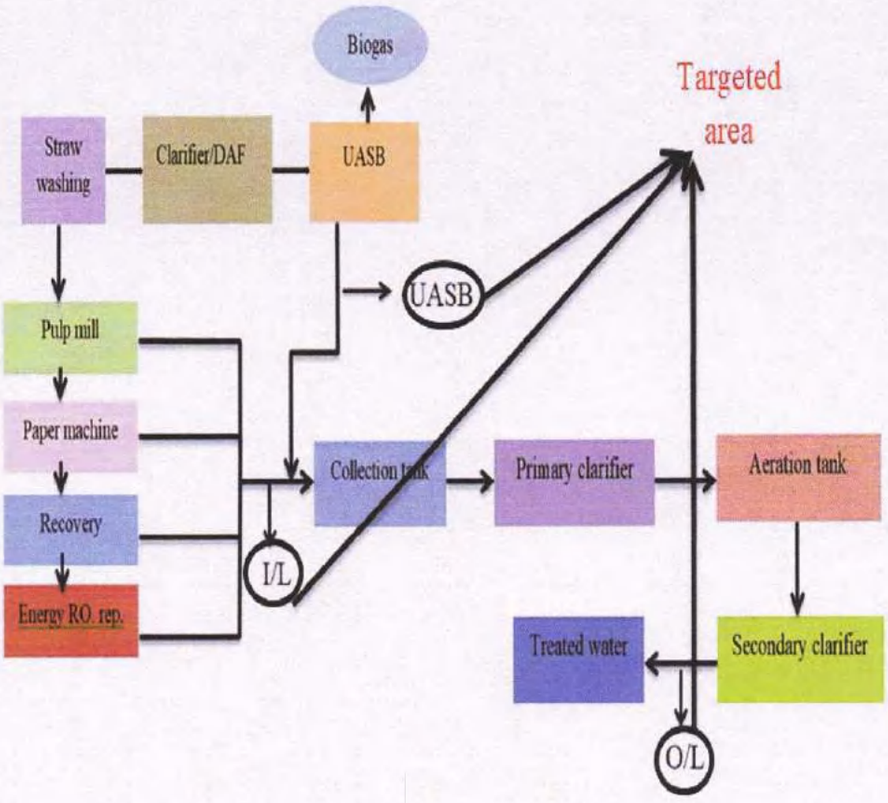

Fig. 2: Targeted streams of industry

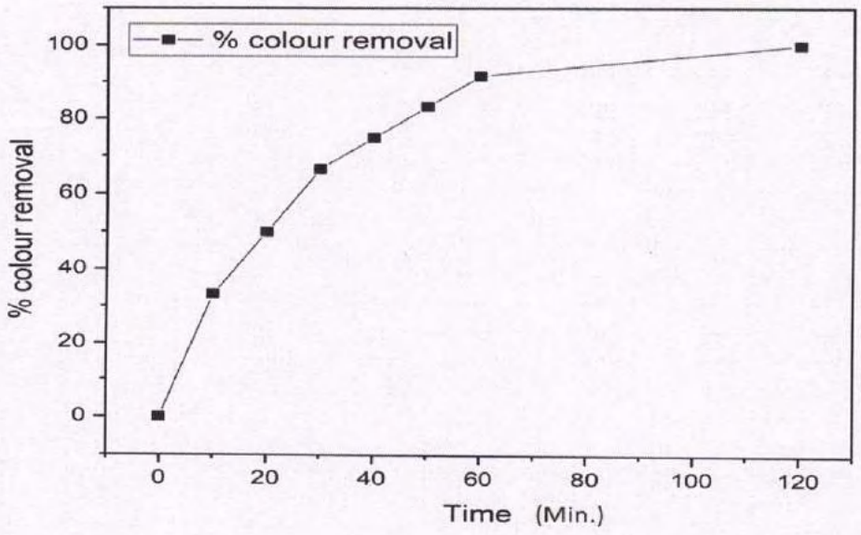

Fig.3: Graph of % colour removal with respect to time of treatment.

- **Stream 3 O/L:**

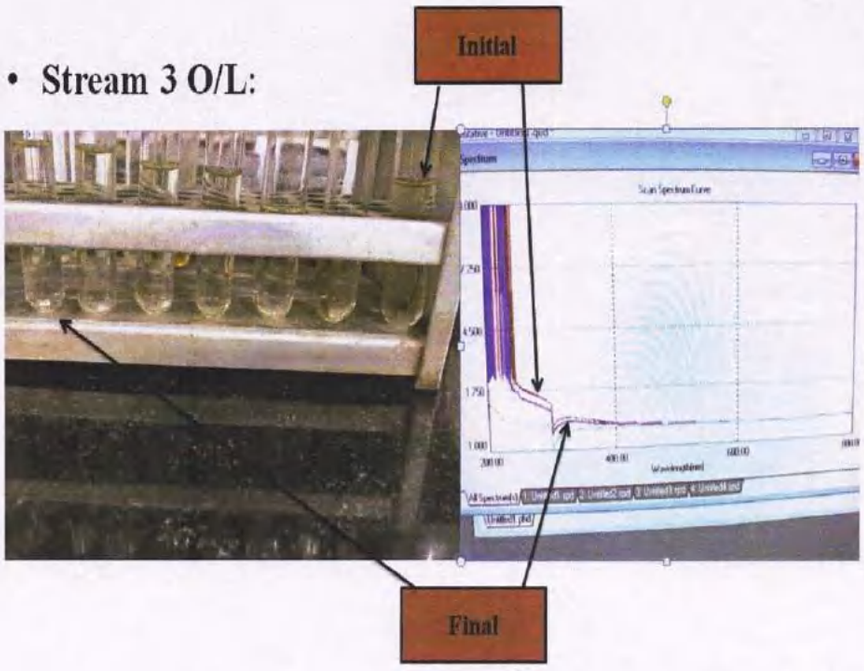

Fig.4: Spectroscopic analysis of O/L after treatment.

3. **Future plans:**
   - Currently we are working on final effluent but in near future we will start optimization studies and hit and trials on other streams i.e. UASB and I/L as well.
   - Further testing and process optimization will be done by varying factors like catalyst dose, time, oxidant dose, pH etc.
   - Best efforts would also be made to study dual effect in once through process using fixed bed reactors. Furthermore, this study will try to increase the process economics and will suggest the suitable steps to be taken to the concerned industry for further applications.

Fwd: Submission of Project Proposal : Color Removal : Pilot Study

RAJAT MONGA <rajatmonga@tridentindia.com>
Thu 21/10/2021 10:47
To: AJAY MOLIYA <Ajaymoliya@tridentindia.com>

Get Outlook for iOS

From: RAJAT MONGA <rajatmonga@tridentindia.com>
Sent: Tuesday, February 23, 2021 12:55:48 PM
To: registrar@thapar.edu <registrar@thapar.edu>
Cc: SOURAV CHOUDHARY <SouravChoudhary@tridentindia.com>; Anoop Kumar <anoop.kumar@thapar.edu>
Subject: Re: Submission of Project Proposal : Color Removal : Pilot Study

Dear Sir,

This is in reference to the project proposal related to the removal of color from our treated ETP Effluent.

We would like to be associated with your prestigious institute for conducting feasibility analysis on the new technological adoption for removal of color.

We have discussed with Dr Anoop Verma Department of Energy and Environment and allocated this project for conducting this study .

The details of payment of 4.48 Lacs as mentioned in the proposal will be shared in the subsequent mail .

You are requested to please accept our confirmation for the same and work with us.

Thanks & Regards

Rajat Monga
DC | Sustainability Pb
Sustainability Pb
Dhaula

Corporate Address:

TRIDENTGROUP™
E-212 Kitchlu Nagar, Ludhiana - 141001 , Fax : +91 161 5039900
Mob. +91-+919878997508 | Toll Free No.1800-180-2999 (Extn. 2708)
| rajatmonga@tridentindia.com
Visit us at http://www.tridentindia.com

From: Anoop Kumar <anoop.kumar@thapar.edu>
Sent: Sunday, February 14, 2021 11:46 AM
To: RAJAT MONGA <rajatmonga@tridentindia.com>
Subject: Re: Submission of Project Proposal

EXTERNAL EMAIL:** Treat hyperlinks and attachments in this email with caution

Dear Mr Rajat
Hope you are doing well. As requested, I have sent the required details for transferring the funds to thapar account. Kindly confirm me once you execute the transfer (reference number), so that we can claim that amount in our project.
As requested, Kindly mail one acceptance letter to the Registrar (registrar@thapar.edu) with cc to me also.
The requested details are as follows (once again with GSTIN number also):
GSTIN: 03AAAAT4247P1Z9
Pan :AAAA T4247P
TAN :PTLT10043F
Account holder name: Registrar, TIET
Looking forward to hearing from you soon
Best regards

Dr. Anoop Verma
Associate Professor,
School of Energy and Environment
Thapar Institute of Engineering and Technology, Patiala-147004
email: anoop.kumar@thapar.edu, anoop_tiet@yahoo.co.in
Ph: 09815654776(M)
http://scholar.google.co.in/citations?user=HZHZGVUAAAAJ&hl=en
https://orcid.org/0000-0003-2818-6348

On Sat, Feb 13, 2021 at 1:09 PM RAJAT MONGA <rajatmonga@tridentindia.com> wrote:

> Dear Mr Anoop,
>
> Greetings from the Trident!!
>
> We need to know some more details to process the payment as per information received from our accounts team.
>
> GST No.
> PAN No.
> Bank Account Holder Name

From: Anoop Kumar <anoop.kumar@thapar.edu>
Sent: Sunday, February 7, 2021 2:16 PM
To: RAJAT MONGA <rajatmonga@tridentindia.com>
Cc: SOURAV CHOUDHARY <SouravChoudhary@tridentindia.com>
Subject: Re: Submission of Project Proposal

EXTERNAL EMAIL:** Treat hyperlinks and attachments in this email with caution

Dear Mr. Rajat
Really nice to hear from you. Thanks for accepting our proposal to collaborate with your organization on study and piloting on colour removal of pulp and paper Treated Effluent. We are looking forward to working on this project and have fruitful collaboration with your industry for this problem.

Now to proceed further, you are kindly requested to mail an **acceptance letter to Registrar TIET** (registrar@thapar.edu) mentioning all the details with cc to me. This acceptance letter may contain our past discussion on the industry problem during your visit and submission of concept note by me. Kindly mention the title of the project and sanctioned amount in that letter.
For transferring the **project amount**, the details of the bank account of Thapar are attached herewith for your reference.
In case of any clarification, please do not hesitate to contact me.
Best Regards

Dr. Anoop Verma
Associate Professor,
School of Energy and Environment
Thapar Institute of Engineering and Technology, Patiala-147004
email: anoop.kumar@thapar.edu, anoop_tiet@yahoo.co.in
Ph: 09815654776(M)
http://scholar.google.co.in/citations?user=HZHZGVUAAAAJ&hl=en
https://orcid.org/0000-0003-2818-6348

On Sat, Feb 6, 2021 at 12:59 PM RAJAT MONGA <rajatmonga@tridentindia.com> wrote:

> Dear Mr Anoop ,
>
> Thank you for submitting us the proposal .
>
> We would like to collaborate for this study and piloting on colour removal of Paper Treated Effluent based on the case note submitted .
>
> We would also request you kindly submit us the details how can we process the payment .
>
> Thanks & Regards
>
> 
>
> Rajat Monga
> DC | Sustainability Pb
> Sustainability Pb
> Dhaula
>
> Corporate Address:
>
> TRIDENTGROUP™
> E-212 Kitchlu Nagar, Ludhiana - 141001 , Fax : +91 161 5039900
> Mob. +91-+919878997508 | Toll Free No.1800-180-2999 (Extn. 2708)
> | rajatmonga@tridentindia.com
> Visit us at http://www.tridentindia.com
>
> **From:** Anoop Kumar <anoop.kumar@thapar.edu>
> **Sent:** 26 January 2021 22:20
> **To:** RAJAT MONGA <rajatmonga@tridentindia.com>
> **Subject:** Submission of Project Proposal

EXTERNAL EMAIL:** Treat hyperlinks and attachments in this email with caution

Dear Mr. Rajat
Hope you are doing well. This is regarding your request and our subsequent discussion on the project proposal related to removal of color from the treated effluent at Thapar Institute. It was a really nice discussion with you and as agreed upon, I am attaching the brief concept note along with financial requirements for your perusal. Kindly go through it and let me know if some information is required from my side.
Looking forward to hearing from you soon
Best Regards

Dr. Anoop Verma
Associate Professor,
School of Energy and Environment
Thapar Institute of Engineering and Technology, Patiala-147004
email: anoop.kumar@thapar.edu, anoop_tiet@yahoo.co.in
Ph: 09815654776(M)
http://scholar.google.co.in/citations?user=HZHZGVUAAAAJ&hl=en
https://orcid.org/0000-0003-2818-6348

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ANNEXURE R-10

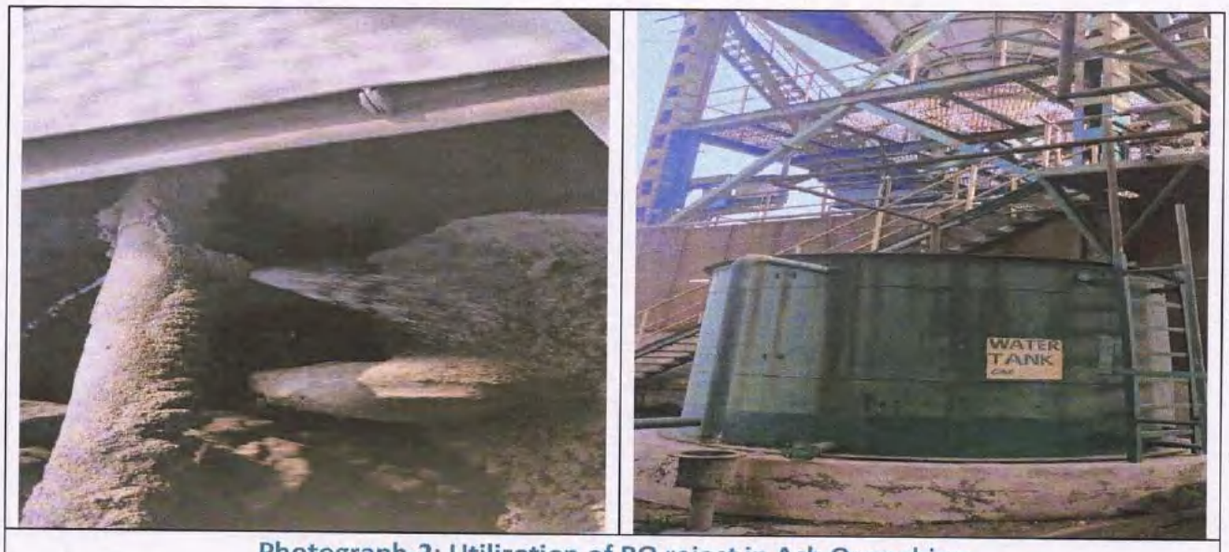
STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS:	WATER REDUCTION MEASURES AND DATA				

Action Plan & List of projects completed not impacting the TDS of final treated water

Sl. no	Project Description	Month & Year of Implementation	Water Savings (KLD)
1	Utilization of UF treated water in cooling tower make up of energy section	Sep 2020	168
2	Utilization of RO reject water in ash quenching	Oct 2020	96
3	Usage of RO reject water in Coal Dust suppression	Nov 2020	48
4	Replacement of Raw Water RO reject water with ETP treated water in the lime preparation unit (Raw Water RO Reject utilization started in coal & ash quenching)	Mar 2021	100
	Total		412

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS:	WATER REDUCTION MEASURES AND DATA				

Photograph-1: Utilization of UF reject in Cooling Tower of Energy Plant



Photograph-2: Utilization of RO reject in Ash Quenching

STANDARD OPERATING PROCEDURE					TRIDENTGROUP™
BUSINESS/ UNIT	PAPER CHEMICAL DIVISION	**LOCATION**	PUNJAB	**MACHINE NAME/PROCESS NAME**	WATER CONSUMPTION
PROCESS:	WATER REDUCTION MEASURES AND DATA				

Photograph-3: Utilization of RO reject in Coal Dust Suppression

Photograph-4: Replacement of RO reject water with ETP treated water in the lime preparation

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ANNEXURE. R. 11

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STANDARD OPERATING PROCEDURE					TRIDENT GROUP
BUSINESS/ UNIT	SUSTAINABILITY	LOCATION	PUNJAB	MACHINE NAME/PROCESS NAME	WASTE WATER MANAGEMENT
PROCESS :	IRRIGATION MANAGEMENT PLAN				

PCD Plantation Zone Wise Roster

Description	Zone No.	Area (Acres)	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
AREA 1	ZONE 2A	20							
	ZONE 4	5							
	ZONE 8	2							
	ZONE 10	2							
	ZONE 16	3							
	ZONE 17	5							
	ZONE 18	9							
AREA 2	ZONE 1	5							
	ZONE 7	6							
	ZONE 15	2							
AREA 3	ZONE 14	3							
	ZONE 19	32							
AREA 4	ZONE 2B	20							
	ZONE 3	16							
	ZONE 6	15							
	ZONE 12	2							
	ZONE 13	2							
AREA 5	ZONE 11	4							
AREA 6	ZONE 5	10							
	ZONE 9	2							

PREPARED BY	DOCUMENT NO	PAGE 1 OF 2
AJAY KUMAR	SUS/PB/IRRIGATION -01	
APPROVED BY	ISSUE DATE	REVISION NO./ REVISION DATE
RAJAT MONGA	10/03/2021	-

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TO BE UNCONTROLLED.

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ANNEXURE R-12

Dear Sir/ Madam ,

We are pleased to place the Purchase Order no. 7600006909 on your esteemed organization as per the terms & conditions agreed upon.

99

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited

TRIDENTGROUP

E-212, KITCHLU NAGAR, LUDHIANA 141001
Contact No. : 9878999147
Email : ishneetkaur@tridentindia.com
Purchase Team .

100

TRIDENTGROUP

Trident Limited - Towel
Mansa Road, Dhaula
BARNALA (PUNJAB)
PURCHASE ORDER

Vendor 741067
ELETTA INSTRUMENTATION INDIA PRIVATE LIMITED
CRPOFFICE NO.5,7TH FLOOR, TOWER-A
NOIDA
201301
Country India
Vendor GSTIN No. 09AABCE4836E1ZR

Ship To
TL Dhaula Towel 2
Mansa Road, Dhaula
BARNALA (PUNJAB)
BARNALA
148107

Mobile 9878999147
ishneetkaur@tridentindia.com

Bill To
Trident Limited - Towel
Mansa Road, Dhaula
BARNALA (PUNJAB)
148107

Mobile 9878999147
ishneetkaur@tridentindia.com

PO Number	7600006909	**Dated**	20.11.2020
Our Ref.	70228	**Currency**	INR
Your Ref.	email		

PO Status :- Valid/Approved
Quality Certificate :- Required

S.No.	Item Code Item Description Sale Order PO Number/ Week Code	UOM/ Brand	Order Qty.	Basic Rate	Discount	PKG-FWD	HSN/SAC	CGST/SGST/IGST/ C.Cess	Coal Cess	Item Value	Cancellation Date	Plant
00001	701010781 MEASURE-10"-53-1767M3/HR-ELEC MAG FLOWME WITH MATING FLANGES	NOS/ ELETTA	1.000	109,620.00 INR/ 1 NOS	0.00 0.00	0.00 0.00	8424.90.00	0.00 /0.00 /18.00 19,731.60	0.00	129,351.60	30.12.2020	TT02 THT-2
00002	701010782 MEASURE-8"-34-1131M3/HR-ELEC MAG FLOWMET WITH MATING FLANGES	NOS/ ELETTA	1.000	87,500.00 INR/ 1 NOS	0.00 0.00	0.00 0.00	8424.90.00	0.00 /0.00 /18.00 15,750.00	0.00	103,250.00	30.12.2020	TT02 THT-2
00003	701010783 MEASURE-4"-8-283M3/HR-ELEC MAG FLOWMETER WITH MATING FLANGES	NOS/ ELETTA	1.000	60,480.00 INR/ 1 NOS	0.00 0.00	0.00 0.00	8424.90.00	0.00 /0.00 /18.00 10,886.40	0.00	71,366.40	30.12.2020	TT02 THT-2

Total Value 303,968.00 INR

Total Value:INR THREE LAKH THREE THOUSAND NINE HUNDRED SIXTY EIGHT Rupees

TRIDENTGROUP

Trident Limited - Towel
Mansa Road, Dhaula
BARNALA (PUNJAB)
PURCHASE ORDER

Vendor 741067 ELETTA INSTRUMENTATION INDIA PRIVATE LIMITED CRPOFFICE NO.5,7TH FLOOR, TOWER-A NOIDA 201301 **Country** India **Vendor GSTIN No.** 09AABCE4836E1ZR	**Ship To** TL Dhaula Towel 2 Mansa Road, Dhaula BARNALA (PUNJAB) BARNALA 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**Bill To** Trident Limited - Towel Mansa Road, Dhaula BARNALA (PUNJAB) 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**PO Number**	7600006909	**Dated**	20.11.2020
			Our Ref.	70228	**Currency**	INR
			Your Ref.	email		
			PO Status :- Valid/Approved **Quality Certificate** :- Required			

Price Basis: FOR BARNALA **Freight:** F **Special Instruction** Installation on FOC basis

Payment Terms: Due Net in 30 Days **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY SUPPLIER

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf
Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch,Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.. 03AABCA4139J1Z0

This is computer generated Purchase Order.Hence requires no signature.

TRIDENTGROUP

Trident Limited - Towel
Mansa Road, Dhaula
BARNALA (PUNJAB)
PURCHASE ORDER

Vendor 741067 ELETTA INSTRUMENTATION INDIA PRIVATE LIMITED CRPOFFICE NO.5,7TH FLOOR, TOWER-A NOIDA 201301 **Country** India **Vendor GSTIN No.** 09AABCE4836E1ZR	**Ship To** TL Dhaula Towel 2 Mansa Road, Dhaula BARNALA (PUNJAB) BARNALA 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**Bill To** Trident Limited - Towel Mansa Road, Dhaula BARNALA (PUNJAB) 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**PO Number**	7600006909	**Dated**	20.11.2020
			Our Ref.	70228	**Currency**	INR
			Your Ref.	email		
			PO Status :- Valid/Approved **Quality Certificate** :- Required			

S.No.	Item Code Item Description	Master Inspection Characteristics(MIC)	Upper Specification Limit	UOM	Target Specification Limit

TRIDENTGROUP

Trident Limited - Towel
Mansa Road, Dhaula
BARNALA (PUNJAB)
PURCHASE ORDER

Vendor 741067 ELETTA INSTRUMENTATION INDIA PRIVATE LIMITED CRPOFFICE NO.5,7TH FLOOR, TOWER-A NOIDA 201301 **Country** India **Vendor GSTIN No.** 09AABCE4836E1ZR	**Ship To** TL Dhaula Towel 2 Mansa Road, Dhaula BARNALA (PUNJAB) BARNALA 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**Bill To** Trident Limited - Towel Mansa Road, Dhaula BARNALA (PUNJAB) 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**PO Number**	7600006909	**Dated**	20.11.2020
			Our Ref.	70228	**Currency**	INR
			Your Ref.	email		
			PO Status :- Valid/Approved **Quality Certificate** :- Required			

S.No.	Item Code Item Description	Mat. Classification	PO Material Text
00001	701010781 MEASURE-10"-53-1767M3/HR-ELEC MAG FLOWME	Standard	
00002	701010782 MEASURE-8"-34-1131M3/HR-ELEC MAG FLOWMET	Standard	
00003	701010783 MEASURE-4"-8-283M3/HR-ELEC MAG FLOWMETER	Standard	

TRIDENTGROUP

Trident Limited - Towel
Mansa Road, Dhaula
BARNALA (PUNJAB)
PURCHASE ORDER

Vendor 741067 ELETTA INSTRUMENTATION INDIA PRIVATE LIMITED CRPOFFICE NO.5,7TH FLOOR, TOWER-A NOIDA 201301 **Country** India **Vendor GSTIN No.** 09AABCE4836E1ZR	**Ship To** TL Dhaula Towel 2 Mansa Road, Dhaula BARNALA (PUNJAB) BARNALA 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**Bill To** Trident Limited - Towel Mansa Road, Dhaula BARNALA (PUNJAB) 148107 **Mobile** 9878999147 ishneetkaur@tridentindia.com	**PO Number**	7600006909	**Dated**	20.11.2020
			Our Ref.	70228	**Currency**	INR
			Your Ref.	email		
			PO Status :- Valid/Approved **Quality Certificate** :- Required			

DELIVERY SCHEDULE

S.NO	Item Code Item Description	UOM	PO Qty	Scheduled Date	Sch Qty	Delivered Qty	Open Qty as on 20.10.2021	Contract No	Remaining Contract Value/Qty
00001	701010781 MEASURE-10"-53-1767M3/HR-ELEC MAG FLOWME	NOS	1.000	30.12.2020	1.000	1.000	0.000		0.00
00002	701010782 MEASURE-8"-34-1131M3/HR-ELEC MAG FLOWMET	NOS	1.000	30.12.2020	1.000	1.000	0.000		0.00
00003	701010783 MEASURE-4"-8-283M3/HR-ELEC MAG FLOWMETER	NOS	1.000	30.12.2020	1.000	1.000	0.000		0.00

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.
Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.
The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.
The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.
The Seller shal unconditionally submit its account statement on Quarterly basis for reconciliation.
Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.
This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.
Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.
The Seller shal not disclose any confidential information pertaining to the Purchaser's business to any third party.
Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.
The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.
'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional of such advantage.
The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.
The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.
The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.
All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.
The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.
Seller shall share the progress of the order on weekly basis in writing.
If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.
Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.
In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with interest @18% per annum.
Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.
Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.
Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.
The prices under this Order shall remain firm until completion of the Contract.

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.
Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material,the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.
In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.
All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.
The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.
All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.
Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties.This Purchase order shall be governed by and construed in accordancewith the laws of India, and the parties agree to submit themselves tothe exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.
This Purchase Order supersedes any/and/all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.
Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise,respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate.

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TRUE COPY

Advocate

TRUE COPY

Advocate

TRUE COPY

Advocate

ANNEXURE R-13

107

PUNJAB POLLUTION CONTROL BOARD

HEAD OFFICE AIR LAB. VATAVARAN BHAWAN, PATIALA

Ph.:- 0175-2302391
Web: www.ppcb.gov.in
E-mail:- ppcbairlab@gmail.com

1. Laboratory Sample No.	93-94/ S.O.Lab./Air/Monitoring/2020-21
2. Name of Industry	M/s Trident Ltd. (PCD), Mansa Road, Dhaula, Distt Barnala.
3. Name of Sample collecting Officer	Er. Vipin Kumar AEE and Dr. Sonam Dogra, SA
4. Designation of authorizing Test	EE, RO, Sangrur
5. Type of Sample	Stack Emission
6. Date &Time of Sample collection	30.04.2021
7. Date &Time of Sample receipt in Lab.	03.05.2021
8. Point of Sample collection	Details as Given Below

Results

Point of sample Collection	Parameter	Results	Prescribed Standards
Port Hole on stack after APCD of Chemical recovery plant-II	Particulate Matter	83 mg/Nm^3	150 mg/Nm^3
Port Hole on stack after APCD of 2 no Boilers of Cap. 130 TPH each	Particulate Matter	86 mg/Nm^3 at 12% CO_2	150 mg/Nm^3 at 12% CO_2

Note: If any, stringent limits/specific standard has been prescribed time to time by MoEF&CC, CPCB and PPCB, then stringent limits/specific standard would prevail subject to clarification from the concerned Regional office

5/5/2021

for **Scientific Officer**

Endst. No: 1/28385 **Dt.** 11/5/2021

A copy of the above is forwarded to the following for information and necessary action:-

1. The Chief Environmental Engineer, Punjab Pollution Control Board (Air), Jalandhar
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II Patiala
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur

5/5/2021

for **Scientific Officer**

108

PUNJAB POLLUTION CONTROL BOARD
HEAD OFFICE AIR LAB. VATAVARAN BHAWAN, PATIALA

Ph:- 0175-2302392

Web: www.ppcb.gov.in
E-mail:- ppcbairlab@gmail.com

1.	Laboratory Sample No.	326-327/ H.O.Lab./Air Monitoring/2021
2.	Name of Industry	M/s Trident Ltd. (PCD), Mansa Road, Dhaula, Distt. Barnala.
3.	Name of Sample collecting Officer	Er. Simarpreet Singh JEE, Dr. Sonam Dogra, SA
4.	Designation of authorizing Test	EE, RO, Sangrur
5.	Type of Sample	Stack Emission
6.	Date &Time of Sample collection	21.09.2021
7.	Date &Time of Sample receipt in Lab.	22.09.2021
8.	Point of Sample collection	Details as Given Below

Results

Point of sample Collection	Parameter	Results	Prescribed Standards
Port Hole on stack after APCD of Chemical recovery plant-II of Cap. 54 TPH	Particulate Matter	127 mg/Nm^3	150 mg/Nm^3
Port Hole on common stack after APCD of Boiler of Cap. 130 TPH each	Particulate Matter	134 mg/Nm^3 at 12% CO_2	150 mg/Nm^3 at 12% CO_2

Note: If any, stringent limits/specific standard has been prescribed time to time by MoEF&CC, CPCB and PPCB, then stringent limits/specific standard would prevail subject to clarification from the concerned Regional office

01/10/2021
Scientific Officer

Endst. No: 2750-52 **Dt.** 4/10/2021

A copy of the above is forwarded to the following for information and necessary action:-
1. The Chief Environmental Engineer, Punjab Pollution Control Board (Air), Jalandhar
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II Patiala
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur

01/10/2021
Scientific Officer

TRUE COPY

Advocate

ANNEXURE R-14

109

Dear Sir/ Madam ,

We are pleased to place the Purchase Order no. 7600007936 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited

TRIDENTGROUP

E-212, KITCHLU NAGAR, LUDHIANA 141001
Contact No. : 9878999481
Email : jasbirpurchase@tridentindia.com
Purchase Team .

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TRIDENTGROUP

Trident Limited - Energy
P&C Division,Mansa Road
Dhaula, Barnala (Punjab)
PURCHASE ORDER

PO Number	7600007938	Dated	25.08.2021
Our Ref.	13760	Currency	INR
Your Ref.	offer		

PO Status :- Invalid/Unapproved
Quality Certificate :- Required

Vendor 740059
ADOR POWERTRON LIMITED
PLOT NO -51, D-II BLOCK, RAM NAGAR
PUNE
411019
Country India
Vendor GSTIN No. 27AABCA5150B1ZA

Ship To
TL - Dhaula Energy 2
P&C Division,Mansa Road
Dhaula, Barnala (Punjab)
BARNALA
148107

Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaula
BARANALA (PUNJAB)
148101

Mobile 9878999481
jasbirpurchase@tridentindia.com

S.No.	Item Code / Item Description / Sale Order / PO Number/ Week Code	UOM/ Brand	Order Qty.	Basic Rate	Discount	PKG-FWD	HSN/SAC	CGST/SGST/IGST/ C.Cess	Coal Cess	Item Value	Cancellation Date	Plant
00001	877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR	NOS/ ADOR	1.000	303,000.00 INR/ 1 NOS	0.00 0.00	0.00 0.00	8541.40.90	0.00 /0.00 /18.00 54,540.00	0.00	357,540.00	25.12.2021	TE02 ENERGY-2
00002	877015618 IGBT BASED HFPS CONTROL PANEL ESP	NOS/ ADOR	2.000	1,262,500.00 INR/ 1 NOS	0.00 0.00	0.00 0.00	8548.10.90	0.00 /0.00 /18.00 454,500.00	0.00	2,979,500.00	25.12.2021	TE02 ENERGY-2

Total Value 3,337,040.00 INR

Total Value:INR THIRTY THREE LAKH THIRTY SEVEN THOUSAND FORTY Rupees

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TRIDENTGROUP

Trident Limited - Energy
P&C Division,Mansa Road
Dhaula, Barnala (Punjab)
PURCHASE ORDER

Vendor	Ship To	Bill To				
Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA	TL - Dhaula Energy 2 P&C Division,Mansa Road Dhaula, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com	Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaula BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com	PO Number	7600007938	Dated	25.08.2021
			Our Ref.	13760	Currency	INR
			Your Ref.	offer		
			PO Status :- Invalid/Unapproved Quality Certificate :- Required			

Price Basis: EXW PUNE **Freight :** F

Special Instruction 1) 90% against COD with 100% GST. 2) 10% PBG valid for 1 year 3) PBG will release subject to minimum emission reduction of more than 40% from current level.

Payment Terms: Payable in 2 partial amounts **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf
Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch,Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.. 03AABCA4139J1Z0

This is computer generated Purchase Order.Hence requires no signature.

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TRIDENTGROUP

Trident Limited - Energy
P&C Division,Mansa Road
Dhaula, Barnala (Punjab)
PURCHASE ORDER

Vendor 740056 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA	Ship To TL - Dhaula Energy 2 P&C Division,Mansa Road Dhaula, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com	Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaula BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com	PO Number	7600007938	Dated	25.08.2021
			Our Ref.	13760	Currency	INR
			Your Ref.	offer		
			PO Status :- Invalid/Unapproved Quality Certificate :- Required			

S.No.	Item Code Item Description	Master Inspection Characteristics(MIC)	Upper Specification Limit	UOM	Target Specification Limit

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TRIDENTGROUP

Trident Limited - Energy
P&C Division,Mansa Road
Dhaula, Barnala (Punjab)
PURCHASE ORDER

Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA	Ship To TL - Dhaula Energy 2 P&C Division,Mansa Road Dhaula, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com	Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaula BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com	PO Number	7600007938	Dated	25.08.2021
			Our Ref.	13760	Currency	INR
			Your Ref.	offer		
			PO Status :- Invalid/Unapproved Quality Certificate :- Required			

S.No.	Item Code Item Description	Mat. Classification	PO Material Text
00001	877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR	Standard	
00002	877015618 IGBT BASED HFPS CONTROL PANEL ESP	Customize	

TRIDENTGROUP

Trident Limited - Energy
P&C Division,Mansa Road
Dhaula, Barnala (Punjab)
PURCHASE ORDER

Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA	Ship To TL - Dhaula Energy 2 P&C Division,Mansa Road Dhaula, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com	Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaula BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com	PO Number	7600007938	Dated	25.08.2021
			Our Ref.	13760	Currency	INR
			Your Ref.	offer		
			PO Status :- Invalid/Unapproved Quality Certificate :- Required			

DELIVERY SCHEDULE

S.NO	Item Code Item Description	UOM	PO Qty	Scheduled Date	Sch Qty	Delivered Qty	Open Qty as on 25.08.2021	Contract No	Remaining Contract Value/Qty
00001	877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR	NOS	1.000	25.12.2021	1.000	0.000	1.000		0.00
00002	877015618 IGBT BASED HFPS CONTROL PANEL ESP	NOS	2.000	25.12.2021	2.000	0.000	2.000		0.00

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Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Seller acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorised in writing.
Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.
The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.
The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.
The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.
Weights / quantities as reported by the Purchaser shall be final and binding on the Seller.
This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.
Any other terms & conditions of the Seller mentioned on its Bills,invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.
The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.
Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.
The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.
'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.
The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.
The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.
The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.
All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.
The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.
Seller shall share the progress of the order on weekly basis in writing.
If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser
Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.
In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with interest @18% per annum.
Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.
Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.
Forms / Permits / Declerations shall be submitted as per the applicable laws/statute.
The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.
Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material,the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.
In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.
All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.
The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.
All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences of question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996. Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties.This Purchase order shall be governed by and construed in accordancewith the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.
This Purchase Order supersedes any/and/all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.
Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise,respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate.

TRUE COPY

Advocate

TRUE COPY

Advocate


ADOR - CORONA
REDKOH
ADOR - CORONA
REDKOH
PREDICON-R
OPPO Reno2 Z · ©Raj

ANNEXURE R-15

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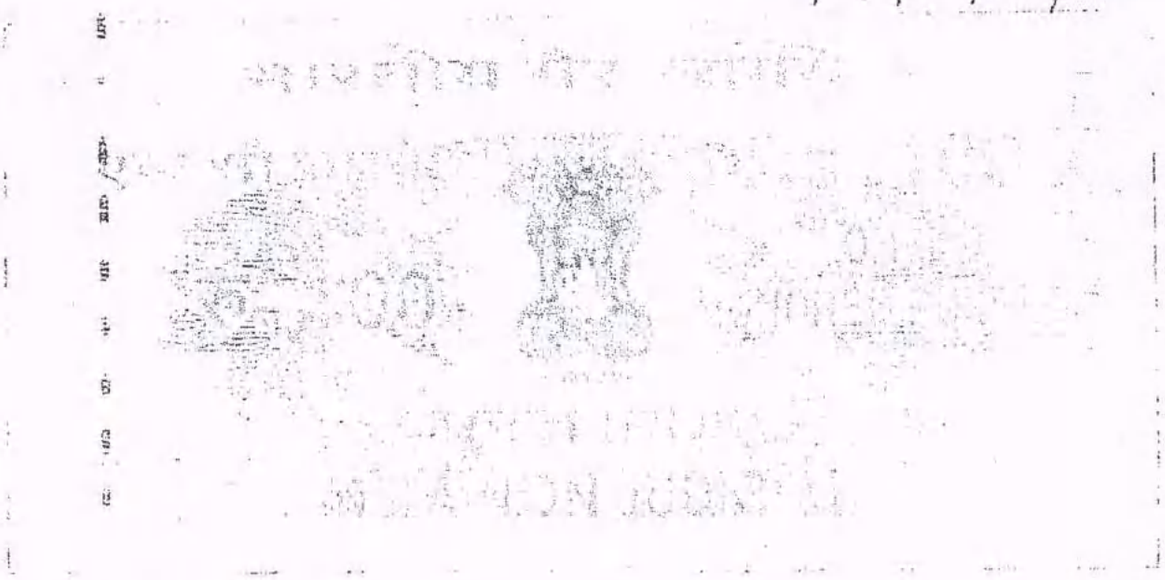
2021/PRJ/PC/PRJ/716



PUNJAB AP 005577

SUPPLY AGREEMENT

This Supply Agreement (hereinafter referred to as the "Agreement"), is made on this 27th day of November, 2021 between

1. TRIDENT LIMITED, a company incorporated under the Companies Act 1956 and having its registered office at Trident Group, Sanghera - 148 101, India (hereinafter referred to as the "Purchaser", which expression shall, unless it be repugnant to the context or meaning thereof, include its successor and assigns) of the First Part; and

2. HAMON RESEARCH COTTRELL INDIA PRIVATE LIMITED, a Company incorporated under the Companies Act, 1956 identified by CIN U73100TN2011PTC099578 and having its registered office at Pacifica Tech Park, Block I, 1st Floor,Core-2,Module No 1Ga1H, Survey No 76, Rajiv Gandhi (OMR), Navalur Chennai Kancheepuram TN 600130, India, represented by Mr Vivek Menezes, duly Authorised by the Board of Directors vide their resolution dated May 11, 2021 (hereinafter referred to as the "Supplier" / "Hamon" or "HRC", which expression shall, unless it be repugnant to the context or meaning thereof, include its successor and agreed assigns) of the Second Part.

Purchaser and Supplier are each individually referred to as a "Party" and collectively as the "Parties".

A. Whereas the Purchaser desires to purchase certain equipments whose specifications, technical characteristics and guaranteed performances are set out in Annexure I.

B. Whereas the Supplier has represented that it has the necessary skill, know-how, and resources for the supply, installation and commissioning of the equipment as set out in Annexure-I and has expressed willingness to provide the same to the Purchaser, subject to the terms and conditions set forth hereunder.

TRIDENT GROUP
Trident Limited
Sanghera-148101, India

HAMON RESEARCH COTTRELL INDIA PVT LTD
HRCIN

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NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

1.0 Scope of the agreement & deliverables

1.1 The Supplier hereby undertakes to sell, deliver, install and commission the equipment, in accordance with the Technical Specifications as per Annexure I and in accordance with the Bill of Quantities, delivery schedule, terms of payment specified in Annexure II upon the terms and subject to the conditions contained herein.

1.2 The Supplier's obligations comprise of the following:

(a) Supply of the equipment, including spare parts and consumables specified in Annexure I in such quantities as specified in Annexure II.

(b) Fulfilment of Guaranteed Performance as per Annexure I.

(c) Supply of the Technical Documentation, drawings, manuals, standard operating procedures etc.

(d) The installation, Commissioning and Performance Testing of the equipment as provided in this Agreement.

(e) The technical training of the Purchaser personnel to operate the equipments effectively

2.0 Prices & payment terms

2.1 The equipment shall be supplied on CIF Price basis at Dhaula, at the contract Price set forth in Annexure II. The price under this agreement shall remain firm until completion of the agreement.

2.2 Payment of the Contract Price shall be made by the Purchaser in accordance with the terms of payment specified in Annexure II.

2.3 The Supplier shall submit an unconditional Advance Bank Guarantee to Purchaser as per the Purchaser's format attached as Annexure V within 15 days of signing of the Agreement to secure advance payment under the agreement. The purchaser shall have a right to extend or invoke Advance Bank Guarantee in the event of failure of supplier to supply the goods in conformity with this agreement. Any extension of guarantee by Purchaser shall be without prejudice to other rights of Purchaser under the Agreement.

2.4 The documents required to be attached by the Supplier before invoice submission to the Purchaser is attached as Annexure III.

2.5 The Supplier shall submit an unconditional Performance Guarantee to the Purchaser as per mutually agreed format as specified in Annexure VI to secure the proper performance of the Agreement for the period upto 12 months from the date of issue of Final Acceptance Certificate. The Purchaser reserves the right to invoke the said guarantee if upon written request of the Purchaser, the extension is not provided/ arranged by the supplier or if the performance of the goods supplied by the Supplier is not in accordance with Annexure I of this Agreement. Any extension of guarantee by Purchaser shall be without prejudice to other rights of Purchaser under the Agreement.

TRIDENT GROUP
Trident Limited
Ganghera-148101, India

HARION RESEARCH-COTTRELL INDIA PVT LTD * HRCIN

3.0 GENERAL TERMS AND CONDITIONS

3.1 The Supplier shall be accountable for:

(a) Successful installation, commissioning, erection, delivery of the equipment in terms of the agreement;

(b) Compliance of all applicable legislation or laws of land or any provision thereof which shall also include references of such laws as it may, after the date hereof, from time to time, be amended, supplemented or reenacted, and any reference to a statutory provision including any subordinate legislation made from time to time under that provision.

3.2 Both the parties hereby agree to the General Terms and conditions as contained in Annexure IV which shall be an integral part of this Agreement.

For TRIDENT LIMITED

TRIDENT GROUP

[Anubhav Nayyar]
Authorized Signatory
Witness:
(Name, address & signatures)

For HAMON RESEARCH COTTRELL INDIA PRIVATE LTD

[Vivek Menezes]
Authorized Signatory
Witness:
(Name, address & signatures)

(A MURUGAN
1385 - VELACHERY CHECK POST
VELACHERY
CHENNAI - 600042)

ANNEXURE I

TECHNICAL SPECIFICATIONS AND GUARANTEED PERFORMANCES OF EQUIPMENT

A TECHNICAL SPECIFICATIONS OF EQUIPMENT:

The brief technical specifications of the Electrostatic Precipitator ('ESP') are as stated below, for detailed specifications refer **Exhibit-1:**

Description	New ESP Chamber (50% Flue gas flow of 500 TDS/d)	New ESP Chamber (70% Flue gas flow of 500 TDS/d)
Number of precipitators	1	1
Boiler firing capacity - TDS/day	500 TDS/d	500 TDS/d
ESP Sizing	50 % MCR Condition	70 % MCR Condition
Total flue gas flow Nm^3/s - Wet	11.56	16.16
Total flue gas flow Nm^3/s - Dry	8.47	11.86
Inlet dust concentration - Dry - g/Nm3	25	25
Projected collecting electrode area for 1 ESP (m^2)	4108	4108
Outlet emission - Dry - mg/ Nm3	30	30
Gas passages per chamber	16	16
Spacing between collecting plate	300	300
Specific collection area	200 $m^2/m^3/sec$	143 $m^2/m^3/sec$
Collecting electrode height (m)	9.4	9.4
Collecting electrode length per field (m)	3.414 (each field)	3.414 (each field)
Total treatment time - (Secs)	29.94	21.39 secs
Number of fields	4 Nos	4 Nos
T-R set quantity.	4 Nos	4 Nos
Available current density	0.58	0.58
T-R set KV rating	Field 1 110 kV, 600 mA Single Phase (1ϕ) TR set + SMPS controller Field 2 110 kV, 600 mA Single Phase (1ϕ) TR set + SMPS controller Field 3 110 kV, 600 mA Single Phase (1ϕ) TR set+ SMPS controller Field 4 110 kV, 600 mA Single Phase (1ϕ) TR set+ SMPS controller	Field 1 110 kV, 600 mA Single Phase (1ϕ) TR set + SMPS controller Field 2 110 kV, 600 mA Single Phase (1ϕ) TR set + SMPS controller Field 3 110 kV, 600 mA Single Phase (1ϕ) TR set+ SMPS controller Field 4 110 kV, 600 mA Single Phase (1ϕ) TR set+ SMPS controller
Gas Velocity - m/s	0.46	0.64

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B GUARANTEED PERFORMANCES OF EQUIPMENT

Guaranteed Emission

S. No.	Parameter	Value
1.	ESP outlet dust emission	a) <30 mg/Nm³ (dry, 3% O2) guaranteed dust emission level at 50% MCR condition b) <30 mg/Nm³ (dry, 3% O2) guaranteed dust emission level at 70% MCR condition
2.	ESP Power Consumption	a) ESP Power Consumption for 50% MCR Condition: 119 KW b) ESP power Consumption for 70% MCR Boiler Load: 123 KW
3.	Pressure Drop (across ESP inlet to Outlet Flange)	25 mmWC

Estimated Emission- Soot Blowing

S. No.	Parameter	Value
4.	ESP outlet dust emission	a) <35 mg/Nm³ (dry, 3% O2) guaranteed dust emission level at 50% MCR condition b) <35 mg/Nm³ (dry, 3% O2) guaranteed dust emission level at 70% MCR condition
5.	Pressure Drop	25 mmWC

- The above guarantee of emission for ESP will be considering the ESP being operated under the operating conditions specified, under stable operation.
- The ESP is operated at the specified design parameters and under steady state.
- The test shall be as per CPCB guidelines.

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C **SPARES**

The Supplier hereby further undertakes to supply to the Purchaser all the spare parts and other critical parts and equipments for the smooth and efficient running of the equipments during a period of 10 years after the expiry of warranty period, which will be at Purchaser's cost, within 15 days of the receipt of request of the Purchaser for supply / replacement of spare parts and / or other critical equipments.

In case of failure of spare during the warranty period, the supplier shall send a replacement with 7 working days from the date of receipt of information from the Purchaser on FOC DDP basis. In this case, the import/custom duties, taxes and levies will be borne by supplier.

List of spares included in Scope of Work :

Erection & Commissioning Spares

Item No.	Description	Quantity
1	Discharge electrodes	1% of Installed Quantity of 1 ESP
2	Collecting plates	1% of Installed Quantity of 1 ESP
3	Support Insulator	2 Numbers

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ANNEXURE II

A BILL OF QUANTITES

S. No.	Description	Quantity	Unit Price	Amount in INR*
1	<u>Supply Portion :</u> Supply of one number of ESP as per the scope matrix listed below	1 (One)	5,25,00,000/-	5,25,00,000/- (Rupees Five Crores Twenty-Five Lakhs only)
2	<u>Service Portion including erection, installation and commission:</u> Charges for Service Portion including, erection, installation and commission of ESP with Ducting System, conveyors and RAV valve, E&I Items and Panels (as identified in Scope matrix below)	1 (One)	1,15,00,000/-	1,15,00,000/- (Rupees One Crore Fifteen Lakh Rupees only)

* The contract price is inclusive of packing, forwarding, freight, installation, installation and other service charges but exclusive of GST.

The Supplier shall be solely and exclusively liable for payment of all taxes, duties, levies and for all necessary Tax Compliances including but not limited to GST and any other New Tax, on or in connection with the manufacture and sale of the said equipment by the Supplier to the Purchaser under and in accordance with this Agreement. The Purchaser shall not be liable or responsible therefore, in event, of any claim, penalty or liability levied on or incurred by the Supplier due to above Non-Compliance and Non-Payment of applicable Taxes and duties. The Supplier shall indemnify and keep indemnifying the Purchaser from and against claims including any tax input credits denials to the Purchaser by Tax department due to any Non-Compliance by the Supplier.

GST amount will be held back and will paid after the same is reflected in our GSTR-2A, 3B or Annex-2, as the case may be.

The detailed Bill of Quantities is as below :

S No	Item Description	UOM	Total Billing Value(INR)
A	Mechanical - Fabricated Items		
1	Inlet/outlet cone & Stiffeners, Duct, G.D. Screen with Accessories, Cold Roof Plate, Duct Support,	1 LOT	95,01,500
2	Internals (CE, DE, Etc)	1 LOT	83,87,000
3	Insulation and Sheeting	1 LOT	23,33,300
4	Seal Air System for Support Insulator	1 LOT	7,10,000
5	PTFE Bearing	1 LOT	1,61,000

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S No	Item Description	UOM	Total Billing Value(INR)
6	Mechanical Miscelleneous	1 LOT	7,84,000
B	Mechanical - Bought Out Items		
1	Drag Chain conveyor with accessories & Rotary Air lock valve	1 LOT	22,56,860
2	Monorail, Weather Enclosure, platforms and Stair, Grating, Handrail	1 LOT	25,13,000
3	Scrapper Conveyor with accessories	1 LOT	39,80,400
4	Rotary air lock Valve	1 LOT	5,72,900
5	NMEJ	1 LOT	5,00,700
6	DTPA Damper at Inlet and Outlet	1 LOT	16,07,900
7	Multi louver Damper	1 LOT	4,63,300
8	Conical Support Insulator & Wall Bushing Insulator	1 LOT	9,22,900
9	Hoist	1 LOT	5,47,800
C	Electrical & Instrumentation		
1	ESP MCC	1 LOT	15,84,800
2	TR set, with Panel	1 LOT	60,03,700
3	JB - (Power and Control) & LBPS	1 LOT	2,62,900
4	Cables, Cable Trays with Accessories, Earthing Flat - above ground	1 LOT	52,48,500
5	Rapper Control Panel	1 LOT	5,72,900
6	MIGI Coils	1 LOT	24,90,000
7	Miscelleneous E & I	1 LOT	10,94,640
	Total		5,25,00,000

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Sonchera-148116, India

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B TIME SCHEDULE

i. The supply of the Equipment shall be completed within 7 (Seven) months from the date of the agreement; and

ii. The installation & commissioning of the Equipment shall be completed on or before 15th July 2022, subject to completion of civil work, which is within the scope of the Purchaser to be completed within 7 (Seven) months from the date of the Agreement. In case of delay in completion of civil work due to reasons attributable to the Purchaser, the time schedule for installation & commissioning of the Equipment shall be extended proportional to the period of delay.

iii. Grace period of 2 weeks shall be granted to the Supplier (from 15th July 2022) for calculation of Liquidated Damages.

C TERMS OF PAYMENT

1. Supply

- 10% of the Supply part of the contract price shall be paid against submission of Advance Bank Guarantee as per the Purchaser's format, issued by any of the following Banks, valid up to the Commissioning.
  - ✓ State Bank of India
  - ✓ Punjab National Bank
  - ✓ Central Bank of India
  - ✓ Canara Bank
  - ✓ Indian Bank
  - ✓ Union Bank of India
  - ✓ Axis Bank
  - ✓ HDFC Bank
  - ✓ ICICI Bank
- 65% of the Supply Part of the contract price plus 100 % of taxes shall be paid on pro-rata basis within 15 days from delivery as per Bill of Quantities given above.
- 15% of the Supply Part of the contract price shall be paid on successful commissioning or 180 days from the date of dispatch whichever is earlier, if the delay in commissioning is not attributable to Supplier.
- 10% of the Supply part of the contract price shall be paid against submission of Performance Bank Guarantee as per the Purchaser's format, issued by any of the above Banks, valid for a period of 12 months from the date of Final Acceptance Certificate.

2. Service Portion including erection, installation and commission

- 90% of the Installation & Commissioning Part of the contract price plus 100 % of taxes shall be paid within 7 days from achievement of milestones:

  Milestone A : 20% of Service Portion including erection, Installation and commission (incl 100% of taxes) upon Erection of Collecting Electrode Discharge Electrode, Chassis installation and alignment for the conveyors.

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Trident Limited
Sanghera-148101 (Punjab)

HARCN-COTTRELL INDIA PVT. LTD.

Milestone B : 30% of Service Portion including erection, Installation and commission (Incl 100% of taxes) upon Erection of ESP Scrapper Conveyor, ESP Screw Conveyors, Inlet and Outlet Hood, Cold Roof, Weather enclosure

Milestone C : 40% of Service Portion including erection, Installation and commission (Incl 100% of taxes) upon Erection of ESP Electricals & Instruments (Including MCC panel), Completion of Duct works, Air Load Test, GD Test of ESP

- 10% of the Installation & Commissioning Part of the contract price shall be paid against submission of Performance Bank Guarantee as per the Purchaser's format, issued by any of the following Banks, valid for a period of 12 months from the date of Commissioning.
  - ✓ State Bank of India
  - ✓ Punjab National Bank
  - ✓ Central Bank of India
  - ✓ Canara Bank
  - ✓ Indian Bank
  - ✓ Union Bank of India
  - ✓ Axis Bank
  - ✓ HDFC Bank
  - ✓ ICICI Bank

Note:

For the Erection part following are the activities considered:

1. The ESP Mechanical Erection and Electrical Erection will be started once the complete RCC Works (within the scope of purchaser) are completed. Although, for activities unrelated to RCC works, this shall not be applicable.
2. The Estimated days for complete Mechanical and Electrical works are 60 days from the completion of RCC Works.
3. Supplier will depute Crane & Hydra services for the period of 60 days. However, any delay in work on supplier's part shall not be considered within the aforesaid period.
4. Supplier's Supervision Engineer man-days for the complete erection, Installation and Commission of ESP is considered as follows:
   i. Supervision for ESP RCC Works : 75 days (15 days x 5 months)
   ii. ESP Mechanical Supervision - 1 Engineer : 45 days for Complete Mechanical installation + 15 Days for Commissioning
   iii. ESP E&I Supervision - 1 Engineer : 30 days for Installation + 15 Days for Commissioning
5. Purchaser shall provide the Food, Accommodation, local transport within the site for Supervision Engineer and crane operator (Max. 3 person).

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Baddi, Distt. Solan (H.P.)

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6. The Scaffolding, Tools, safety accessories as required and to carry out the erection works will be provided by Supplier.
7. Power and Water (as applicable) shall be provided by purchaser nearby ESP terminal point area (5 meters from ESP footing).

D BANK CHARGES, INSURANCE & TAXES

Beneficiary's Bank Charges shall be borne by the beneficiary and the applicant's bank charges shall be borne by the applicant.

All Deliveries under this agreement shall be covered by the Supplier's Insurance from the Supplier's warehouse up to the Purchaser's site/warehouse.

E SCOPE

The supplier's scope of work under this proposal covers:

1. Mechanical design, engineering, manufacturing, supply, transportation and delivery up-to site. The material and equipment included in the scope of supply is listed in the Agreement.
2. Civil Design of ESP and accessories, New ID fan Foundation (with detail equipment engineering)
3. Supervision of ESP RCC construction (15 Days x 5 months)
4. Supervision of Erection and Commissioning.
5. Mechanical erection and commissioning.

Scope of services includes:

(a) The civil design for ESP and its auxiliaries, mechanical design and engineering of all material included in the scope of supply as well as the design input data required for the engineering of interface systems and equipment, as per the scope agreed under this agreement.

(b) The following documents will be submitted:

- G.A. Drawing with civil load data
- P&I diagram
- Single line diagram
- Erection manual and erection drawings
- Operation and Maintenance manual

(c) Engineering of the new ducting modification.

(d) Computerised Flow dynamics (CFD study) for the ducting system & ESP, To ensure the even distribution of flow between the chambers.

(e) Erection of the ESP and its auxiliaries.

(f) Commissioning of the system and setting up the performance test.

Material scope of supply:

Battery limits:

Main Equipment

Gas : At flanges of ESP inlet and outlet flange.

Ash System : At the Rotary feeder outlet flange till the inlet of existing AMT /conveying setup

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Sangrur-148101

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Electrical : At the field equipment and cabinets connection terminals (see scope hereafter)

Flue Gas duct:

ESP inlet duct : At the tapping point of existing ESP inlet duct

ESP outlet duct : At the tapping point to the existing ESP outlet duct to chimney (including inlet/outlet duct of the new ID fan)

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Matrix of supply

S No.	Description of Item	Supplier	Purchaser	Remarks
1	Civil Items			
1.1	Construction of Civil works - Includes foundation, Columns, Beams upto bottom baffle level i		✓	Load data of Supplier's equipments shall be provided by Supplier
1.2	Approach and access roads		✓	
1.3	Electrical control rooms		✓	
1.4	Issuance of Civil Drawings with Inserts arrangement (Good for construction drawings For ESP Accessories and Electrical Control Room)	✓		
1.5	Supply of Material for RCC work		✓	
1.6	RCC embedment's		✓	
1.7	ESP Insert Plates		✓	Supply Shall be in Purchaser's Scope. However, Engineering & BOM shall be in Supplier's scope.
2	Mechanical Items			
2.1	ESP casings and casing columns, ESP hot roof (RCC Construction), RCC floor for conveyor maintenance and RCC stair till ESP conveyor floor level		✓	
2.2	ESP Inlet and Outlet hoods	✓		
2.3	ESP cold-roof arrangement (Carbon Steel)	✓		
2.4	ESP Quick opening doors	✓		
2.5	ESP Internals including electrodes, suspension and steadying frames, rapping shafts, anvils and baffles.	✓		
2.6	Gas distribution devices with support accessories.	✓		
2.7	Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices.	✓		
2.8	Insulators as required by Supplier's design.	✓		BHEL Make
2.9	HV bus-duct and T-R oil trays.	✓		
2.10	Mechanical key safety interlocks system.	✓		
2.11	Fixed and slide bearings	✓		
2.12	Access steel structures including platform and staircase from ESP Conveyor floor level to ESP roof with gratings and stair steps.	✓		
2.13	Weather enclosure for new ESP	✓		
2.14	Maintenance structure with monorail	✓		

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S No.	Description of Item	Supplier	Purchaser	Remarks
2.15	Inlet & outlet expansion joints - Non-metallic type	✓	✓	Existing shall be used and new NMEJ will be supplied as required.
2.16	New ESP inlet DTPA dampers	✓		
2.17	New ESP Outlet DTPA dampers	✓		
2.18	Rotary valve at ash conveyor outlet	✓		Capacity 5 TPH
2.19	Scrapper Conveyor & Drag Chain Conveyor	✓		Capacity 4 TPH
2.20	Bearings for Scrapper Conveyor	✓		
2.21	Thermal insulation & Cladding Sheet of ESP including its installation	✓		
2.22	New ESP inlet and outlet ductwork with supports	✓		The new duct size will be arrived and firmed up as per the CFD analysis. The new duct portion at the Hookup location connected with the existing setup will be supplied as first dispatch.
2.23	Induced draft fan + VFD panel		✓	Civil Design of New ID fan Foundation with detail equipment engineering shall be in Supplier's scope
2.24	Ash Mixing tank with Agitator		✓	
2.25	AMT Transfer Pump		✓	
2.26	Mechanical erection works	✓		
2.27	Multi Louver Damper at ESP outlet	✓		As required by Trident Group
3	**Electrical Items**			
3.1	T-R sets including dielectric mineral oil, protection devices and ground switches.	✓		
3.2	Electrical hoist	✓		
3.3	Insulator heaters with seal air fan	✓		Seal Air Fan (SAF) Capacity - 2.75 KW Heater Capacity - 32 KW Max. cut off temp for SAF is 160 °C
3.4	Motor Control Center (MCC)	✓		
3.5	Main Lighting Distribution Board (MLDB)		✓	Existing shall be used
3.6	T-R controller cabinets	✓		
3.7	Insulator heater junction box	✓		
3.8	Local Push button stations	✓		
3.9	Complete supply of power & Control cables from the MCC to field	✓		Type of cables: Armoured cables

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S No.	Description of Item	Supplier	Purchaser	Remarks
	Equipment's. Control cables from ESP to Field JB and JB to control room			
3.10	Provision in MCC panel to connect with DCS	✓		
3.11	Supply of communication cable from ESP MCC panel to plant DCS		✓	
3.12	Supply of grounding system above ground	✓		
3.13	Supply of cable trays	✓		FRP Trays with SS Tie's
3.14	Earthing of ESP till bearing level	✓		
3.15	Underground earth grid and/or pits		✓	
3.16	Lightning protection system/Arrestors		✓	
3.17	Equipment lighting system		✓	
3.18	Ventilation and air conditioning system for control room		✓	
3.19	Electrical erection works	✓		
3.20	MCCB with type 2 coordination	✓		For panels as applicable
3.21	Local Canopy for existing ESP TR sets	✓		For 3 numbers of existing ESP TR sets Supplier shall provide the engineering & supply of local enclosure/canopy for the TR sets of ESP. Supplier shall carry out the engineering for complete weather enclosure of ESP.
4.	Instrumentation items			
4.1	Instrument junction boxes.	✓		
4.2	Supply of instrument cables	✓		Type of cables: Armoured cables
4.3	Supply of cable trays and ducts for instrument cables	✓		
4.4	Instrument installing and cabling works	✓		
4.6	SOX, NOX analyzer and CO Analyzer with, • Measurement of emission value in Normalization unit i.e., mg/Nm3 • Stack Gas Temperature Measurement (0 - 300o C) and compensation • Stack Gas Velocity (Flow) 0 - 40 m/s and compensation • Absolute Stack Gas Pressure measurement (0 to 100mmWC) and compensation • Diagnosis features for Pressure / Vacuum, Flow failures		✓	

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HRCIN

S No.	Description of Item	Supplier	Purchaser	Remarks
	• Temperature & Moisture measurement at Analyzer			
4.8	Zero Speed Switch for conveying system motors	✓		
4.9	Flow meter for New ESP chamber (1 Number)	✓		

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ANNEXURE III

DOCUMENTS REQUIRED FOR DISPATCH

The original set of documents should include the following:

a) MTR/GR/RR (as the case may be) reputed transport Company

b) Original Tax documents to enable Purchase to avail tax benefits on Purchase of Equipment.

c) The Commercial invoice, packing and weight list in triplicate duly signed

d) Certificate certifying that goods are free from any manufacturing defect and are of excellent quality issued by the Supplier

e) Beneficiary certificate certifying that all technical details as per agreement, in English language along with the consignment.

f) Acknowledgement by the Buyer for the performance bank guarantee. The Supplier shall submit the performance bank guarantee for 10% of the Contract value as per Purchaser's format.*

h) Warranty Certificate by the Supplier as per Purchaser's format.

i) Inspection certificate issued by the Buyer on the inspection of goods at the premises of manufacturer, before the dispatch takes effect. Certificate to be signed by Mr. Deepak Nanda or Ms Ramandeep Kaur or any person authorized by either in writing.*

j) A certificate confirming that non negotiable set of documents has been sent directly to the Buyer by courier within 7 working days from the date of shipment of the goods.

k) Particulars of consignment to be sent by email at ID kaustubhkokane@tridentindia.com, i.e., description of goods dispatched, value of goods, name of carrier company, number and date of bill of lading or airway bill as the case may be, number of cases/container and their gross & net weight, copy of insurance cover note certifying that goods are insured from warehouse to warehouse up to 110% value of the consignment.

The copies of above documents shall be sent by email to the Purchaser within 3 working day from the date of shipment of the goods.

The invoice shall be raised in the name and address of our works as below:

TRIDENT LIMITED
Mansa Road
Dhaula
Barnala, Punjab 148107

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ANNEXURE IV

GENERAL TERMS & CONDITIONS

1. Infringement of intellectual property rights

   The Supplier undertakes that the equipment supplied does not infringe any third party intellectual property rights and the Supplier further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by equipment supplied under this agreement.

2. Inspection

   The Supplier shall, on completion of manufacture of the equipment, notify the Purchaser who shall conduct an inspection prior to the dispatch or shipment of the equipment, in order to conduct the said inspection, the Supplier shall provide the Purchaser 10 days in advance of the deadlines for dispatch mentioned in the Time Schedule. Upon each such inspection as aforementioned, an inspection certificate recording the fact of inspection and certifying that the equipments are in conformity with the specifications under the said Purchase Order shall be issued by Mr Deepak Nanda, Managing Director of the Purchasing Company or any other person authorized by Mr Deepak Nanda.

   The Inspection by Mr Deepak Nanda or any other person authorised by him/her as above shall not constitute a waiver of any of the supplier's responsibilities, Obligations, representations or warranties.

3. Erection, commissioning and performance testing

   - The Supplier undertakes to provide, with its specialized personnel (as agreed in scope of work), the erection, installation, commissioning and performance testing of the equipments. The Purchaser shall provide the required resources and personnel to enable and assist the Supplier in the provision of the said services. In the event that the Performance Testing indicates any defaults or deficiencies, the Supplier shall immediately rectify the same and the process of Performance Testing will be repeated thereafter. This Performance Testing process can be undertaken to a maximum of three times.
   - In case the equipment fails to attain the guaranteed performance parameters as defined in the agreement, the Supplier shall indemnify the Purchaser and shall replace the equipment within minimum time at the risk & cost of the Supplier.

4. Warranty

   The Supplier hereby warrants and represents that equipment is capable of achieving Minimum Guaranteed Performance as provided in the agreement, as per the format attached as Annexure VII, as per the Purchaser's format for a period of 18 months from the date of shipment of materials or 12 months from the date of issue of Final Acceptance Certificate, whichever comes earlier.

5. Liquidated damages

   If the installation and commissioning of the equipment occurs later than time specified in the Time Schedule and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to liquidated damages of 0.5% of the Contract Price per week of delay or part thereof subject to a maximum of 5% of the Contract price. For purpose of computing liquidated damages in the event of delay in installation and commissioning of the equipment, mere installation of the equipment and spare parts within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to installation and commissioning of within the agreed commissioning date. The Purchaser shall

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have the right to invoke the Performance Bank Guarantee submitted by the Supplier for recovering the Liquidated damages. Any delay by the Supplier in submission of Performance Bank Guarantee shall not constitute grounds for levying liquidated damages.

6. Termination

In the event that a Party (the "defaulting Party"):

a) commits a material breach of this Agreement and has not remedied the same within thirty (30) days after receipt of a notice from the other party specifying the nature of the breach and requesting that it be remedied; or

b) fails to deliver the equipments as per specifications & time schedule specified in this Agreement issued under this agreement; or

c) is insolvent or a receiver or liquidator (including provisional liquidator) is appointed over all or part of its undertaking, or enters into any scheme of arrangement or compromise for the benefit of its creditors or negotiations therefore, or declares a moratorium on the payment of its debts or becomes unable to meet its financial obligations; or

d) is the subject of an order by any competent court seeking its liquidation or dissolution;

the other Party may, without prejudice to the exercise of any other rights or remedies which may be available to it, cancel the agreement issued by giving the defaulting Party written notice to that effect. In case of termination for default of the other Party as mentioned above, the terminating party will be entitled to compensation for the loss it has suffered as a direct consequence of the default justifying termination.

7. Confidentiality

The Supplier agrees not to disclose any confidential information pertaining to the Purchaser's business to any third party and shall use its best efforts to ensure that their directors, officers, employees, contractors and suppliers keep secret, all Confidential Information disclosed by the Purchaser, including without limitation, documents, technical information, software, processes, know-how and other unpublished information, except as may be authorised in writing by the Purchaser. The provisions of this clause survive after termination/ completion of the agreement.

8. Packing

All items of the equipment and spare parts shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc. The packing shall allow for easy removal and inspection at sight. Any damage or loss to the equipment or deterioration in the quality of equipment during transport due to faulty protection or insecure packing shall be to the Supplier's account.

9. Sub Contracting

The Supplier may sub-contract any part of its obligation, after obtaining the prior written approval of the Purchaser by providing the details of the sub-contractor or sub-supplier. Any such sub-contracting does not absolve the Supplier of its obligations and the Supplier shall continue to be primarily and solely responsible for performance of obligations. The approved list of sub-contractors is enclosed as Exhibit-2.

10. Prevention of Bribery

The Supplier hereby undertakes that, at the date of the entering into force of the Contract, itself, its directors, officers or employees have not offered, promised, given, authorized, solicited or accepted any undue pecuniary or other advantage of any kind (or implied that they will or might do any such thing at any time in the future) in any way connected with the Contract and that it has taken reasonable measures to prevent sub suppliers, agents or any

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HAMON RESEARCH-COTTRELL INDIA PVT. LTD. HRCIN

other third parties, from doing so. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Supplier or by an employee, agent or sub-supplier of the Supplier shall, without affecting the its liability for such failure and act, result in this contact being invalidated.

11. Prohibition of Insider Trading

The Supplier or his relatives, associates, employees, agents and/ or sub- supplier shall not trade, directly or indirectly, in the shares of Trident Limited during the currency of this agreement or during six months post expiry of this agreement.

12. Force majeure

Notwithstanding anything contained herein, either party shall have the option to exercise at any time in its sole discretion to terminate, with immediate effect, this Contract under any or all of the following circumstances:

i. Declaration of war or occurrence of insurrection, civil commotion, or any other serious or sustained financial, political or industrial emergency or disturbance.

ii. The offer is subject to force majeure by which it means causes such as war, invasion, civil disobedience, government orders or restrictions due to covid, pandemic like Covid, strikes, lockouts, riots, fires, epidemics, trade embargoes, acts of God such as earthquakes, fire, floods, any natural calamity or any other causes whatsoever beyond our reasonable control, affecting us or our subcontractors, suppliers etc.

13. Assignment

Neither this contract, nor any right or obligation hereunder may be assigned, in whole, or in part, by the Supplier without the prior permission of the Purchaser.

14. Amendment

This Contract shall not be amended, modified, altered or changed in any way except by writing executed by the Purchaser and the Supplier.

15. Arbitration & Jurisdiction

- Any dispute, controversy or claims arising out of or relating to this agreement, or the breach, termination or invalidity thereof shall be settled by Sole arbitrator to be appointed by purchaser and be governed as per the Arbitration and Conciliation Act 1996. The place of arbitration shall be Barnala, Punjab in India. The language used in arbitral proceedings shall be English. Any testimony, documents produced and outcome of the arbitration shall be confidential.
- This agreement shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only.

16. Designated Single Point of Contact (SPOC) and Authorised Signatory:

Trident Limited hereby designate Mr. Anubhav Nayyar, Authorized Signatory (hereinafter referred to as "the SPOC"/"the designated SPOC"/"the Authorised Signatory") who shall serve as a single point of contact and shall be responsible for proposing or accepting in writing any variation from the terms of the contract executed with the you during its tenure.

The said SPOC is only authorized signatory on behalf of the Trident Limited for all communications with the you and the Trident Limited does not have any obligation or binding for any communications on its behalf by any person other than the designated SPOC as aforesaid.

No payment, invoice, debit notes, material, services, shall be considered accepted by the Trident Limited till the time same has been duly accepted in writing by the designated SPOC.

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Trident Limited is entitled to change the designated SPOC at any point of time and shall promptly give written notice of the change to you including the new contact details of the new designated SPOC immediately on happening of such change event.

TRIDENT GROUP

Trident Limited
Barnala-148101, Punjab

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ANNEXURE V

ADVANCE BANK GUARANTEE (DOMESTIC-SUPPLIER)

Note : To be executed on Stamp Paper of Rs 100/- or such higher value as per Stamp Duty applicable in the State in which the Guarantee is issued. Stamp Paper should be in the name of the Bank issuing the Guarantee).

BANK GUARANTEE NO:
DATE :

THIS DEED OF GUARANTEE is made on this .....day of ....., YYYY between M/s _____ Limited having its registered office at _____, India (hereinafter referred to as "Purchaser" which expression shall unless excluded by or repugnant to the context include its successors and assigns) of the one part and the .....(Name of Bank) operating through its branch at ..... (here-in-after referred to as "Bank" which expression shall unless excluded by or repugnant to the context include its successors and assigns) of the other part.

Whereas the Purchaser has entered into an Agreement No. ..... dated ..... (here-in-after referred to as "Agreement") with M/s ..... having its registered office at ..... (hereinafter referred to as "Supplier" which expression shall unless excluded by or repugnant to the context include its successors and assigns) towards supply of ..... (hereinafter referred to as "equipment") as per the said Agreement. The Agreement provides that the Purchaser shall make an advance payment to the Supplier to the extent of Rs. ..... (Rupees ..... only) being .....% of the value of the Agreement on submission of Advance Bank Guarantee by the Supplier.

AND WHEREAS at the request of the Supplier, the Bank has to execute these presents.

THIS DEED WITHNESSETH AND IT IS HEREBY AGREED AND DECLARED BY AND BETWEEN PARTIES HERETO AS FOLLOWS:

1. The Bank hereby irrevocably & unconditionally undertakes and guarantees to Purchaser that if the supplier fails to supply the goods in conformity with the terms of the Agreement for any reason whatsoever, the Bank shall merely on demand and without demur pay to Purchaser all and any sum up to a maximum of Rs. ..... (Rupees .....) without any reference to the supplier and without questioning the claim with in three working days of receipt of the demand for claim.
2. The Bank further agrees that the Purchaser shall be the sole judge as to whether the Supplier has failed to abide by the terms of said Agreement or has failed to perform as per the said Agreement in any respect of the whole or part of the payment made by the Purchaser. Any demand made on the Bank by the Purchaser shall be conclusive and binding upon the Bank. The Bank shall pay forthwith the amount demanded by the Purchaser not withstanding any dispute, if any, between the Purchaser and the Supplier.
3. The Bank undertakes to honor the demand for claim under this bank Guarantee at any of its branch in India.
4. The Bank undertakes to extend the period of this Guarantee merely on request by the Purchaser and with intimation to the supplier.

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5. This Guarantee shall not be affected by any change in constitution of the Supplier, the Purchaser or the Bank nor shall it be affected by any change in constitution or by any amalgamation or absorption or reconstruction thereof.

6. The Bank further agrees, that the Purchaser shall have the fullest liberty without affecting in any way obligation of the Bank hereunder, with or without the consent or knowledge of the Bank, to vary any of the terms and conditions of the said Agreement or to extend the time of delivery from time to time or postpone for any time or from time to time any of the powers exercisable by the Purchaser against the Supplier and either of forbear or enforce any of the terms and conditions relating to the said Agreement and the Bank shall not be relieved from its liability by reason of any such variation or any indulge or forbearance shown or any act or omission on the part of the Purchaser or by any such matter or thing whatsoever under the law relating to sureties would but for this provision have the effect of so relieving the Bank.

7. It shall not be necessary for Purchaser to proceed against the Supplier before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank, not withstanding any security which Purchaser may have obtained or obtain from the Supplier at any time or when proceeding taken against the Bank, hereunder, be outstanding or realised.

8. The Bank further agrees that this Guarantee shall not be revoked by the Bank at any time during its currency without previous consent in writing signed by Managing Director of the Purchaser.

9. The Bank further agrees that any legal action or proceedings arising out of this Guarantee shall be brought in the courts or tribunals at Barnala in India and irrevocably submit themselves to the jurisdiction of such courts and tribunals.

10. Notwithstanding anything contained herein before, the liability of the Bank under this guarantee is restricted to Rs. .....(Rupees .....only) and shall remain in force up to DDMMYYYY unless a claim under the Guarantee is filed against the Bank on or before DDMMYYYY (60 days beyond the expiry date of the Guarantee)[Thus if the Guarantee is valid up 1st April, the claim lodging period shall be up to 31st May] and expires in full automatically, irrespective of whether the Guarantee is returned to the Bank or not.

IN WITNESS WHEREOF the Guarantor has hereunto set his hands on the day and year first hereinabove written.

Signature
Name
Designation

Complete Address of Bank
Fax Number of Bank
Email ID of Bank

TRIDENT GROUP

HARMON RESEARCH-COTTRELL INDIA PVT LTD ★ HRCIN

ANNEXURE VI

Note : To be executed on Stamp Paper of Rs 100/- or such higher value as per Stamp Duty applicable in the State in which the Guarantee is issued. Stamp Paper should be in the name of the Bank issuing the Guarantee).

PERFORMANCE BANK GUARANTEE (DOMESTIC)

BANK GUARANTEE NO.:

DATE :

THIS DEED OF GUARANTEE made on this .....day of ....., YYYY between M/s _____ Limited having its registered office at _____, India (hereinafter referred to as "Purchaser" which expression shall unless excluded by or repugnant to the context include its successors and assigns) of the one part and ..... operating through its branch at ..... (here-in-after referred to as "Bank" which expression shall unless excluded by or repugnant to the context include its successors and assigns) of the other part.

Whereas the Purchaser has entered into a Agreement No. ..... dated ..... (here-in-after referred to as "agreement") with M/s ..... having its registered office at ..... (here-in after referred to as "Supplier" which expression shall unless excluded by or repugnant to the context include its successors and assigns) towards supply of ..... (here-in-after referred to as "Equipment") as per the said agreement.

The agreement provides that the Supplier shall furnish a Bank Guarantee to the extent of Rs. ....., (Rupees .....) being .....% of the value of the agreement as security for compliance of the terms of agreement including satisfactory working of the equipment.

AND WHEREAS at the request of the Supplier, the Bank has to execute these presents

THIS DEED WITHNESSETH AND IT IS HEREBY AGREED AND DECLARED BY AND BETWEEN PARTIES HERETO AS FOLLOWS:

1. The Bank hereby irrevocably and unconditionally guarantees to the Purchaser that the equipment contracted is capable of performing the work as agreed in the Agreement. In the event of equipment failing to comply with the terms of the agreement including performing to the satisfaction of the Purchaser, which shall be final and conclusive of the factum of non-performance, the Bank shall indemnify and keep the Purchaser indemnified to the extent of Rs. .....(Rupees .....) against any loss or damage that may be caused to or suffered by the Purchaser consequent to non-performance of the contracted equipment supplied by the Supplier, without any reference to the supplier and without questioning the claim with in three working days of receipt of the demand for claim.

2. The guarantee herein shall remain in full force and effect for a period of ..... months from the date of certification by the Purchaser of successful installation and commissioning of the equipment contracted.

3. The decision of the Purchaser regarding the liability of the Bank under the guarantee and the amount payable there under shall be final and conclusive and binding on the Bank. The Bank shall pay forthwith the amount demanded by the Purchaser not withstanding any dispute, if any, between the Purchaser and the Supplier.

TRIDENT GROUP

Bangalore-560104, India

HRCIN

4. This Guarantee shall not be affected by any change in constitution of the Supplier, the Purchaser or the Bank nor shall it be affected by any change in constitution or by any amalgamation or absorption or reconstruction thereof.

5. The Purchaser have the fullest liberty without affecting the guarantee to postpone at any time or from time to time any of the powers exercisable by it against the Supplier, either to enforce or forbear the clause governing guarantee in the terms and conditions of the said Agreement and Bank shall not be released from its liabilities under the guarantee by any matter referred to or by reason of time being given to the Supplier or any other forbearance, act or omission on the part of the Purchaser or any material or things whatsoever which under the law relating to sureties shall, but for the provisions hereof, have the effect of so releasing the Bank from its liabilities.

6. The Bank further agrees, that the Purchaser shall have the fullest liberty without affecting in any way the Banks obligations hereunder, with or without consent or knowledge of the Bank, to vary any of the terms and conditions of the Agreement or to extend the time of delivery from time to time.

7. The Bank undertakes to extend the period of this Guarantee merely on request by the Purchaser and with intimation to the supplier.

8. The Bank undertakes to honor the demand for claim under this bank Guarantee at any of its branch in India.

9. The Bank further agrees, that in order to give full effect to the guarantee herein contained, the Bank shall be entitled to act as if the Bank is the principal debtor of the Purchaser in respect of claim against the Supplier hereby guaranteed by the Bank as aforesaid, and the Bank hereby expressly waive its rights of suretyship and other rights, if any, which are in any way inconsistent with the above or any other provision of this Guarantee.

10. The Bank further agrees that any legal action or proceedings arising out of this Guarantee shall be brought in the courts or tribunals at Barnala in India and irrevocably submit themselves to the jurisdiction of such courts and tribunals.

11. Notwithstanding anything contained herein before, the liability of the Bank under this guarantee is restricted to Rs. ..... (Rupees .....) and shall remain in force up to ..... unless a claim under the Guarantee is filed against the Bank on or before .....(60 days beyond the expiry date of the Guarantee)[Thus if the Guarantee is valid up 1st April, the claim lodging period shall be up to 31st May] and expires in full automatically, irrespective of whether the Guarantee is returned to the Bank or not.

IN WITNESS WHEREOF the Guarantor has hereunto set his hands on the day and year first hereinabove written.

Signature
Name
Designation

Complete Address of Bank
Fax Number of Bank
Email ID of Bank

TRIDENT GROUP

ANNEXURE VII

WARRANTIES

(To be executed by Supplier on its Letter Head)

To

TRIDENT LIMITED
Mansa Road
Dhaula
Barnala, Punjab 148107

This has reference to our Supply Agreement No. _____ dated _____ (hereinafter referred to as Agreement) for the supply of _____(Name & quantity of machine) (hereinafter referred to as equipment) at a total contract price of _____ to be shipped by _____ (date of shipment).

We hereby warrant following in respect of the equipment to be supplied under above said Agreement.

1) The design of all items of the equipment will be modern, approved and of the latest type as developed by recent experience and each item of the equipment shall be capable, under normal use of operation and maintenance, of accomplishing the performance guarantees.

2) All items of equipment shall be brand new and unused and will comply with relevant specifications, drawings and other description furnished therefore by Supplier.

3) All items of equipment and spares will be of first class workmanship, high quality and appropriate materials and in conformity with internationally accepted standards and engineering practices

4) All items of equipment under normal conditions at site would be free from design and manufacturing defects or defects in materials and workmanship.

5) The equipment, including any extras, will, in all respect, comply with the specifications of the agreement and with the representations and warranties set forth herein.

6) During the aforesaid warranty period, we shall, at our own expense, upon demand by Purchaser, promptly repair and make good or replace free of cost to Purchaser at site any item of the equipment, equipment and spare parts

   i) which may not comply with the specifications hereof and the representations and warranties set forth herein; or

   ii) which may be of defective or incorrect design; or

   iii) which under normal and proper use and maintenance proves defective in workmanship or materials.

   iv) which does not reach the minimum performance parameters as defined in Annexure I of the Agreement.

7). Our liability under this warranty shall be in addition to and not in substitution of any other liability that may be undertaken by supplier/us in any other provisions of the Agreement. The supplier's liability under this agreement shall not exceed 100% of the Contract price.

TRIDENT GROUP
Trident Limited
Sanghera -148107 India

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8). Our warranty is valid till _____. The warranty is liable to be extended by us, if the performance of equipment is not satisfactory.

9). Any legal action or proceedings arising out of this warranty shall be governed by this Agreement which shall be construed in accordance with and governed by the laws Courts at Barnala, Punjab, India.

For _____

Name

Designation

TRIDENT GROUP

Sanghera-148101

HAMON RESEARCH-COTTRELL INDIA PVT. LTD. HRCIN

EXHIBIT-1

DETAILED TECHNICAL SPECIFICATIONS OF EQUIPMENT

1. Electrostatic Precipitator ('ESP')

1.1. Process description

1.1.1. The electrostatic precipitator is a particulate control device that uses electrical forces to remove particulate from the flowing gas stream.

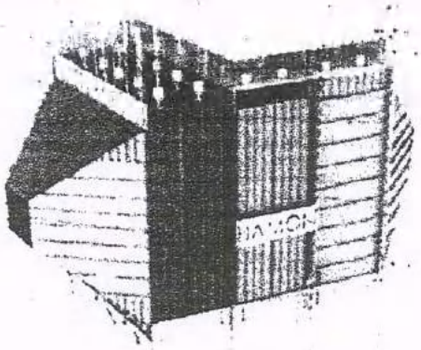
1.1.2. The electrical forces are generated by high voltage electrical fields created by suitable alternate arrangements of positive and negative electrodes suspended in the gas stream inside the precipitator casing.

1.1.3. The high voltage charge on the negative electrodes causes discharge of electrons into the gas stream, in the form of corona, which is a luminous blue glow of ionized gases. Dust particles passing through the corona zone receive a negative electrical charge, which causes them to be attracted to the positive electrodes, where the force of the electrical field holds them.

1.1.4. Negative and positive electrodes are referred to as "Discharge electrodes" and "Collecting electrodes" or "Collecting plates" respectively.

1.1.5. After the particulate is collected on the collecting electrodes, it must be removed from the electrodes while minimizing re-entrainment onto the gas stream. The particulate is removed by "rapping", a process whereby the particles are knocked loose from the plates, allowing the collected layer of particles to slide down to the bottom of the precipitator.

1.1.6. As a consequence of the ionization of the gas stream, a small percentage of particles receive a positive, rather than negative, electrical charge. These particles are attracted to the negative electrode, where they accumulate. The negative electrodes are rapped periodically to remove these accumulations to reduce their possible interference with corona generation.



1.1.7. To maintain the high voltage charge on the discharge electrodes, it is essential that the discharge electrodes and frames be isolated at all points from ground and from the collecting electrodes. To accomplish this, all connections to the frames for support, stabilization, and rapping are made through high voltage insulators, and the spacing between positive and negative electrodes is carefully maintained.

1.1.8. The high voltage support insulators and rapper insulators are housed in a penthouse on the top of the precipitator. A seal air system is provided to prevent inlet gas from contaminating this area and the insulators housed in it.

1.2. Precipitator characteristics

Technical parameters	Characteristic	Type	Material
Number of precipitators	1		
Number of chambers / precipitator	1		
Number of fields / precipitator	4		
Number of collecting plates / field	25 Assemblies	G-Opzel	COR-TEN / Equivalent
Number of discharge electrodes / field	144 pipe electrodes	Pipe & Spike	Carbon / Equivalent
Spike density	I Field double density; Remaining Fields single density.		
Nb. of collecting plate rappers / field	16	MIGI	
Nb. of discharge electrode rappers / field	4	MIGI	
Nb. of inlet distribution devices rappers	3	MIGI	
Nb. of outlet distribution devices rappers	2	MIGI	
Nb. of support insulators / field	4		BHEL make
Nb. of wall bushing insulators / ESP	4		BHEL make
Seal air flow - Per ESP m³/hr	1125		
Support insulator heaters / field (# x power)	2 heater banks	Electrical	
Nb. T-R field 1.1 (# x power)	1 x 110 KVP x 600 mA	SMPS Controller	
Nb. T-R field 1.2 (# x power)	1 x 110 KVP x 600 mA	SMPS Controller	
Nb. T-R field 1.3 (# x power)	1 x 110 KVP x 600 mA	SMPS Controller	
Nb. T-R field 1.3 (# x power)	1 x 110 KVP x 600 mA	SMPS Controller	
Nb. of casing access doors / ESP chamber	4 at casing side wall 4 at casing Top Roof	Rectangular / Circular	
Nb. hoods access doors / ESP chamber	1 at Inlet and 1 at outlet	-	
T-R maintenance hoist (# x power)	-	Electrical	

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1.3. Precipitator casing

1.3.1. The precipitator casing wall, roof and support column are of RCC construction, designed to withstand the maximum operating conditions specified in section 5 and its general arrangement is shown on appendix.

1.3.2. Precipitator casings of the dust collecting system is divided in 4 different compartments:

- Inlet and outlet transition shall be of steel construction.
- To prevent gas from bypassing the treatment zone, internal baffles will be provided as required for the application.

1.3.3. Platforms and walkways shall be provided inside the precipitator at the bottom part of the casing to access the collecting, discharge electrodes and rapper shafts.

1.3.4. The following quick access doors per chamber are foreseen in order to access the different precipitator sections:

- 4 Rectangular quick opening doors for casing bottom side access. (Per chamber)
- 4 Rectangular quick opening doors at casing top - Hot Roof area. (Per chamber)
- 1 circular quick access doors for inlet hood and 1 circular quick access doors (600mm) for outlet hood. (Per chamber)
- 2 circular access doors for penthouse access. (Per chamber)

1.3.5. Precipitator Penthouse:

The precipitator hot roof of each chamber will be enclosed by a full penthouse which contains the high voltage insulator bushings that support the discharge electrode system and the discharge electrode rapper shaft insulators.

1.3.6. It also contains the high voltage distribution cables which run between the Transformer-Rectifiers and their associated bus sections.

1.3.7. Quick opening access doors in the penthouse floor allow access to the top of the collecting surface and discharge electrodes for inspection. An adequate space will be provided between the top of the collecting plates and the underside of the hot roof plate.

1.3.8. Access into the penthouse is through two (2) key interlocked doors which are located on diagonally opposite corners of the penthouse roof. Access into the penthouse can be gained only after all the T-R sets of the precipitator have been de-energised, grounded, and locked out.

1.3.9. Heat insulation material will be provided as option and field installed by others on the outside of the penthouse walls and underside of the penthouse roof.

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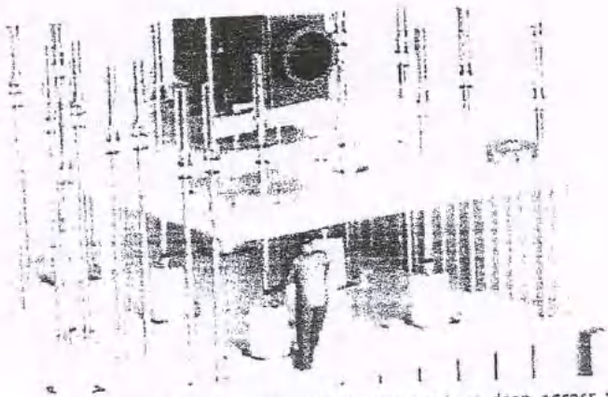


1.3.10. This is done to minimise overall gas temperature drop across the precipitator, at the same time utilising the heat conducted through the penthouse floor to help keep the support bushings hot and dry.

1.3.11. The MOC of penthouse is Carbon steel plate with stiffeners.

1.4. Collecting Electrodes

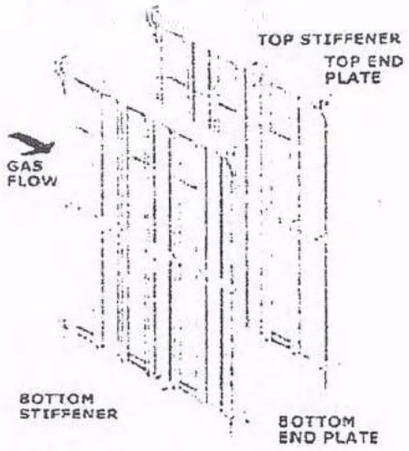
1.4.1. The collecting electrodes or collecting plates are located in the precipitator casing and are arranged to form a series of gas passages through the precipitation chamber. The collecting plates run parallel to the gas flow.

1.4.2. The "G-OPZEL" collecting plate is specially designed to provide quiet zone in order to improve collection and minimize dust re-entrainment during rapping.

1.4.3. The collecting plates hang by groups of 3 or 4 on two anvil beams which are themselves suspended to the casing upper beams by means of rods.

1.4.4. Top and bottom spacers keep the distance between plates constant through the entire precipitator cross-section.

1.4.5. The bottom of the collecting plates is unrestrained and guided in order to allow for their thermal expansion.



ESP Collecting Electrodes (Typ.)

1.4.6. The bottom of the collecting plates is unrestrained and guided in order to allow for expansion

1.4.7. Material of construction of the proposed collecting Electrode is COR-TEN / equivalent.

1.5. Discharge Electrodes

1.5.1. The discharge electrode is from the vertical pipe and spike design. Pipe and Spike discharge electrodes are being proposed which are formed from mild steel tubing.

1.5.2. The sharp edge spikes promote the Corona effect and gas ionization.

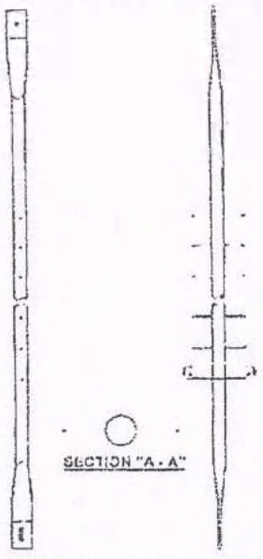
1.5.3. The discharge electrodes are located in the gas stream at equal distance of the juxtaposed colleting plates delimiting the flow lane.

1.5.4. The equidistance between the discharge electrode and the juxtaposed collecting plates is one of the factors that can affect precipitator performance. Pipe and spike discharge electrodes are self-aligning and thereby ensure accurate and stable mounting position.

1.5.5. Each discharge electrode is hanging from a high voltage support frame by a bolted connection. The individual discharge electrodes are interconnected at the bottom through a lower steadying frame. This assembly ensures the verticality and correct spacing of the electrodes and increases their inertia and stability to electrical and gas drag forces.

1.5.6. The discharge electrode system is virtually maintenance free and is resilient to operational upsets.

1.5.7. The high voltage frame is hung at the top of the precipitator from the high voltage support insulator. Insulators are made of ceramic-like materials that have high impact and dielectric strength.



ESP Discharge Electrode Frame (Typ.)

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1.6. Rapping system

1.6.1. Rappers:

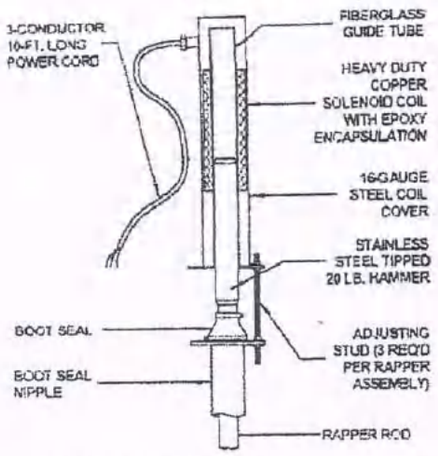
The Magnetic Impulse Gravity Impact (MIGIR) rapper is capable of delivering strong shearing forces to remove the dust from collecting plates and rigid mast designed high voltage systems.

1.6.2. The HRC MIGI is ruggedly built with a coil assembly of copper wire wound on a wall phenolic tube. The coil assembly is mounted on a cast iron junction box and protected by an all steel housing.

1.6.3. Rapper operation is initiated by a controlled, short duration, low voltage (110 / 220 V DC) pulse which energizes the coil, which acts like a solenoid and lifts the hammer up inside the phenolic guide tube. After the coil is de-energized, the rapper drops by gravity, and impacts on a stationary rapper rod which transmits the forces to the internal components.

1.6.4. The rapper can deliver a whopping 3,3 kg-m of mechanical energy using its only moving part, a 10-kg stainless steel faced plunger. Rapping force is easily adjusted via control current input and/or physical adjustments to rapper height. This energy is dissipated by the electrodes vibration.

1.6.5. Unlike other mechanical rapping systems it has no moving parts inside the gas stream and is not exposed to the erosive effects of the inlet gases and particulate.



1.6.6. The MIGI rappers are installed on the precipitator cold roof and are easily accessible for service maintenance. The absence of moving parts inside the precipitator casing makes this equipment fit for long runs, since all maintenance operations can be performed without stopping and cooling it down.

1.6.7. The discharge electrodes rapper shaft penetrates in the precipitator penthouse from the exterior and for this reason it must isolate the high voltage frame for the protection of personnel operating around or on the precipitator as well as for the protection of the rapper itself. The discharge electrode rapper shafts are multi-sectioned and an insulator is inserted in the central section.

1.7. Rapper Controller

1.7.1. Even the most adequately sized precipitator will lose performance if electrode cleanliness is not maintained. A fine balance exists between the cleaning of the electrodes and the ability to maintain precipitator performance levels. Rapping too little or at low intensity causes power to deteriorate. Rapping too frequently or at high intensity causes dust to be re-entrained or, in the case of too high an intensity, components may fail. In all of these instances, precipitator performance will deteriorate.

1.7.2. Each electrical field downstream of the inlet field will sequentially see and collect lesser amounts of dust. Particle size, temperature, and characteristics of deposited dust also vary from field to field. Therefore, each field will need an appropriate rapping program.

1.7.3. Rappers operating on the same gas lanes should not operate simultaneously in order to avoid re-entrainment and dust release to the stack.

1.7.4. The selection of the appropriate rappers sequence, intensity and frequency is critical to the success of any precipitator installation.

1.7.5. The Magnetic Rapper Controller (MRC) controls the working sequence of all rappers installed on the precipitator as well as the intensity of the rapping blow and the rapping frequency of each rapper. The MRC achieves the proper control of the rapping system and greatly enhances the precipitator performance.

1.7.6. The controller is easily programmed for rapper cycle time, intensity repetitive raps and a host of other operating parameters.

1.7.7. All rapper control parameters can be easily programmed from the display key-pad mounted on the front face of the MRC cabinet. The keyboard entry system is provided with a security code feature that will allow only designated personnel to make rapping parameter changes to the system.

1.7.8. There are three modes of operation: Normal Mode, Sequence Mode, and Repeat Mode. The mode is selected by imputing the access code with the keypad.

1.7.9. Normal Mode: Allows all clocks to run automatically and energizes timely all circuitry taking in accordance with the controller program.

1.7.10. Sequence Mode: Energizes all rappers of a particular group in sequential order for test purposes.

1.7.11. Repeat Mode: In the test mode a single rapper can be repeatedly energized for troubleshooting.

1.7.12. The rapper controller constantly monitors the operation of each rapper. If a rapper field wiring failure occurs, the control will give an alarm and remove the defective rapper from the normal sequence.

1.7.13. If the controller board fails or a loss of power occurs, a latching contact closes and generates a remote alarm indicating a control cabinet failure.

1.8. Insulators

1.8.1. Support insulators

1.8.1.1. High voltage support insulators mechanically support and electrically isolate the discharge electrodes from the grounded ESP casing. Support insulators are designed for high compressive strength to support the loads imposed by the high voltage electrodes and associated framing. Providing the primary application point for high voltage and located in close proximity to the gas stream, high voltage support insulator design must also consider the voltage applied and operating environment.

1.8.1.2. Support insulators are cylindrically shaped with a wide base for use with very high voltage applications. Insulators are available in porcelain and in various grades of alumina, based on application requirements.

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1.8.1.3. The insulators must be kept clean (free from dust) and dry in order to avoid current leaks and surface tracking that could damage them and hinder the ESP operation.

1.8.1.4. Support insulators are located in the penthouse away from the gas stream. A seal air system is provided to prevent inlet gas from contaminating this area and the insulators housed in it. A steel shroud below each insulator further inhibits dust diffusion into the insulator.

1.8.1.5. The insulators are kept dry and at a temperature above dew-point through heating. Before start-up the insulators are heated by means of electrical heaters while during operation the penthouse temperature will be kept at elevated temperature by heat transfer through the hot roof in contact with the waste gas.

1.8.1.6. Removable cover plates provide easy top access to the inside surface of the insulators for inspection and cleaning.

1.9. Rapper insulators

1.9.1. Rapper shaft insulators are installed on the middle section of the discharge electrode rapper shaft line. These insulators must provide superior electrical isolation at the casing penetrations as well as possess superior mechanical characteristics for the reliable transmission of rapping energy to the discharge electrodes.

1.9.2. Rapper shaft insulators and their connections are selected with consideration given to the process and operating environment. Rapper shaft insulators can be constructed out of alumina or reinforced plastics.

1.10. Wall bushing insulators

1.10.1. Wall bushing insulators are provided where conductors penetrate a wall, a roof or other plane that separate different environment conditions. Such insulators are provided with the appropriate mounting flange, usually located at the mid-point of the insulator, to provide appropriate electrical clearances and seals.

1.11. Purge air system

1.11.1. The seal air system blows hot air into the precipitator penthouse in order to:

(a) Prevent flow of inlet gas and particulate into the penthouse.

(b) Prevent particulate build-up on inside the support insulator.

(c) Maintain gas/air mixture within and below the insulator cavity above its dew-point to prevent condensation and corrosion.

(d) Cool insulators subjected to high operating temperatures.

(e) Maintain thermal gradients within insulators at acceptable levels.

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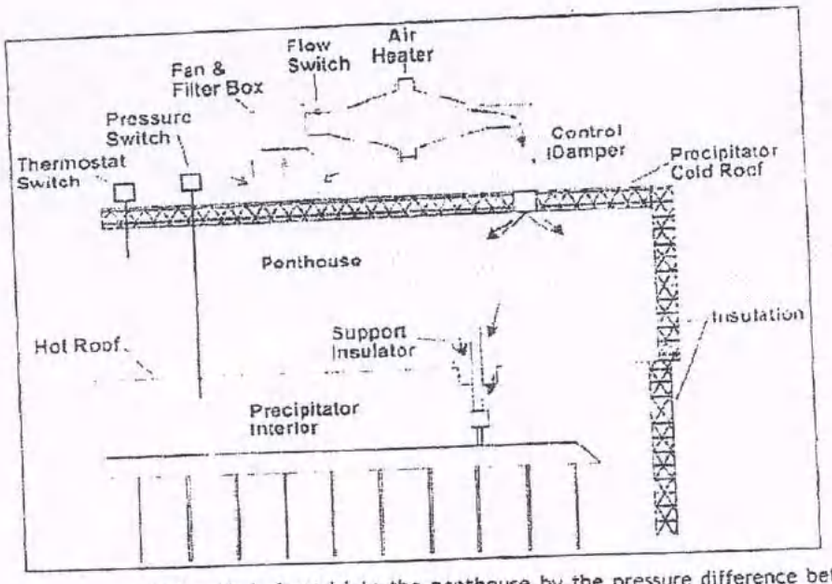

1.11.2. Air is forced into the penthouse by the pressure difference between outside atmosphere and the precipitator chamber. The seal air flowing in a duct mounted on the precipitator hot roof is warmed up by heat transfer through the hot roof in contact with the waste gas.

1.11.3. The air flow pressurizes the penthouse slightly above the precipitator chamber pressure, preventing inlet gas to enter the penthouse. The seal air flows from the penthouse into the precipitator chamber through the support insulators cover plate.

1.11.4. The seal air system per ESP is as follows;

1.11.5. The air flow passing through the insulator cover plate is forced to swirl inside the insulator cavity.

1.11.6. This swirling flow helps preventing particulate to build-up on the insulator inside surface.

1.12. **High Voltage energizing system**

1.12.1. Each electric field of the precipitator is energized by a transformer rectifier.

1.12.2. All transformer-rectifiers are mounted on the precipitator cold roof.

1.12.3. The transformer tank is partially or totally filled with the dielectric fluid, mineral oil is generally used.

1.12.4. A high voltage conductor connects the transformer outlet bushing to the precipitator HV frames. The conductor section is protected by a bus duct.

1.12.5. A wall bushing insulator is installed where the high voltage conductor penetrates the support insulator chamber wall. The insulator is flanged mounted and protects the transformer outlet bushing from the hot environment.

1.12.6. A ground switch, mounted on the transformer tank, grounds the precipitator HV frame and the transformer output bushing in case of emergency or shut-

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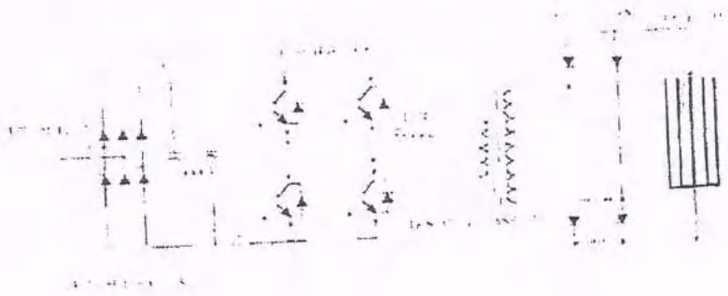
down. If the ground switch is not in open position, the transformer is automatically switched off.



Field 1 to 4 of the ESP chamber will be equipped with Switch Mode power supply (SMPS) TR panel. This will help in better collection.

1.13. Key Interlock System

1.13.1. The principal purpose of the key interlock system is to prohibit entry into the precipitator via normal interlocked man way access doors until all the high voltage transformers are locked off and grounded.

1.13.2. The interlock system consists of a series of locks and keys located and sequenced to control the steps of de-energizing, grounding, and opening of equipment to prevent personnel from coming in contact with energized high-voltage components

1.14. T/R maintenance facilities

1.14.1. A monorail structure equipped with an Electrical hoist will be installed on the ESP roof for the maintenance of the T/R's.

1.15. Electrical

1.15.1. For the scope of supply of Supplier includes:

- Four (4) nos. of T-R controller cabinets

1.16. Instruments

1.16.1. The following instruments are foreseen for the ESP system.

- 2 numbers of Temperature & Pressure transmitters at the inlet and outlet of the ESP.
- 1 number of Temperature transmitter for penthouse of the ESP.

1.17. Grounding system

1.17.1. The supply of grounding system above ground (up to ESP bearing level) is included in from HRC India scope.

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1.17.2. The supply of grounding system underground is excluded from Supplier's scope.

1.18. Thermal insulation

1.18.1. The precipitator casing external walls are heat insulated to avoid the flue gas to condensate. Not only the flue gas acid condensation corrodes the steel parts but also causes the collected dust to agglomerate ant stick to the steel surfaces.

1.18.2. Thermal insulation will also be provided and installed on the outside of the roof. This is done to minimize the heat loss and utilize the heat transferred through the roof (casing hot roof) to keep the support insulators hot and dry.

1.18.3. Mineral wool lagging with a minimum density of 100kg/m³ and wire mesh reinforcement along with 0.6 mm aluminium cladding, galvanized fixing screws, cleats and supports will be provided for all ESP external surfaces having a skin temperature higher than 60°C.

1.18.4. The insulation thickness will be designed to limit the cladding surface temperature to 60°C wherever the cladding surface is not under direct sun radiation taking into consideration a maximum ambient temperature of 45°C and a minimum wind velocity of 1m/s.

Insulation thickness: 75 mm

1.19. Construction material of major components.

1.19.1. Supplier shall supply the precipitator in material of construction as tabulated below.

Item	Plate work		
	Thickness	Material	Remarks
Casing bottom Portion, bottom baffle, Conveyor access floor		Concrete	by Trident Limited
Support Structure	-	Concrete	by Trident Limited
Casing Top Cold Roof structure with handrail		Steel	by Supplier
Slide Bearing	-	PTFE	
Insert Plates	-	IS 2062	
Penthouse Roof	4 mm / 5 mm	Carbon steel	
Deflectors	3.15 mm / 4.0 mm	Carbon / IS 2062	
Inlet Transition	5 mm	Carbon / IS 2062	
Outlet Transition	5 mm	Carbon / IS 2062	
Perforated Plates	3.15 mm	Carbon / IS 2062	
Collecting Electrodes	1.25 mm	Cor-ten Steel	

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Item	Plate work		
	Thickness	Material	Remarks
Discharges Electrodes	50.8 Dia. with nails	Carbon / IS 2062	
Handrail Top / Post	25 NB	MS-ERW	Above Conveyor Floor level
Handrail Mid	25 NB	MS-ERW	Above Conveyor Floor level
Toe Plate	100 x 3 mm	IS 2062	
Access Grating	25 mm	IS 2062	
Stair Treads	25 mm	IS 2062	
High Voltage Guard	3.15 mm		
Ground Switch Encl.	3.15 mm		
High Voltage Insulators		Porcelain	
Heat Insulation	ESP Roof, Cone	LRB Mineral wool	
Cladding	ESP Roof, Cone	0.6 mm AL. / GI. Cladding sheet	0.6 mm AL. Sheet for Insulation 0.6 mm GI. Cladding sheet for Weather Enclosure

1.20. **Surface preparation and painting specifications**

1.20.1. Surface preparation & painting specification shall be as per details mentioned below. It is summarized here below the painting specification as envisaged for the components to be painted at shop.

Item/surfaces	Surface preparation	Painting detail
Surfaces exposed to atmosphere / non-insulated surfaces. Outdoor structural steel and monorail structure	Sa 2.5	Primer: 2 Coats of red oxide primer (50 microns total DFT)
Insulated surfaces (Top Casing wall modification works, Top Insulator compartment)	Sa 2.5	Primer: 2 Coats of red oxide primer (50 microns total DFT)
Collecting Electrode & Discharge Electrode	St 2 / St 3	Tectyl 506 / Equivalent
Access system - walkways, staircase, platforms, treads, gratings (As required to access the modified ESP roof)	St 2 / St 3	Primer: 2 Coats of red oxide primer (50 microns total DFT)

Note:

Equipment supplied by the supplier shall be pre-painted before delivery at site.

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1.21. ESP Auxiliaries:

1.21.1. Flue Gas Ducting

- Duct tapping at Existing ESP inlet duct to be modified to suit the new ESP arrangement.
- The material of construction of the duct plate shall be of carbon steel and stiffeners shall be carbon steel

1.22. Dampers for Flue Gas Ducting

- 2 Nos. of DTPA shall be used

1.23. Details of Drag chain conveyor:

- Make : Redler / Demech
- Equivalent
- Total no. of Conveyor : 2 Nos.

1.24. Details of Scrapper conveyor

- Make : HAMON / Redler / Demech/ EIL/ RUD/ Mahindra / Equivalent
- Total no. of Conveyor : 1 Number

1.25. Details of RAV:

- Make : Anval / Redler / Demech/ EIL/ RUD/ GMV/ Fourteckh / Equivalent
- Total Qty. : 1 Nos.

1.26. Geared Motor

- Nord / Bonfiglioli / Rossi / ABB / Equivalent

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Exhibit-2

APPROVED LIST OF SUB-CONTRACTORS

S No	ITEMS	NAME	LOCATION	REMARK
1	Collecting & Discharge Electrodes	Pennar Industries Limited.	Hyderabad	
		PatcoTech	Kolkata	
2	Internals - Machined & Fabricated	Mrudul Industries	Pune	
		Emkay Engineering	Mumbai	
3	H.T.Grounding Switch	Industrial Control System	Mumbai	ICS is preferred
		Caltronic controls India Pvt Ltd	Mumbai	
4	PDPL	Diamond Metal Screens Pvt Ltd.	Belgaum	
		Bright Engineering,	Kolkata	
5	Seal Air System	M K Associates	Mumbai	
		Chemin	Pondichery	
6	Supporting Insulator	B.H.E.L	Bangalore	Max. 45% ALUMINA
7	Wall through bushing	B.H.E.L	Bangalore	
8	Non-Metallic Expansion Joints	GBM Manufacturing,	Kolkata	
		Keld Ellentoft	Mumbai	
9	Junction Boxes	HENSEL	Chennai	Hensel is preferred
		Power control	Chennai	
		Electric India Pvt Ltd	Chennai	
10	Temperature Switch	Waaree	Mumbai	
		Switzer	Chennai	
11	Pressure Transmitter / Temperature Transmitter	Emerson	Chennai	
		Yokogawa	Chennai	
		Endress-Hauser India	Mumbai	
12	Cables	CCI	Chennai	LAPP CABLES
13		RPG (KEC)	Mumbai	PolyCab is preferred over KEC too.
		Polycab	Kolkata	
14	LPBS (Isolator)	Siemens	Chennai	OK
15	MCC panel	Power Controls	Chennai	MCC Panel control switchgears should be Siemens / Schneider / ABB
		Control Devices	Kolkata	
		FOX	Bangalore	
		Adarsha Control	Bangalore	
16	TR sets	Ador Powertron	Pune	REDKHOH

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ANNEXURE R-16

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Soil and Groundwater Quality Assessment

at

Dhanuala Drain, Barnala

Prepared for:

TRIDENTGROUP™ LOTUS LOTUS INTEGRATED TEXPARK LIMITED

Trident Ltd. and Lotus Integrated Texpark Ltd.

Dhaula Complex, Mansa Road, Barnala, Punjab, 148101

Prepared by:

Chola MS RISK SERVICES

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December 2019

Document History

Project:	Groundwater Quality Assessment	
Client:	Trident Ltd. and Lotus Integrated Texpark Ltd.	
Project Site:	Dhaula Complex, Mansa Road, Barnala, Punjab, 148101	
Project Team Members:	Mr. Bhaskar VS Mr. Rama Satya Kamesh Pudi Ms. Supritha V	
Prepared by: (Chola MS, India)	Mr. Rama Satya Kamesh Pudi (Project Manager)	P.R.S.Kamesh
Reviewed by: (Chola MS, India)	Mr. Bhaskar V.S (Senior General Manager)	V Sabh

Document Number:	**Date:**
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http://www.cholarisk.com/env_services/aboutus.html

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List of Abbreviation

BDL	:	Below Detectable Limits
BGL	:	Below Ground Level
BIS	:	Bureau of Indian Standards
CGWB	:	Central Ground Water Board
CMSRSL	:	Cholamandalam MS Risk Services Limited
CPCB	:	Central Pollution Control Board
DEM	:	Digital Elevation Model
EIA	:	Environmental Impact Assessment
ICAR	:	Indian Council of Agricultural Research
IS	:	Indian Standards
MOEF&CC	:	Ministry of Environment and Forests & Climate Change
MSL	:	Mean Sea Level
NABET	:	National Accreditation Board for Education and Training

EXECUTIVE SUMMARY

M/s Trident Ltd. and Lotus Integrated Texpark Ltd. are operating an integrated Agro-based paper mill and a textile division respectively in Dhaula Complex, Mansa Road, Barnala, Punjab, 148101. In regards to the notice issued by the Punjab Pollution Control Board, Trident Group has approached Cholamandalam MS Risk Services Limited (CMSRSL), a NABET accredited EIA consulting organization to undertake the groundwater quality assessment along the drain located adjacent to the existing plant in Barnala.

The study team had a detailed site reconnaissance and walkthrough along the drain and collected the samples as mentioned above from Dec 3, 2019, to Dec 6, 2019.

To understand the regional scenario of land details in terms of physiography, elevation profile in the region, groundwater flow direction in the aquifer, etc. the published data by the central groundwater board has been collected. Similarly, the regional level soil and groundwater quality have been studied based on the information collected from published technical and scientific documents.

Based on the collected information regarding groundwater survey and exploration data published by CGWB for Barnala block, the groundwater flow direction in the area was evaluated to be towards the west. The land elevation slope in the area is also in line with the flow direction.

The Water level as per the published EIA report in the region ranges from 8.72m to 23.89m bgl during the pre-monsoon period and 9.95 m to 25.41 m bgl during the post-monsoon period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates an average fall of 0.65m/year. Barnala block is categorized as an Over Exploited Zone by CGWB.

Based on the details obtained from during the assessment, the utilisation of treated wastewater for irrigation is in the order of 150 m^3 per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m^3/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.

For the purpose of this assessment, the soil and groundwater samples have been collected (i) Along the Dhanuala drain (less than 100m from the Drain), (ii) at the upgradient locations to map the baseline background levels and (iii) at the onsite irrigation area. Groundwater samples were collected from the existing private borewells which were drilled up to the deeper aquifer which are in use.

- pH in the groundwater samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012. Whereas the pH in soil was found to be more alkaline in the entire region.
- TDS in the samples collected from the existing borewells were recorded to be in the range of 524 to 1276 mg/l. The TDS levels in groundwater from the samples collected is a regional phenomenon and is in line with the published regional level data. The groundwater's Salinity as NaCl is in-line with TDS which contributes to 50% to 60%. Similarly, the electrical conductivity in the soil is also high and depicting regional scenario which reflects the equivalent salinity as NaCl in soil.
- Total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l.
- Minor traces of nutrients and Heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.

1. INTRODUCTION

Groundwater is a valuable natural resource, being both an important source of water supply and a major component of the water cycle. The groundwater quality in the overall country has undergone a tremendous change over the past decade. Groundwater in shallow aquifers generally contains calcium bicarbonate, mixed type and other types including sodium chloride water near the coastal areas. Similarly, the quality in deeper aquifers also varies from place to place and is generally found suitable for common uses. The main groundwater quality problems in India include due to inland salinity, coastal salinity, fluorides, nitrates, heavy metals including arsenic, iron, etc.

Irrigation through tube wells is well-practiced in Punjab due to the limited availability of canal waters (surface water). Such practices were well established due to the initiative and enterprise of the individual farmers and have spread up to more than 75% of the total agricultural land in the state is depending on the groundwater. Punjab is one of the successful states in the country in terms of agricultural aspects based upon the use of groundwater for irrigation. The quality of groundwater in the state has been characterized by Geogenic contamination and anthropogenic contamination including agricultural activities, animal waste disposals, industrial discharges and urban pollution due to municipal wastes.

M/s Trident Ltd. and Lotus Integrated Texpark Ltd. (part of Trident Group companies- hereafter referred to as Trident Group) are operating an integrated Agro-based paper mill and a textile division respectively in Dhaula Complex, Mansa Road, Barnala, Punjab, 148101. In regards to the notice issued by the Punjab Pollution Control Board, Trident Group has approached Cholamandalam MS Risk Services Limited (CMSRSL), a NABET accredited EIA consulting organization to undertake the groundwater quality assessment along the drain located adjacent to the existing plant in Barnala.

2. ABOUT THE CONSULTING ORGANISATION

Cholamandalam MS Risk Services Limited (CMSRSL) is a 50:50 joint venture between USD $3.14 Billion Murugappa Group, India and Mitsui Sumitomo Insurance Group, Japan and has a technical collaboration with InterRisk, a group company of Mitsui Sumitomo Insurance Group.

Established in the year 1994, Cholamandalam MS Risk Services is a Chennai based Risk Consulting Company offering comprehensive Risk management & Engineering solutions in the field of Safety, Health and Environment. The company has pioneered many innovative and specialized services catering to the needs of Asian & European markets for the last 15 years. The organization has successfully executed more than 2000 projects (Domestic/International) which not only helped its

clients maintain compliance but also optimize their EHS performance and set new benchmarks. Cholamandalam MS Risk Services, an ISO 9001:2008 company, is a certified "Environment Impact Assessment" Consultant organization by NABET EIA Accreditation committee, a constituent of the Quality Council of India. The company has a well-established experience in safety and environmental studies in India and overseas over the last decade.

3. METHODOLOGY ADOPTED FOR THE STUDY

The soil and groundwater quality assessment in the area has been carried out by adopting the below study methodology:

- The groundwater survey and exploration data published by CGWB for the Barnala block are collected and utilized to map the groundwater flow direction in the aquifer.
- Based on the satellite and topographical maps of the region, the natural drains and canals will be mapped.
- A basic review of the wastewater utilization for irrigation has been done.
- A thorough walkthrough along the Dhanuala drain (approx. 10 km stretch) especially where the industrial wastewater and sewage is being discharged.
- The below sampling program has been adopted for the soil and groundwater assessment:
    - Collection of soil samples at 1m depth along the Dhanuala drain covering the upstream to the plant discharges, near the plant discharge and downstream to the plant discharges.
    - Similarly, the groundwater samples are collected from the existing borewells along the Dhanuala drain (not more than 100m away from the drain) covering the upstream to the plant discharges, near the plant discharge and downstream to the plant discharges.
    - Collection of groundwater samples from the existing borewells and the soil samples from the onsite irrigation area where treated wastewater is being utilized.
    - Collection of groundwater samples from the existing borewells and the soil samples at 5 to 6 km away (upgradient as per the aquifer flow direction) to map the background baseline conditions in terms of soil and groundwater quality.
    - All the soil samples were analyzed for the necessary analytes including pH, electrical conductivity, salinity, total organic carbon, available Phosphorous, total nitrogen, heavy metals, total petroleum hydrocarbons, pesticides and lignin. The analytical data is compared with ICAR and other standards for soil quality.

- Similarly, the groundwater samples were analyzed for the necessary analytes such as pH, electrical conductivity, total dissolved solids, salinity, dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), total hardness, essential nutrients (NPK), total petroleum hydrocarbons, heavy metals, pesticides etc. the analytical data is compared with CPCB standards for drinking water to check its compliance.

- Based on the analytical data, the contamination profile is developed depicting as two-dimensional contours or graphical representation for the critical parameters. The long term published groundwater quality data is utilized for mapping the regional level quality profile.

The study team had a detailed site reconnaissance and walkthrough along the drain and collected the samples as mentioned above from Dec 3, 2019 to Dec 6, 2019.

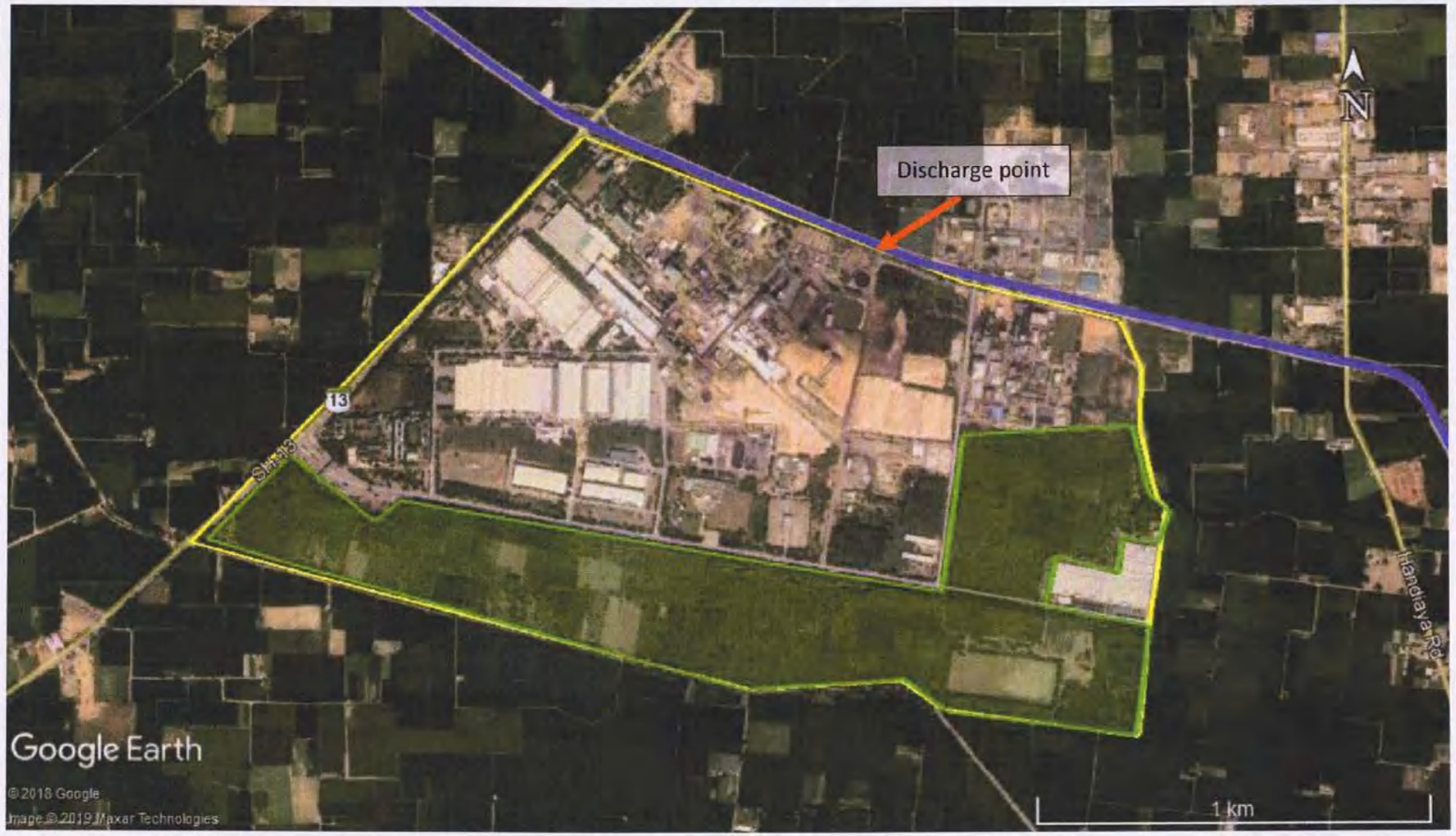
4. OVERALL SOIL AND GROUNDWATER SCENARIO IN BARNALA REGION

4.1. Study area and Geographical details

Trident group's paper manufacturing division and integrated textile park are located in Dhanuala Complex, Mansa Road, Barnala District in the state of Punjab. Based on the Central Ground Water Board (CGWB) published block-wise groundwater resource assessment, 2017, all the three blocks in Barnala district is categorized as *overexploited* in terms of groundwater extraction. The geographical boundary of the study is limited to the plant area and area along the drain where the industrial wastewater is discharged. Hence the primary data of soil and groundwater has been collected from the area which is discussed further in detail. The published regional level quality data has also been collected and presented in the report.

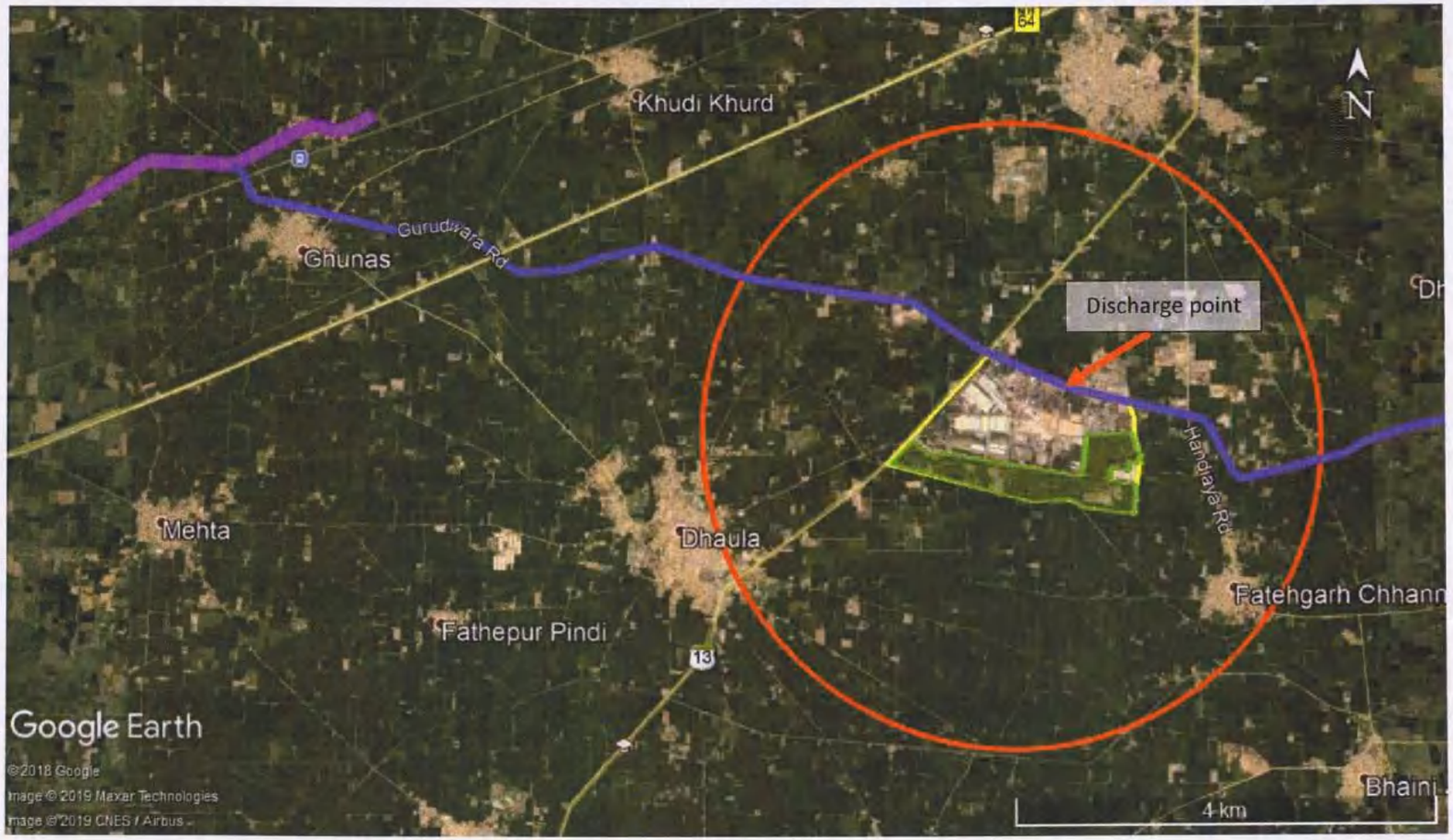
The location map is presented in Figure 4.1 and Figure 4.2. The plant is surrounded by a natural drain named Dhanuala drain (marked as a blue line) along the northern boundary passing from East to West. The Dhanuala drain is joining the Lisarna drain in the west at 8 km downstream from the plant. The plant including the paper division and textile division is spread to an extent of approx. 220 Ha in which approx. 85 Ha is the irrigation area where the treated wastewater (of 12,800 m^3/day) is being used. Whereas, the treated wastewater quantity of 8,700 m^3/day is being discharged to Dhanuala drain. Thus, utilisation of treated wastewater for irrigation is in the order of 150 m^3 per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m^3/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.

Figure 4.1: Location map 1



- *Plant Boundary is marked as Yellow line*
- *Onsite irrigation area is marked as green area*
- *Adjacent Dhanula drain is shown as a blue line and the flow direction in the drain is from East to West*
-

Figure 4.2: Location map 2



- *Plant Boundary is marked as Yellow line. Red circle radius: 3km (from the approx. center of the plant)*
- *Onsite irrigation area is marked as green area*
- *Adjacent Dhanuala drain is shown as a blue line. The flow direction in Dhanuala drain is from East to West*
- *Lisarna drain where the Dhanuala drain is joining is shown as a Purple line. The flow direction in the Lisarna drain is from Northeast to Southwest.*

4.2. Land Details

Based on details collected from the published EIA report in 2016, the elevation of the land in the buffer zone (10km from the plant boundary) varies from 196 m above msl in the southwestern to 285 m above msl in the northeast. The elevation of the land in the core zone (5km) varies from 198 m above msl in the southwestern to 250 m above msl in the northeast. Hence it is evident as per the ground elevation that the upgradient is towards east and the downgradient is towards west from the plant site. The Physiography and DEM are shown in Figure 4.3, Figure 4.4 and Figure 4.5 respectively.

According to the Watershed Atlas of India, the study area of 10km forms part of Lower Sutlej Sub-Basin below Bhakra Dam and is shared by SLJL010 watershed. There is no well-defined material drainage system in the area. Two main drains pass through the area – Upper Lisarna Nala in the northwest and Dhanaula Drain in the central part. The drainage with the watershed boundary is presented in Figure 4.6.

The overall land use of a 10 km radius area reveals the dominance of agriculture land (88.55%) followed by built-up land (9.48%), wasteland (1.17%) and water bodies (0.80%). The Level I and Level II land-use landcover maps are presented in Figure 4.7 and Figure 4.8.

Figure 4.3: Physiography of the Study Area (10KM from the plant boundary)

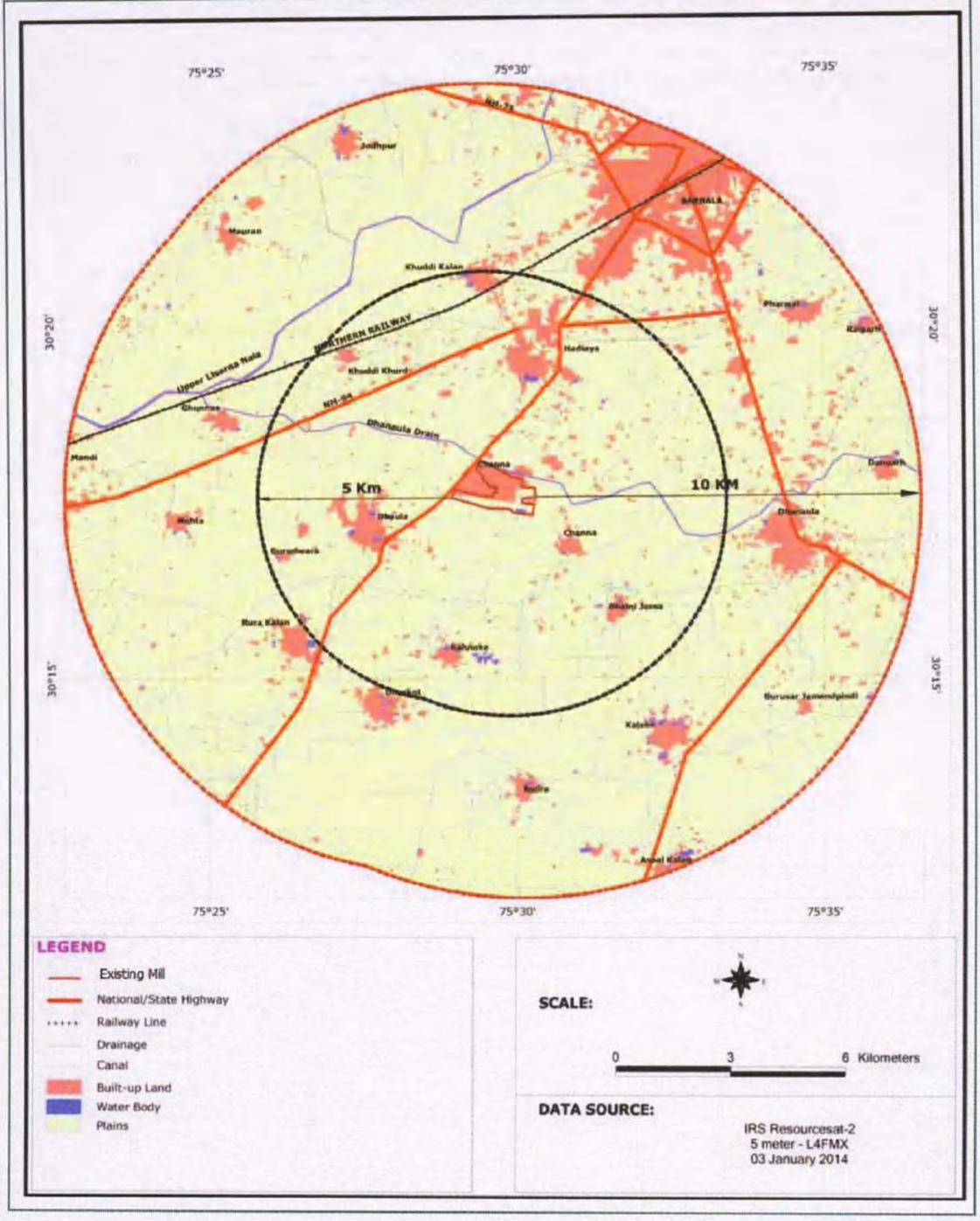


Figure 4.4: Digital Elevation Model of the Study Area (10KM from the plant boundary)

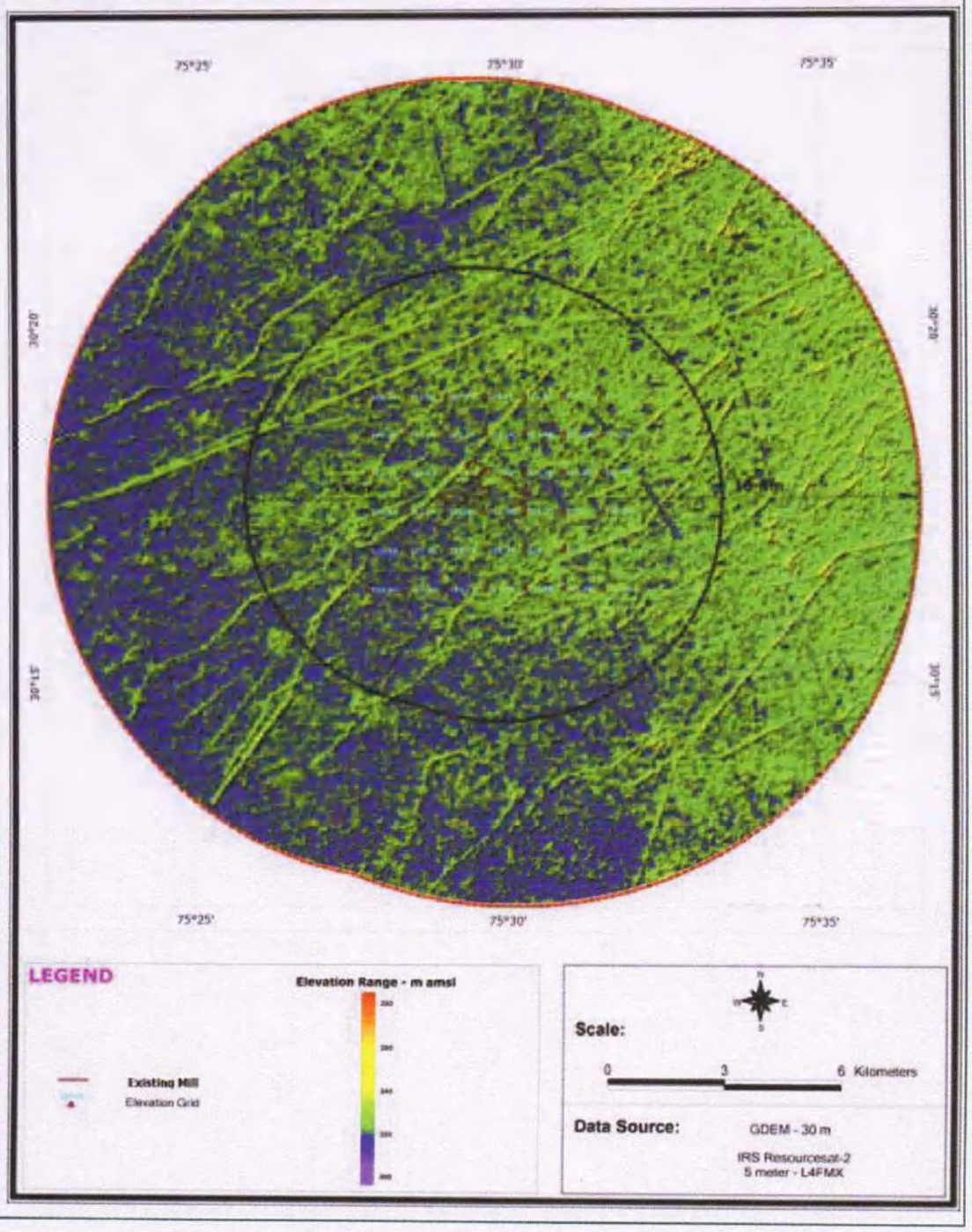


Figure 4.5: Digital Elevation Model of the Study Area (5KM from the plant boundary)

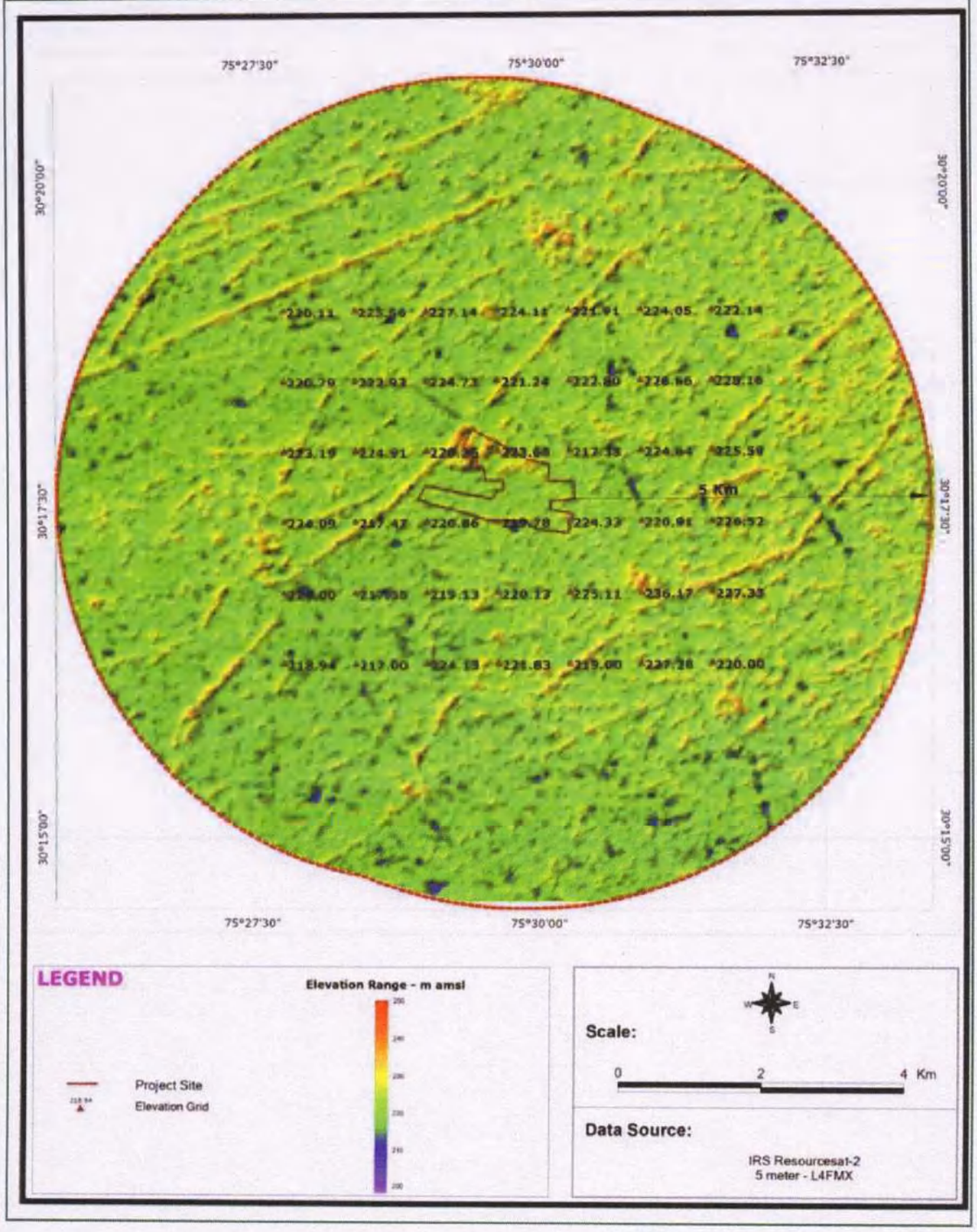


Figure 4.6: Drainage and Water Bodies in the Study Area (10KM from the plant boundary)

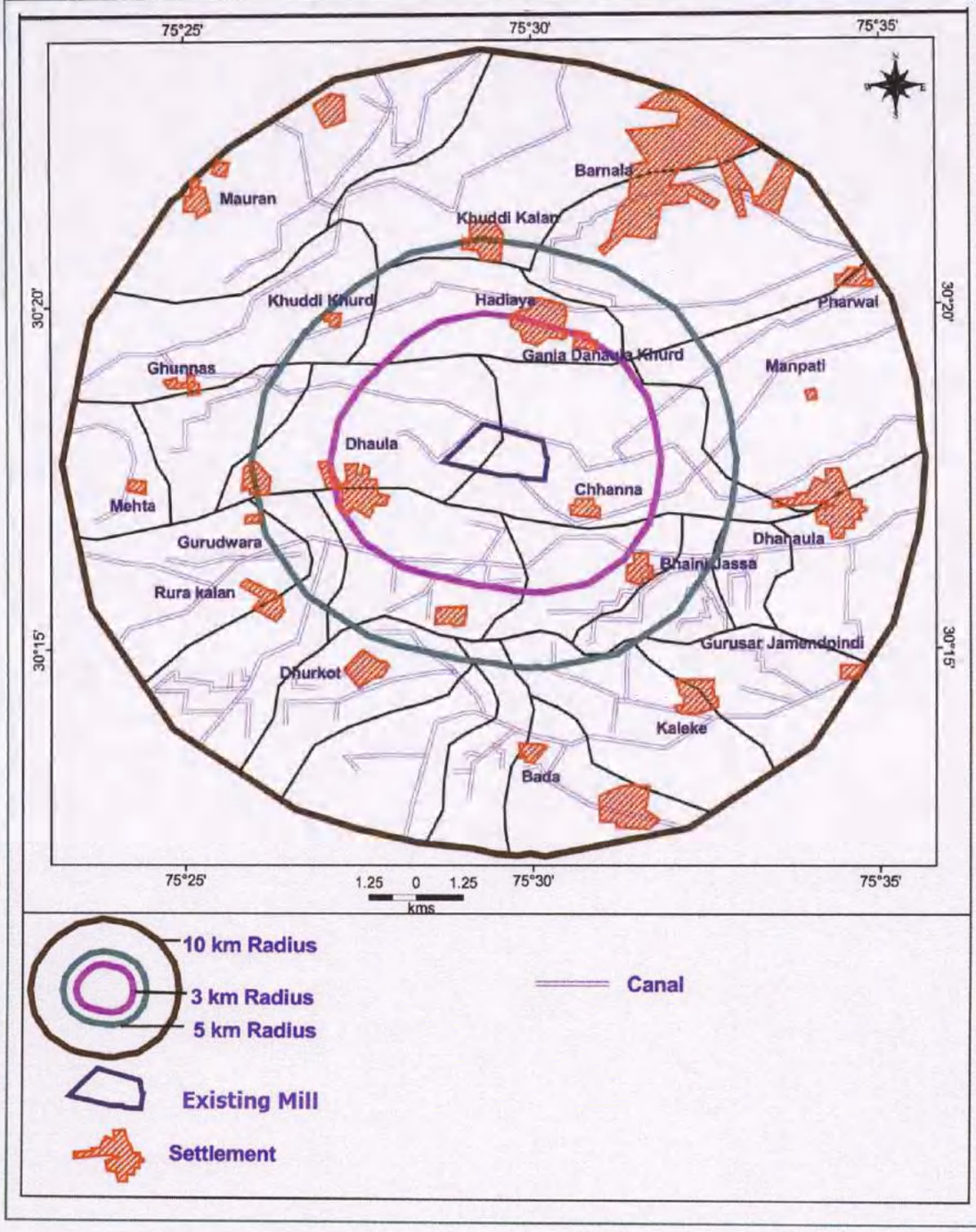


Figure 4.7: Level I Land use and Landcover in the Study Area (10KM from the plant boundary)

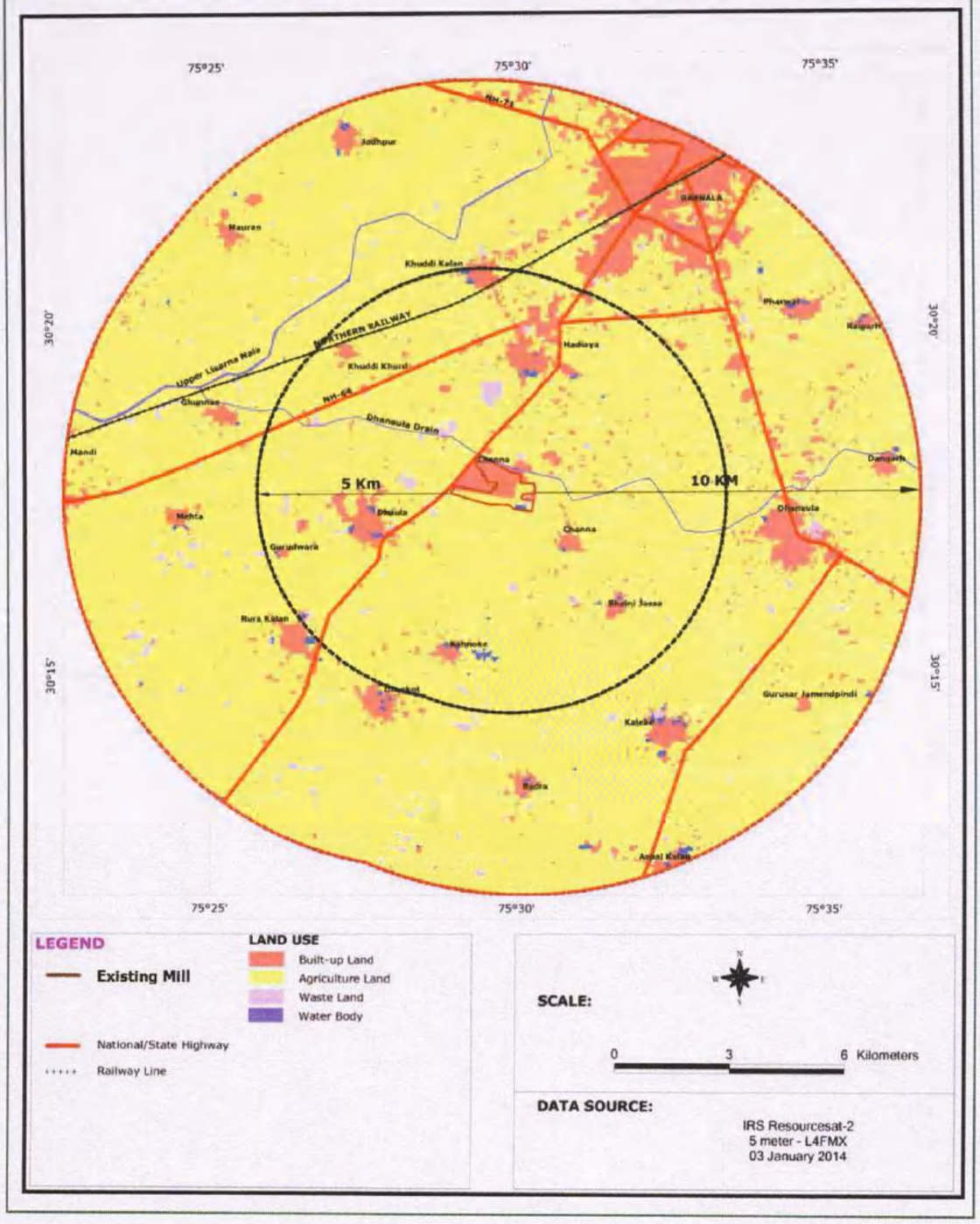
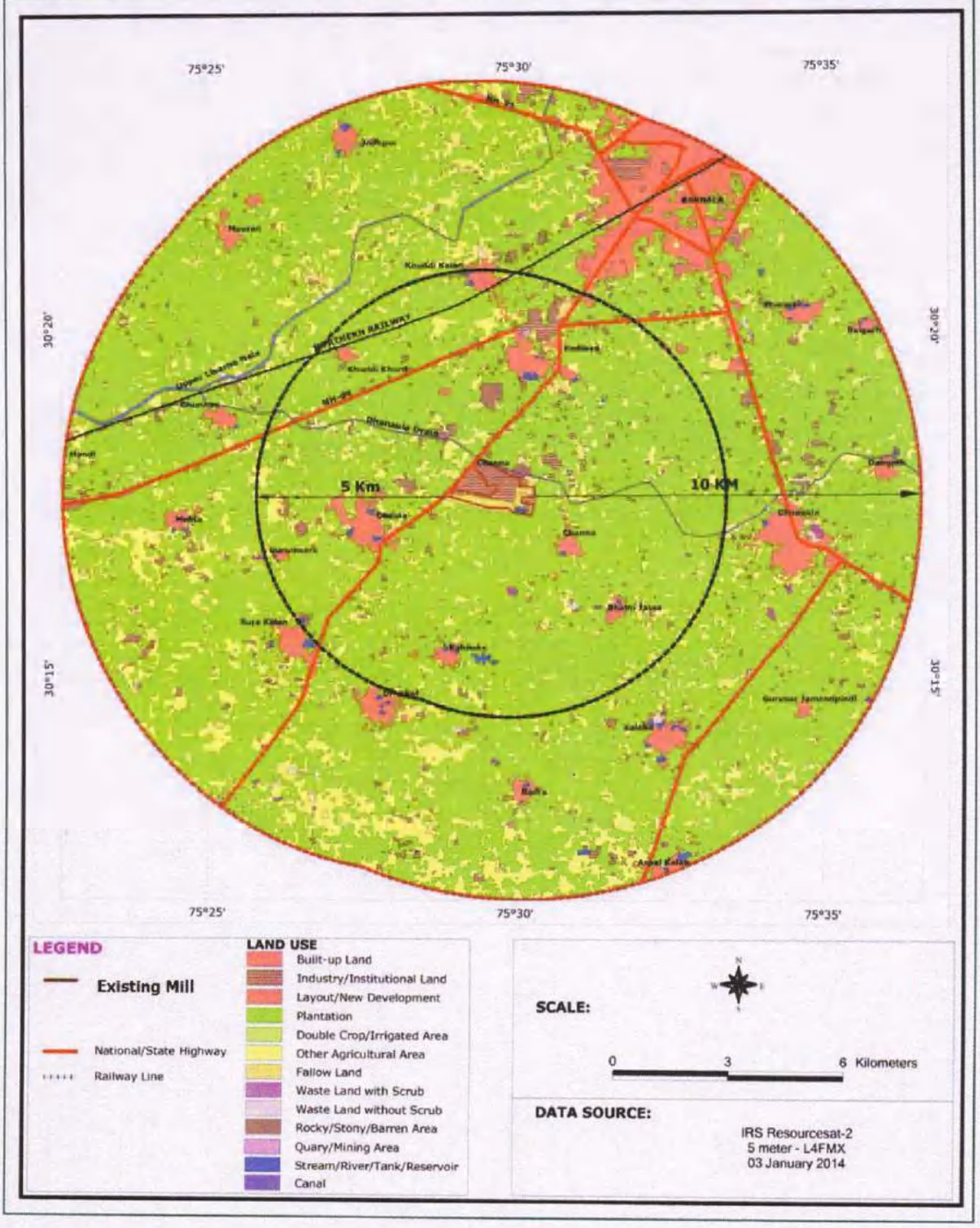


Figure 4.8: Level II Land use and Landcover in the Study Area (10KM from the plant boundary)



4.3. Geology and Soil Type

Based on details collected from the published EIA report in 2016, geologically the area is covered by the Sedimentary formation of the Quaternary area. The region is underlined by Grey micaceous, fine to coarse-grained sand, silt and clay (Active flood plain), Cyclic sequence of grey micaceous sand silt and clay (Older flood plain deposit and Multicyclic sequence of brown to grey silt, clay and kankar and reddish-brown to grey sand (older alluvial plain). The geology of the area (10km radius from the plant boundary) is given in Figure 4.9.

The landforms / geomorphic units and structures such as fractures, fissures and faults have been interpreted from the satellite image. All the landform / geomorphic units and structures occurring in the study area are mapped. The geomorphology and structures of the area play a vital role in identifying the groundwater potential zones. Two geomorphic units namely Dune complex, Alluvial plain older – under canal command in the study area. The following geomorphic units have been interpreted.

1) Dune Complex

2) Alluvial plain older – under canal command

Dune complex and the Alluvial plain older are good in groundwater occurrence and movement. However, the Dune complex is very good as this unit completely comprised of sand. Alluvial plan older under canal command is clay and silt dominant. The percolation rate is comparatively low in this unit. The existing mill site area is located in Alluvial Plain older under canal command. The Geomorphology of the study area is presented in Figure 4.10.

Prominent types of soil in the district are coarse loamy calcareous soils, fine loamy calcareous soils and a thin layer of sandy over loamy soils presents western and southern parts of the district. In the study area more specifically, Coarse loamy over sandy soils, Moderate flooding sandy soils are observed. Soil classification of the area is given in Figure 4.11.

Figure 4.9: Geology of the Study Area (10KM from the plant boundary is marked as a circle)

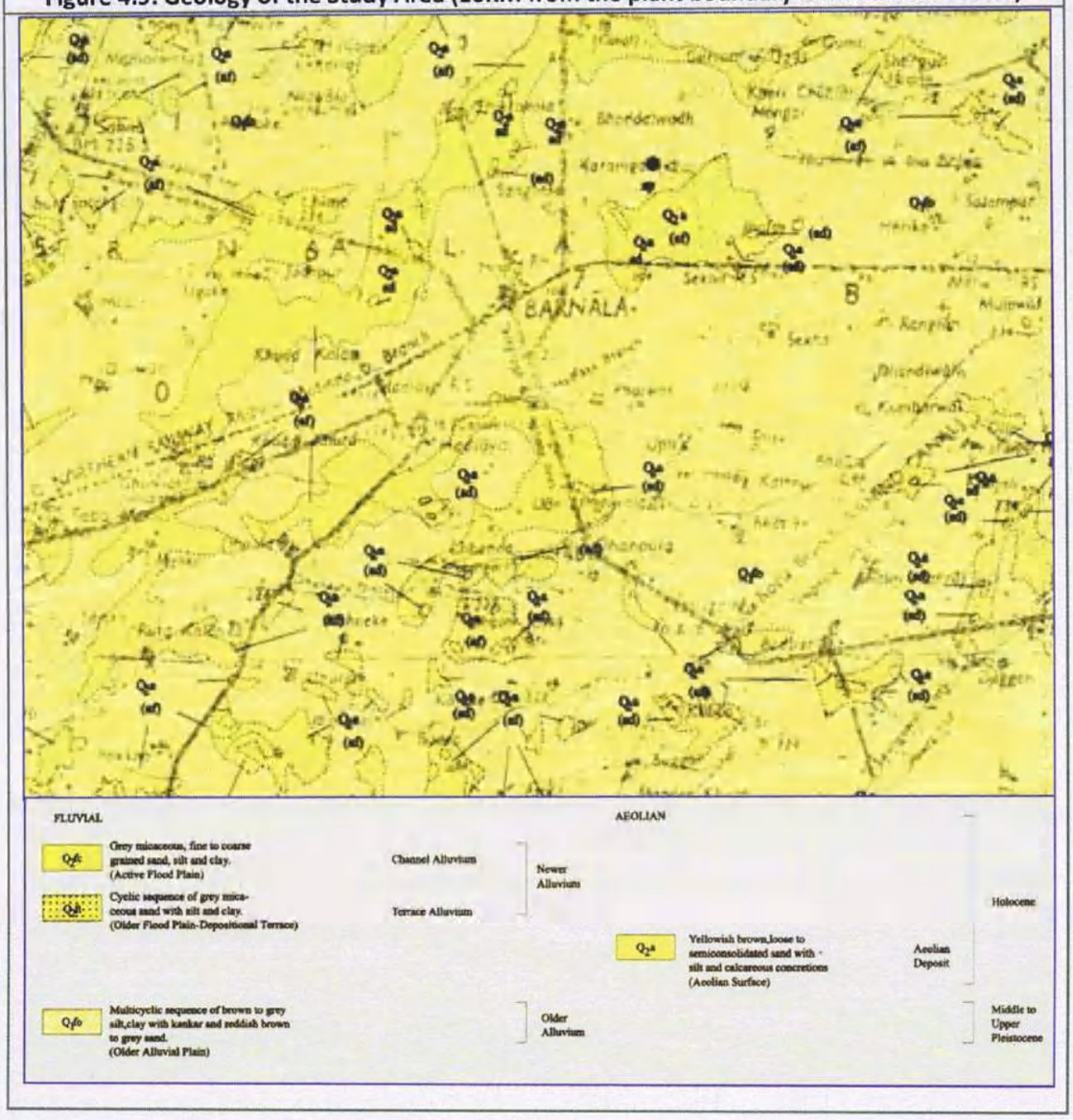


Figure 4.10: Geomorphology of the Study Area (10KM from the plant boundary)

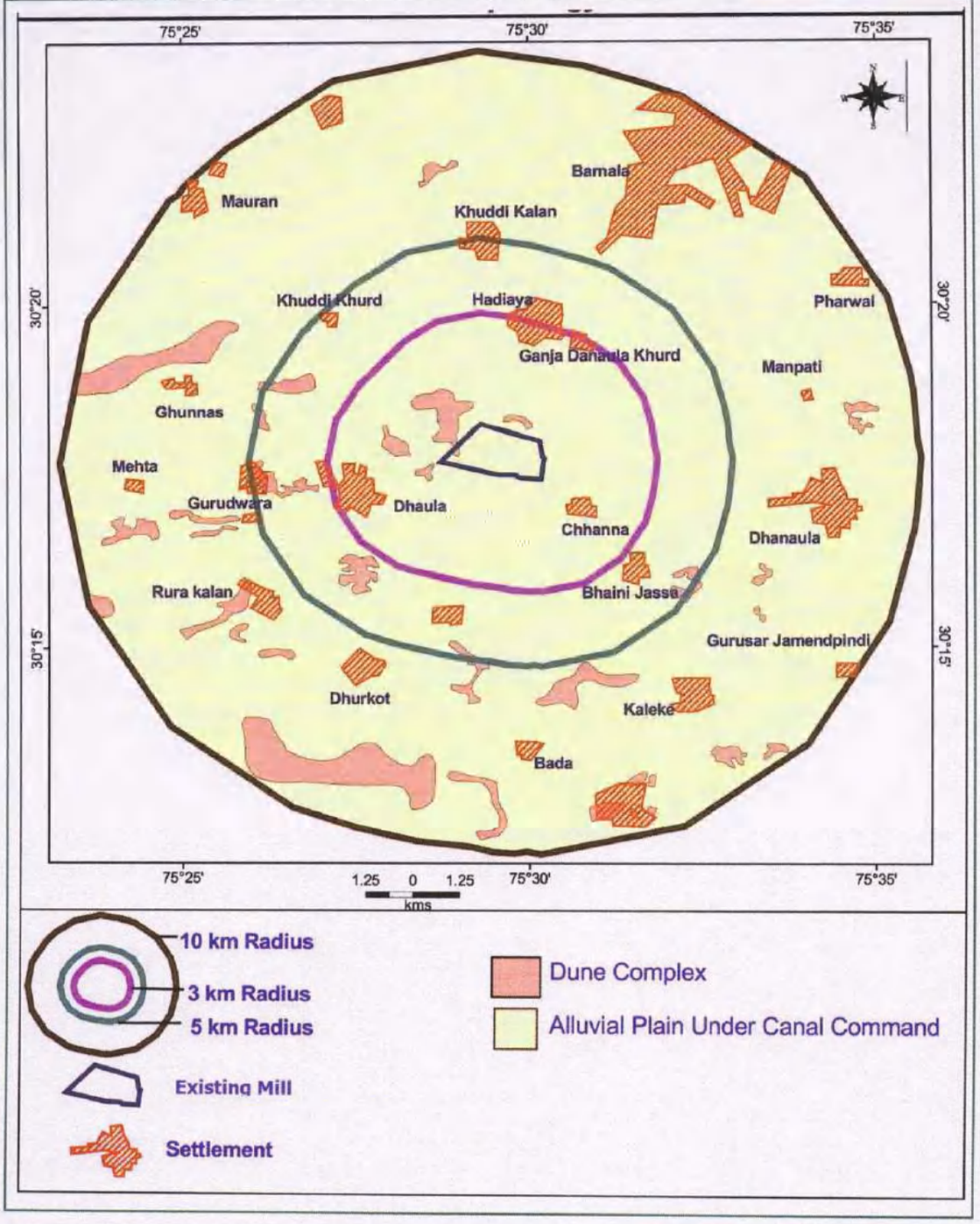
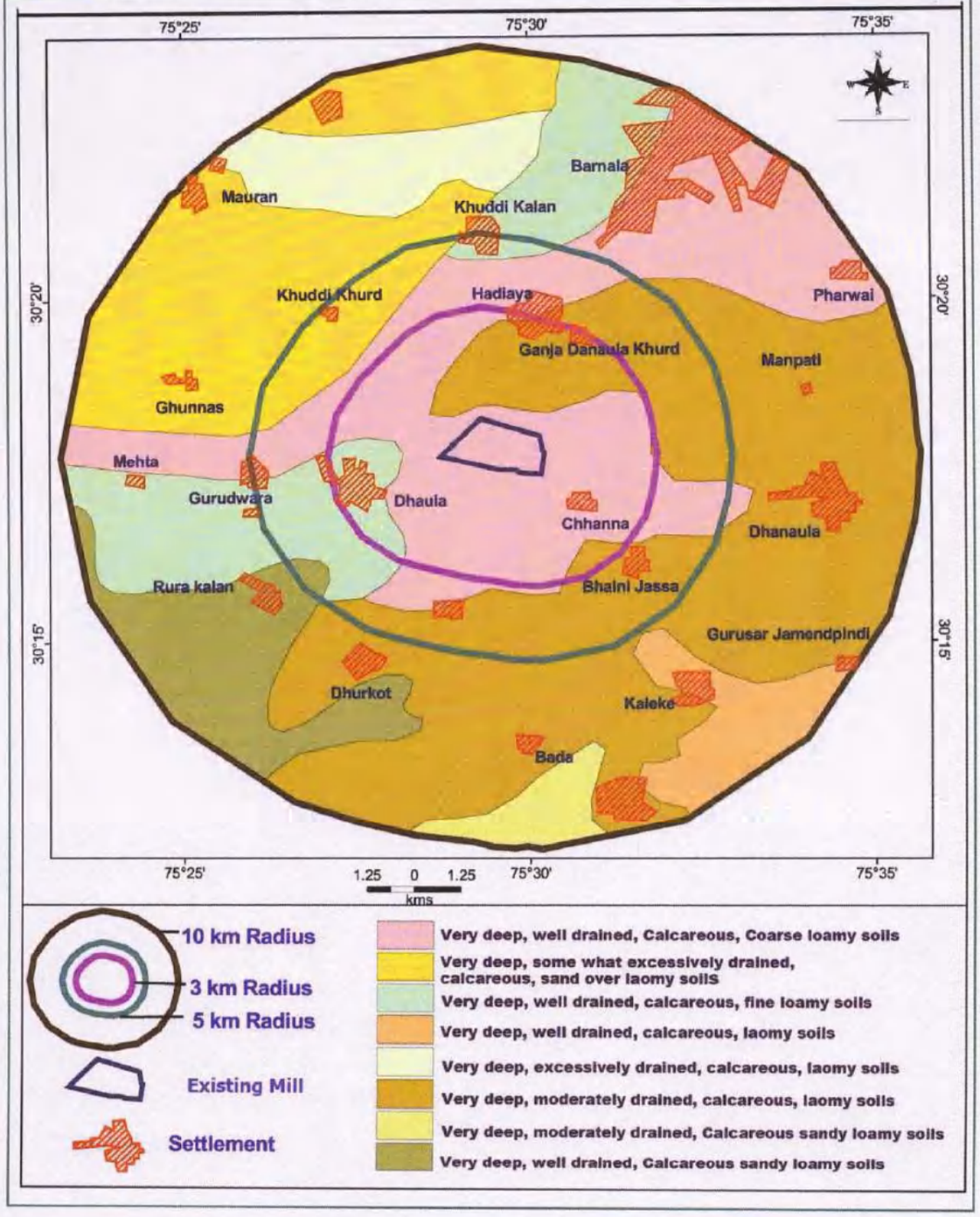


Figure 4.11: Soil classification of the Study Area (10KM from the plant boundary)



4.4. Hydrogeology

Based on details collected from the published EIA report in 2016, there are around 23 watersheds within the study area of 10km radius from the plant which covers an aerial extent of 328.38 Sq.Km. Watersheds within a 10Km radius from the mill are given in Figure 4.12.

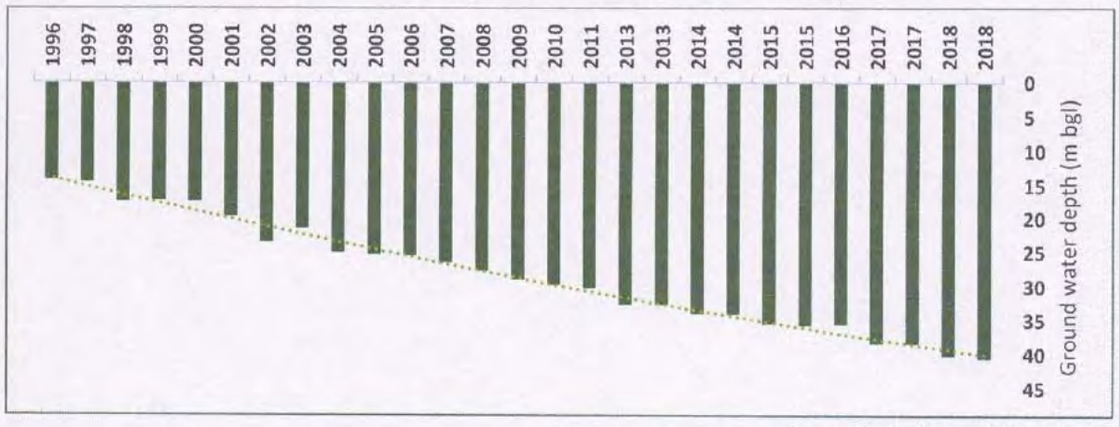
The district is occupied by Indo-Gangetic alluvial plain of Quaternary age and falls in Ghaggar sub-basin. The groundwater occurs in alluvium formations comprising fine to coarse sand which forms the potential aquifers. In the shallow aquifers up to 50m bgl groundwater occurs under unconfined /water table conditions whereas in deeper aquifers semi-confined /confined conditions exist.

Water level Behaviour- as per the published EIA report, the depth to the water level in the region ranges from 8.72 m to 23.89 m bgl during the pre-monsoon period and 9.95 m to 25.41m bgl during post-monsoon period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates an average fall of 0.65m/year. The hydrogeology map of the district is given in Figure 4.13.

As per the details published by Central Ground Water Board, the Barnala block is categorized as an Over Exploited Zone. The groundwater potential and the categorization of blocks is given in Figure 4.14. The regional groundwater levels vary between 15 to 27 m bgl which is in line with the above and the yield of the wells varies between 1000 to 4000 liters per minute. Groundwater level contour is presented in Figure 4.15.

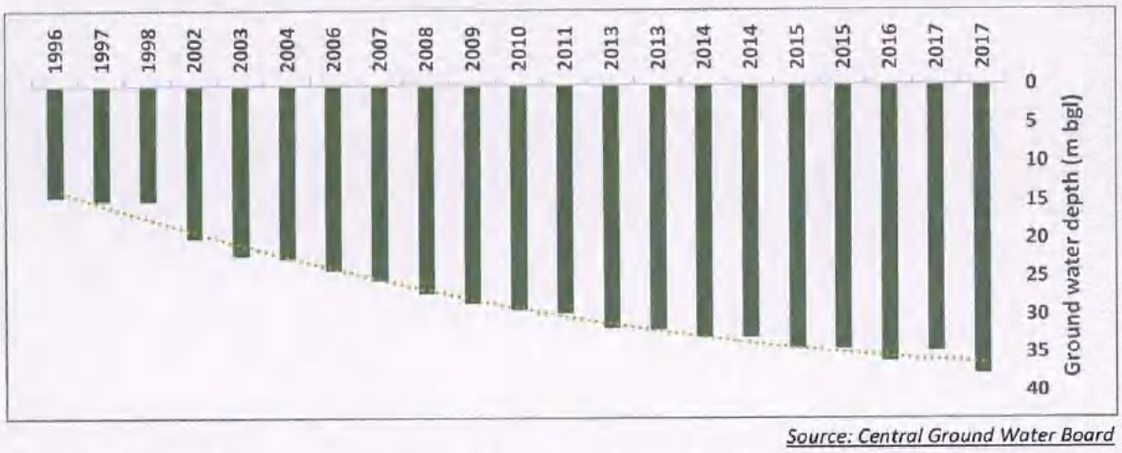
The published data on the historical trend of groundwater depth at the nearest CGWB maintained tube well located in Barnala town during monsoon and pre-monsoon is presented below:

Historical trend of groundwater depth in the region during monsoon



Source: Central Ground Water Board

Historical trend of groundwater depth in the region during pre-monsoon



Source: Central Ground Water Board

Over the past 22 years, the groundwater depth has been increased to an extent of approx. 26.1m during monsoon and 23.4m during pre-monsoon which could be due to the extensive utilization of groundwater for irrigation and improved urbanization in the region.

As per the published EIA report in 2016, the soil lithology reveals that the porosity of the soil is 46.82% and the Texture is Sandy clay. The porosity indicates that the infiltration rate of the soil is moderate. The groundwater table contour depicts that the flow is towards the west direction in both the seasons which is in line with the land elevation profile. The hydraulic gradient in the mill site is moderate and has been observed as 4.8 m/Km in pre-monsoon and 3.9 m/Km in post-monsoon. It is also noticed groundwater trough and mound in isolated pockets of the study area which indicates the convergent and divergent flow of groundwater. The groundwater table constructed for the study area is presented in Figure 16 and Figure 17.

Figure 4.12: Water Shed of the Study Area (10KM from the plant boundary)

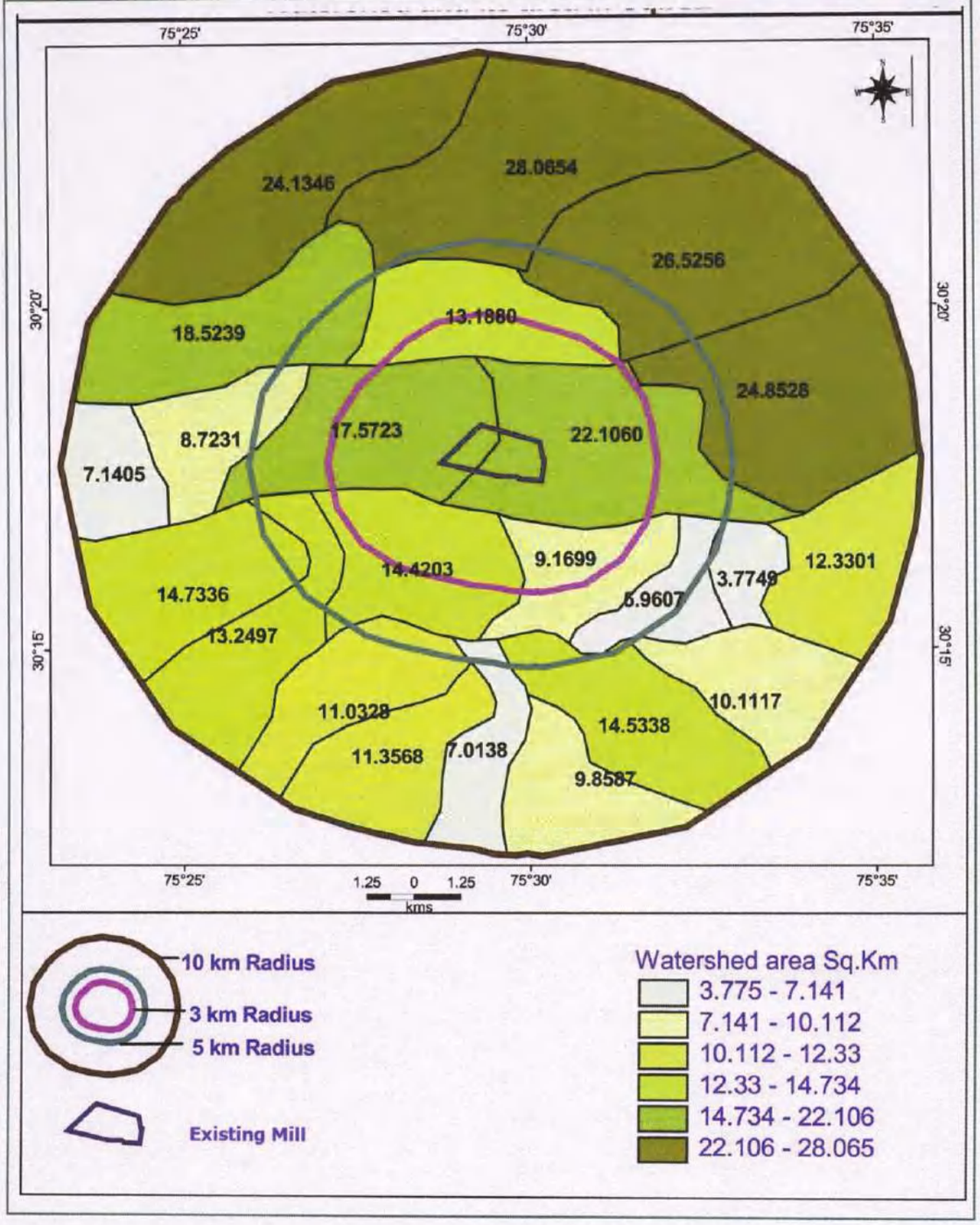
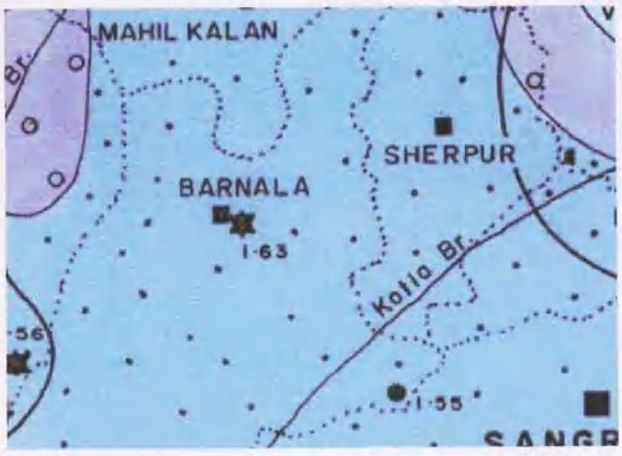


Figure 4.13: Hydrogeology map of the Area

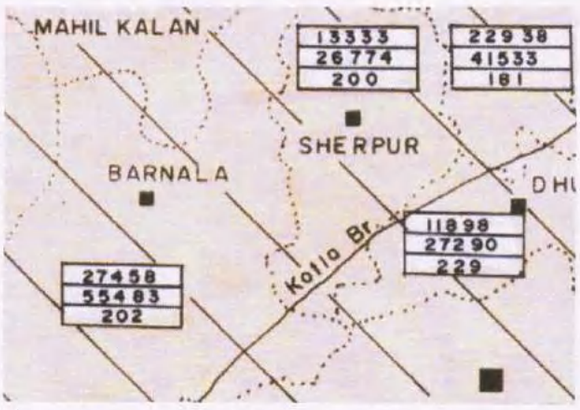


	WELLS FEASIBLE	RIGS SUITABLE	DEPTH OF WELL (m)	DISCHARGE (lpm)	SUITABLE ARTIFICIAL RECHARGE STRUCTURES
SOFT ROCK AQUIFER	TUBE WELLS	REVERSE / DIRECT ROTARY	50 – 100	1300 – 2500	RECHARGE TRENCH WITH INJECTION WELL
SOFT ROCK AQUIFER	TUBE WELLS	REVERSE / DIRECT ROTARY	40 – 150	1000 – 1300	RECHARGE TRENCH WITH INJECTION WELL
SOFT ROCK AQUIFER	TUBE WELLS	REVERSE / DIRECT ROTARY	50 – 100	600 – 1000	RECHARGE TRENCH WITH INJECTION WELL

ELECTRICAL CONDUCTIVITY (MICROMHOS / CM AT 25°C)
1000

1·55 ● FLUORIDE > PERMISSIBLE LIMIT 1·5 ppm
1·56 ✲ IRON > PERMISSIBLE LIMIT 1·0 ppm

Figure 4.14: Groundwater potential and the categorization of Blocks in the Area



19038	NET GROUND WATER AVAILABILITY (HAM)
32269	GROSS ANNUAL DRAFT FOR ALL USES (HAM)
169	STAGE OF GROUND WATER DEVELOPMENT %

OVER EXPLOITED BLOCK

Figure 4.15: Groundwater level contour of the Study Area (10KM from the plant boundary)

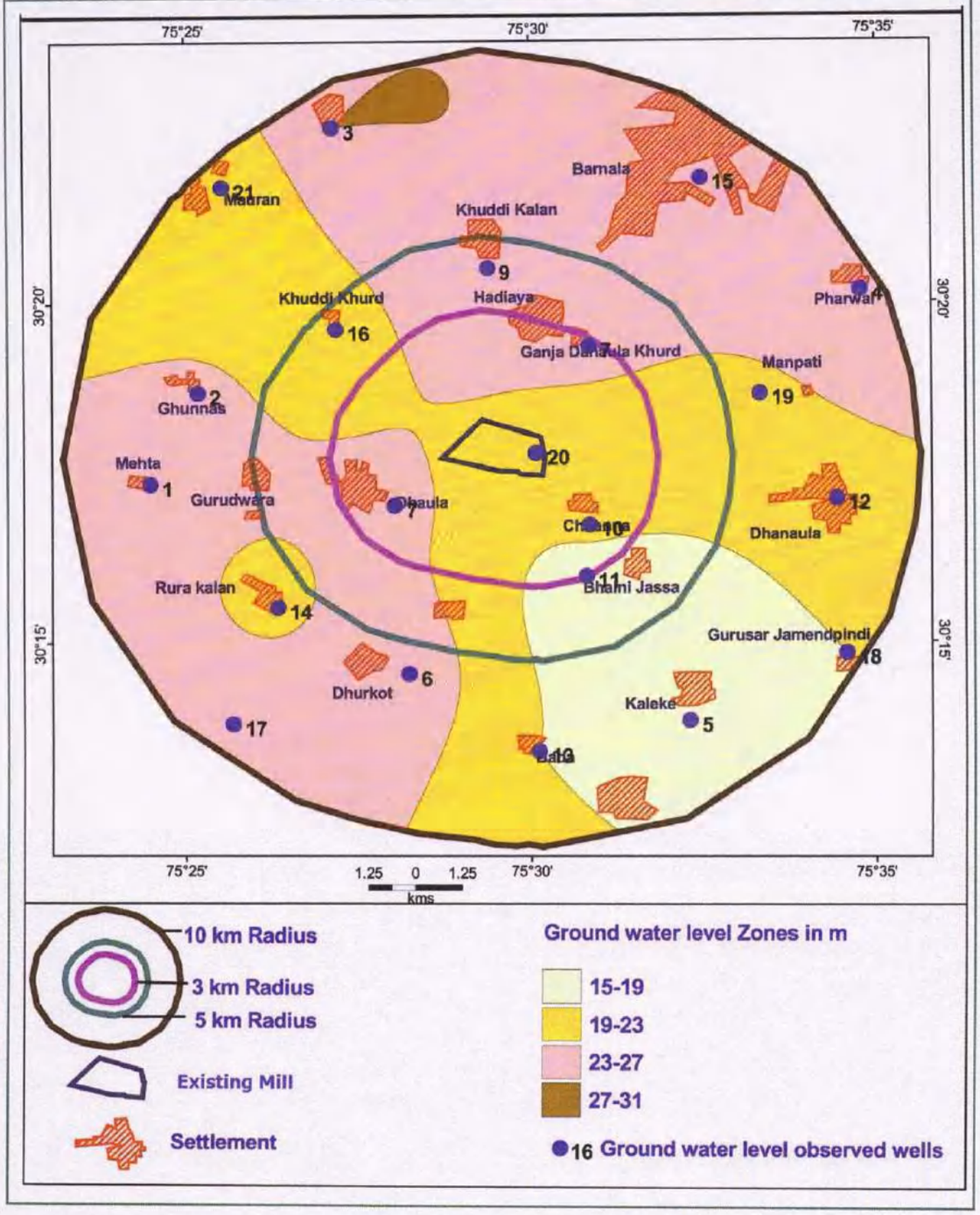


Figure 4.16: Groundwater table and hydraulic gradient during Pre-Monsoon (10KM from the plant boundary)

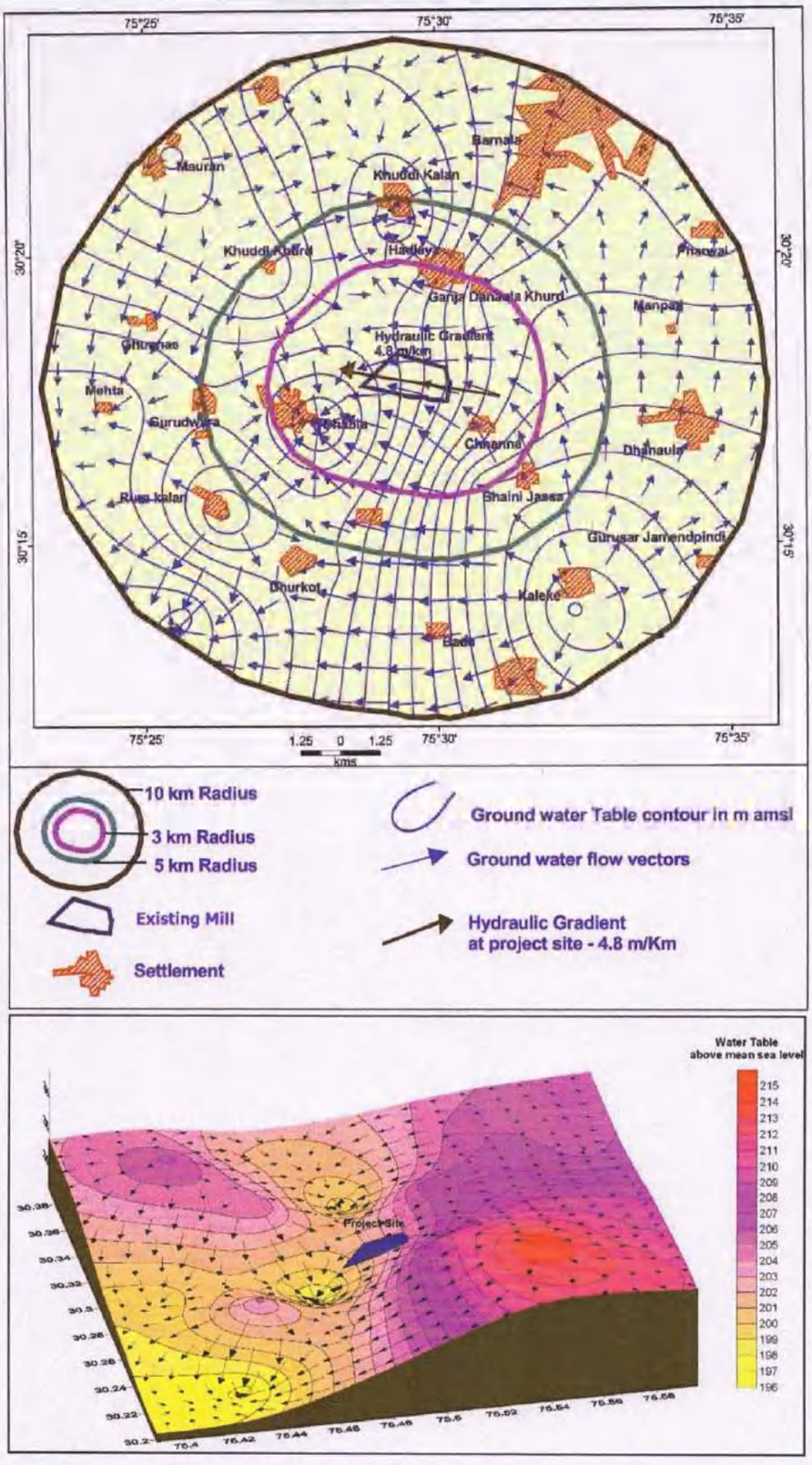
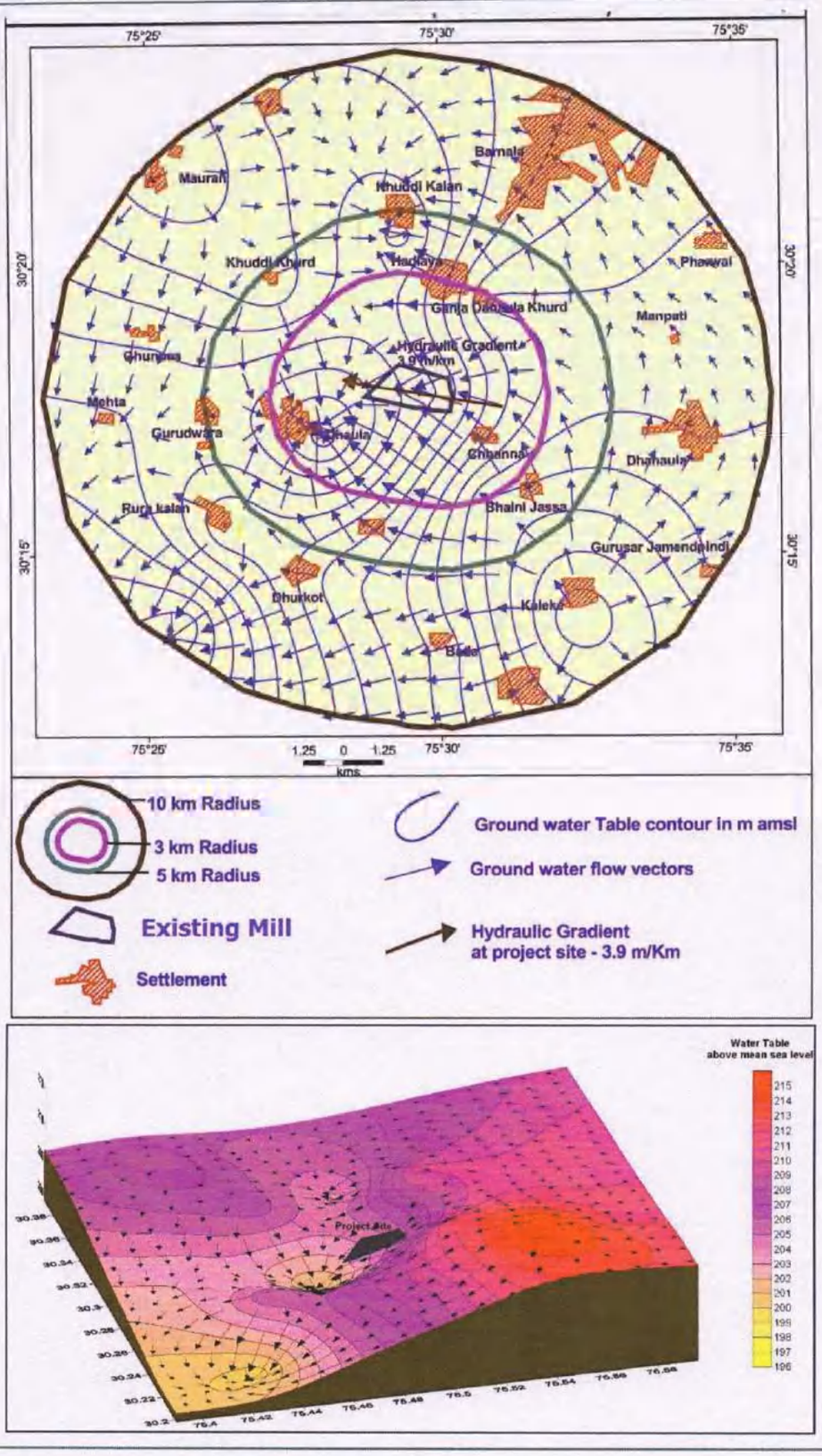


Figure 4.17: Groundwater table and hydraulic gradient during Post-Monsoon (10KM from the plant boundary)



5. SOIL AND GROUNDWATER QUALITY IN THE REGION

5.1. Published Information on Soil and Groundwater Quality in the Region

Based on the quality data published by Central Ground Water Board, Ministry of water resources, Govt. of India, the groundwater in the district is generally alkaline in nature. The chemical quality data from the shallow and deep aquifers indicate that all major cations (Ca, Mg, Na, and K) and anions (CO_3, HCO_3, Cl, SO_4) are within the permissible limits set by BIS, 2012. The physical parameters such as electrical conductivity show a wide variation from 827 µS/cm in the southern and northern part to 1140 µS/cm in the central part of the district particularly where the existing mill is location. It was also concluded that since all the physical and chemical parameters are below the permissible limit prescribed by BIS and the groundwater in the area is suitable for drinking purposes.

As per the data published by Water Resource Information System under the central water commission, the groundwater quality in the Barnala block (Coordinates of the well: 30.3583, 75.5583) was being recorded during 2015 and 2016. The summary of the quality data is below:

The average electrical conductivity was recorded was about 915 µmhos/cm which indicates that approx. total dissolved solids concentration is 450 to 500 mg/l. Thus, the regional level of groundwater quality in terms of TDS is moderate. The average pH recorded was about 8.8 which is also slightly exceeding the acceptable limit for drinking water. Hence the tendency to scale is significantly high.

The average *Sodium Adsorption Ratio (SAR)* value of 5.17 and *Residual Sodium Carbonate (RSC)* value of 3.73 has been recorded which indicates the SAR is below the permissible limit of 10 while the RSC value is slightly above the prescribed limit of 2.5 for the agricultural purpose. SAR is an indicator of the suitability of water used for agricultural purposes and also a standard diagnostic parameter for the sodicity hazard of soil. Whereas the RSC is an indicator for alkalinity hazard of soil and it can be inferred that the entire region has the tendency to exhibit higher pH in the soil.

5.2. Soil and Groundwater Quality – Primary Data

For the purpose of this assessment, the soil and groundwater samples have been collected from the below areas. The groundwater samples collected are from the existing private borewells which were drilled up to the deeper aquifer. There are no open wells located in the area.

I. ***Samples along the Dhanuala drain (less than 100m from the Drain)-***
   - Upstream with respective to the plant discharge point
   - Near the plant discharge point

- Downstream with respective to the plant discharge point

II. ***Samples to map the baseline background levels***

- Upgradient location with respect to the groundwater flow direction (Southeast to the plant)
- Cross gradient location with respect to the groundwater flow direction (Southwest to the plant)

III. ***Samples within the onsite irrigation area***

The location details for the above-mentioned soil and groundwater sampling points are given in Table 5.1 and Table 5.2 respectively. The location maps are presented in Figure 5.1 and Figure 5.2.

The analytical data of soil and groundwater samples are summarized and presented in Table 5.3 and Table 5.4 respectively. The laboratory test reports are attached as Annexure of this report.

Table 5.1: Groundwater Sampling location details

Code	Location Description	Latitude	Longitude
GW1	Along the drain - Upstream of Dhanuala from plant	*30.295647°*	*75.510133°*
GW2	Along the drain - Upstream of Dhanuala from plant	*30.293611°*	*75.520917°*
GW3	Baseline background Location (Upgradient as per groundwater flow direction)	*30.273278°*	*75.525667°*
GW4	Baseline background Location (Upgradient as per groundwater flow direction)	*30.269889°*	*75.529806°*
GW5	Along the drain – Near the plant	*30.303547°*	*75.491189°*
GW6	Along the drain – Downstream of Dhanuala from plant	*30.306944°*	*75.480528°*
GW7	Along the drain – Downstream of Dhanuala from plant	*30.307833°*	*75.474722°*
GW8	Along the drain – Downstream of Dhanuala from plant	*30.314167°*	*75.429583°*
GW9	Along the drain – Downstream of Dhanuala from plant	*30.316199°*	*75.418556°*
GW10	Baseline background Location (the Nearest village in the South)	*30.283539°*	*75.465386°*
GW11	Within the onsite irrigation area	*30.297722°*	*75.486056°*
GW12	Within the onsite irrigation area	*30.290187°*	*75.499296°*

Table 5.2: Soil Sampling location details

Code	Location Description	Latitude	Longitude
S1	Along the drain - Upstream of Dhanuala from plant	*30.297361°*	*75.510417°*

S2	Along the drain - Upstream of Dhanuala from plant	30.293611°	75.520917°
S3	Baseline background Location (Upgradient as per groundwater flow direction)	30.273278°	75.525667°
S4	Baseline background Location (Upgradient as per groundwater flow direction)	30.269889°	75.529806°
S5	Along the drain – Near the plant	30.300357°	75.497876°
S6	Along the drain – Downstream of Dhanuala from plant	30.307833°	75.474722°
S7	Along the drain – Downstream of Dhanuala from plant	30.313606°	75.429431°
S8	Along the drain – Downstream of Dhanuala from plant	30.316173°	75.418771°
S9	Within the onsite irrigation area	30.297722°	75.486053°
S10	Within the onsite irrigation area	30.295487°	75.489771°
S11	Within the onsite irrigation area	30.290632°	75.499480°

Figure 5.1: Locations of Groundwater Sampling

Figure 5.2: Locations of Soil Sampling

Figure 5.3: Photographs of Soil and Groundwater Sampling

Table 5.3: Summary of Groundwater Analytical results

S. No.	Parameters	Units	Detection Limit	Along Dhanuala Drain							Within the onsite irrigation area		Background baseline locations			Dutch Standards	
				Upstream		Near the Plant	Downstream										
				GW-1	GW-2	GW-5	GW-6	GW-7	GW-8	GW-9	GW-11	GW-12	GW-3	GW-4	GW-10	Target Values	Intervention Values
1	pH			7.64	7.98	7.47	7.14	7.63	7.52	7.46	7.39	7.62	7.71	7.77	7.59		
2	Total Dissolved Solids	mg/l		874	894	1060	1276	876	784	1062	1222	942	524	558	676		
3	Electrical Conductivity	µmhos/cm		1409	1444	1710	2060	1411	1265	1716	1971	1523	846	901	1092		
4	Total Hardness (as $CaCO_3$)	mg/l		260	220	265	595	310	305	375	380	285	145	140	180		
5	Chemical Oxygen Demand (COD)	mg/l	4	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl		
6	BOD at 27ºC for 3 days	mg/l	2	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl		
7	Dissolved Oxygen	mg/l		7.4	7.4	7.5	7.4	7.4	7.4	7.4	7.5	7.4	7.4	7.5	7.4		
8	Salinity (as NaCl)	mg/l		588.05	666.83	658.7	518.42	424.39	257.68	579.03	738.5	502.16	220.83	376.36	439.13		
9	Nitrogen (as N)	mg/l	0.3	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl		
10	Phosphorus (as P)	mg/l	0.2	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl		
11	Potassium (as K)	mg/l		7.09	6.78	7.35	8.27	8.08	7.46	7.4	7.3	6.65	4.91	5.09	5.55		
12	Aluminium (as Al)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.16	bdl	bdl	bdl		
13	Barium (as Ba)	mg/l	0.005	0.065	0.044	0.1	0.083	0.078	0.058	0.062	0.058	0.069	0.041	0.031	0.035	0.05	0.625
14	Copper (as Cu)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.008	bdl	bdl	bdl	0.015	0.075
15	Iron (as Fe)	mg/l	0.05	bdl	bdl	bdl	bdl	bdl	bdl	0.13	0.056	0.94	bdl	bdl	bdl		
16	Manganese (as Mn)	mg/l	0.005	bdl	bdl	bdl	0.038	bdl	bdl	bdl	0.008	0.03	bdl	bdl	0.009		
17	Selenium (as Se)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.00007	0.16
18	Silver (as Ag)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	-	0.04
19	Zinc (as Zn)	mg/l	0.02	bdl	bdl	bdl	bdl	bdl	bdl	0.025	bdl	0.12	bdl	bdl	bdl	0.065	0.8
20	Molybdenum (as Mo)	mg/l	0.005	0.006	0.008	bdl	bdl	0.011	bdl	bdl	0.006	0.006	0.014	0.028	0.007	0.005	0.3
21	Cadmium (as Cd)	mg/l	0.02	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0004	0.006
22	Lead (as Pb)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.015	0.075

23	Mercury (as Hg)	mg/l	0.0005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.00005	0.0003
24	Nickel (as Ni)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.015	0.075
25	Total Arsenic (as As)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.01	0.06
26	Total Chromium (as Cr)	mg/l	0.005	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.001	0.03
27	Polychlorinated biphenyl (PCB)	µg/l	0.05	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.01	0.01
28	Polynuclear Aromatic hydrocarbons (PAH)	µg/l	0.05	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl		
29	Residual Pesticides	µg/l	0.01	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl		

	Detected values
	Below detectable levels
	Values exceeding the Dutch Target values
	Values exceeding the Dutch Intervention values

Table 5.4: Summary of Soil Analytical results

S. No.	Parameters	Units	Detection Limit	Along Dhanuala Drain						Within the onsite irrigation area			Background baseline locations		Dutch Standards	
				Upstream		Near the Plant	Downstream									
				S-1	S-2	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-3	S-4	Target Values	Intervention Values
1	pH			8.72	8.86	8.39	9.23	8.49	9.05	8.98	9.25	8.95	8.62	8.68		
2	Electrical conductivity	µmhos/cm		220	259	280	119	116	148	108	258	164	279	155	2000*	
3	Organic Matter	% wt/wt		0.7	0.49	0.49	0.68	0.85	0.63	0.42	0.5	0.54	1.01	0.62		
4	Available Phosphorus (as P)	% wt/wt		0.083	0.101	0.054	0.063	0.08	0.091	0.069	0.033	0.054	0.083	0.056		
5	Total Nitrogen (as N)	% wt/wt		0.08	0.21	0.16	0.043	0.065	0.046	0.074	0.047	0.05	0.05	0.09		
6	Oil & Grease	% wt/wt		*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*		
7	Salinity (as Nacl)	% wt/wt		0.09	0.12	0.1	0.17	0.17	0.11	0.1	0.12	0.13	0.11	0.14		
8	Moisture	% wt/wt		13.95	13.25	10.31	9.64	13.39	10.41	1.89	5.21	2.83	10.47	11.48		
9	Cadmium (as Cd)	mg/kg	1	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	0.8	12
10	Zinc (as Zn)	mg/kg	1	42.33	50.22	35.33	33.47	34.83	32.34	19.19	39.73	55.32	43.16	74.56	140	720
11	Total Chromium (as Cr)	mg/kg	1	22.16	30.19	21.24	18.66	17.56	16.07	10.42	14.23	13.92	21.06	19.79	100	380
12	Nickel (as Ni)	mg/kg	1	14.31	23.6	13.08	9.04	9.41	5.39	*bdl*	6.52	6.82	13.47	12.59	35	210
13	Total Arsenic (as As)	mg/kg	1	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	29	55
14	Mercury (as Hg)	mg/kg	1	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	0.3	10
15	Copper (as Cu)	mg/kg	1	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	36	190
16	Lead (as Pb)	mg/kg	1	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	3.95	3.95	*bdl*	*bdl*	85	530
17	Polychlorinated biphenyl (PCB)	mg/kg	0.05	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	0.02	1
18	Polynuclear aromatic hydrocarbons (PAH)	mg/kg	0.05	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	*bdl*	1	40

** Acceptable limit as per Indian counsel of Agricultural research*

	Detected values
	Below Detectable Levels (*bdl*)
	Values exceeding the Dutch Target values
	Values exceeding the Dutch Intervention values

5.3. Summary of Groundwater Quality

pH:

pH may not have a direct impact but one of the important water quality parameters as the lower pH water is more likely to be corrosive and higher pH is water tends to scale. Based on the laboratory test results, the pH of the samples collected is in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012.

Total Dissolved Solids:

The palatability of water with a total dissolved solids (TDS) level of less than about 500 mg/l is an acceptable limit for drinking purposes as per Indian standards. Considering the regional scenario of groundwater quality, the TDS levels in the district are likely to exceed 500 mg/l. Based on the laboratory results, the TDS in the samples collected from the existing borewells was recorded to be in the range of 524 to 1276 mg/l. The contour map is presented in Figure 5.4 and the graphical representation is presented in Figure 5.5.

It can be inferred from the analytical data that the background baseline concentrations of TDS are reported in the range of 524 mg/l to 675 mg/l which is in line with the regional groundwater quality. The TDS concentration along the drain is in the range of 784 mg/l to 1276 mg/l and precisely varying from 874 mg/l to 894 mg/l in the upstream of drain from plant discharge, around 1060 mg/l near the plant discharge and from 784 mg/l to 1276 mg/l in the downstream of drain from plant discharge. The TDS concentration ranging from 942 mg/l to 1222 mg/l is recorded from the samples collected within the onsite irrigation. Based on the TDS level mapping, it can be inferred that the TDS levels in the groundwater is a regional phenomenon and is in line with the published regional level data.

Figure 5.4: TDS Concentration Contour Map

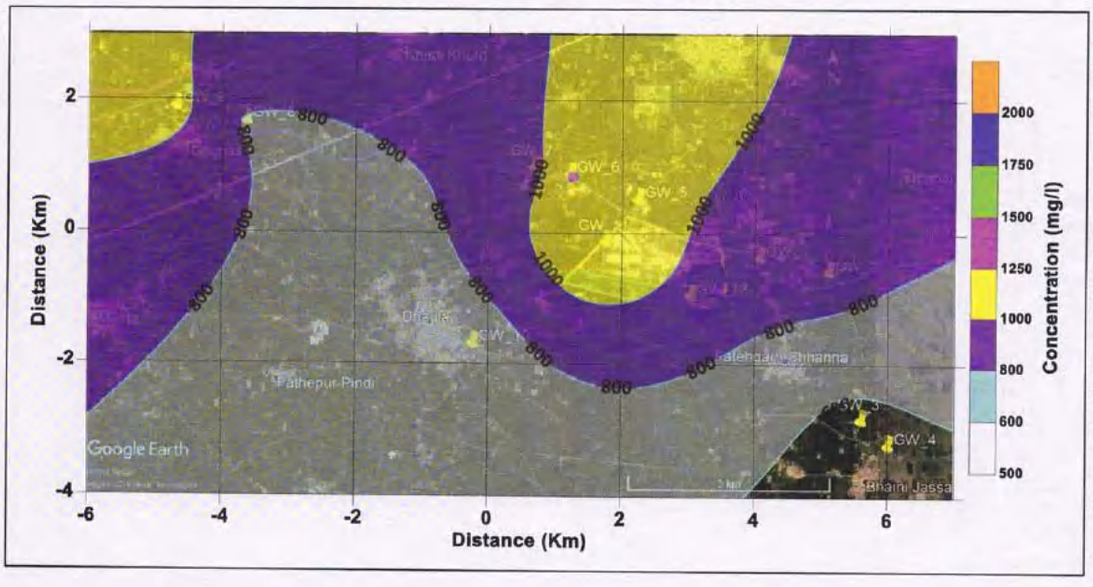
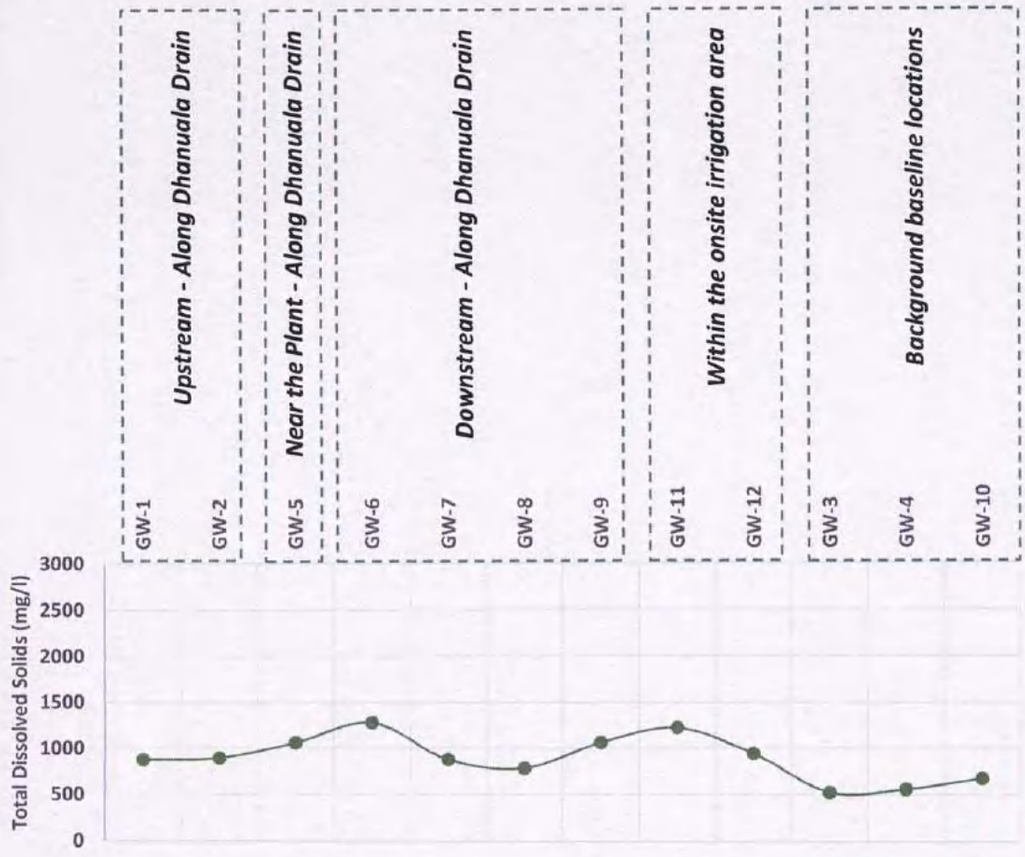


Figure 5.5: TDS Concentration in the Groundwater Samples Collected



Total Hardness:

Depending on the other parameters such as pH and alkalinity, hardness can cause increased scaling and corrosion tendencies. General guidelines for classification of waters are: 0 to 60 mg/l is classified as soft, 60 to 120 mg/l as moderately hard 120 to 180 mg/l as hard and more than 180 mg/l as very hard.

The water with a total hardness of less than 200 mg/l is an acceptable limit for drinking purposes as per Indian standards. Based on the laboratory results, the total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l. The contour map is presented in Figure 5.6 and the graphical representation is presented in Figure 5.7.

It can be inferred from the analytical data that the background baseline concentrations of hardness are reported in the range of 140 mg/l to 180 mg/l which is classified as moderately hard to hard but acceptable for drinking purposes as per Indian standards. The hardness concentration along the drain is in the range of 220 mg/l to 595 mg/l and precisely varying from 220 mg/l to 260 mg/l in the upstream of drain from plant discharge, around 265 mg/l near the plant discharge and from 305 mg/l to 595 mg/l in the downstream of drain from plant discharge. The hardness concentrations ranging from 285

mg/l to 380 mg/l are recorded from the samples collected within the onsite irrigation. Based on the hardness level mapping, it can be inferred that hardness is apparent at the plant site and exhibiting to be the local phenomenon and drastically diluted in the surrounding areas.

Figure 5.6: Hardness in Groundwater Contour Map

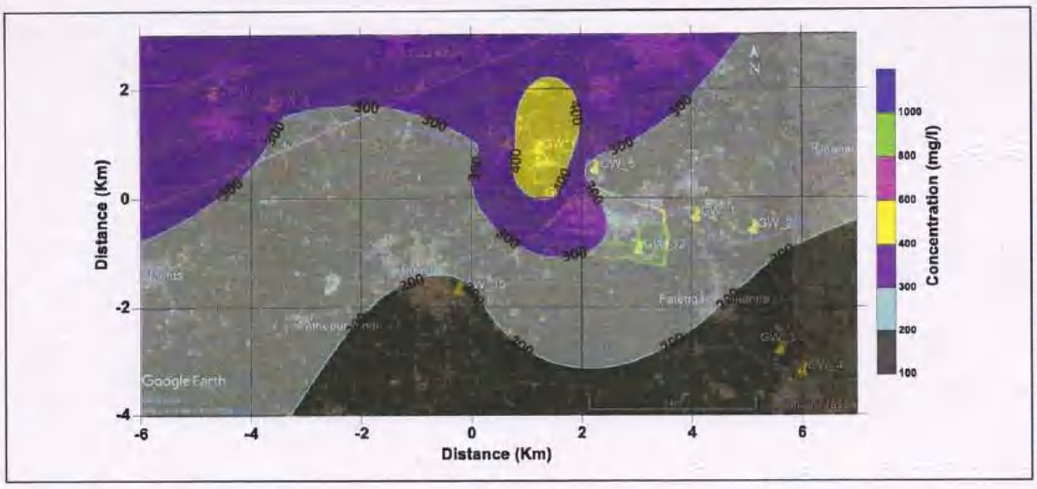
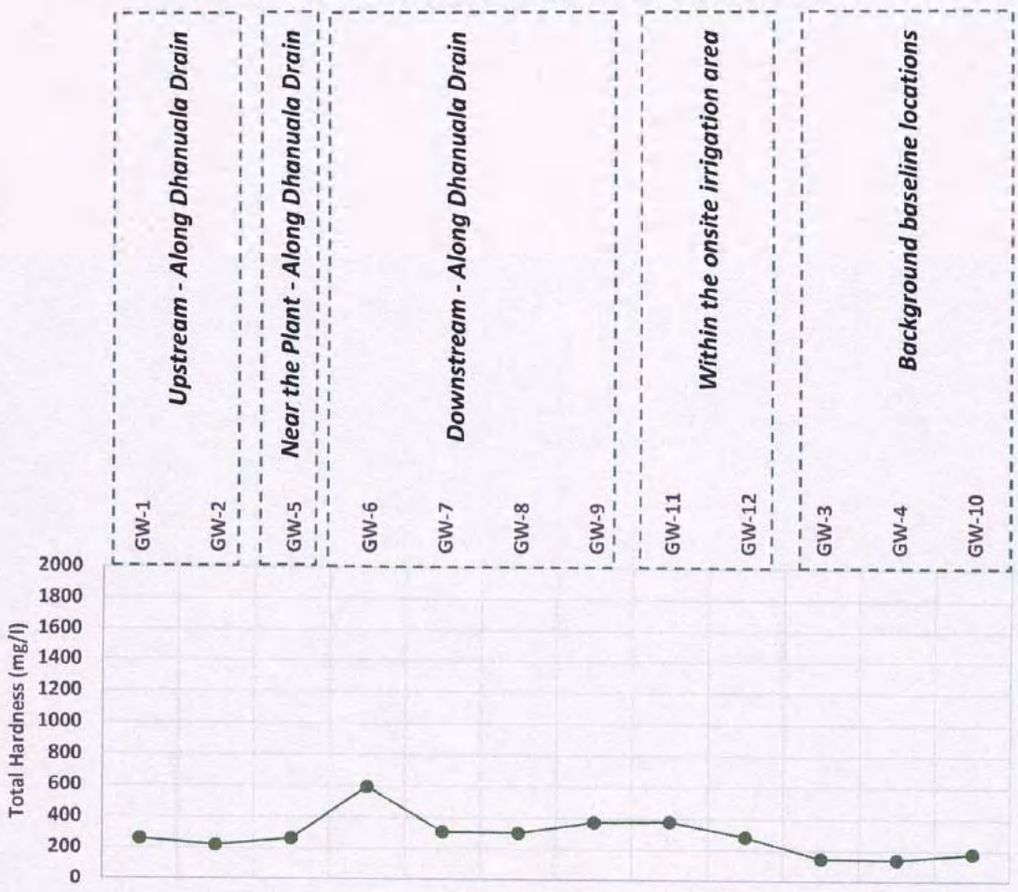


Figure 5.7: Hardness in the Groundwater Samples Collected



COD and BOD:

The chemical oxygen demand and biological oxygen demand concentrations do not exhibit or insignificant or below the detectable limits from the groundwater samples collected. Hence, it is evident that no direct ingression of industrial wastewaters or domestic sewages into the groundwater is envisaged.

Salinity:

In general, the Inland salinity in groundwater is prevalent mainly in the arid and semi-arid regions of various states including Punjab which is also reflected in terms of TDS concentration in the region. The salinity as NaCl concentrations in the groundwater samples collected is in the range of 220 mg/l to 739 mg/l. The contour map is presented in Figure 5.8 and the graphical representation is presented in Figure 5.9.

There are no drinking water standards particularly for Salinity as NaCl. But higher concentrations of salinity in agricultural water impacts on plant growth and yield.

It can be inferred from the analytical data that the background baseline concentrations of salinity as NaCl are reported in the range of 220 mg/l to 439 mg/l. Whereas it is in the range of 258 mg/l to 667 mg/l and precisely varying from 588 mg/l to 667 mg/l in the upstream of drain from plant discharge, around 659 mg/l near the plant discharge and from 257 mg/l to 579 mg/l in the downstream of drain from plant discharge. The salinity as NaCl concentrations ranging from 502 mg/l to 739 mg/l is recorded from the samples collected within the onsite irrigation borewells. Based on the salinity level mapping, it can be inferred that it is a regional phenomenon.

Figure 5.8: Salinity as NaCl in Groundwater Contour Map

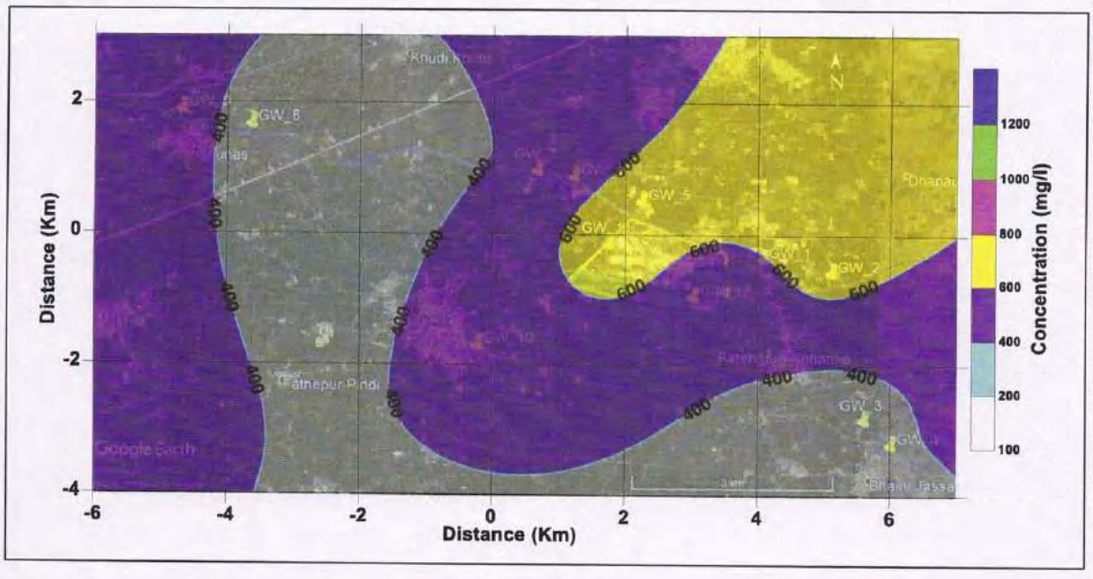
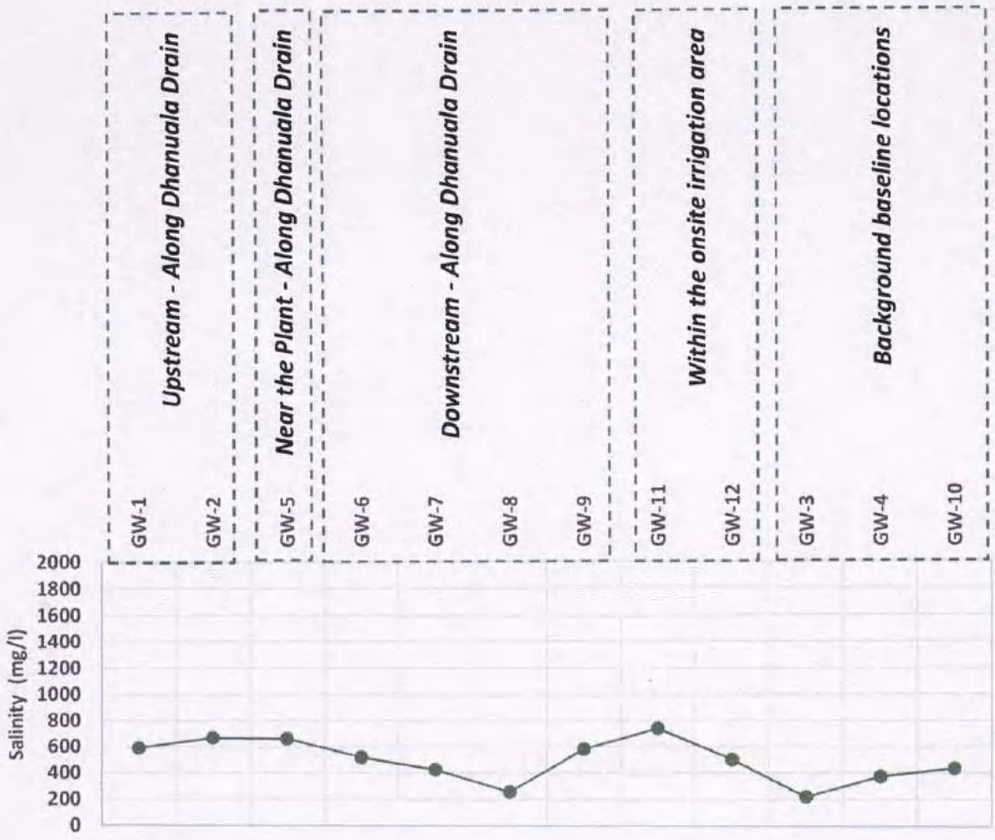


Figure 5.9: Salinity as NaCl in the Groundwater Samples Collected



Nutrients (NPK):

Nitrogen, Phosphorous, and Potassium are three primary nutrients that play an important role in agriculture for plant nutrition. Based on the analytical results of groundwater water samples collected, both nitrogen and phosphorous are concentrations do not exhibit or insignificant or below the detectable limits. Whereas, the potassium is varying in the range of 4.9 mg/l to 8.3 mg/l. There are no specific limiting concentrations for drinking water requirement whereas potassium is one of the primary nutrients for agriculture.

Heavy Metals:

The analytical results of groundwater samples collected and analyzed for Heavy metals concentrations were found to be below the intervention values as per Dutch International Standards. Hence, the groundwater in this region is not contaminated to the level of remediation and no further assessment and delineation of heavy metals contamination in the groundwater are necessarily required. Whereas, comparing the concentrations with the drinking water acceptable limits published by Indian Standards inferences that Aluminium, Iron and Manganese concentrations in the groundwater samples collected from borewell located in onsite irrigation land.

5.3. Summary of Soil Quality

The soil samples collected at various locations mentioned above were analyzed for 18 parameters. The values were then compared with the standard soil classification from the Handbook of Agriculture, Indian Council of Agricultural Research, New Delhi, 2012 to understand the suitability for agriculture and Dutch standards to evaluate the contamination if any.

pH:

The pH of the soil was found to be in the range of 8.39 to 9.25. pH above 7 is normally classified as alkaline and the high values of alkalinity. The pH in soil could be due to nitrogen-rich fertilizers in the soil. However, the alkaline soils could contribute to the growth of the plants rather than the acidic soils.

Electrical Conductivity:

The electrical conductivity of the soil was found to be in the range of 108 µmhos/cm to 280 µmhos/cm which could be a regional phenomenon and may be attributed to the use of fertilizers or could be due to the salinity intrusion in groundwater.

Organic Content & Total Nitrogen:

The organic content in the soil ranged from 0.42% wt/wt to 1.01% wt/wt. This could be due to the potential release of the nitrogen in the soil. The total nitrogen in the soil was found in the range of 0.043% wt/wt to 0.21% wt/wt. A typical agricultural soil would contain 0.10% to 0.15% N and hence the soil can be considered good for crop growth in terms of total nitrogen.

Available Phosphorus:

The available phosphorus in the soil was found between 0.033% wt/wt and 0.101% wt/wt. The cool, wet soils show low values of phosphorus. High values of available phosphorus will induce excessive plant growth due to the supply of essential primary nutrients. The phosphorus values could be increased by the use of phosphorus-rich fertilizers.

Salinity:

The salinity as NaCl in soil was found to be in the range of 0.09% wt/wt to 0.17% wt/wt. Since sodium does not contribute to the growth of the plants, its significance is less. Excessive sodium levels could be attributed to the irrigation waters which is the groundwater in this region.

Moisture:

The moisture in the soil samples was found to be between 1.89 % wt/wt and 13.95 % wt/wt. The higher moisture content implies that the water holding capacity of the soil is more and hence it is good for plant growth.

Zinc:

The values of Zinc ranged from 19.19 mg/kg to 74.56 mg/kg. These were found to be less than the target/Intervention values as per the Dutch Intervention Standards. This shows that the soil is not contaminated and non-toxic. Since the concentration of zinc is found to be moderate, the levels are found to be good for plant growth.

Total Chromium:

The values of Total chromium in the soil was in the range of 10.42 mg/kg to 30.19 mg/kg. This means that the soil is not contaminated. High values of chromium could be toxic.

Nickel:

The values of Nickel were found to be between 5.39 mg/kg and 23.6 mg/kg. The high content of nickel in the soil will cause toxicity. Since the values were found to be less than 35 mg/kg, it acts as a good source of nutrients that could be transferred as an important element in the diet of the human being.

Lead:

The lead values were found to Below Detection Limit (BDL) at all the locations except at the onsite irrigation areas where the traces were found.

All the other parameters such as Oil & grease, Cadmium, Total Arsenic, Mercury, Copper, Polychlorinated biphenyl (PCB) and Polynuclear aromatic hydrocarbons (PAH) were found to be Below Detection Limit (BDL) in all the soil samples collected.

6. SUMMARY AND CONCLUSIONS

The summary of soil and groundwater quality assessment carried out in the area is presented below:

- Based on the collected information regarding groundwater survey and exploration data published by CGWB for Barnala block, the groundwater flow direction in the area was evaluated to be towards the west. The land elevation slope in the area is also in line with the flow direction.
- The Water level as per the published EIA report in the region ranges from 8.72m to 23.89m bgl during the pre-monsoon period and 9.95 m to 25.41 m bgl during the post-monsoon

period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates the average fall of 0.65m/year. Barnala block is categorized as an Over Exploited Zone by CGWB.

- Based on the details obtained from during the assessment, the utilisation of treated wastewater for irrigation is in the order of 150 m^3 per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m^3/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.
- For the purpose of this assessment, the soil and groundwater samples have been collected (i) Along the Dhanuala drain (less than 100m from the Drain), (ii) at the upgradient locations to map the baseline background levels and (iii) at the onsite irrigation area. Groundwater samples were collected from the existing private borewells which were drilled up to the deeper aquifer which are in use.
    - pH in the groundwater samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012. Whereas the pH in soil was found to be more alkaline in the entire region.
    - TDS in the samples collected from the existing borewells were recorded to be in the range of 524 to 1276 mg/l. The TDS levels in groundwater from the samples collected is a regional phenomenon and is in line with the published regional level data. The groundwater's Salinity as NaCl is in-line with TDS which contributes to 50% to 60%. Similarly, the electrical conductivity in the soil is also high and depicting regional scenario which reflects the equivalent salinity as NaCl in soil.
    - Total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l.
    - Minor traces of nutrients and Heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.

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Annexure I

Laboratory Analytical Test Reports for Groundwater Samples

Annexure II

Laboratory Analytical Test Reports for Soil Samples

ANNEXURE R-17

207

Guidelines
for
Utilisation of Treated Effluent in Irrigation

CENTRAL POLLUTION CONTROL BOARD
(Ministry of Environment, Forest & Climate Change)
'Parivesh Bhawan', East Arjun Nagar,
Delhi- 110 032

September 2019

Guidelines for Utilisation of Treated Effluent in Irrigation

1.0 Background

The Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi, vide order dated 24.05.2019 in the matter of O.A. No. 348/2017, Shailesh Singh Vs Al-Dua Food Processing Pvt. Ltd., issued the following directions to CPCB:

"..We may add that no industry can be permitted to dispose treated effluents on land for irrigation, plantation or horticulture/gardening by prescribing standards applicable without assessment of adequate availability of land and impacts of such disposal on agricultural / crops /plants and the recipient ground water. Impact of precipitation levels also needs consideration while granting such approvals. ZLD needs to be considered with respect to use of effluents in the industrial processes not in terms of its disposal on land or farm. Therefore, the CPCB needs to look into this aspect with the help of experts and issue appropriate guidelines in this regard. This aspect may also be covered in the report to be submitted in the present case..."

CPCB, constituted an Expert Group, comprising of members from Indian Institute of Technology (IIT), Delhi, National Environmental Engineering Research Institute (NEERI), Delhi and Central Pollution Control Board (CPCB), Delhi, to lay down guidelines as directed by the Hon'ble NGT. The Expert Group in its two meetings held on 7.8.2019 and 23.09.2019, discussed the issues thoroughly and finalised the **"Guidelines for Utilisation of Treated Effluent in Irrigation"** as given in the following paragraphs/sections.

2.0 Introduction

Zero Liquid Discharge (ZLD) implies that the industries are not discharging any effluent, either on the land or in the water body or at any other place i.e. recycling the same in the process entirely without releasing any effluent.

ZLD accomplishment may need physical & chemical treatment, followed by biological system to remove organic load. The treated effluents can be then subjected for concentration and evaporation. The concentration method quite often involves the adoption of Reverse Osmosis (RO) and Nano Filtration (NF) methods. The evaporation methods involve drying/evaporation of effluent in multi effect evaporators (MEE).

Adopting ZLD practices may not be feasible in many cases in view of techno-economical reasons. However, the industries should still to be encouraged for

recycling and reuse of waste water as far as practicable in order to minimize the fresh water consumption and discharge of waste water into the environment. The treated waste water of an industry may also be utilised for irrigation. This type of utilisation/application is considered an efficient approach for managing/conserving water resources, compensating water shortages caused by seasonality or the irregular availability of water sources for irrigation throughout the year.

The possible risks of wastewater usage in agriculture may range from changes to physico-chemical and micro-biological properties of soils to impact on human health. In unfavorable economic conditions, the search for alternative irrigation sources, such as the use of untreated or inadequately treated wastewater may result in risk factors. Thus, it is necessary to ensure the beneficial aspects of this practice before application of treated wastewater in irrigation.

3.0 Guidelines for Utilisation of Effluent in Irrigation

(i) The industry should engage an agricultural scientist or tie-up with an agricultural university or institute for advice on the utilization or the rate of application of the effluent for irrigation considering the agro-climatic conditions.

(ii) As seasons and the sowing periods of the crops put restrictions on the utilisation of effluent for irrigation, the industry should prepare a comprehensive Irrigation Management Plan (IMP), which should include the following, in consultation with the agricultural scientist or agriculture university/institute and submit to SPCBs/PCCs which should verify the same while issuing Consent to the industry:

a. Areas to be covered under irrigation.
b. Survey/plot (khasra) numbers of land and their area covered in the scheme.
c. Written agreement with the farmers to bring their land under the scheme.
d. The quantity of effluent to be used in different periods of the year and crop-wise.
e. The treated effluent distribution system and arrangement for low/no demand period.
f. Agronomic plan for effective utilisation of land.

iii. The treated effluent should meet the norms prescribed for irrigation under Environment (Protection) Rules, 1986/Consent. The effluent should also conform to Total Dissolved Solid (TDS)- 2100 mg/l and Sodium Adsorption Ratio (SAR)- preferably less than 18 but not more than 26, depending on soil/crop type, besides meeting any other parameters suggested by agricultural scientist or agricultural university/institute in the IMP.

iv. Meeting the prescribed norms shall not be the only criteria for use of treated waste water in irrigation, the requirement of water for irrigation will also be a limiting condition and this depends upon various factors, as follow:

   a. **Crop:** This is the main subject determining the water requirement, such as, paddy crops (in general) need more water than trees.
   b. **Climate:** In tropical and subtropical climate especially in arid regions, irrigation frequency is higher. However, in slightly moist conditions the frequency decreases.
   c. **Irrigation type:** There are various irrigation types, namely, flood irrigation, sprinkler, rain gun, drip irrigation, etc., which influences the water requirement for irrigation.
   d. **Soil condition:** The various soil types, such as loam, clay, sandy, clay loam, sandy loam etc., determine the crop types and also alters the irrigation system thus determining the water requirement.
   e. **Soil permeability:** The soil permeability, which is also known as water conductivity of the soil, determines the water retention capacity. This determines the cultivable crops, which in turn determines the water requirement for irrigation.
   f. **Total Salt Concentration:** Total salt concentration (for all practical purposes, the total dissolved solids) is one of the most important agricultural water quality parameters. The plant growth, crop yield and quality of produce are affected by the total dissolved salts in the irrigation water.

v. The command area for effluent utilisation should be as near as feasible to the industry in order to facilitate easy monitoring and effective control. The industry should construct a distribution network of impervious conduits to cover the irrigated area.

vi. The industry should construct impervious lined storage tank of minimum 15 days capacity for storage of treated effluent during low/no demand, based on the Irrigation Management Plan.

vii. The treated effluent should be analysed regularly, say after every 15 days. The effluent samples should be taken at the point from where the effluent is discharged for irrigation.

viii. The physico-chemical characteristics of the soil under irrigation with treated effluent, should be monitored twice in a year to assess conditions in summer and post monsoon seasons, in order to determine the deterioration of soil quality.

ix. Similarly, the groundwater quality should also be monitored twice in a year. Samples should be collected from the first water bearing strata from existing hand pumps or by installing the same for sampling purpose only. The sampling points should be uniformly spread in the command area and near effluent storage area.

x. The industry should carry out the analysis of various prescribed effluent/soil/ground water quality parameters from the NABL/EPA/ SPCBs/PCCs recognised/accredited laboratories.

xi. Reports regarding compliance of effluent quality standards and status of soil and ground water quality shall be submitted to SPCBs/PCCs twice in a year, in first week of January and July.

xii. In case of observation of any deterioration of the soil and groundwater quality parameters in the assessment by agricultural scientist or agricultural university/institute, the application of effluent should be stopped immediately and the industry should inform the SPCB, accordingly. The industry shall be solely responsible for reclaiming the soil and water quality at their cost in the affected area.

****

TRUE COPY

Advocate

ANNEXURE R-18

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ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ

PUNJAB POLLUTION CONTROL BOARD

No. 7292 Dated 27-12-2021

To

M/s Trident Ltd. (PCD),
Village Dhaula, Mansa Road,
Tehsil & District Barnala.

Subject: - Analysis reports of effluent and air emission samples collected on 07/12/2021.

Enclosed, please find herewith copies of the analysis reports of stack emission as well as effluent samples collected by Board's Lab on 07/12/2021 for information and record.

DA/Analysis reports

27/12/21

Asstt. Environmental Engineer

ਖੇਤਰੀ ਦਫਤਰ, ਇੰਡਸਟਰੀਅਲ ਫੋਕਲ ਪੋਆਇੰਟ, ਸੰਗਰੂਰ
REGIONAL OFFICE, INDUSTRIAL FOCAL POINT, SANGRUR
Email: eerosangrur@gmail.com; www.ppcb.gov.in Ph./Fax no. 01672-233475

Results

Point of sample Collection	Parameter	Results	Prescribed Standards

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PUNJAB POLLUTION CONTROL BOARD
AIR LABORATORY, HEAD OFFICE, VATAVARAN BHAWAN, PATIALA

Web: www.ppcb.gov.in
E-mail:- ppcbairlab@gmail.com
Ph:- 0175-2302302

1. Laboratory Sample No.	481-483/ H.O.Lab./Air Monitoring/2021
2. Name of Industry	M/s Trident Ltd. (PCD), Mansa Road, Dhaula, Distt. Barnala.
3 Name of Sample collecting Officer	Er. Vipin Kumar AEE and Dr. Sonam Dogra, SA
4. Designation of authorizing Test	EE, RO, Sangrur
5. Type of Sample	Stack Emission
6. Date &Time of Sample collection	07.12.2021
7. Date &Time of Sample receipt in Lab.	09.12.2021
8. Point of Sample collection	Details as Given Below

Results

Point of sample Collection	Parameter	Results	Prescribed Standards
Port Hole on stack after APCD of Chemical recovery plant-II of Cap. 50 TPH	Particulate Matter	112 mg/Nm^3	150 mg/Nm^3
Port Hole on stack after APCD of Chemical recovery plant-I of Cap. 20 TPH	Particulate Matter	91 mg/Nm^3	150 mg/Nm^3
Port Hole on common stack after APCD of 2 no Boilers of Cap. 130 TPH each	Particulate Matter	70 mg/Nm^3 at 12% CO_2	150 mg/Nm^3 at 12% CO_2

Note: If any, stringent limits/specific standard has been prescribed time to time by MoEF&CC, CPCB and PPCB, then stringent limits/specific standard would prevail subject to clarification from the concerned Regional office

Scientific Officer

Endst. No: 27605-07 Dt. 23-12-21

A copy of the above is forwarded to the following for information and necessary action:-
1. The Chief Environmental Engineer, Punjab Pollution Control Board (Air), Jalandhar
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II Patiala
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur

Scientific Officer

TRUE COPY

Advocate

TRUE COPY

Advocate

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IN THE NATIONAL GREEN TRIBUNAL , PRINCIPAL BENCH , NEW DELHI

IN RE:

BEANT SINGH BAJWA ..... PETITIONER

VERSUS

STATE OF PUNJAB .....RESPONDENT

Know all towhom these presents shall come that I /wehereby appoint **VIRAJ GANDHI , VAIBHAV SHARMA , ADARSH DUBEY** Advocates, to be my/our Advocates in the above mentioned cause and to do all the following the acts, deeds, and things or any of them, that is to say:-

To act, appear and plead in the above mentioned cause in this Court or any other Court in which the same may be tried or heard in the first instance or in appeal or Letters Patent appeal or review, revision or execution or in any other stage of its progress until its final decision.

To present pleading, appeals, applications, Letters Patent Appeals, cross-objections or petitions for execution, review, revisions withdrawal, compromise or other petitions or affidavits or other documents as shall be deemed necessary or advisable for the prosecution of the said cause in all its stages.

To withdraw or compromise the said cause or submit to arbitration any differences or disputes that shall arise touching or in any manner relating to the said cause.

To receive money, grant receipts therefore, and to do all other acts and things which may be necessary to be done for the progress and prosecution of the said cause.

To employ any other Legal Practitioner authorizing him to exercise the power and authority hereby conferred on the Advocates whenever they may think fit to do.

I/we hereby agree to ratify wherever the Advocates or their substitute shall do in remises.

I/we hereby agree not to hold the Advocates or their substitute responsible for the of the said cause in consequence of his absence from the Court when the said is called up for hearing.

I/we hereby agree that in the event of the whole or any part of the fee agreed by me to be paid to the Advocate/s remaining unpaid, he shall be entitled to withdraw from the prosecution of the said cause until the same is paid.

IN WITNESS WHEREOF I/we hereto set my/our hand to these presents the contents of which have been explained to and understood by me/us, this the ..26..... day of .DECEMBER.....2020

Accepted

(Viraj Gandhi)(AdarshDubey)

VAIBHAV SHARMA
P/2247/2009
Lawyers' Chamber No. 2
Punjab & Haryana High Court, Chd.
Mobile : 98721-70870

Advocate (Signature or thumb Impression)

CANUBHAU NAYAK

P/801/2014 UP/9348/2017

Advocates

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Address: # 62, Sector 2, Chandigarh
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SUVINEET SHARMA
Advocate
#1608, Sector 80, Mohali-160059
P/255/1977

TRIDENTGROUP™
Excellence in nature

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Punjab, India

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Fax: +91 161 5038800
Visit: tridentindia.com

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED AT THE MEETING OF RISK MANAGEMENT COMMITTEE OF TRIDENT LIMITED HELD ON THURSDAY, AUGUST 12, 2021

"RESOLVED that pursuant to the powers delegated by the Board of Directors of the Company in their meeting held on May 15, 2021 to the Risk Management Committee of Trident Limited, the authority in connection with the business of the Company to represent, negotiate, file, write, stamp, seal, sign or digitally sign, make petitions, applications, deeds, documents, issue certified copies of documents and to settle matters as per below mentioned matrix:

Sr No	Authorities	Mode of Operation	Authorized Persons
1	Customers, Vendors, Suppliers, Consultants, Business Partners and Business Associates, State Transport Authorities, Post & Telegraph Department, Telephone and Mobile Companies, Insurance Companies, State Labour Department, State Electricity Boards, State Power Corporations, State Transmission Corporations, Electricity Regulatory Commissions, Electricity Distribution Companies, Pollution Control Board, other Central and State Government authorities, local bodies, Registration Authorities, Urban Development Authorities, Transport Authorities, Embassy, Consulate of India and other countries	--	Mr Deepak Nanda, Managing Director
2	Income Tax Authorities and Direct Taxation Matters, Indirect Tax Authorities including DGFT, Sales Tax, VAT, Service Tax, Excise & Customs, etc	--	Mr Deepak Nanda, Managing Director
3	Civil, Labour and Criminal Courts, High Court, Supreme Court, Arbitrator, Arbitration Tribunals, any other Quasi Judicial Bodies and Tribunals, Intellectual Property Rights matters and to appoint Advocates, sign and file Vakalatnama, Settlement, tender Evidence, file Petition, Reference, Review, Revision, Caveat and Appeals; To sign and file necessary petitions, statements, pleadings, applications, affidavits and other related documents before any court/tribunal/authority/etc.;	Jointly/ Severally	Mr Deepak Nanda, Managing Director, Mr Anubhav Nayyar, Authorised Signatory Mr Ankit Malhotra, Authorised Signatory
4	To appoint/empanel, deal with advocates or law firms or Arbitrator;	Jointly/ Severally	Mr Deepak Nanda, Managing Director, Mr Anubhav Nayyar, Authorised Signatory Mr Ankit Malhotra, Authorised Signatory
5	All Contracts, Agreements, Deeds, Documents, Correspondences etc, whether National or International including matters relating to Intellectual Property Rights of the Company;	Jointly/ Severally	Mr Deepak Nanda, Managing Director, Mr Anubhav Nayyar, Authorised Signatory

"RESOLVED FURTHER that Mr Deepak Nanda, Managing Director be and are hereby severally authorised to delegate/ withdraw the powers to the officers of the Company for attainment of the above objects."

"RESOLVED FURTHER that the aforesaid authorization shall be valid even if there is change in designation of the persons mentioned in the resolution."

Certified to be true copy
For **TRIDENT LIMITED**

TRIDENT LIMITED SANGHERA-148101, INDIA TRIDENTGROUP

[Hari Krishan]
Deputy Company Secretary
ICSI Membership No. ACS 31976

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भारत सरकार
Government of India

आधार

भारत सरकार
Government of India

भारतीय विशिष्ट पहचान प्राधिकरण
Unique Identification Authority of India

Enrolment No.: 0652/11029/48550

To
Anubhav Nayyar
S/O: Varinder Kumar Nayyar
House No - 51 Sukhdev Enclave
Ferozpur Road
Three Kay
Tharike
Threekey
Ludhiana Punjab - 142021
7009490647

Download Date: 11/08/2020

Issue Date: 24/12/2019

Validity unknown

आपका आधार क्रमांक / Your Aadhaar No. :

9870 9657 7611

VID : 9198 4433 0532 3100

मेरा आधार, मेरी पहचान

Government of India

AADHAAR

सूचना

- आधार पहचान का प्रमाण है, नागरिकता का नहीं।
- सुरक्षित QR कोड / ऑफलाइन XML / ऑनलाइन ऑथेंटिकेशन से पहचान प्रमाणित करें।
- यह एक इलेक्ट्रॉनिक प्रक्रिया द्वारा बना हुआ पत्र है।

INFORMATION

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- आधार कई सरकारी और गैर सरकारी सेवाओं को पाना आसान बनाता है।
- आधार में मोबाइल नंबर और ईमेल ID अपडेट रखें।
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भारत सरकार
Government of India

आधार

Anubhav Nayyar
Date of Birth/DOB: 20/06/1989
Male/ MALE

Download Date: 11/08/2020

Issue Date: 24/12/2019

9870 9657 7611

VID : 9198 4433 0532 3100

मेरा आधार, मेरी पहचान

भारतीय विशिष्ट पहचान प्राधिकरण
Unique Identification Authority of India

AADHAAR

Address:
S/O: Varinder Kumar Nayyar, House No - 51 Sukhdev Enclave, Ferozpur Road, Three Kay, Tharike, Ludhiana, Punjab - 142021

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