

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL PRINCIPAL  
BENCH, AT NEW DELHI.**

**O.A NO. 1326/2024**

**IN THE MATTER OF:**

**PUBLIC ACTION COMMITTEE & ORS.**

**.....APPLICANTS**

**VERSUS**

**UNION OF INDIA & ORS.**

**...RESPONDENTS**

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PLACE: DELHI  
DATE: 18.02.2025

  
  
  
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**REPLY ON BEHALF OF RESPONDENT No. 4 I.E.  
M/S PUNJAB DYERS ASSOCIATION (FOCAL  
POINT MODULE) TO THE ORIGINAL  
APPLICATION FILED BY THE APPLICANTS.**

**MOST RESPECTFULLY SHOWETH:**

1. That the present Original Application has been filed by the Applicants and the same is pending adjudication before this Hon'ble Tribunal and is now listed for hearing on 20.02.2025.
2. That the Respondent No. 4 CETP herein i.e. Punjab Dyers Association (Focal Point Module) is filing the present reply in compliance of the order dated 23.12.2024 passed by this Hon'ble Tribunal and to bring on record important facts and documents that are necessary for the fair and proper adjudication of the present matters and these facts and documents would help in better understanding of this case.

**PRELIMINARY SUBMISSIONS:**

3. The brief facts necessary for the adjudication of the present matter are as follows:
  1. That Govt of Punjab through irrigation/drainage department prepared a project to collect all waste water flowing from city of Ludhiana in to Buddha Nala to use it

for irrigation of about 80000 hectare agricultural land, after treatment in STPs/ CETPs. The DPR of this Project inter-alia observes in Chapter 1 titled as INTRODUCTION at Serial No. ii, given heading as INTRODUCTION OF PROPOSED DISTRIBUTARY, as under:

"After studying the topography of the area it is found that only the belt of the area falling between Buddha Nalah and the river Satluj can be irrigated with the treated water of STPs / CETPs by constructing an open channel connected with the network of water courses at suitable points. Under the scheme, sewage of Ludhiana city, and highly polluted water discharge from industry in general, and dyeing industry in particular, will be utilized for irrigation purpose after treatment by STP/CETP at Baloke, Jamalpur, Tajpur and Bahadurke villages. The proposed distributary will be constructed by utilizing govt land lying surplus due to abandoning of Grey Canal System for last more than 50 years".

Copy of the extract of Project report of June 2012 is marked and annexed herewith as **Annexure-R4/1**.

2. The Ministry of Environment and Forests (CP Division) in the year 2013 issued revised guidelines for Centrally Sponsored Scheme of Common Effluent Treatment Plants (CETPs) and under serial number 3, titled "Pattern of financial assistance", following provisions were laid down, the relevant portion of the revised guidelines is reproduced herein below:

*"3.1.1-The Central assistance (subsidy) will be restricted to 50% of the total project cost. The modified ratio proposed in respect of Central share: State share: project proponent's share will be 50: 25: 25. Out of the proponent's share, at least 40% of contribution has to*

*be from the proponent and balance 60% is to be raised through loan to the proponent from Banks/Financial institutions.*

*3.2-For CETPs involving primary/secondary/tertiary treatment, financial assistance would be provided by GOI to the tune of 50% of maximum Rs.1.50 crore/ MLD capacity, subject to a ceiling of Central assistance of ₹ 15 crore per CETP.”*

3. That the Environment Clearance for setting up CETP for the dyeing units at Ludhiana was granted by MoEFCC on 03.05.2013. Copy of the Environment Clearance dated 03.05.2013 is marked and annexed herewith as **Annexure R-4/2**.
4. That once the scheme for subsidy became available from the Government of India, Punjab Dyers Association (Originally a collective body of all 3 CETPs), got a detailed project report (DPR) prepared from ILFS (117 MLD) and later on after bifurcation into small modules, DPR for this 40 MLD CETP ( hereinafter referred as PDA i.e. Respondent No 4 herein) was got prepared from Guru Nanak Dev Engineering College (Consultancy Cell), Ludhiana. **That as per the DPR, effluent generated by various textile industries of industrial clusters located at Focal Point Area was to be collected through gravity pipeline (21 km long) at the CETP of 40 MLD.** The DPR proposed to subject the effluent to physio-chemical treatment followed by a biological treatment through SBR technology. The cost of the Project was estimated to be around 70 crore and the construction period and trial run was estimated to be 18 months. Copy of the DPR dated January 2015 is marked and annexed herewith as **Annexure-R4/3**.
5. That it is pertinent to mention herein that the Government of Punjab had earlier approved the project for providing conveyance system for carrying the treated effluents from the STPs and CETPs in Ludhiana for irrigation. A condition to this

effect in the consent to establish was also stipulated in the case of 40 MLD CETP that the farmers shall be made aware that the water supplied to them is treated effluent. The Consent to Establish (NOC) under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 was granted to 40 MLD CETP with the mode of disposal as under:

***Mode of disposal (40 MLD CETP): Trade effluent from CETP @ 40 MLD through dedicated conveyance system leading upto the outlet of STP, Jamalpur installed by Municipal Corporation, Ludhiana for mixing with treated domestic waste water of STP. Domestic Effluent @ 20 KLD into sewer.***

Copy of the Consent to Establish dated 20.05.2015 granted to the 40 MLD CETP is attached herewith as **Annexure R-4/4**.

6. That as per the directions/mandate of the MoEF, the DPR aforesaid along with the recommendations of PPCB was sent for further technical evaluation and appraisal to IIT Madras and on 28<sup>th</sup> October 2015, Prof Ligy Philip of the said IIT appraised this project of 40 MLD CETP and certified that designs and drawings were technically evaluated and found to be adequate for the intended purpose of treatment. It is imperative to mention that the Punjab Pollution Control Board vide letter number 7726 dated 19.11.2015 after duly technically appraising the project report aforesaid recommended the same to the Ministry of Environment and Forests certifying that the project was technically feasible and the treated trade effluent would be discharged onto land for irrigation. Copy of letter dated 19.11.2015 is marked and annexed herewith as **Annexure- R-4/5**.
7. **It is crucial to highlight that from the inception of this project, during the DPR stage and thereafter, it was always intended that the treated effluent**

from the CETP would be mixed with treated domestic effluent from 225 MLD Jamalpur STP, and used for irrigation either directly or through Buddha Nallah. The proposed scheme of mixing treated trade effluent from the CETP with the treated domestic effluent from the STP aimed to dilute the treated trade effluent and resolve the TDS level issue before it is collectively used for irrigation purpose etc. This intent is evident from the fact that the State Government selected the existing parcel of land for constructing the CETP due to its proximity to the 225 MLD Jamalpur STP and Buddha Nallah both. The geo-coordinates of 225 MLD STP are 30.92058, 75.91277, THAT OF 40 MLD CETP are 30.91614, 75.91430 and that of 50 MLD CETP 30.91757, 75.91288. Copy of the map showing the location of the 40 MLD CETP, 50 MLD CETP and 225 MLD Jamalpur STP and the Buddha Nallah is marked and annexed herewith as **Annexure R-4/6**.

8. That the MoEF in its appraisal committee meeting held on 03.03.2016 under the chairmanship of Dr. Manoranjan Hota, Advisor MoEF and comprising of other environmental experts, duly approved the project upon confirmation given by Member Secretary, PPCB during the meeting which stands recorded in the approval letter issued by MoEF itself that the treated effluent from CETP will be utilised for irrigation purpose and he further confirmed that Government of Punjab had approved a project for carrying treated effluent from STP/CETP for irrigation purpose. Further the sanction letter specifically states that the treated effluent will be discharged at the outfall of Ludhiana Sewage Treatment Plant (STP) and will be utilized for irrigation of agricultural land. It is relevant to mention herein that the discharge of the Respondent No. 4 CETP is just 50-100 mtrs before the outfall of discharge of the 225 MLD Jamalpur STP and the effluent of STP and the Respondent No.

**4 CETP gets automatically mixed.** Copy of the sanction letter issued by MoEF is marked and annexed herewith as **Annexure R-4/7.** **That therefore it was upon the Statutory Authorities, State Government, Respondent No. 3 Board, Water Supply/Irrigation Department and CPCB, Municipal Corporation Ludhiana to device a methodology to provide the treated trade effluent to the farmers for irrigation after mixing the same with domestic effluent from the STP.**

9. That another aspect which needs to be highlighted here is that the method of bringing high TDS from CETPs by dilution with treated Domestic Effluent is a common method and the same has been used/approved by PPCB in case of CETP of Jalandhar leather complex where treated trade effluent of CETP of tanneries is being mixed with treated domestic effluent from STP at Focal Point Jalandhar. The notification dated 1<sup>st</sup> of January 2016 issued by the MoEF authorizes the State/Central Board to prescribe the mixing ratio so that the combined treated trade effluent does not harm the irrigated soil on account of high TDS. MoEF by way of this notification while amending Environment (Protection) Rules, 1986 substituted in schedule-1 the entry at serial number 55 in which note 3 reads as under:

*“In case of discharge of treated effluent on land for irrigation, the impact on soil and groundwater quality shall be monitored twice a year i.e. pre and post monsoon by the CETP management. For combined discharge of treated effluent and sewage on land for irrigation, the mixing ratio with sewage shall be prescribed by the State Board.”*

That further it was incumbent upon the Government of Punjab in coordination with the Respondent No. 3 Board to implement the project for taking the treated

trade effluent from the Respondent No. 4 CETP to the nearby STP at Jamalpur and then utilize the same for irrigation after mixing of both effluents i.e. treated trade effluent of CETP and treated domestic effluent of STP in a ratio as prescribed by the Respondent No. 3 Board in terms of MoEF notification dated 1st of January 2016. Copy of the MoEF notification dated 1<sup>st</sup> January 2016 is marked and annexed as **Annexure R-4/8**. **Even a project has been conceived and commissioned with expenditure of more than 12 crores INR jointly by Municipal Corporation Ludhiana and PPCB for infusing Fresh water from canal near Nelon Distt. Ludhiana to be taken to Buddha Nallah for further dilution and enhancing its assimilating capacity.**

10. That it is under these circumstances that upon approval of the project as well as subsidy to be granted for the same by both MoEF and Government of Punjab as per their respective shares, the construction of 40 MLD CETP started, for which the contract was given to Larsen and Toubro (L&T). **It is imperative to mention herein that the 40 MLD CETP was conceived, planned, designed, approved, sanctioned, set up (after getting subsidies from the Ministry of Environment, Government of India and the Punjab Government) under the step-by-step close supervision of the Respondent No. 3 Board.** That the Respondent No. 4 CETP is ab initio being operated by Larsen and Toubro (L&T).

11. That the Respondent No. 4 CETP module was strictly constructed as per the approved design and for evaluation of which MoEF constituted a Joint Evaluation Committee. **That the Joint Committee carried out its 1<sup>st</sup> visit to the under construction CETP of Respondent No. 4 CETP on 10.09.2021 for the mid-term evaluation and observed that CETP is being constructed as per Design provided for intended purpose of treatment and subsequent disposal and suggested no major changes.**

12. That the Consent to Operate under the Water (Prevention & Control of Pollution) Act, 1974 was granted to the Respondent No. 4 CETP on 16.05.2022 and same was valid upto 15.05.2023 for discharge of effluent into Buddha Nallah. Copy of the Consent to Operate dated 16.05.2022 is marked and annexed herewith as **Annexure R-4/9**. That the Consent to Operate had a specific condition that the trade effluent shall be disposed into the Buddha Nallah after treatment through CETP of 40 MLD (Focal Point Module).
13. That the Joint Evaluation Committee in its second visit post commissioning of this CETP on 04.08.2022, apart from other observations inter alia reported that the treated trade effluent was being discharged through underground pipeline into Buddha Nallah and also that all parameters except TDS were found in compliance. It is however relevant to mention herein that in terms of the MoEF notification dated 01.01.2016 which is still in force except TDS all parameters were within limits whereas this notification did not prescribe any standard of TDS.
14. The Consent to Operate was then renewed on 24.06.2023 and was valid upto 23.09.2023. It is imperative to mention that the consents to operate granted to the Respondent No. 4 CETP always carried a condition that the treated trade effluent conforming to the approved parameter would be discharged into the Buddha Nallah through the underground pipeline. Relevant portion of the Consent to Operate is reproduced hereinbelow for the ready reference of this Hon'ble Tribunal:

**“Mode of Disposal: Into Buddha Nallah after treatment through CETP. Finally, the effluent shall be used for plantation/irrigation purpose.”**

That the Consent to Operate was further renewed on 28.06.2024 and is valid upto 30.06.2026. That the Consent to Operate was renewed on the same condition that the treated trade effluent shall be discharged into the Buddha Nallah. Copy of the Consent to Operate dated 24.06.2023 and Consent to Operate dated 28.06.2024 are collectively marked and annexed herewith as **Annexure R-4/10 (Colly)**.

**15. That the plant was being operated after duly obtaining Environmental Clearance from MoEF as well as consent to operate from the PPCB. It is important to mention here that PPCB was all through from the beginning an important companion along with the government who were both keen that the trade effluent from the dyeing industries and Ludhiana doesn't get discharged untreated/partially treated anywhere but should be treated in the CETPs to be established for this purpose by the SPV and then get discharged. It was all through in the knowledge of the PPCB that the state of Punjab was yet to introduce and implement the scheme for irrigation usage of this treated trade effluent from these CETPs of the dyeing industries, and the CETPs had no option but to discharge the treated trade effluent meeting with the parameters into the Buddha Nallah near the outlet of the STP for mixing, till the implementation of the project of carrying treated effluent from CETPs for irrigation as committed by MS PPCB to the MoEF during appraisal of the project in the appraisal committee meeting held on 03.03.2016. It is precisely for this reason that the consents to operate granted to the CETPs always carried a condition that the treated trade effluent conforming to the approved parameters would be discharged into the Buddha Nallah through the underground pipeline. It is further necessary to mention herein that instead of implementing the project of carrying treated effluent from CETPs for irrigation, the Respondent PPCB refused a request of Water Resource**

**Department of Govt of Punjab to fund a project of about 35.97 crore to utilise waste water of Buddha Nala for irrigation through lower buddha Nala.** Copy of extract from said proposal / project along with letter dated 02.02.2024 intimating non availability of funds for said project is marked and annexed herewith as **Annexure R-4/11.**

16. It is imperative to mention herein that the Online Continuous Emission Monitoring System (OCEMs) is connected with the servers of the CPCB/PPCB and the parameters were always found to be well within the prescribed limits. Copy of the OCEMs data for the period 01.09.2023 till 21.09.2024 is marked and annexed herewith as **Annexure R-4/12.**

17. That the OCEMs system of the Respondent No. 4 CETP is calibrated at regular intervals by specialized agency duly approved by PPCB, with the latest one having been done on 26.03.2024. That as per the calibration report dated 26.03.2024, the parameters were always well within the limits. Copy of the calibration report dated 26.03.2024 of OCEMS is marked and annexed herewith as **Annexure R-4/13.**

18. That the water analysis was further carried out by PPCB and DC Ludhiana on 06.08.2024 and 09.08.2024 from various points in the Buddha Nallah. That result of water samples collected after the mixing of the treated trade effluent from the 40 MLD CETP i.e. at Mahavir Jain Pully, have been found to be well within the prescribed limits.

19. That from time-to-time samples have been drawn by various statutory authorities including the Respondent No. 3 Board and sample analysis reports from the laboratory of the Respondent No. 3 Board as well as the state laboratory i.e. Punjab Biotechnology Incubator have always found all the parameters including BOD/COD/TSS etcetera to be well within the prescribed limits. A compilation of

these reports relevant for this OA and to bring home the point that Respondent No. 4 CETP is being operated in accordance with law is marked and annexed herewith as **Annexure R-4/14**.

20. That recently samples for analysis from untreated water collection tank and from final outlet of the Respondent No. 4 CETP were collected by Punjab Biotechnology Incubator a State Laboratory of (Department of Science, Technology and Environment) on 17.10.2024, 08.11.2024 and 22.11.2024 and the results of parameters have been found to be well within limits (except TDS). Copy of analysis report of samples collected on 17.10.2024, analysis report of samples collected on 08.11.2024 and analysis report of samples collected on 22.11.2024 are marked and annexed herewith as **Annexure R-4/15 (Colly)**. **Regarding TDS, it is noted that while the MoEF notification dated 01.01.2016 does not specify any parameters for TDS, compliance can be achieved by mixing it with the treated domestic effluent from the STP, which formed the basis for the planning and conception of the Respondent CETP and the Respondent No. 3 Board is required to provide the appropriate mixing ratio for this purpose.**
21. There is no deterioration in the parameters of Buddha Nallah upon discharge of treated effluent of the 40 MLD CETP into it, rather the overall quality improves on account of dilution by the addition of CETP's treated effluent. The Deputy Commissioner of Ludhiana recently ordered closure of all dyeing industries for 36 hours and the parameters from various points in Buddha Nallah were evaluated by taking samples before and after the closure of dyeing industries. This exercise was conducted in coordination with the Respondent No. 3 Board and it was established that there was no deterioration of the parameters in the Buddha Nallah after addition of treated effluent from the CETPs.

22. That while the outlet from Respondent No. 4 CETP discharges treated effluent (parameters of which are within the prescribed limits), there are a total of approximately 241+ outlets which discharge untreated domestic/trade effluent into Buddha Nallah. These 241+ outlets present along the entire stretch of Buddha Nallah are discharging untreated effluent even having BOD beyond 4500mg/L & COD beyond 10,000 mg/L especially from dairies. There are a large number of colonies/villages as well discharging their domestic and other effluents into Buddha Nallah. It is relevant to mention herein that the entire discharge from the Habowal Dairy Complex goes into the Buddha Nallah on a daily basis. Further, approximately 700 tonnes of cow dung goes into the Buddha Nallah daily from the dairy clusters at Tajpur Road and Habowal. There are a large number of colonies/villages as well discharging their domestic and other effluents into Buddha Nallah. Even the Vidhan Sabha committee in its meeting dated 24-10-2024 has constituted a committee of all line departments separately to identify and work out modalities to carry effluent from Dairies, domestic, Industries and all other sources for disposal onto land for irrigation.

23. That there are total 6 Sewage Treatment Plants in Ludhiana city i.e. 225 MLD in Jamalpur, 111+50 MLD in Bhatina and 152 + 60 + 105 MLD in Balloke. It is imperative to mention herein that none of these STP's have Environmental Clearance and are also not complying with the prescribed standards. Further, as per the Consent to Operate granted to them, they can discharge the treated sewage into Buddha Nallah.

24. That recently a committee has been constituted by the Government of Punjab, Department of Science, Technology and Environment (STE Branch) to diagnose the issues concerning pollution in Buddha Nallah. That the said committee has been constituted in compliance of the decision taken in the review meeting held

on 07.10.2024 under the chairmanship of Secretary to Government of India, D/o Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, New Delhi. Copy of the order dated 13.11.2024 issued by Government of Punjab, Department of Science, Technology and Environment (STE Branch) is marked and annexed herewith as **Annexure R-4/16**.

**REPLY TO FACTS IN BRIEF:**

- i. That the contents of the para (i) are wrong and hence denied. It is submitted that the Respondent No. 4 CETP discharging its treated trade effluent into the Buddha Nallah in compliance to the conditions of Consent to Operate granted to the Respondent No. 4 CETP by Respondent No. 3 Board. Further, even if for the sake of arguments if it is taken, though not admitted, that the treated effluent so being discharged into Buddha Nallah was contrary to the conditions prescribed in the Environmental Clearance granted to the Respondent No. 4 CETP, it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Member Secretary Punjab Pollution Control Board to implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the Respondent No. 4 CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted mode of disposal as per the conditions of consent to operate granted to the Respondent No. 4 CETP, the Respondent No. 3 Board should have collaborated with the State Government and conceived and implemented the project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

- ii. That in response to the contents of Para ii, it is submitted that Govt of Punjab through irrigation/drainage department prepared a project to collect all waste water flowing from city of Ludhiana in to Buddha Nala to use it for irrigation of about 80000 hectare agricultural land, after treatment in STPs/ CETPs. Govt of Punjab through Irrigation department prepared DPR for use of Buddha Nala effluent for irrigation of 80000 acres. The Project report observes in Chapter 1 Titled as INTRODUCTION, in clause ii under the heading INTRODUCTION OF PROPOSED DISTRIBUTARY as under:

"After studying the topography of the area it is found that only the belt of the area falling between buddha nala and the river Satluj can be irrigated with the treated water of STPs / CETPs by constructing an open channel connected with the network of water courses at suitable points. Under the scheme, sewage of Ludhiana city, and highly polluted water discharge from industry in general, and dyeing industry in particular, will be utilized for irrigation purpose after treatment by STP/CETP at Baloke, Jamalpur, Tajpur and Bahadurke villages. The proposed distributary will be constructed by utilizing govt land lying surplus due to abandoning of Grey Canal System for last more than 50 years".

The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

- iii. That in response to the contents of para iii, it is submitted that the entire Scheme had been prepared by the Department of Irrigation, Govt. of Punjab for carrying the treated effluent downstream the Buddha Nallah, in and around village Vallipur for the same to be used by the farmers before the same gets discharged into the Sutlej River. It was decided that it will be the responsibility

of the Department of Irrigation and Department of Agriculture, Govt. of Punjab to make the farmers aware regarding the quality of effluent which will be suitable for irrigation purposes. It is pertinent to mention herein that Punjab Agriculture University has already carried out a study wherein the University in question has declared that treated industrial effluent mixed with treated sewage from the CTPs and STPs respectively, will be fit for irrigation usage, which will ultimately increase the yield of the crops. It is further submitted that it is not the responsibility of the Respondent No. 4 CETP to make the public aware, but rather of the Respondent No. 3 Board, Department of Irrigation and Department of Agriculture, Govt. of Punjab. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

- iv. That in response to the contents of para iv, it is submitted that CPCB issued directions dated 12.08.2024 under Section 18(1) (b) of the Water Act and the same were based on an analysis report of the samples collected by CPCB dated 20.06.2024. It is submitted that the same cannot be relied upon in any administrative or legal proceedings as the same were drawn without following the due procedure of law in terms of Section 21 (3) (b) of the Water Act. It is submitted that the Respondent No. 3 Board before passing the said directions failed to appreciate that the provisions of Section 21 of the Water (Prevention and Control of Pollution) Act, 1974 stands violated by the Respondent No. 2 team while collecting sampling process and consequently the analysis report thereof not admissible or liable to be legally relied upon for taking any action against the Respondent No. 4 CETP herein. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

v. That in response to the contents of para v, it is submitted that the Respondent No. 3 Board without applying its own mind has taken this drastic step against the Dyeing industries in focal point area of Ludhiana who after obtaining statutory prior consent to operate/permission from the Respondent No. 3 Board were discharging their treated trade effluent into this 40 MLD CETP, which in turn after full treatment was discharging the treated trade effluent into Buddha Nallah as per the terms of the Consent to Operate (Renewal) dated 28.06.2024, granted to it under the Water Act which was valid upto 30.06.2026. It is reiterated that it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Member Secretary Punjab Pollution Control Board to implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted mode of disposal as per the conditions of consent to operate granted to the Respondent No. 4 CETP, the Respondent No.3 Board should have collaborated with the State Government and conceived and implemented a project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. Even as of today the dyeing industry and the Respondent No. 4 CETP are willing to extend all help for utilization of their treated trade effluent towards irrigation. The Respondent No. 3 Board ought to have appreciated that the dyeing industry cannot be penalized in such a manner without there being any fault on their part. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

**REPLY TO GROUNDS OF APPLICATION:**

1. That in response to the contents of the corresponding paragraph it is submitted that the treated effluent from the Respondent No. 4 CETP is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30<sup>th</sup> June 2026. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.
2. That the contents of the corresponding paragraph are wrong and hence denied except those which are specifically admitted herein. It is denied that the Respondent No. 4 failed to complete the CETP in stipulated time. It is denied that the Respondent No. 4 CETP failed to treat the effluent as per the standards as per the Environment Norms. It is reiterated that the treated effluent from the Respondent No. 4 CETP is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30<sup>th</sup> June 2026. That from time-to-time samples have been drawn by various statutory authorities including the Respondent No. 3 Board and sample analysis reports from the laboratory of the Respondent No. 3 Board as well as the state laboratory i.e. Punjab Biotechnology Incubator have always found all the parameters including BOD/COD/TSS etcetera to be well within the prescribed limits (**Annexure R- 4/15**). The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.
3. That in response to the contents of the corresponding paragraph, it is submitted that the entire Scheme has been prepared by the Department of Irrigation, Govt. of Punjab for carrying the treated effluent downstream the

Buddha Nallah, in and around village Walipur for the same to be used by the farmers before the same gets discharged into the Sutlej River. Thus, it will be the responsibility of the Department of Irrigation and Department of Agriculture, Govt. of Punjab to make the farmers aware regarding the quality of effluent which will be suitable for irrigation purposes. It is pertinent to mention herein that Punjab Agriculture University has already carried out a study wherein the University in question has declared that treated industrial effluent mixed with treated sewage from the CTPs and STPs respectively, will be fit for irrigation usage, which will ultimately increase the yield of the crops. It is further submitted that it is not the responsibility of the Respondent No. 4 CETP to make the public aware, but rather of the Respondent No. 3 Board, Department of Irrigation and Department of Agriculture, Govt. of Punjab. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

4. That in response to the contents of the corresponding paragraph it is submitted that the Respondent No. 4 CETP is discharging its treated trade effluent into the Buddha Nallah in compliance to the conditions of Consent to Operate granted to the Respondent No. 4 CETP by the Respondent No. 3 Board. Further, even if for the sake of arguments if it is taken, though not admitted, that the treated trade effluent so being discharged into Buddha Nallah was contrary to the conditions prescribed in the Environmental Clearance granted to the Respondent No. 4 CETP it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Respondent No. 3 Board to implement the project for carrying treated effluent from CETP/STP for irrigation. The contents of the

Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

5. That in response to the contents of the correspondent paragraph, it is submitted that CPCB issued directions dated 12.08.2024 under Section 18(1) (b) of the Water Act and the same were based on an analysis report of the samples collected by CPCB dated 20.06.2024. It is submitted that the same cannot be relied upon in any administrative or legal proceedings as the same were drawn without following the due procedure of law in terms of Section 21 (3) (b) of the Water Act. It is submitted that the Respondent No. 3 Board before passing the said directions failed to appreciate that the provisions of Section 21 of the Water (Prevention and Control of Pollution) Act, 1974 stands violated by the Respondent No. 2 team while collecting sampling process and consequently the analysis report thereof not admissible or liable to be legally relied upon for taking any action against the Respondent No. 4 CETP herein. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.
6. That in response to the contents of the corresponding paragraph, it is submitted that the Respondent No. 3 Board without applying its own mind has taken this drastic step against the Dyeing industries in focal point area of Ludhiana who after obtaining statutory prior consent to operate/permission from the Respondent No. 3 Board were discharging their treated trade effluent into this 40 MLD CETP, which in turn after full treatment was discharging the treated trade effluent into Buddha Nallah as per the terms of the Consent to Operate (Renewal) dated 28.06.2024, granted to it under the Water Act which was valid upto 30.06.2026. It is reiterated that it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held

on 03.03.2016 through Member Secretary Punjab Pollution Control Board to implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted mode of disposal as per the conditions of consent to operate granted to the Respondent No. 4 CETP, the Respondent No. 3 Board should have collaborated with the State Government and conceived and implemented a project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. Even as of today the dyeing industry and the Respondent No. 4 CETP are willing to extend all help for utilization of their treated trade effluent towards irrigation. The Respondent No. 3 Board ought to have appreciated that the dyeing industry cannot be penalized in such a manner without there being no fault on their part. The contents of the Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

7. That in response to the contents of the corresponding paragraph, it is submitted that from time-to-time samples have been drawn by various statutory authorities including the Respondent No. 3 Board and the sample analysis reports from the laboratory of the Respondent No. 3 Board as well as the state laboratory i.e. Punjab Biotechnology Incubator have always found all the parameters including BOD/COD/TSS etcetera to be well within the prescribed limits (**Annexure R-4/15**). That the OCEMs system of the Respondent No. 4 CETP is calibrated at regular intervals, with the latest one being done on 26.03.2024. That as per the calibration report dated 26.03.2024, the parameters were well within the limits (OCEMs data for the period 01.09.2023 till 21.09.2024 @ **Annexure R-4/12**). The contents of the

Preliminary Submissions above are reiterated and not repeated herein for the sake of brevity.

8. That in response to the contents of para 8, it is submitted that the pollution is a consequence of about 241+ outlets releasing untreated domestic/Industrial/dairy and other effluent/waste into Buddha Nallah whereas the water released from the Respondent No. 4 CETP is fully treated as submitted in the foregoing and following paras of the reply. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

**REPLY TO THE SUBMISSIONS OF THE APPLICANT:**

- 1&2. That the contents of para 1 and para 2 to the extent that they relate to the Application Association and its activities are denied for want of knowledge. Their locus standi to file and maintain the present Original Application is seriously disputed and appears to be motivated. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.
3. That in response to the contents of para 3 it is reiterated that even if for the sake of arguments, it is taken, though not admitted, that the treated trade effluent so being discharged into Buddha Nallah was contrary to the conditions prescribed in the Environmental Clearance granted to the Respondent No. 4 CETP, it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Respondent No. 3 Board to implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the Respondent No. 4 CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted

mode of disposal as per the conditions of consent to operate granted to the Respondent No. 4, the Respondent No. 3 Board should have collaborated with the State Government and conceived and implemented a project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. Even as of today the dyeing industry and the Respondent No. 4 CETP are willing to extend all help for utilization of their treated trade effluents towards irrigation. The contents of the brief facts are reiterated and not repeated herein for the sake of brevity.

4. That the contents of para 4 are wrong and hence denied except those which are specifically admitted herein. It is denied that the Respondent No. 4 CETP deliberately did not complete the project after getting Environmental Clearance and to save from Environmental Compensation and to get financial assistance from Centre as well as the State, got divided into three different clusters. It is submitted that the Respondent No. 4 CETP was conceived, planned, designed, approved, sanctioned, set up (after getting subsidies from the MoEF, Government of India and the Punjab Government) under the step to step supervision of the Respondent No. 3 Board, and was being operated all through following applicable norms prescribed by the Respondent No. 3 Board and only after getting due consent to operate from time to time from the Respondent No. 3 Board. It is submitted that there is no relevance of the allegations of the Applicant with respect to delay in construction of the Respondent No. 4 CETP, as in the present, the Respondent No. 4 CETP is operational and adequately treats the trade effluent received from the member industries before its discharge into the Buddha Nallah as per the conditions of consent granted to the Respondent No. 4 CETP. It is submitted that the capacity of Respondent No. 4 i.e. 40 MLD CETP is very limited which is

strictly adhered to so as to maintain its efficiency and prevent overloading. It is important to highlight that after its establishment no new industries have been granted permission to discharge waste into the CETP and no pollution is being caused by any of the existing industries. It is submitted that the Respondent No. 4 CETP is fully compliant with the guidelines and regulations established by the Respondent No. 3 Board. It is further submitted that the required green belt has been developed by the Respondent No. 4 CETP as per the Environmental Clearance granted. That the photos showing the development of green belt are marked and annexed herewith as **Annexure R-4/17 (Colly)**. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

9. That in response to the contents of the wrongly numbered para 9, it is submitted that the MoEF in its appraisal committee meeting held on 03.03.2016 under the chairmanship of Dr. Manoranjan Hota, Advisor MoEF and comprising of other environmental experts, duly approved the project upon confirmation given by Respondent No. 3 Board during the meeting which stands recorded in the approval letter issued by MoEF itself that treated effluent from Respondent No. 4 CETP will be utilised for irrigation purpose and further confirmed that Government of Punjab had approved a project for carrying treated effluent from STP/CETP for irrigation purpose. It is further submitted that the sanction letter stated that the treated effluent will be discharged at the outfall of Ludhiana Sewage Treatment Plant (STP) and will be utilised for irrigation of agricultural land. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

10. That the facts stated in the wrongly numbered para 10 are totally misconceived with respect to the delay in construction of the Respondent No. 4 CETP, as at present, the Respondent No. 4 CETP is operational and adequately treats the trade effluent received from the member industries before its discharge into the Buddha Nallah as per the conditions of consent granted to the Respondent No. 4 CETP. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

5. That the contents of para 5 are wrong and hence denied. It is denied that there is failure in fulfilling the condition of Zero Liquid Discharge and the so called treated effluent from the Respondent No. 4 CETP is not even fit for irrigation purposes and the effluent is being discharged into Buddha Nallah 24\*7 by the Polluters in active connivance and collusion with Respondent No. 5. At the outset it is submitted that the condition of obtaining Zero Liquid Discharge was not for the Respondent No. 4 CETP, however was in respect of the 15 MLD CETP. That it would be clear from the sanction letter dated 18.03.2016 issued by MoEF that the MoEF in its appraisal committee meeting held on 03.03.2016 under the chairmanship of Dr. Manoranjan Hota, Advisor and comprising of other environmental experts, duly approved the project upon confirmation given by Respondent No. 3 Board during the meeting which stands recorded in the approval letter issued by MoEF itself that treated effluent from Respondent No. 4 CETP will be utilised for irrigation purpose and further confirmed that Government of Punjab had approved a project for carrying treated effluent from STP/CETP for irrigation purpose. It is further submitted that the sanction letter stated that the treated effluent will be discharged at the outfall of Ludhiana Sewage Treatment Plant (STP) and will be utilised for irrigation of agricultural land. It is reiterated that the treated

effluent from the Respondent No. 4 CETP is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30.06.2026. That from time-to-time samples have been drawn by various statutory authorities including the Respondent No. 3 Board and sample analysis reports from the laboratory of the Respondent No. 3 Board as well as the state laboratory i.e. Punjab Biotechnology Incubator have always found all the parameters including BOD/COD/TSS etcetera to be well within the prescribed limits (**Annexure R- 4 /15 of the Reply**). That even if for the purpose of irrigation the TDS of this treated effluent from CETP is higher and not suitable for the crops, then in such an eventuality it is again incumbent upon Respondent No. 3 Board to prescribe a mixing ratio to combine the discharge of treated effluent from CETP with the treated water from the STP concerned and use the same for irrigation in terms of notification dated 1<sup>st</sup> of January 2016 issued by the MoEF. MoEF by way of this notification while amending Environment (Protection) Rules, 1986 substituted in schedule-1 the entry at serial number 55 in which note 3 reads as under:

*“In case of discharge of treated effluent on land for irrigation, the impact on soil and groundwater quality shall be monitored twice a year i.e. pre and post monsoon by the CETP management. For combined discharge of treated effluent and sewage on land for irrigation, the mixing ratio with sewage shall be prescribed by the State Board.”*

That this method of dilution has already been adopted and approved by the Respondent No. 3 Board in case of CETP of Jalandhar leather complex were

high TDS treated effluent discharged from CETP is being mixed with the STP and then released into the drain leading to River Sutlej. That further it was incumbent upon the Government of Punjab in coordination with the Respondent No. 3 Board to implement the project for taking the treated trade effluent from the Respondent No. 4 CETP to the nearby STP at Jamalpur and then utilize the same for irrigation after mixing of both effluents i.e. treated trade effluent of CETP and treated domestic effluent of STP in a ratio as prescribed by the Respondent No. 3 Board in terms of MoEF notification dated 1st of January 2016. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

- 6-7. That to the contents of para 6 and 7 it is imperative to state some brief facts, which are as under:
- a. That Govt of Punjab through irrigation/drainage department prepared a project to collect all waste water flowing from city of Ludhiana in to Buddha Nala to use it for irrigation of about 80000 hectare agricultural land, after treatment in STPs/ CETPs. The DPR of this Project inter-alia observes in Chapter 1 titled as INTRODUCTION at Serial No. ii, given heading as INTRODUCTION OF PROPOSED DISTRIBUTARY, as under:

"After studying the topography of the area it is found that only the belt of the area falling between Buddha Nalah and the river Satluj can be irrigated with the treated water of STPs / CETPs by constructing an open channel connected with the network of water courses at suitable points. Under the scheme, sewage of Ludhiana city, and highly polluted water discharge from industry in general, and dyeing industry in particular, will be utilized for irrigation purpose after treatment by STP/CETP at Baloke, Jamalpur, Tajpur and Bahadurke villages. The proposed distributary will be

constructed by utilizing govt land lying surplus due to abandoning of Grey Canal System for last more than 50 years".

- b. The Ministry of Environment and Forests (CP Division) in the year 2013 issued revised guidelines for Centrally Sponsored Scheme of Common Effluent Treatment Plants (CETPs) and under serial number 3, titled pattern of financial assistance, following provisions were laid down. That the relevant portion of the revised guidelines is reproduced herein below:

*"3.1.1-The Central assistance (subsidy) will be restricted to 50% of the total project cost. The modified ratio proposed in respect of Central share: State share: project proponent's share will be 50: 25: 25. Out of the proponent's share, at least 40% of contribution has to be from the proponent and balance 60% is to be raised through loan to the proponent from Banks/Financial institutions.*

*3.2-For CEPs involving primary/secondary /tertiary treatment, financial assistance would be provided by GOI to the tune of 50% of maximum Rs.1.50 crore/ MID capacity, subject to a ceiling of Central assistance of 7 15 crore per CETP.*

- c. That the Environment Clearance for setting up CEIP for the dyeing units at Ludhiana was granted by MoEFCC on 03.05.2013.
- d. That once the scheme for subsidy became available from the Government of India, Respondent No. 4 CETP got a detailed project report (DPR) prepared from ILFS (117 MLD) and laterally after bifurcation into small modules, DPR for this 40 MLD CETP was got prepared from Guru Nanak Dev Engineering College (Consultancy Cell), Ludhiana. That as per the DPR, effluent generated by various textile industries of industrial clusters located at Focal Point Area was to be collected through gravity pipeline at the CETP of 40

MLD. The DPR proposed to subject the effluent to physio-chemical treatment followed by a biological treatment through SBR technology. The cost of the Project was estimated to be around 70 crore and the construction period and trial run was estimated to be 18 months. That as per the directions/mandate of the MoEF, the DPR aforesaid along with the recommendations of PPCB was sent for further technical evaluation and appraisal to IIT Madras and on 28th October 2015, Prof Ligy Philip of the said IT appraised this project of 40 MLD CETP and certified that designs and drawings were technically evaluated and found to be adequate for the intended purpose of treatment. It is imperative to mention that the Respondent No. 3 Board vide letter number 7726 dated 19.11.2015 after duly technically appraising the project report aforesaid recommended the same to the Ministry of Environment and Forests certifying that the project was technically feasible and the treated trade effluent would be discharged onto land for irrigation.

- e. That the MoEF in its appraisal committee meeting held on 03.03.2016 under the chairmanship of Dr Manoranjan Hota, Advisor MoEF and comprising of other environmental experts, duly approved the project upon confirmation given by Member Secretary, PPCB during the meeting which stands recorded in the approval letter issued by MoEF itself that treated effluent from CEIP will be utilised for irrigation purpose and he further confirmed that Government of Punjab had approved a project for carrying treated effluent from STP/CETP for irrigation purpose.
- f. That ab initio when this project was conceived at the stage of DPR and even thereafter it was always taken that the treated effluent from the CETP would be taken to the STP and mixed with treated domestic effluent and used for irrigation either directly or through Buddha Nallah. This is clear from the fact

that even while selecting/allocating land for construction of CETP, the existing parcel of land was chosen by the State Government as it had 225 MLD Jamalpur STP and Buddha Nallah near this site. Once this fact is looked at in conjunction with the Statement made by the Member Secretary (PPCB) in the appraisal committee meeting dated 03.03.2016 it is established that beyond the treatment provided for in the CETP, Respondent No. 4 CETP had nothing more to do and it was upon Statutory Authorities, State Government, Respondent No. 3 Board, Water Supply/Irrigation Department and CPCB, Municipal Corporation Ludhiana to devise a methodology to provide the treated trade effluent to the farmers for irrigation after mixing the same with domestic effluent from the STP. The geo-coordinates 225 MLD CETP ARE 30.92058, 75.91277, that of 40 MLD CETP are 30.91614, 75.91430 and that of 50 MLD CETP 30.91757,75.91288.

- g. That it is under these circumstances that upon approval of the project as well as subsidy to be granted for the same by both MoEF and Government of Punjab as per their respective shares, the construction of 40 MLD CETP started, for which the contract was given to Larsen and Toubro. It is imperative to mention herein that the 40 MLD CETP was conceived, planned, designed, approved, sanctioned, set up (after getting subsidies from the Ministry of Environment, Government of India and the Punjab Government) under the step to step close supervision of the Respondent No. 3 Board.
- h. That the Respondent No. 4 CETP module was strictly constructed as per the approved design and for evaluation of which MoEF constituted a Joint Evaluation Committee. That the Joint Evaluation Committee carried out its 1st visit to the under construction Respondent No. 4 CETP for the mid-term evaluation and observed that CETP is being constructed as per Design

provided for intended purpose of treatment and subsequent disposal and suggested no major changes.

- i. That the Consent to Operate under the Water (Prevention & Control of Pollution) Act, 1974 was granted to the Respondent No. 4 CETP on 16th May 2022 and same was valid upto 15th May 2023. Copy of the Consent to Operate dated 16.05.2022 is marked and annexed herewith as Annexure-A/9. That the Consent to Operate had a specific condition that the trade effluent shall be disposed into the Buddha Nallah after treatment through CETP of 40 MLD (Focal Point Module).
- j. That the Consent to Operate was then renewed on 24.06.2023 and was valid upto 23.09.2023. It is imperative to mention that the consents to operate to the Respondent No. 4 CETP always carried a condition that the treated trade effluent conforming to the approved parameter would be discharging into the Buddha Nallah through the underground pipeline. Relevant portion of the Consent to Operate is reproduced hereinbelow for the ready reference of this Hon'ble Tribunal:

“Mode of Disposal: Into Buddha Nallah after treatment through CETP. Finally, the effluent shall be used for plantation/irrigation purpose.”

That the Consent to Operate was further renewed on 28.06.2024 and is valid Upto 30.06.2026. That the Consent was renewed on the same condition that the treated trade effluent shall be discharged into the Buddha Nallah.

- k. That the plant was being operated after duly obtaining Environmental Clearance from MoEF as well as consent to operate from the Respondent No. 3 Board. It is important to mention here that Respondent No. 3 Board was all

through from the beginning an important companion along with the government who were both keen that the trade effluent from the dyeing industries and Ludhiana doesn't get discharged untreated/partially treated anywhere but should be treated in the CETPs to be established for this purpose by the SPV and then get discharged. It was all through in the knowledge of the PPCB that the state of Punjab was yet to introduce and implement the scheme for irrigation usage of this treated trade effluent from these CETPs of the dyeing industries, and the CETPs had no option but to discharge the treated trade effluent meeting with the parameters into the Buddha Nallah till the implementation of the project of carrying treated effluent from CETs for irrigation as committed by MS PPCB to the MoEF during appraisal of the project in the appraisal committee meeting held on 03.03.2016. It is precisely for this reason that the consents to operate granted to the CETs always carried a condition that the treated trade effluent conforming to the approved parameters would be discharged into the Buddha Nallah through the underground pipeline.

That it is for the State Government/Department of Irrigation to reply to the remaining contents of these paras, as the contents factually relate to the said department. That the contents of the brief facts are reiterated and not repeated herein for the sake of brevity.

8. That the contents of para 8 are wrong and hence denied except those which are specifically admitted herein. It is imperative to mention that the consents to operate granted to the Respondent No. 4 CETP always carried a condition that the treated trade effluent conforming to the approved parameter would be discharging into the Buddha Nallah through the underground pipeline.

Relevant portion of the Consent to Operate is reproduced herein below for the ready reference of this Hon'ble Tribunal:

*“Mode of Disposal: Into Buddha Nallah after treatment through CETP. Finally, the effluent shall be used for plantation/irrigation purpose.”*

It is important to mention here that Respondent No. 3 Board was all through from the beginning an important companion along with the government who were both keen that the trade effluent from the dyeing industries and Ludhiana doesn't get discharged untreated/partially treated anywhere but should be treated in the CETPs to be established for this purpose by the SPV and then get discharged. It was all through in the knowledge of the Respondent No. 3 Board that the state of Punjab was yet to introduce and implement the scheme for irrigation usage of this treated trade effluent from these CETPs of the dyeing industries, and the CETPs had no option but to discharge the treated trade effluent meeting with the parameters into the Buddha Nallah till the implementation of the project of carrying treated effluent from CETPs for irrigation as committed by MS PPCB to the MoEF during appraisal of the project in the appraisal committee meeting held on 03.03.2016. **It is precisely for this reason that the consents to operate granted to the CETPs always carried a condition that the treated trade effluent conforming to the approved parameters would be discharged into the Buddha Nallah through the underground pipeline.** The contents of the brief facts are reiterated and not repeated herein for the sake of brevity.

9. That the contents of para 9 are wrong and hence denied. It is denied that the pollution due to the discharge of so called treated effluent by Dyeing

Industries into Buddha Nallah is resulting in death and diseases. It is reiterated that the treated effluent from the Respondent No. 4 CETP is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30.06.2026. That from time-to-time samples have been drawn by various statutory authorities including the Respondent No. 3 Board and sample analysis reports from the laboratory of the Respondent No. 3 Board as well as the state laboratory i.e. Punjab Biotechnology Incubator have always found all the parameters including BOD/COD/TSS etcetera to be well within the prescribed limits (**Annexure R-4/15 of the Reply**). It is submitted that while the outlet from Respondent No. 4 CETP discharges treated effluent (parameters of which are within the prescribed limits), there are a total of approximately 241+ outlets which discharge untreated domestic/trade effluent into Buddha Nallah. These 241+ outlets present along the entire stretch of Buddha Nallah are discharging untreated effluent even having BOD beyond 4500mg/L & COD beyond 10,000 mg/L especially from dairies. There are a large number of colonies/villages as well discharging their domestic and other effluents into Buddha Nallah. It is relevant to mention herein that the entire discharge from the Habowal Dairy Complex goes into the Buddha Nallah on a daily basis. Further, approximately 700 tonnes of cow dung goes into the Buddha Nallah daily from the dairy clusters at Tajpur Road and Habowal. Further the contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

10. That to the contents of para 10, it is submitted that the submissions made in the foregoing paras as well as para no. 6 and 7 (wrongly numbered by the

Applicant) are reiterated and the contents of the same may kindly be read as a part of the reply to this para as well. It is submitted that the Respondent No. 4 CETP has been set up in accordance with law and is being operated lawfully with its effluent discharge meeting with the prescribed norms. In so far as the reference made by the mentioned gastroenterologist regarding various diseases due to contamination in Buddha Nallah, it is submitted that the same is on account of organic organisms like faecal bodies etc. being discharged into Buddha Nallah due to untreated domestic outlets/dairies etc. and are not attributable to the treated effluent being discharged by the Respondent No. 4 CETP. That the rest of the contents of the para are denied for want of knowledge. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

11. That the contents of para 11 do not pertain to the Respondent No. 4 CETP and hence need no reply. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.
12. That the contents of para 12 are wrong and hence denied. It is denied that by discharging so called treated water into Buddha Nallah by going against the mandatory condition of EC, the Respondent No. 4 has committed an offence under Section 24(1) read with Section 43, 44, 47 and 48 of the Water (Prevention and Control of Pollution) Act, 1974. It is submitted that MoEF in its appraisal committee meeting held on 03.03.2016 under the chairmanship of Dr. Manoranjan Hota, Advisor and comprising of other environmental experts, duly approved the project upon confirmation given by Respondent No. 3 Board during the meeting which stands recorded in the approval letter issued by MoEF itself that treated effluent from Respondent No. 4 CETP will be utilised for irrigation purpose and further confirmed that Government of

Punjab had approved a project for carrying treated effluent from STP/CETP for irrigation purpose. It is further submitted that the sanction letter stated that the treated effluent will be discharged at the outfall of Ludhiana Sewage Treatment Plant (STP) and will be utilised for irrigation of agricultural land. It is reiterated that the treated effluent from the Respondent No. 4 CETP is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30.06.2026. The Respondent No. 4 CETP cannot be penalized in such a manner without there being no fault on their part. Further, the contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

13. That in response to the contents of para 13, it is submitted that the Respondent No. 4 CETP is not contravening any provisions of the Environment Protection Act, 1986. It is reiterated that the treated effluent from the Respondent No. 4 CETP is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30.06.2026. It is further submitted that from time-to-time samples have been drawn by various statutory authorities including the Respondent No. 3 Board and sample analysis reports from the laboratory of the Respondent No. 3 Board as well as the state laboratory i.e. Punjab Biotechnology Incubator have always found all the parameters including BOD/COD/TSS etcetera to be well within the prescribed limits. Further, The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

14. That the contents of para 14 are wrong and hence denied except those which are specifically admitted herein. It is imperative to mention that the consents to operate granted to the Respondent No. 4 CETP always carried a condition that the treated trade effluent conforming to the approved parameter would be discharging into the Buddha Nallah through the underground pipeline. Relevant portion of the Consent to Operate is reproduced herein below for the ready reference of this Hon'ble Tribunal:

*“Mode of Disposal: Into Buddha Nallah after treatment through CETP. Finally, the effluent shall be used for plantation/irrigation purpose.”*

It is important to mention here that the Respondent No. 3 Board was all through from the beginning an important companion along with the government who were both keen that the trade effluent from the dyeing industries and Ludhiana doesn't get discharged untreated/partially treated anywhere but should be treated in the CETPs to be established for this purpose by the SPV and then get discharged. It was all through in the knowledge of the Respondent No. 3 Board that the State of Punjab was yet to introduce and implement the scheme for irrigation usage of this treated trade effluent from these CETPs of the dyeing industries, and the CETPs had no option but to discharge the treated trade effluent meeting with the parameters into the Buddha Nallah till the implementation of the project of carrying treated effluent from CETPs for irrigation as committed by MS PPCB to the MoEF during appraisal of the project in the appraisal committee meeting held on 03.03.2016. **It is precisely for this reason that the consents to operate granted to the CETPs always carried a condition that the treated trade effluent conforming to the approved parameters would be discharged**

**into the Buddha Nallah through the underground pipeline.** Further, the contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

15. That the contents of para 15 are wrong and hence denied. It is denied that the document pertaining to Environment Clearance came into public domain only after this Hon'ble Tribunal took Suo Moto Cognizance in case titled as "Ludhiana PPCB report flags 54 dyeing units in Buddha Nallah's catchment". It is imperative to mention that the Environmental Clearance pertaining to the Respondent No. 4 CETP was already in public domain and also brought within the knowledge of this Hon'ble Tribunal in an already existing OA/225/2022 titled as "Nitin Dhiman vs State of Punjab". The contents of the Preliminary Submissions above are reiterated here as well and not repeated for the sake of brevity.

16. That in response to the contents of para 16, it is submitted that the treated effluent from the Respondent No. 4 CETP is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30.06.2026. That from time-to-time samples have been drawn by various statutory authorities including the Respondent No. 3 Board and sample analysis reports from the laboratory of the Respondent No. 3 Board as well as the state laboratory i.e. Punjab Biotechnology Incubator have always found all the parameters including BOD/COD/TSS etcetera to be well within the prescribed limits (Annexure-A/17 of the Appeal). That the OCEMs system of the Respondent No. 4 CETP is calibrated at regular intervals, with the latest one having been done on 26.03.2024. That as per the calibration report dated 26.03.2024, the parameters were well within the limits (OCEMs

data for the period 01.09.2023 till 21.09.2024 @ **Annexure-R4/12** of the Reply). Further the contents of the Preliminary Submissions above are reiterated here as well and not repeated for the sake of brevity.

17. That in response to the contents of para 17, it is submitted that the Respondent No. 3 Board without applying its own mind has taken this drastic step against the Dyeing industries in focal point area of Ludhiana who after obtaining statutory prior consent to operate/permission from the Respondent No. 3 Board were discharging their treated trade effluent into this 40 MLD CETP, which in turn after full treatment was discharging the treated trade effluent into Buddha Nallah as per the terms of the Consent to Operate (Renewal) dated 28.06.2024, granted to it under the Water Act which was valid upto 30.06.2026. It is reiterated that it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Member Secretary Punjab Pollution Control Board to implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted mode of disposal as per the conditions of consent to operate granted to the said CETP, the Respondent No. 3 Board should have collaborated with the State Government and conceived and implemented a project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. Even as of today the dyeing industry and the Respondent No. 4 CETP are willing to extend all help for utilization of their treated trade effluent towards irrigation. The Respondent No. 3 Board ought to have appreciated that the dyeing industry cannot be penalized in such a manner without there being no fault on their part. The contents of the

Preliminary Submissions above are reiterated herein as well and are not being repeated for the sake of brevity.

18. That in response to the contents of para 18, it is submitted that the Dyeing Industries in focal point area of Ludhiana who after obtaining statutory prior consent to operate/ permission from the Respondent No. 3 Board were discharging their treated trade effluent into this 40 MLD CETP as per the terms of the Consent to Operate (Renewal) dated 28.06.2024, granted to them under the Water Act which was valid upto 30.06.2026. That since the State of Punjab and the Respondent No. 3 Board have till date failed to provide a mechanism for carrying treated trade effluent from the Respondent No. 4 CETP for irrigation, if the impugned directions dated 26.09.2024 are implemented, it would virtually have an effect of flooding of treated effluent from the CETP consequently shutting down of the entire dyeing industry in Ludhiana. The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

19. That the contents of para 19 are wrong and hence denied. It is denied that the Respondent No. 4 CETP continued to damage the environment by dumping their waste into Buddha Nallah since 2013. The Applicants on one hand are stating that the construction of the Respondent No. 4 CETP was delayed by more than two years and the Respondent No. 4 CETP became functional in 2022 and on the other hand are stating that the effluent from the Respondent No. 4 CETP is being dumped since 2013. It is submitted that prior to the establishment of the CETP's all the dyeing industries had their own Effluent Treatment Plants. The Respondent No. 4 CETP started its operation in 2022 and the first Consent to Operate was granted to it by the Respondent No. 3 Board on 16th May 2022 and same was valid upto 15th May 2023. That the

Consent to Operate had a specific condition that the trade effluent shall be disposed into the Buddha Nallah after treatment through CETP of 40 MLD (Focal Point Module). It is also relevant to mention that there is no deterioration in the parameters of Buddha Nallah upon discharge of treated effluent of the CETPs into it, rather the overall quality improves on account of dilution by the addition of CETP's treated effluent. The Deputy Commissioner of Ludhiana recently ordered closure of all dyeing industries for 36 hours and the parameters from various points in Buddha Nallah were evaluated by taking samples before and after the closure of dyeing industries. This exercise was conducted in coordination with the Respondent No. 3 Board and it was established that there was no deterioration of the parameters in the Buddha Nallah after addition of treated effluent from the CETPs. Further the contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

20. That the contents of para 20 are denied for want of knowledge and need no reply from the Respondent No. 4 CETP.

21. That the contents of para 21 are wrong and hence denied. It is denied that the Appeal filed by the Respondent No. 4 had not been filed with clean hands. It is denied that the treated trade effluent is not fit for irrigation purpose. It is reiterated that the treated effluent from the Respondent No. 4 is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30.06.2026. It ought to be taken into consideration that it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Member Secretary Punjab Pollution Control Board to

implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted mode of disposal as per the conditions of consent to operate granted to the said CETP, the Respondent No. 3 Board should have collaborated with the State Government and conceived and implemented a project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. Even as of today the dyeing industry and the Respondent No. 4 SPV are willing to extend all help for utilization of their treated trade effluent towards irrigation. Rest of the contents relating to the Applicants having filed an Impleadment Application in the appeal filed by the Respondent No. 4 are a matter of record, needing no reply. However it is submitted that the said case is not an original proceeding where the Applicants can seek themselves to be impleaded, as it is an appeal specifically challenging the order dated 26.09.2024 issued by the Respondent No. 3 Board against the Respondent No. 4 CETP. The interlocutory applicants cannot, as a matter of right, get themselves impleaded. The proposed parties/applicants are not privy to the impugned order dated 26.09.2024. It is submitted that the Appeal filed by the Respondent No. 4 CETP is a Statutory Appeal under the provisions of the Water (Prevention and Control of Pollution) Act 1974 and the National Green Tribunal Act 2010 against the order of the Respondent No. 3 Board, to which the proposed applicants are not a party.

22. That the contents of para 22 are wrong and hence denied. It is denied that besides criminal liability, environmental compensation should be imposed on the Respondent No. 4 CETP on Polluter Pay Principal. It is reiterated that the treated effluent from the Respondent No. 4 is being discharged into the

Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till 30.06.2026. It ought to be taken into consideration that it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Member Secretary Punjab Pollution Control Board to implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted mode of disposal as per the conditions of consent to operate granted to the said CETP, the Respondent No. 3 Board should have collaborated with the State Government and conceived and implemented a project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. Even as of today the dyeing industry and the Respondent No. 4 SPV are willing to extend all help for utilization of their treated trade effluent towards irrigation. The Respondent No. 4 CETP cannot be penalised in such a manner without there being any fault on their part. Further, The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

23. That the contents of para 23 are wrong and hence denied. It is denied that the onus to handle the treated waste is with the Respondent No. 4. It is denied that the Respondent No. 4 CETP has no consent to discharge even the treated water into Buddha Nallah. It is reiterated that the treated effluent from the Respondent No. 4 is being discharged into the Buddha Nallah with parameters of various pollutants well within the prescribed limits and as per the conditions of consent to operate granted to the Respondent No. 4 CETP valid till

30.06.2026. It ought to be taken into consideration that it was for the State of Punjab as per their assurance given to MoEF in the appraisal committee meeting held on 03.03.2016 through Member Secretary Punjab Pollution Control Board to implement the project for carrying treated effluent from CETP/STP for irrigation. It is submitted that instead of passing directions prohibiting the CETP from discharging the treated trade effluent into Buddha Nallah, especially when it was a permitted mode of disposal as per the conditions of consent to operate granted to the said CETP, the Respondent No. 3 Board should have collaborated with the State Government and conceived and implemented a project for using this trade effluent by mixing it with STP treated domestic effluent for irrigation. Even as of today the dyeing industry and the Respondent No. 4 SPV are willing to extend all help for utilization of their treated trade effluent towards irrigation. It is further submitted that the required green belt has been developed by the Respondent No. 4 CETP as per the Environmental Clearance granted. Further, The contents of the Preliminary Submissions above are reiterated herein and are not being repeated for the sake of brevity.

#### **PRAYER**

In the light of the facts and circumstance mentioned hereinabove, it is respectfully prayed that this Hon'ble Tribunal may kindly be graciously pleased to:

- i. Dismiss this Original Application filed by the Applicants with heavy costs being devoid of merits and being a motivated and malafide OA;

It is further prayed that this Hon'ble Tribunal may kindly be pleased to pass any such or further orders as deemed fit and proper in the peculiar facts and circumstances of this present case.

**Note : Affidavit in support is attached.**

For Punjab Dyers Association  
DIRECTOR

**RESPONDENT NO 4**  
PUNJAB DYERS ASSOCIATION  
THROUGH ITS DIRECTOR MR. VISHAL JAIN

(A.R. TAKKAR, SHRIYA TAKKAR, MANAN TAKKAR

ASMITA DUGGAL, AASTHA TYAGI, PRINCE SHARMA, UDIT SAINI,

SMRITI SRIVASTAVA, DEVIKA SINGH ROY CHOWDHURY)

ADVOCATES

M/S ARTLO

# P-6/2-E, DLF PHASE 2,

GURGAON – 122002

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PRINCE@ARTLO.IN

**VERIFICATION**

I, Vishal Jain S/o Vipan Kumar, Aged about 44 years, Director of Punjab Dyers Association, SCF- 36, 1<sup>st</sup> Floor, Commercial site, phase - 5, Focal point Ludhiana, Punjab – 141010 hereby verify that the contents there of are true and correct to my knowledge No part of it is false and no material fact has been kept concealed therefrom.

For Punjab Dyers Association  
DIRECTOR

**RESPONDENT NO 4**  
PUNJAB DYERS ASSOCIATION  
THROUGH ITS DIRECTOR MR. VISHAL JAIN

**Place: New Delhi**

**Date: 18/02/2025**

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL  
BENCH, NEW DELHI**

**OA NO 1326 OF 2024**

**IN THE MATTER OF:**

**PUBLIC ACTION COMMITTEE AND ORS**

...APPLICANT

**VERSUS**

**UNION OF INDIA & ORS.**

...RESPONDENTS

**AFFIDAVIT**

I, Vishal Jain S/o Vipin Kumar, Aged about 44 years, Director of Punjab Dyers Association, SCF- 36, 1<sup>st</sup> Floor, Commercial site, phase 5, Focal point Ludhiana, Punjab – 141010 the above named deponent do hereby solemnly affirm and state as under:



1. That the Reply has been drafted under the authority and instructions of the deponent and after perusing its contents, the deponent has duly signed it, and the contents of paragraph Nos. 1 to 23 thereof are true and correct to the knowledge of the deponent, and the same may be read as contents of this affidavit also, which are not being reproduced for the sake of brevity. No part of it is false and nothing material has been kept concealed therefrom.
  
2. That the contents of paragraphs no. 1 to 23 of above tilted Reply are true and correct to my knowledge, no part of it is false and nothing material has been kept concealed therefrom.

3. That the Annexures attached with the Reply are true copies of their respective original.

Place:

Date:

verified that the affidavit Has been read ow  
explained to the deponent / executant wh  
seemed correctiv to understand the same &  
the time of making above there of

For Punjab Dyers Association

DIRECTOR

DEPONENT

**VERIFICATION:**

Verified that the contents of para 1 and 3 of my affidavit are true and correct to my knowledge. No part of it is false and nothing material has been kept concealed therefrom.

Place:

Date:

For Punjab Dyers Association

DIRECTOR

DEPONENT

Requested As Identified.

NOTARY PUBLIC  
LUDHIANA. (PUNJAB)

13 FEB 2025



**PART-1 (PAGE NO.1 TO 170)**  
**GOVT. OF PUNJAB**  
**DEPARTMENT OF IRRIGATION**

**PROJECT ESTIMATE**  
**FOR**  
**THE DOMESTIC SEWERAGE OF LUDHIANA CITY**  
**AFTER TREATMENT AT S.T.P. THROUGH**  
**BUDHA NALLA AND BY CONSTRUCTING NET**  
**WORK OF DISTRIBUTORY/WATER COURSES.**

**Estimated Cost**

**137.67 Crores**

**MAY.2012**

**Chief Engineer/ Canals**  
**Irrigation Works/Punjab**  
**Chandigarh**

PROJECT ESTIMATE FOR THE DOMESTIC SEWERAGE OF LUDHIANA CITY AFTER TREATMENT AT STP THROUGH BUDHA NALLAHA AND BY CONSTRUCTING NET WORK OF DISTRIBUTARY/WATER COURSE.

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**CHECK LIST FOR PREPARATION FOR DETAILED  
PROJECT REPORT TO BE SUBMITTED FOR LOANS  
UNDER RIDF**

<b>1</b>	<b>IRRIGATION PROJECTS</b>	
<b>i</b>	<b>Name of Project</b>	PROJECT ESTIMATE FOR THE DOMESTIC SEWERAGE OF LUDHIANA CITY AFTER TREATMENT AT STP THROUGH BUDHA NALLAHA AND BY CONSTRUCTING NET WORK OF DISTRIBUTORY/WATER COURSE.
<b>ii</b>	<b>Districts covered</b>	Ludhiana, Moga
<b>iii</b>	<b>Project Outlay (Rs.Crore)</b>	Rs.137.67 Crores

S.No.	Item	Remarks	Furnishe d (Yes /No)
<b>1</b>	<b>Genral</b>		
i	Whether the project is prioritized by the State Govt.	The Govt. of Punjab has decided to prevent the direct discharge of polluted water of Sewerage System and Industrial discharge into the Rivers passing through the Territory of State.	No
ii	Whether the project submitted through the Nodal Dept.	Through PID	No.
iii	Whether the project included in the State Plan	It is proposed to be funded by the Nabard.	No
<b>2</b>	<b>Clarence from (Wherever applicable)</b>		
i	Ministry of welfare (involving rehabilitation & resettlement)	No rehabilitation & resettlement is involved	No
ii	Administrative Approval	Yes, required	No
iii	Technical Sanction	Yes, Required	No
iv	Land Acquisition- Extent, status and time frame	Land required= 82.23 Acre approximately, Land Acquisition process will be started after Technical and financial sanction of the project. This disty. is proposed to be constructed primarily on the surplus abandoned land	Yes (Calculations for land require attached)

		of the Grey Canal System and Budha Nalla along its present alignment. If the land is further required for the smooth running of the channel and to straighten up its alignment at later stage, the same will be assessed and acquired after wards.	
<b>3</b>	<b>General Profile</b>		
i	Objectives of the Project	To prevent the direct discharge of polluted water of Sewerage System and Industrial discharge of Ludhiana city into the River Sutlej. The present condition of Budha Nalla is causing acute health problems to the people of Ludhiana city & these districts. Beside this, the water habitation of River Sutlej is being affected to the large extent due to this highly polluted water. Even the density of trees is decreasing alongside the the Budha Nalla due to this highly polluted water. All these factories have necessitated to treat the highly polluted water of Budha Nalla and utilize this for irrigation purposes for approximately 13543 Ha CCA and to increase the production of State.	Yes
ii	Salient features of Project Area	<ul style="list-style-type: none"> <li>• <u>Land Classification</u>:- Based on soil survey- sandy clay.</li> <li>• <u>Topographical features</u>:-Low lying belt in between Budha Nalla and River Sutlej. ,</li> <li>• <u>Drainage</u>:- Good ,</li> <li>• <u>Soil Characteristics</u>:- Sandy Clay.</li> </ul>	Yes
<b>4</b>	<b>Agro-economic survey</b>		
i	Demographic and social characteristics	<ul style="list-style-type: none"> <li>• <u>Population</u>:- Low density</li> <li>• <u>Farm size</u>:- Average</li> <li>• <u>Land use</u>:- Agriculture but not utilized to its full potential due to lack of irrigation facilities.</li> <li>• <u>Land holding pattern/farm size distribution</u>:- Average Size Land holding.</li> </ul>	No
ii	Cropping Pattern	Existing and proposed cropping pattern and yields-as per detailed attached in T-9 & T-8	Yes

iii	Agricultural support services	<u>Extension services and supply of inputs, marketing, credit arrangement:- Poor</u>	No
<b>5</b>	<b>Technical Aspects</b>		
i	Surface Water Projects		
a	Location and suitability of the project area	This project proposal falling in District Ludhiana and Moga in the low lying belt running parallel to the left side of the River Sutlej. There is lack of irrigation facility for the said area at present as the area does not fall within the irrigation 'Chakk' area of Sirhind canal system.	Yes
b	Source of water	The sewage /effluent of Ludhiana city and Industry after treatment by 4 No. STP /CETP	Yes
c	Catchment Area	152.60 Sq. Miles as per information collected from Drainage Department..	No
d	Rainfall	Data Attached	Yes
e	Hydrology	As per hydrological studies of the three Rivers (Sutlej , Ravi , Beas ) conducted prior to the construction of Ropar Head Works, based on the flow series of 1921-60, the average flow in the rivers has been assessed as 34 MAF, which comprises 14 MAF, 13 MAF , 7 MAF for river Sutlej , beas and Ravi respectively.	Yes
f	Design of dam, weir, barrage etc.	N.A.	No
g	Design of main canal ,branch canals, distributaries	Typical drawing attached	Yes
h	Any other relevant detail	Attached at suitable places.	Yes
i	Status of land acquisition	Land required= 82.23 Acre approximately, Land Acquisition process will be started after Technical and financial sanction of the project. This disty. is proposed to be constructed mainly on the surplus abandoned land of the Grey Canal System and Budha Nalla along its present alignment. If the land is further required for the smooth running of the channel and to straighten up its alignment at later stage. the same will be assessed and acquired after wards.	No
j	Submergence area	N.A.	No

	under reservoir and canals/distribution system.		
<b>ii</b>	<b>Ground water projects</b>		
a	Location	N.A.	
b	Geological formation	N.A.	
c	Hydrogeology	N.A.	
d	Ground Water availability	N.A.	
e	Design of wells	N.A.	
f	Specification of Pumping machinery	N.A.	
g	Available discharge from the	N.A.	
h	Structures	N.A.	
i	Command area of structures any other relevant detail.	N.A.	
<b>6</b>	<b>Financial Aspects</b>		
i	Schedule of rates adopted (Whether updated to current costs)	The analysis of rates of various items have been prepared and attached. Rates provided are as per common schedule of rates 2010 plus sanctioned zonal premium operative w.e.f. 5.12.2011.	Yes
ii	If, not whether cost proposed will be sufficient to create the assets.	N.A.	No
iii	<b>Cost Estimate</b>		
a	Item-wise cost of project	As per detailed attached	Yes
b	Item wise expenditure incurred	Nil	No
c	Item wise cost of balance works	This is a new project and execution of work for this project will be started after receipt of funds.	No
d	Item wise RIDF loan	95% of the project cost	No
e	Item wise State Govt. Contribution year wise phasing of RIDF loan and	Three year phasing schedule.	Yes
f	State Govt. Contribution	5% of the project cost	No
g	Bar/PERT/CPM charts.	N.A.	No

h	Specific justification for high cost of development	The sewage /effluent of Ludhiana city and Industry after treatment by STP /CETP will be utilized for irrigation purpose. To construct the New Disty in the existing abandoned land of the Gray Canal system of the Budha Nalla parallel to River Sutlej in the low lying area. Huge Number of pucca structures e.g bridges, syphon crossing, aqueducts ,escapes, Cross regulator, heavy earth work filling to construct the proposed disty and paralle drains are required to be constructed. Hence high cost involved.	Yes
7	<b>Benefits and justification</b>		
	Overall impact of the project need to be assessed and detailed	The project provided to prevent the direct discharge of polluted water of Sewerage System and Industrial discharge into the River Sutlej. At present, the highly polluted water containing many harmful contents due to direct discharge of Sewerage of Ludhiana city and Industrial discharge of dying industry passing through Buddha Nalla is being discharge into River Sutlej at the out skirts of Ludhiana city. Due to usage of River Sutlej water for drinking purposes in the Eastern & Southern part of Punjab including District Bathinda, Ferozepur, Faridkot, Mukatsar Sahib etc., and the present condition of Budha Nalla is causing acute health problems to the people of these districts. Beside this the water habitation of River Sutlej is being affected to the large extent due to this highly polluted water. Even the density of trees is decreasing alongside the the Budha Nalla due to this highly polluted water. All these factors have necessitated the treatment of this highly polluted water of Budha Nalla and utilize this for	Yes

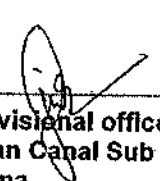
		irrigation purposes for approximately 13543 Ha CCA and to increase the agricultural production of Punjab State.	
		After the completion the project SOCIO-ECOLOGICAL AND ENVIRONMENTAL condition of the people of the State living long side the proposed disty. and Budha Nalla will be improved considerably besides the increase in production of the agricultural land thus improving the financial position of the small farmers of the area.	
8	<b>Operation and Maintenance</b>		
	Arrangements for O/M inc.involvement of water user's Association/User Groups,Water charges.	After the construction of disty the operation and maintenance cost to be borne by the PID. Water Charges will be applicable as per Government Policy from time to time.	No
9	<b>Infrastructure Facilities</b>		
i	Organizational structure of the implementing Dept.	Attached (Annexure B)	Yes
ii	Capacity and preparedness of the implementing Dept. and status of implementation of earlier sanctioned projects.	The Punjab Irrigation Department is fully equipped with necessary establishment and infrastructure for implementation of the said project.	No
iii	Quality control infrastructure and mechanism	Attached (Annexure C)	Yes
iv	Availability of labour	The work will be executed on the contract basis as per departmental norms and the required labour will be arranged by the contractor. However, the labour is easily available in the said region.	No
v	Budget provision		
a	For contribution to State share	As per State Government Policy	No
b	For subsequent O&M	As per State Government Policy	No
c	For repayment of loans-Principal and interest.	As per State Government Policy	No
10	<b>Project Risks</b>		No

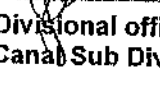
i	Land acquisition	No problem anticipated at present.	No
ii	Rehabilitation and resettlement	Not required.	No
iii	Forest clearance	Will be obtained, if required at the time of execution.	No
iv	Railway/road crossings	Not involved.	No
v	Construction hazards	No problem anticipated	No
vi	Any other risk.	No.	No
11	<b>Convergence with any other programme.</b>	No.	No

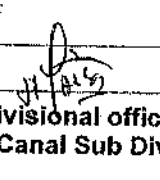
**PROJECT ESTIMATE FOR THE DOMESTIC SEWERAGE OF LUHDIANA CITY  
AFTER TREATMENT AT STP THROUGH BUDHA NALLAHA AND BY  
CONSTRUCTING NET WORK OF DISTRIBUTORY/WATER COURSE.**

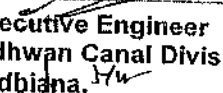
**SALIENT FEATURES**

1	Total Cost of the Project	=	Rs. 137.67 Crores
2	Location of the Project Area	=	In the Districts Ludhiana , Moga and Ferozepur
3	Name of the Village Benifited	=	Walipur Kalan, Banjawal, Ghamnewal, Talwandi Nauabad, walipur Khurd, Allwal, Bhundri, Gorsian Kadar Bakhsh Talwara, Shekh Kutab, Bhani Ariyan , Salempura, Sidhwan Bet, Shafipura, Madepura, Abupura, Perjian, Kaniyan , Flusani, Gidder Wirdi, Kekar Partti, Mund Tihera, Munnaberpura, Terf Kotli , Patti, Multani, Shahbazur Kaniyan Kalan, Chak Kaniyan Kalan, Kaniyan Khurd, Chak Fatehpur, Fatehpur, Kaniyan , Jindra, Thoothgarh , Doburji, Badduwal, Dhamkot.
4	Total Length of Proposed Disty.	=	53.54 KMs.
5	GA to be covered	=	38472 Acres /15755 Ha.
6	CCA to be covered	=	33454 Acres/ 13544 Ha.
6	Type of Canal	=	Unlined
7	Benefited Area	=	30109 Acres./12190 Ha
8	Benefit Cost Ratio (B.C.Ratio)	=	1.52:1

  
Sub Divisional officer  
Sidhwan Canal Sub Division  
Ludhiana.

  
Sub Divisional officer  
Zira Canal Sub Division  
Zira

  
Sub Divisional officer  
Moga Canal Sub Division  
Moga.

  
Executive Engineer  
Sidhwan Canal Division  
Ludhiana.

**PROJECT ESTIMATE FOR THE DOMESTIC SEWERAGE OF LUHDIANA CITY  
AFTER TREATMENT AT STP THROUGH BUDHA NALLAHA AND BY  
CONSTRUCTING NET WORK OF DISTRIBUTORY/WATER COURSE.**

**BENEFIT COST RATIO**

1	Name of Scheme	=	PROJECT ESTIMATE FOR THE DOMESTIC SEWERAGE OF LUHDIANA CITY AFTER TREATMENT AT STP THROUGH BUDHA NALLAHA AND BY CONSTRUCTING NET WORK OF DISTRIBUTORY/WATER COURSE.
2	Length of Scheme	=	53.54 Kms
3	Total cost of Project	=	137.67 Crore
4	G.A.	=	15755 Ha
5	CCA	=	13544 Ha
6	Existing Irrigation	=	1354 Ha
<b>BENEFITTED AREA</b>			
	Additional irrigation potential created (13544-1354) = 12190	=	12190 Ha
	<b>Total</b>	=	<b>12190 Ha</b>

**INCOME FOR 100 HA.**

**Before Project**

Value of production (In Lacs)	Cost of Cultivation (In Lacs)	Benefit (In Lacs)	See Table T-13
139.67	50.57	89.1	

**After Project**

Value of production (In Lacs)	Cost of Cultivation (In Lacs)	Benefit (In Lacs)	See Table T-13
154.29	50.57	103.72	

Increase in income per 100  
Ha

### TOTAL INCOME

1. Income in benefit of crops

$103.72 - 89.10 = 14.62/100$  Ha

$121.90 \times 14.62 = 1782.18$

### MAINTENANCE COST

	Saving in annual Maintenance cost after Lining		Nil
	As per previous studies @ 39.23% of unlined expenditure		Nil
	Total Benefit per Ha		Rs. 1782.18 Lacs
	<b>EXPENDITURE</b>		
1	<b>PROJECT COST</b>		13767 Lacs
2	Annual interest @ 6.5%		894.86
3	Depreciation charges @2%		275.34
	<b>TOTAL</b>		1170.2
	Economics of the project/benefits cost ratio 1782.18/1170.20		1.52:1
	Required benefit cost ratio		1.5:1

PROJECT ESTIMATE FOR THE DOMESTIC SEWERAGE OF LUDHIANA CITY  
AFTER TREATMENT AT STP THROUGH BUDHA NALLAH AND BY  
CONSTRUCTING NET WORK OF DISTRIBUTORY/WATER COURSE.

MAIN ABSTRACT OF COST

Part-I

	DIRECT CHARGES	AMOUNT IN RS.LACS
A	A-Preliminary	43.00
B	Land	2878.03
C	Works	19.95
D	Regulator	633.40
E	Falls	19.25
F	Cross Drainage Works	1767.00
G	Bridges	942.00
H	Escapes	402.88
I	Navigation works	0.00
K	Building	51.92
L-1	Earth Work	66.50
L-2	Lining	0.00
M	Plantation	0.00
N	Tanks & Reservoirs	0.00
O	Misc.	18.76
P	Maintenance	105.06
Q	Special T&P	1.58
R	Communication	0.00
S	Power Plant & Electrical System	0.00
T	Water supply works	0.00
U	Distributaries, Minors & Sub Minors	0.00
V	Water Courses and field channels	0.00
W	Drainage	0.00
X	Environment & Ecology	0.00
Y	Losses & Stock and Unforeseen	26.26
	Total Direct Charges	6975.59
	Indirect Charges	207.83
	<b>Total</b>	<b>7183.42</b>
	<b>Say</b>	<b>137.67 Cr.</b>

Executive Engineer  
Sidhwan Canal Division  
Ludhiana.

Superintending Engineer  
Sirhind Canal Circle  
Ludhiana.

## CHAPTER 1 INTRODUCTION

*Part A - 1*

### i. GENERAL INTRODUCTION

The State of Punjab has sub-tropical climate and is located in the North western Part of India between 29-32° N and 32-31° N latitude and between 73-52' E and 76-55' E Longitude. It is bounded by Jammu & Kashmir in the North, Himachal Pradesh in the north-east, Haryana in the south and Rajasthan in south west and has a long border with Pakistan in the west.

The Punjab State economy is agriculture based with 70% of its population depending upon farming or agriculture based industries. The Irrigation water is the most important input for agriculture sector and in addition to this the improved varieties of seeds and adequate amount of fertilizer for further boosting agriculture production. Since both surface and ground water sources have been fully utilized, Govt. of Punjab recognized that increase of production would depend entirely upon improved efficiency of water use. It is pertinently brought out that Punjab having a geographical area of only 1.5% of the country, contributes more than 50% of the food stock of the central pool owing to untiring efforts of hard working farming community of the state and making the best use of available land and water resources of the state.

The growth in the agriculture sector remained in the vicinity of 2% for the last many years against an overall growth rate of about 8%. The wheat-paddy cropping pattern which is highly water intensive, thrive to a large extent on under ground water resources on account of inadequate availability of surface waters. The ever decreasing levels of water table require pumping of water from comparatively deeper aquifers which require greater consumption of fuel/electricity which is not abundantly available. The sluggish growth rate in agriculture is attributed mainly to increasing cost of agricultural inputs which is putting a tremendous strain on the socio-economic condition of the farmers. Agriculture production is directly linked to availability of water for irrigation and upkeep of its infrastructure. Punjab is the major contributor of wheat and rice to the national kitty and faced with a huge resource-crunch, finds it difficult to fund the schemes.

Punjab is an agrarian economy and most of the people are dependent on agriculture as their source of income. The state has been able to meet substantial food requirement of the country with unprecedented agriculture growth after the green revolution. The total cultivable area of Punjab is 42.90 lac hectare out of which 30.88 lac hectare has been brought under canal command. As such canal network of the state is of prime importance to sustain the agriculture.

Owing to the consecutive lowering of the ground water table with passing time the dependence on canal water for agrarian needs has substantially increased. So the canal system needs extension, improvement & up-gradation. If it is achieved it will help to reduce the pressure on ground water and increase optimal utilization of surface water. The underground water in south western Punjab is alkaline and is not fit for irrigation and drinking purpose. This cause extra stress on demand of canal water.

## ii. INTRODUCTION OF PROPOSED DISTRIBUTARY (LUDHIANA CITY STP)

After studying the topography of the area it is found that only the belt of the area falling between the Budha Nalla and the River Sutlej can be irrigated with the treated water of STPs/CETPs, by constructing an open channel connected with the network of water courses at suitable points. Under this scheme, sewage of Ludhiana city and highly polluted water discharge from the industry in general and dying industry in particular will be utilized for irrigation after treatment by STP/CETP plants at Balloke, Jamall pur, Tajpur and Bahadar ke villages. This proposed distributary will be construed by utilizing Govt. land lying surplus due to abandoning of Grey Canal System for the last more than 50 years. At present the capacity of Balloke STP is 152 MLD, which is proposed to be increased by 105 MLD, the total capacity of this STP will be 257MLD (102.80 Cs.), similarly the capacity of Jamallpur STP will be increased from 48 MLD (19.20 Cs.) to 96 MLD ie 40 Cs. Apart from that 112 MLD and 38 MLD discharge of CETP Tajpur and Bhaderke respectably will be treated. The discharge of all STP's & CETP's will be 503 MLD (201 Cs.). The proposed Distributary has been designed for 220 Cs. discharge, keeping in view the present discharge of existing Budha Nallaha at R.D 150000 feet which is off take of the proposed distributary. The total length of proposed Disty. is 175600 feet Approx. out falling into 6-R Disty. at R.D. 2300 feet. The capacity statement has been prepared accordingly. At present the effluent water of STP is directly being discharged through Budha Nallaha into River Sutlej. After construction of proposed distributary, 33454 acres G.A/C.C.A. of 35 nos villages falling under Ludhiana and Moga Distt. will be irrigated. The water allowance has been proposed @ 5.5 Cs per thousand acres. However, during periods of lean/no demand or during flood season the treated effluent will be directly discharged into the river Sutlej. It is pertinent to brought out here that the water for irrigation will be supplied through the treatment plants under the control of Sewerage Board/ Municipal Corporation and the acceptability of the water by the farmers will entirely depend upon the treatment of water as per norms set by the Pollution Control Department/ any other relevant

department for the same. Therefore if the farmers refuse to consume the said water, the onus of this will be entirely of the department responsible for carrying out operation/supervision of the treatment plants. This scheme will be published under the IMO Para No. 4.2 and implemented under the Canal & Drainage Act 8 of 1873.

### iii. EFFECTS OF PROPOSED DISTRIBUTARY.

At present, the highly polluted water containing many harmful contents due to direct discharge of Sewerage of Ludhiana city and Industrial discharge of dying factories carried by Buddha Nalla is being discharge into River Sutlej at the out skirts of Ludhiana city. Due to usage of River Sutlej water for drinking purposes in the Southern part of Punjab including District Bathinda, Ferozepur, Faridkot, Mukatsar etc., This present condition of Budha Nalla is causing acute health problems to the people of Ludhiana city & these districts. Beside this the water habitation of River Sutlej is being affected severly due to this highly polluted water. Even the density of trees is decreasing alongside the the Budha Nalla due to this highly polluted water. All these factories have necessitated the treatment of the highly polluted water of Budha Nalla and utilize this for irrigation purposes

### iv. SUB HEAD WISE PROVISIONS MADE IN THE PROJECT ESTIMATE ARE DISCUSSED BELOW :-

#### A-Preliminary

A provision of Rs. 43.50 Lac has been made under this sub-head for the work of leveling, survey, observing X-Sections etc.

#### B-Land

A provision of 19.28 Acre for Disty, 22.95 acre land for drain, 40 Acre land for compensation for disputed to be required has been made in the estimate . A total provision of Rs..2878.03 Lac has been made under sub head..

#### C-Works

Construction of 57 Nos. outlets /Tail Cluster has been made in this project. A provison of Rs. 19.95 Lac has been made under this Sub Head.

#### D-Regulator

A provision of Head Regulator and Cross Regulator At RD 0 of New proposed Disty and Budha Nalla , in take structure at RD 2300 of 6-R Disty and tail RD 175600 of proposed disty has been made in the estimate . A total provision of Rs.633.40 Lac has been made under this sub-head.

#### **E-Fall**

A provision of Construction of 1 No. fall at RD 132200 of proposed disty . A provision of Rs.19.25 Lac has been made under this sub-head.

#### **F-Cross Drainage Works**

A provision of construction of 11 Nos Syphon crossing , 3 Nos Syphon aqueduct crossing and 1 No. Syphon crossing cum Bridge has also been made in the Project Estimate. A total provision of Rs.1767.00 Lac has been made in this sub head.

#### **G-Bridges**

A provision of construction of 47 Nos. bridges has been made in the Project Estimate. A total provision of Rs.942.40 Lac has been made in this sub head.

#### **H-Escape**

A provision of 1 No Escape cum regulator at RD 11000 of proposed disty.has been made in the project estimat. A total provision of 502.88 Lacs has been made under sub head..

#### **I-Navigation Works**

No provision has been made under this sub-head.

#### **K-Building**

A provision of construction of 6 Residential required for employees has been made in the project estimate. A total provision of Rs. 51.92 Lac has been made in this sub head.

#### **L-(i) Earth Work**

Provision of Rs.6650 Lac has been made under this sub head.

#### **L-(ii) Lining**

No provision has been made under this sub-head.

**M-Plantation**

No provision has been made under this sub-head.

**N-Tanks & Reservoir**

No provision has been made under this sub-head.

**O-Miscellaneous**

A Provision of running of vehical, Distance marks and Boundry pills, Sign Boards/Indification boards, inaugural ceremonies, technical reords, photographs and inaugural ceremonies etc. has been made in the project estimate A total provision of Rs. 18.76 Lac has been made under this sub head.

**P-Maintenance**

A Provision of Rs.105.06 Lac has been made under this sub head.

**Q-Special T & P**

A Provision of Rs.1.58 Lac has been made under this sub head for purchase of. computers, Fax machines, photostat machines etc.

**R-Communication**

No provision has been made under this sub-head.

**S-Power Plant & Electrical System**

No provision has been made under this sub-head.

**T - Water Supply Works**

No provision has been made under this sub-head.

**U - Disty, Minor & Sub Minors**

No provision has been made under this sub-head.

**V - Water Course & Field Channel**

No provision has been made under this sub-head.

**W - Drainage**

No provision has been made under this sub-head.

**X-environment and ecology**

No provision has been made under this sub-head.

**Y - Losses Stock & Unforeseen**


Provision of Rs. 26.26 Lac has been made under this Sub head.


**Indirect & Escalation Charges**


A provision of Rs.207.82 Lac under the sub head has been made:


The analysis of rates of various items have been prepared and attached. Rates provided are as per common schedule of rates 2010 plus sanctioned zonal premium operative w.e.f. 5.12.2011.


The total cost of this Project Estimate has been worked out to be Rs 137.67 Crores.

  
Sub Divisional officer  
Sidhwan Canal Sub  
Division  
Ludhiana.

  
Sub Divisional officer  
Moga Canal Sub  
Division  
Moga

  
Sub Divisional officer  
Zira Canal Sub  
Division  
Zira.

  
Executive Engineer  
Sidhwan Canal Division  
Ludhiana.

  
Superintending Engineer  
Sirhind Canal Circle  
Ludhiana.

## CHAPTER 2

### THE PROJECT AREA

#### 2.1 GENERAL

The project of unlined proposed distributary R.D. 0 to R.D. 175600 is a new project. The water allowance of the area falling under this distributary is 5.5 Cusecs per thousand Acres at outlet head. The water used for this project is a treated effluent from 4 No. STP's/CETP's of Ludhiana area.

#### 2.2 TOPOGRAPHY AND SOILS

This project proposal falls in District Ludhiana and Moga in the low lying belt running parallel to the the River Sutlej on its left side. The topography of the area is gently graded having low lying area patches at several places.

The soil in the project area is generally sandy having contents of silt and loam. The soil in general has good drainage characteristics.

#### 2.3 CLIMATE AND RAINFALL

The climate of this area i.e.( of District Ludhiana, Moga and Ferozepur) is of sub-tropical monsoon type having wet hot summers and cold dry winters. Temperature in the area can rise as high as 47<sup>0</sup> C in summer months and as low as 5<sup>0</sup> C in the winters. About 85% rain fall occur during Kharif season. Mean Rainfall, Mean wind speed, Mean Temperature and mean Relative Humidity are given in table T-2

This area is quite suitable for irrigation but due to lack of good irrigation facility the yield per acre is very low. The proposed canal will help in enhancement of yield capacity per acre substantially.

#### 2.4 EXISTING CROPPING PATTERN

There are two crop seasons in Punjab, Kharif season from April to October and Rabi seasons from November to March. Paddy, maize, pulses etc. are grown during Kharif seasons. Wheat rape seed and mustard are the main crop of rabi season. However fodder crops such as jowar during kharif and barseem during rabi season are also grown. Paddy-wheat is the main crop rotation of this area. The existing cropping pattern is given in Table-3.

#### 2.5 HYDROLOGY

As per hydrological studies of the three Rivers (Sutlej , Ravi , Beas ) conducted prior to the construction of Ropar Head Works, based on the flow series of 1921-60, the average flow in the rivers has been assessed as 34 MAF, which comprises 14

MAF, 13 MAF , 7 MAF for river Sutlej , beas and Ravi respectively.

## **2.6 SOCIO- ECOLOGICAL AND ENVIRONMENTAL ASPECTS.**

At present, the highly polluted water containing may harmful contents due to direct discharge of Sewerage of Ludhiana city and Industrial discharge of dying industry carried through Buddha Nalla is being discharged into River Sutlej at the out skirts of Ludhiana city. Due to usage of River Sutlej water for drinking purposes in the Southern part of Punjab including Distict Bathinda, Ferozepur, Faridkot, Mukatsar etc., This present condition of Budha Nalla is causing acute health problems to the people of Ludhiana city & these districts. Besides this the water habitation of River Sutlej is being affected severly due to this highly polluted water. Even the density of trees is decreasing alongside the Budha Nalla due to this highly polluted water. All these factors have necessitated the treatment of highly polluted water of Budha Nalla and utilize this for irrigation purposes.

## CHAPTER 3

### THE PROJECT

#### 3.1 PROJECT OBJECTIVES

The pressure of increasing population has led to the necessity of finding all possible means of increasing the production of food grain. Improved and extensive irrigation facilities are therefore required to meet with the growing demand of irrigators and good crops for increasing production.

The project has been drawn up with the following objectives:-

1. To reduce the pressure on underground water table.
2. To utilize the treated effluent for irrigation purpose.
3. To prevent the direct discharge of polluted effluent of Ludhiana city into the River Sutlej.
4. To increase the production of agriculture in the state.
5. To improve the socio- ecological and environmental condition.

#### 3.2 SURVEYS AND INVESTIGATION

Hydraulic surveys of the proposed new channel shall be undertaken for its proper designing. Full data in regard to the existing structures, foundations and soils shall be observed for detailed designing of works.

#### 3.3 EARTHWORK

The quantities of earthwork of proposed disty. have been estimated from R.D. 0 to 175600 feet, abstract of quantities is as under:-

<u>Sr. No.</u>	<u>Item of Work</u>	<u>Unit</u>	<u>Quantity</u>
1	Earthwork	1000cum	2876.87
2	Compaction of Earthwork	1000cum	1716.52
3	Dressing of Earthwork	1000 sqm	806.42

### 3.4 DESIGN AND CONSTRUCTION METHOD

The proposed channel shall be constructed as unlined as per methodology adopted for unlined section.

Complete hydraulic survey of the new proposed unlined distributary shall be undertaken and Longitudinal Section prepared after double leveling. Cross sections shall be observed at suitable intervals to work out the details of earthwork and L-section shall be prepared after thorough consideration in respect of economy and operational efficiency of every defined reach after proper techno-economic survey. The average lead of 5.0 Km for earthwork have been taken for preparing analysis of rates. Detail estimate shall be prepared for this distributary before the starting of work. This is necessary to have proper control over the execution and expenditure.

#### DESIGN PARAMETER

This disty. proposed to be constructed as un-lined in the first phase, which will be lined subsequently at later stage. The design section of the unlined disty. is proposed by keeping the berm  $2xD$ , where  $D$  is Full Supply Depth of the Distributary (Typical drawing attached), by keeping in view the topography of the field. The banks have been proposed as per C.D.O instructions and site requirements. The value of regosity coefficient 'N' is 0.0225 for unlined channel. The design calculations for sections of disty. are enclosed. The parallel drains on right/ left side from R.D 10000 feet to 110000 feet and from R.D 140000 feet to R.D 160000 feet respectively have been proposed to maintain the existing drainage system. The alignment of proposed disty. is running parallel to the River Sutlej on its left side, hence siphon crossings have been proposed at suitable interval to safe guard the nearby area and disty. from flood water. The alignment of proposed channel is kept as already existing alignment of old disty. & old Budha Nalah to minimize the requirement of new land acquisition.

### 3.5 CONSTRUCTION METHOD

This unlined channel is proposed to be constructed in the land of existing old Budha Nala and old Grey Canal System. As the proposed distributary is a new channel so the work for execution shall be carried out continuously from the start of work. The work will be executed by the 3 No's Sub-Divisions of the Sidhwan Canal Division. The quality of work shall be cross checked by the CTE Patiala and other research wings of the department. The pucca structures shall be constructed after the drawing/ design is approved by the competent authority.

The earthwork shall be executed through labour intensive method. The compaction of earthwork, which is of paramount importance for safety of the channel, shall be got done using a sheep footed rollers. Special compactors driven by compressed air

may also be used to compact the earth in pockets or where sheep footed roller can not work. A dry bulk density of 90% of the maximum dry density of the natural soil shall be attained in each layer of compacted earth (The maximum dry density of soil generally ranges between 1.6-2.7 g/cm<sup>3</sup> for soil and checked at site after compaction of each layer.

The earthwork and structures shall be undertaken through labour intensive method. Machines shall however be used for compaction of earthwork, concrete mixing, dewatering and for transportation of men and material. The work shall be got done through contractor employed through competitive bidding as per departmental codal rules.

## **CHAPTER 4**

### **COST ESTIMATE**

#### **4.1 GENERAL**

Cost estimate are in general based on the prevailing Common Schedule of Rates 2010 with Latest prevailing Sanctioned Premium 6/12/2011. The total cost of the project works out to Rs. 137.67 Crores

#### **4.2 ESTIMATE OF QUANTITIES**

The project includes about 53.54 KM length of proposed unlined channel. The quantity of earthwork has been worked out from typical cross-section observed for different reaches at suitable interval.

#### **4.3 RATES**

The project cost has been computed as per prevailing rates as per Common Schedule of Rates 2010 with Latest prevailing Sanctioned Premium 5/12/2011. The labour and carriage rates applied are as provided in the departmental schedule of rates + SP (6/12/2011). The rates for most of pucca works has been taken as per estimate of similar type of structures. For the new structures for which similar type estimates are not available, the provision for these are taken on lump sum basis. However, the detailed estimate shall be prepared after proper design and drawing approved by the competent authority before the time of execution.

#### **4.4 COSTS**

The costs are worked out at the prevailing rates in 6/12/2011. the total cost of the project works out to be 137.67 Crores. Analyses of rates for various items of work have also been attached as annexures. Detail abstract of cost is depicted in Annexure A-1.

## CHAPTER 5

### ORGANIZATIONAL SETUP AND NEEDS

The present Sidhwan Canal Division comprising of 3 Sub Divisions is under Sirhind Canal Circle, Ludhiana which is further under the Chief Engineer/Canals, Irrigation works Punjab, Chandigarh. One No. Asstt. Research officer (Together with supporting staff) will attached with the Division for maintaining the quality check. The chart showing the organizational setup is attached.

#### 5.1 IMPLEMENTATION OF THE WORKS SCHEDULE

As the proposed distributary is a new channel so the work for execution shall be carried out continuously from the start of work. The work will be executed by the 3 No's Sub-Divisions of the Sidhwan Canal Division, Ludhiana. The works shall be executed by equally distributing among the 3 No. sub Divisions names Sidhwan Canal Sub Division, Ludhiana, Moga Canal Sub Division Moga and Zira Canal Sub Division, Zira. The Superintending Engineer, Sirhind Canal Circle, Ludhiana & Executive Engineer, Sidhwan Canal Division Ludhiana shall ensure proper control both over quality and quantity and proper implementation of work schedule. In addition to this an independent research cell comprising of 1 No. ARO (Together with supporting staff) will conduct field tests by setting up their own testing laboratory at site.

The initial work like Surveying preparation of estimate and L-Section, Tendering and getting sanctions from the competent authority etc. shall be completed much prior to the actual execution of the work.

#### 5.2 PROCUREMENT OF MATERIAL AND EQUIPMENT

The key material for the said project such as earth, cement, sand, steel, bricks etc. shall procured by the contractor themselves. However proper checks for maintaining the quality of the material shall be applied by the deputed departmental representatives.

#### 5.3 EXECUTION OF CIVIL WORKS

The civil works such as earthwork and pucca structures would be carried out through labour intensive method. The work will be carried out continuously from the start of work throughout the year except for minor interruption during monsson.

The works shall be got executed at competitive rates received against e- tendering bids from registered agencies.

#### **5.4 OPERATION AND MAINTENANCE**

The operation and maintenance of this channel will be carried out by the Punjab Irrigation Department. As far as works under the project are involved, their maintenance during construction period will adequately be provided as per norms.

#### **5.5 MONITORING AND EVALUATION**

Monitoring and evaluation of irrigation projects completed/ under execution is presently being done by 2 directorates of monitoring and evaluation under chief engineer. Each directorate is headed by one Superintending Engineer who is assisted by executive engineers and assistant engineers.

#### **5.6 QUALITY CONTROL MECHANISM**

The quality of the work executed at site is continuously monitored and checked by the J.E. incharge of the site who will be present at site daily. He also records the measurements in Measurement books at site. The measurement book is regularly checked by the Sub Divisional officer In charge and Executive Engineer as per codal rules.

Proper quality control setup already exists in the department and is shown at Annexure 7. In addition to this an independent research cell comprising of 1 No. ARO (Together with supporting staff) will conduct field tests by setting up their own testing laboratory at site.

An independent agency working under the Administrative control of Chief Technical Examiner shall also exercise the various field tests during the construction of the project.

## CHAPTER 6

### BENEFITS AND ECONOMIC ANALYSIS

#### 6.1 PROJECT BENEFITS

The project derives its main benefits from assured water supply on account of treated water from the 4 STP's/CETP's. The area under the different crops will be as under:-

Paddy	5417 Ha
Wheat	6772 Ha
Oil Seed	1354 Ha
Total	13543 Ha

#### 6.2 INTANGIBLE BENEFITS

The project shall give following intangible benefits:-

1. Reduction in the pressure on underground water table.
2. Utilization of the treated effluent for irrigation purpose.
3. Prevention of the direct discharge of polluted effluent of Ludhiana city into the River Sutlej.
4. Increase the production of agriculture in the state.
5. Improvement in the socio- ecological and environmental condition.

#### 6.3 INCREMENTAL AGRICULTURAL PRODUCTION

The annual incremental production of crops on full development shall be as under :-

The total production of crop (in 100 Ha) without project	:	31956 Qtls.
The total production of crop (in 100 Ha) with project	:	36017 Qtls

The incremental Agricultural Production in 100 Ha = 36017- 31956	:	4061 Qtls
Total incremental Agricultural Production = 4061x (12190/100)	:	495036 Qtls

#### 6.4 CROP BUDGETS

The present day crop yields in respect of irrigated/ unirrigated crops and summary of latest prices of agriculture produce are given in Table T-5

Average crop cultivation costs for irrigated/ un-irrigated crops in Punjab for the year 2011-2012 are indicated in Table T-6 & T-7 respectively. Crop budgets for the amin crops proposed to be raised on incremental irrigated areas and existi9ng un-irrigated areas have been darwn based on the data given in Table T-5, T-6 & T-7 and indicated in Table T-8 and T-9 respectively. net value of the proposed irrigated/ un-irrigated crops per hectare shall be as under :-

<b>A. Irrigated Crops</b>		
Paddy	:	Rs.47801 /Ha
Wheat	:	Rs.47422 /Ha
Oil Seed	:	Rs.32845 /Ha
<b>B. Un-Irrigated Crops</b>		
Paddy	:	Rs. 40591 /Ha
Wheat	:	Rs. 40997 /Ha
Oil Seed	:	Rs. 30420 /Ha

## 6.5 CROP BENEFITS

The development of net crop benefits from the additional crops are worked out in Table T-4. On full development, net crop benefits shall amount to Rs. 7186.55 lacs per Annum.

The net crop benefits from the existing un-irrigated crops have been worked out in Table T-10 which amounts to Rs. 2916.86 Lacs per annum.

## 6.7 BENEFITS COST ANALYSIS

Benefit Cost analysis of the project has been worked out as per guidelines of the Central Water Commission, Government of India.

## 6.8 ASSUMPTIONS FOR B.C. ANALYSIS.

The following set of assumptions have been adopted for calculations of B.C. ratio:

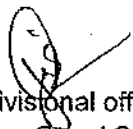
- a) Prices for inputs and outputs remained constant.
- b) The latest prices of the year 2011-12 are applicable.
- c) The crop yields do not improve in future with or without project condition.
- d) Interest rate is considered at 6.5 % per annum.


## 6.9 BENEFIT COST ANALYSIS WITH CWC METHOD

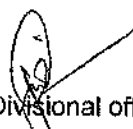
The values of the main produce in the project area, both in the pre-project and post-project stages have been worked out in the standard performa of CWC vide Table T-10 and T-4 and Net values vide Table T-12 and T-11 respectively.



## 6.10 INCREASE IN RURAL EMPLOYMENT

Farm activities would be increased due to cultivation of additional land in future. It will boost the rural employment on full development of the project. Opportunities for employment of skilled/ semi-skilled personnel on supporting services shall also open up.

  
Sub Divisional officer  
Sidhwan Canal Sub Division  
Ludhiana.

  
Sub Divisional officer  
Moga Canal Sub Division  
Moga

  
Sub Divisional officer  
Zira Canal Sub Division  
Zira.

  
Executive Engineer  
Sidhwan Canal Division  
Ludhiana  




IRRIGATION WORKS PUNJAB  
HEAD OFFICE

To

Superintending Engineers :-

- 1) Sirhind Canal Circle, Ludhiana
- 2) U.B.D.C. Circle, Amritsar
- 3) Director/Water Cell I.B.H.O. Pb, Chandigarh.

Memo No.2009/( ) 13-3 Dated 25 / 11/09.

Sub:- **Cleaning of rivers - laying of Irrigation network from the STP's.**

Hon'ble Chief Minister Punjab, took a meeting on 24/11/2009 on the subject. Kindly find enclosed list of towns alongwith the Sewerage Discharge in MLD where Irrigation Schemes are proposed. The concerned Executive Engineer may be directed to contact his counterpart in Water Supply Sewerage Board to know the location of proposed STP and prepare the Irrigation network Scheme alongwith rough cost estimate and submit the same within six days i.e 1/12/2009. The Hon'ble Chief Minister is very serious about the issue and has directed that the Schemes and rough cost estimate be submitted within seven days. He will hold a review meeting after seven days to consider these schemes. An early action is requested.

*[Handwritten Signature]*

Executive Engineer/Canals,  
For Chief Engineer, Irrigation Works, Punjab,  
Chandigarh.

8.943236 / 13-3

25/11/09

*[Handwritten notes in Gurmukhi script, partially illegible]*

25/11/09 11:00 AM

*[Handwritten Signature]*  
 ਨਿਗਰਾਨ ਇੰਜੀਨੀਅਰ  
 ਸਿਰਿੰਦ ਕੈਨਲ ਸਰਕਲ ਲੁਧਿਆਣਾ

25/11/09  
*[Handwritten notes]*

ISIX- J 3 tTEND CANAL E FAX NO. :01722724073

Project: Cleaning of Rivers- laying of Irrigation network from the STP's

List of Towns with sewerage discharge (MLD)

1 cusec = 1MLD/2.5

Sr.No.	Name of Town	District	Discharge as on 2025 (in MLD)
1.	Bholath	Kapurthala → Pipes laid	4
2.	Begowal	STP Road Kapurthala → 16. Dukhalek	2.50
3.	Phagwara	Kapurthala	38
4.	Dhillwan	STP Road Kapurthala	2
5.	Sultanpur Lodhi	Kapurthala → 1801 ac	2.60
6.	Kapurthala	Kapurthala → 35 x 100 ha	25
7.	Nawanshahar	Shaheed Bhagat Singh Nagar	6
8.	Banga	Shaheed Bhagat Singh Nagar	3
9.	Mukerian	Hoshiarpur	5
10.	Dasuya	Hoshiarpur	5
11.	Tanda urmur.	Hoshiarpur	4
12.	Shamchurasl,	Hoshiarpur	1
13.	Hoshiarpur.	Hoshiarpur	35
14.	Makhu.	Ferozpur Moga	3
15.	Dharamkot.	Ferozpur Moga	3
16.	Zira	Ferozpur Moga	8
17.	Talwandi Bhai.	Ferozpur Moga	3
18.	Moga.	Ferozpur Moga	27
19.	Machiwara.	Ludhlana	3.5
20.	Balloke.	Ludhlana	257 ✓
21.	Bhattian.	Ludhlana	161 ✓
22.	Jamalpur.	Ludhlana	48 ✓
23.	Jalandhar	Jalandhar	185 ✓ 2.50 lac
24.	Pathankot	Gurdaspur	20
25.	Nangal	Ropar	5 ✓
26.	Ropar	Ropar	14.50
27.	Kurali	Ropar	5

with 5 days

Jalandhar 1000 ac  
1.5 MLD  
0 MLD  
21.84 crore  
8000 ac

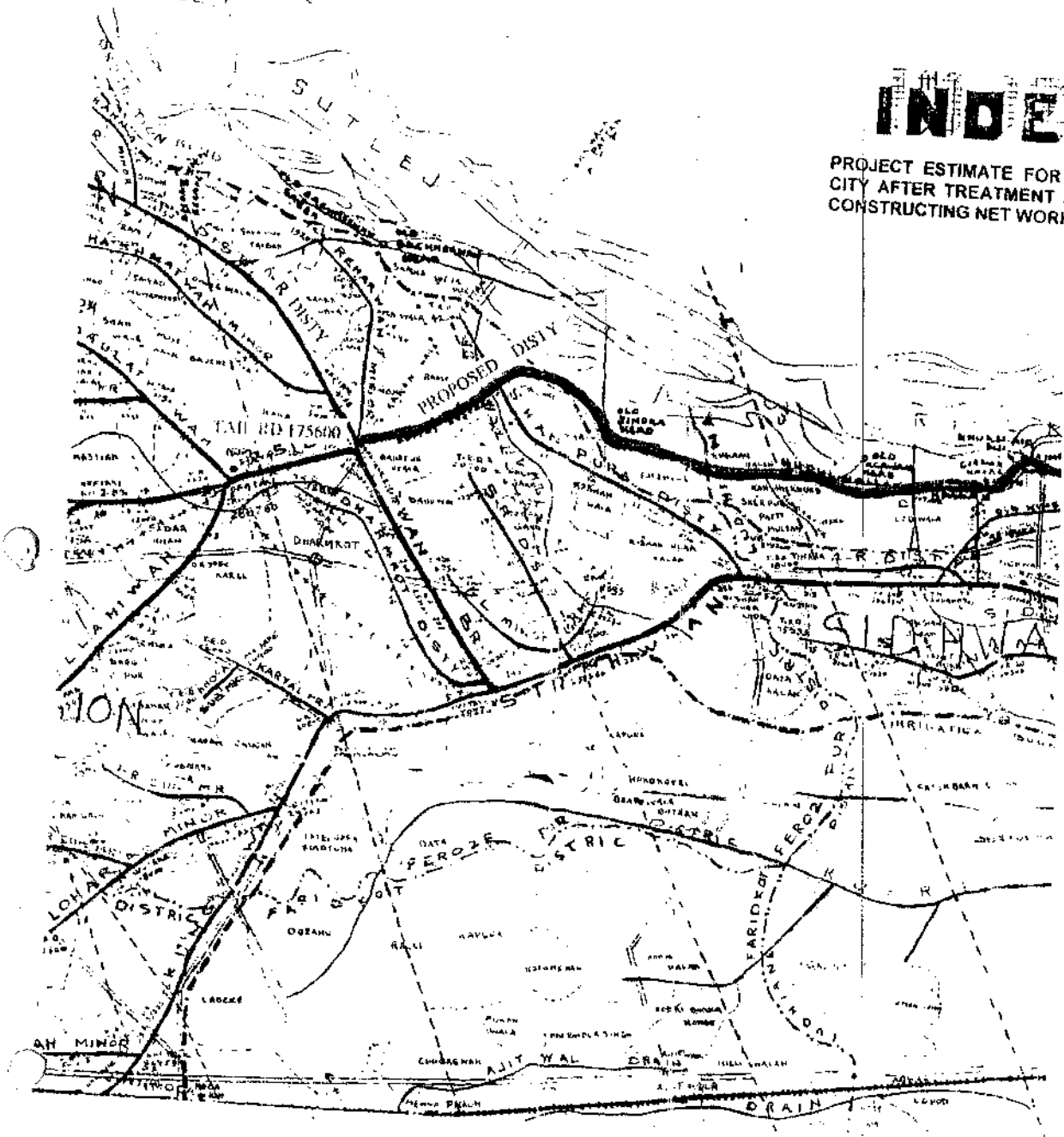
Dasuya = 26.47 lac received  
and utilised  
work in progress. 100 acs - 130 ha

- STA Under construction

SIDHWA

INDEX

PROJECT ESTIMATE FOR  
CITY AFTER TREATMENT /  
CONSTRUCTING NET WORK



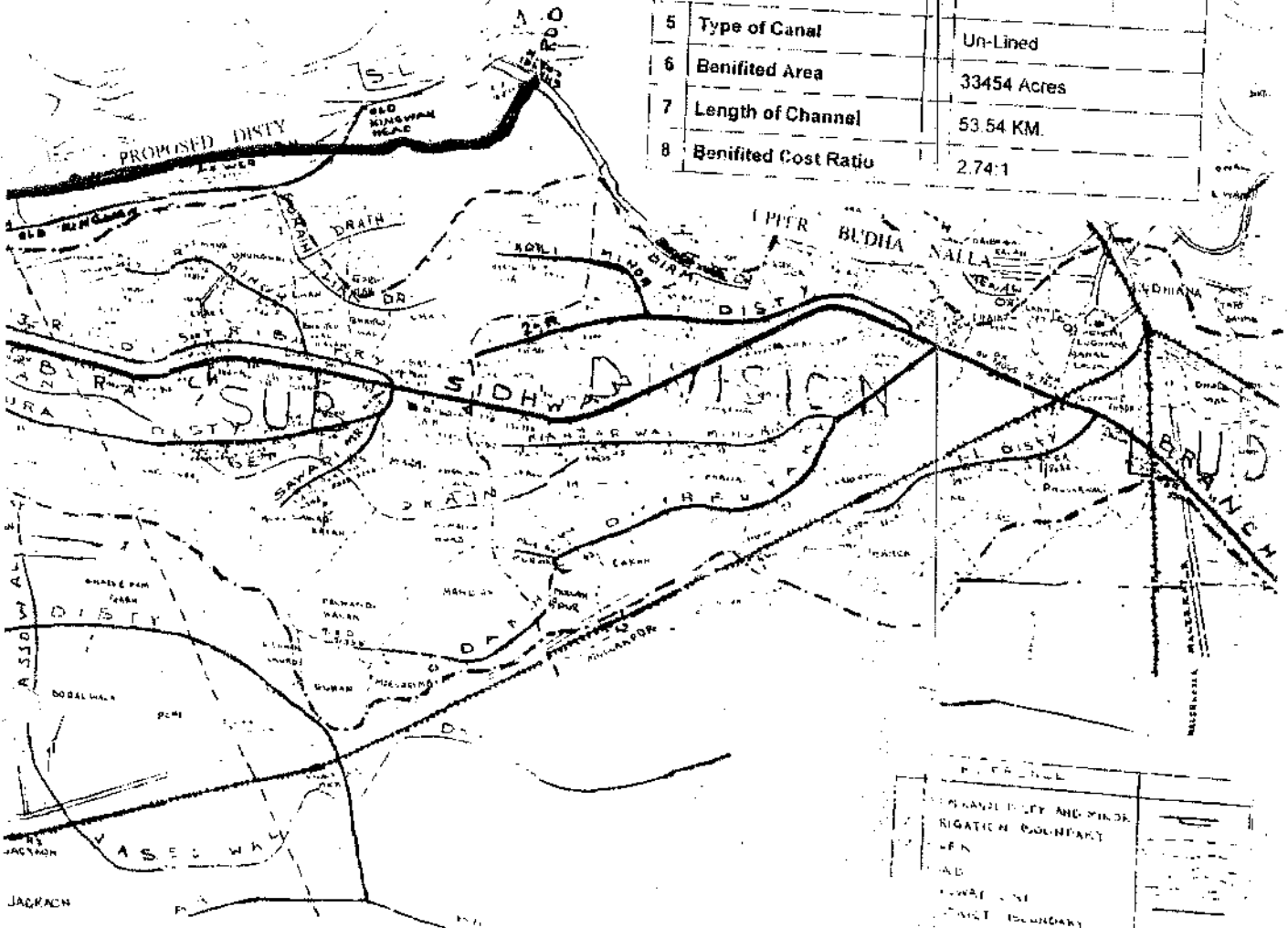
**DIVISION  
LUDHIANA**

**PLAN**

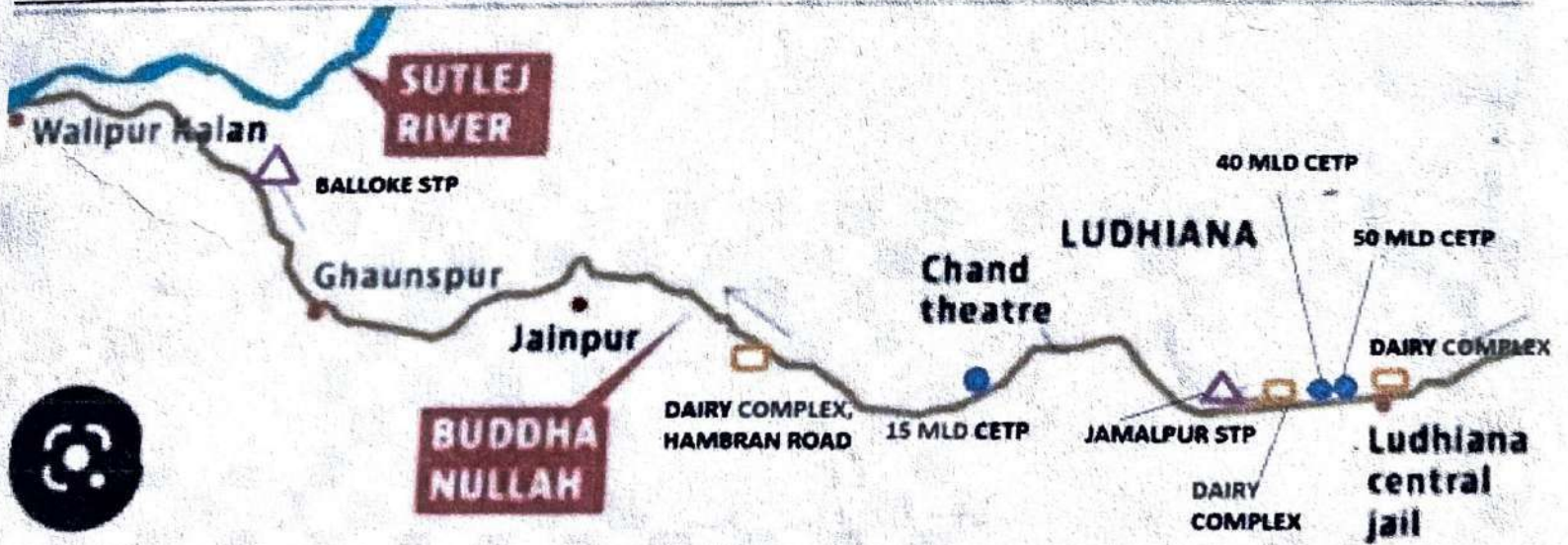
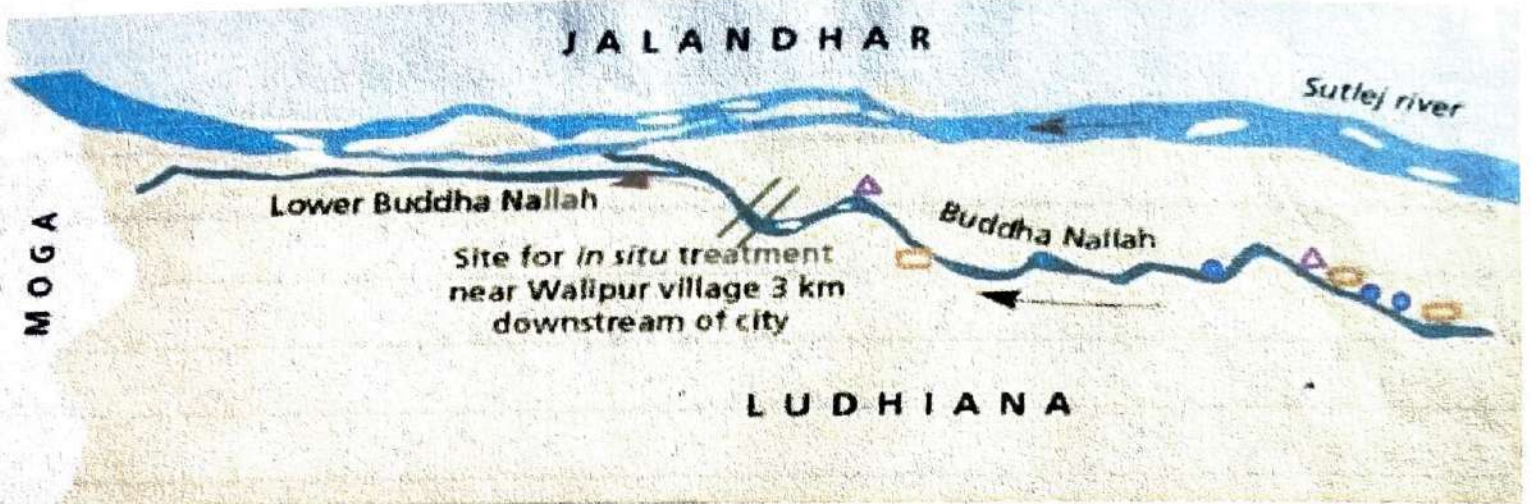
DOMESTIC SEWERAGE OF LUDHIANA  
STP THROUGH BUDHA NALLA AND BY  
DISTRIBUTORY/WATER COURSE.

**SALIENT FEATURE**

1	Total Cost of the estimate	Rs. 120.28 Lac
2	Location of Project Area	In the Districts Ludhiana Moga & Ferozapur
3	Benefited Vilalges in Nos.	35 Nos.
4	Total GA/JCA under Project	38472/33454 Acres
5	Type of Canal	Un-Lined
6	Benefited Area	33454 Acres
7	Length of Channel	53.54 KM.
8	Benefited Cost Ratio	2.74:1



---	RIGATION BOUNDARY
---	WATER LINE
---	DISTRICT BOUNDARY



**DISCHARGE POINTS**

- 15, 40 & 50 MLD CETP
- DAIRY COMPLEX
- △ STP

TRUE COPY  
ADVOCATE

*Atme*

F.No.10-92/2010-IA.III  
 Government of India  
 Ministry of Environment & Forests  
 (IA-III Division)

**ANNEXURE R - 4/2**

Paryavaran Bhawan,  
 CGO Complex, Lodhi Road,  
 New Delhi - 110 003,

Dated: 3<sup>rd</sup> May, 2013

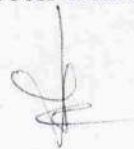
To  
 The Secretary,  
 M/s. Punjab Dyers Association,  
 Nav Ratan Complex, New Chawla Furniture,  
 Link Road, Cheema Chowk,  
 Ludhiana - 141 008, Punjab

**Subject: Environmental Clearance for the construction of Common Effluent Treatment Plant (CETP) at Village Jamalpur Awana, Panchayat Jamalpur Awana, Taluk Ludhiana East, Ludhiana District, Punjab by M/s. Punjab Dyers Association -Reg.**

This has reference to your letter no. Nil dated 04.10.2012 seeking Environmental Clearance under the Environment Impact Assessment Notification, 2006. The proposal has been appraised as per prescribed procedure in the light of provisions under the Environment Impact Assessment Notification, 2006 on the basis of the mandatory documents enclosed with the application viz., the Form-I, EIA, EMP, and the additional clarifications furnished in response to the observations of the Expert Appraisal Committee constituted by the competent authority in its meetings held on 15<sup>th</sup> -17<sup>th</sup> December, 2011, 10<sup>th</sup> - 11<sup>st</sup> May, 2012, 8<sup>th</sup> -9<sup>th</sup> November, 2012 and 18<sup>th</sup> -19<sup>th</sup> February, 2013.

2. It is interalia, noted that the proposal involves development of Common Effluent Treatment Plant (CETP) on a plot area of 32 acres at Jamalpur, Awana, Ludhiana. There are 241 dying units in 5 industrial clusters. The effluent from the industrial units will be collected through the pipeline. The treated wastewater will be used for irrigation in an area of 80,000 acres. The capacity of CETP proposed is 117 MLD. The total cost of the project is Rs. 255.85 Crores.

3. This is a Category 'B' project and since there was no SEIAA, Punjab, the project was considered by the EAC in its meeting held on 18<sup>th</sup> -20<sup>th</sup> Jan, 2011 and finalized the additional TOR, including conduct of Public Hearing. After the reconstitution of SEIAA the project was returned to SEIAA. The SEIAA has appraised the project exempting the Public Hearing and recommended for the issue of Environmental Clearance stating that the project is located within declared industrial area. As Ludhiana has been declared as one of the critically polluted areas hence, the General condition applies to the project since it is within 10 km from Ludhiana. The project has been transferred to Ministry.



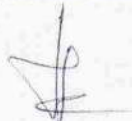
4. The Expert Appraisal Committee, after due consideration of the relevant documents submitted by the project proponent and additional clarifications furnished in response to its observations, have recommended for the grant of Environmental Clearance for the project. Accordingly, the Ministry hereby accords necessary Environmental Clearance for the above project as per the provisions of Environment Impact Assessment Notification, 2006 and its subsequent amendments, subject to strict compliance of the terms and conditions as follows:

**5. SPECIFIC CONDITIONS:**

- (i) Consent order shall be obtained from Pollution Control Board. The PCB shall ensure the treatability of Boron, Sodium Absorption Ration (SAR) and phenolic Compounds to meet the standards for agriculture use.
- (ii) There shall be no discharge into Budha nallah.
- (iii) The farmers shall be made aware that the water supplied to them is treated effluent.
- (iv) The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.
- (v) The funds earmarked for environment management plan shall be included in the budget and this shall not be diverted for any other purposes.
- (vi) Project proponent should develop green belt all along the periphery of the site with plant species that are significant and used for the pollution abatement.
- (vii) All the recommendation of the EMP shall be complied with letter and spirit. All the mitigation measures submitted in the EIA report shall be prepared in a matrix format and the compliance for each mitigation plan shall be submitted to MoEF along with half yearly compliance report to MoEF-RO.

**6. GENERAL CONDITIONS:**

- (i) The project proponent will set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.
- (ii) Full support shall be extended to the officers of this Ministry/ Regional Office at Chandigarh by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.



- (iii) A six-Monthly monitoring report shall need to be submitted by the project proponents to the Regional Office of this Ministry at Chandigarh regarding the implementation of the stipulated conditions.
- (iv) Ministry of Environment & Forests or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.
- (v) The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry.
- (vi) In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment and Forests.
- (vii) The project proponents shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.
- (viii) A copy of the clearance letter shall be marked to concerned Panchayat/local NGO, if any, from whom any suggestion/representation has been made received while processing the proposal.
- (ix) Safety provision such as bus bays, service roads intersection improvement etc., will be carried out by the project proponent. The project proponent shall provide adequate facilities as per IRC norms/guidelines.
- (x) State Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industries Center and Collector's Office/Tehsildar's office for 30 days.

7. These stipulations would be enforced among others under the provisions of Water (Prevention and Control of Pollution) Act 1974, the Air (Prevention and Control of Pollution) Act 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification 2006, including the amendments and rules made thereafter.

8. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest Conservation Act, 1980 and Wildlife (Protection) Act, 1972 etc. shall be obtained, as applicable by project proponents from the respective competent authorities.

9. The project proponent shall advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language

informing that the project has been accorded Environmental Clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen on the website of the Ministry of Environment and Forests at <http://www.envfor.nic.in>. The advertisement should be made within 10 days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional office of this Ministry at Chandigarh.


10. This Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.

11. Any appeal against this clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

12. Status of compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website.

13. The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB.

14. The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.

  
(Lalit Kapur)  
Director (IA-III)

Copy to:

1. The Secretary, Department of Environment, Government of Punjab, Chandigarh.
2. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 110 032
3. The Member Secretary, Punjab Pollution Control Board, Vatavaran Bhavan, Nabha road, Patiala-147001, Punjab.
4. The CCF, Regional Office, Ministry of Environment & Forests (NZ), Bays No. 24-25, Sector-31-A, Dakshin Marg, Chandigarh-160030.
5. IA - Division, Monitoring Cell, MoEF, New Delhi - 110003.
6. Guard file

(Lalit Kapur)  
Director (IA-III)



**TRUE COPY  
ADVOCATE**<sup>4</sup>

PDA-40 MLD CETP AT LUDHIANA, PUNJAB

**ANNEXURE R - 4/3**

**PUNJAB DYERS ASSOCIATION (PDA)**

DETAILED PROJECT REPORT FOR  
40 MLD COMMON EFFLUENT TREATMENT PLANT (CETP)  
FOR PDA FOCAL POINT AT LUDHIANA, PUNJAB STATE



*Approved*  
*Rheema*  
Asst. Prof.,  
Civil Engg. Deptt.,  
GND Engg. College,

*At -* *19/11/15*  
Dean (T & C)  
Guru Nanak Dev. Engg. College,  
Ludhiana. (K15)



Doc. No. : PDA-40MLDCETP-DR-01

PDA-40 MLD CETP AT LUDHIANA, PUNJAB

**VOLUME - I**

DETAILED PROJECT REPORT FOR  
40 MLD COMMON EFFLUENT TREATMENT PLANT (CETP)  
FOR PDA FOCAL POINT AT LUDHIANA, PUNJAB STATE

*[Handwritten signature]*

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

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*Approved*  
*Chern*  
Asstt. Prof.  
Civil Engg. Deptt.,  
G.N.D. Engg. College,  
Ludhiana.

*At - 18/11/15*  
Dean (T & C)  
Guru Nanak Dev. Engg. College,  
Ludhiana. (K15)



## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

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Approved  
 Asst. Prof.  
 Civil Engg. Deptt.,  
 G.N.D. Engg. College,  
 Ludhiana.

19/5/15  
 Dean (T & C)  
 Guru Nanak Dev. Engg. College,  
 Ludhiana. (K15)



## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

### EXECUTIVE SUMMARY

Ludhiana is one of the largest cities of Punjab. The city and surrounding areas are heavily industrialized, with several textile units located in the area. The general slope of the city is from East to West. The Municipal Corporation area of Ludhiana city is 159.37 Km<sup>2</sup>.

Figure No: 1 PUNJAB District Map



#### List of industrial of clusters

- a) Tajpur Road
- b) Focal Point
- c) Industrial Area-A
- d) Rahon Road
- e) Scattered Area

Most of the industries are textile processing units, mainly dyeing and printing units. The textile units generate large quantities of effluent, which are required to be treated and disposed in compliance with applicable regulations. The units are organized under the Punjab Dyers Association (PDA), which was formed to look after the common interests of the units. The PDA plans to implement a textile CETP project to collect and treat the effluents from the textile units.

### **PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

Focal Point Module of the Punjab Dyers Association (PDA) proposes to develop 40 Million Litre per Day (MLD) Common Effluent Treatment Plant (CETP) on Turnkey basis which will cater to effluents generated by the industrial clusters located at Focal Point Area.

The effluent from various textile industries is collected through gravity pipe line to the CETP. The PDA inter-alia stipulated stringent limits for the effluent quality. Notably, the treated effluent is to have BOD 10 mg/l, COD 100mg/l, TSS 50 mg/l etc.

Land allocated by government of Punjab

#### **1.1 Treatment Technology Selection:**

The treatment technology, the entire plant and process need to be sufficiently advanced, to treat the raw effluent to meet the stringent effluent quality limits specified by PDA. Therefore, it is proposed to subject the effluent to physio-chemical treatment followed by a biological treatment by SBR technology

#### **1.2 Project Cost:**

The total estimated project cost for EPC part (capital cost- engineering, procurement and commissioning part) is **Rupees 70cr**

O&M cost in rupees per treated effluent is **Rs. 7.921 /m3. (Without escalation)**

#### **Contract Period**

The total Contract Period shall be as follows:

- Construction Period & trial run: 18 Months

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****CHAPTER 1****INTRODUCTION****1.1 General**

Ludhiana is one of Punjab's largest and most industrialized cities. The city is presently experiencing rapid growth. Ludhiana was founded on a ridge of Budha Nallah, which once was a bed of the River Sutlej. The urban area lies between 30° 51'10" to 30° 57'20"N latitude and 75°46'00" to 75°56'20"E longitude. The average height above mean sea level is 247 m. Earlier the urban area was confined to the south of Budha Nallah but due to growth and increase in population, the low lying area between Budha Nallah and the River Sutlej is also fast becoming urbanized. Ludhiana has about 625 large and medium scale industrial units and 41,116 small scale industrial units. Electroplating, heat treatment, cycle manufacturing, hosiery, machine parts, vegetable oils, dyeing and chemical industries are the major industry categories. These units, though spread all over the city are mainly concentrated in Industrial Area A, Industrial Area B, Focal Point along both sides of GT Road towards Ambala and Jalandhar, Gaushalla Road, Ludhiana-Chandigarh Road and Rahon Road.

The predominant sector of industries in Ludhiana is the hosiery and textile sector. These industries use a large quantity of chemicals and dyes. There are around 250 textile units in and around Ludhiana. Ludhiana occupies an important position in the industrial map of Punjab and India. It is one of the principal producers of woolen and acrylic knitwear, apart from cotton and blended fibre to produce hosiery, knitwear and various readymade garments. Ludhiana has nearly 21% of all the industries and contributes more than 28% of the output of Punjab. The textile industry in Ludhiana makes use of both natural fibres like cotton, silk and wool and artificial fibres such as polyester, acrylic and blended fibres. These industries produce T-Shirts, Shirts, Pullovers, Cardigans, Track suits, Socks, Jersey, Sweat shirts, Gloves, Shawls, Inner wear, etc.

The textile industries are located in the following clusters:

- a) Tajpur Road
- b) Focal Point
- c) Industrial Area-A
- d) Rahon Road
- e) Scattered Area

The majority of small scale industries require a Common Effluent Treatment Plant (CETP) to treat the effluents being generated and discharged to fully comply with the Punjab Pollution

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Control Board (PPCB) norms. Punjab Dyers Association (PDA) is a Public Company incorporated on 25 March 2010. It is classified as Indian Non-Government Company and is registered at Registrar of Companies, Chandigarh. Its registered address is C/o Shree Balaji Processors, Kaka Road, Opp. Central Jail, Tajpur Road, LUDHIANA - 141109, Punjab INDIA.

One of the objectives of PDA is to pursue and undertake the construction, operation and maintenance of Common Effluent Treatment Plants (CETPs) for textile effluent of Ludhiana Region.

Most of the textile units operating in Ludhiana region are mechanized and carry out job work such as scouring, mercerizing, bleaching, dyeing, finishing, printing etc. The mechanical equipment commonly used in the textile industrial area are winches, soft Flow Machines, cabinet, jet dyeing machines, top Dyeing, cone dyeing, drum dyeing, hank dyeing, jiggers, etc.

Figure- 1  
Typical production process



### 1.2 Environmental situation at Ludhiana

Concern about the environment has come about on account of the degradation of the environment due to man's ever-increasing misuse and neglect. The environmental awareness has increased in the last few decades and the need for its systematic monitoring and management is well understood.

It is well known that every consumer product has an impact on the environment. However an average consumer does not know which product has less or more impact than the other one. Any product, which is made, used or disposed of in a way that significantly reduces the harm it would otherwise cause to the environment, could be considered as an ecofriendly product. Gradually, consumers in India are taking lead in prompting manufacturers to adopt clean technologies to produce eco-friendly products. The textile industry is shared between natural fibers such as wool, silk, linen, cotton and hemp, and man-made ones, the most common of which are synthetic fibers (polyamide, acrylic) made from petrochemicals. The synthetic fibers are becoming the textile industry's miracle solution. At each of the six stages typically required to make a garment, the negative impacts on the environment are as numerous as they are varied. Spinning, weaving and industrial manufacture undermine air quality. Dyeing and printing consume vast amounts of water and chemicals, and contaminate the effluent that requires treatment.

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

The latest report released by World Health Organization establishes Ludhiana as the most polluted city in the country. Earlier, it was included in a list of 43 critically polluted cities when the Union ministry of environment and forests imposed a ban on industrial pollution in January 2010. The ban was lifted in February 2011 but the ministry instructed the industry to prepare an action plan to keep a check on pollution.

Immediate under the high bank along the old coast of the Sutlej runs a perennial stream called Budha Nallah. Budha Nallah is an open drain passing through the city with a total length of 14 km. The drain is being used for discharge of rain water, sewerage disposal as well as discharge of Industrial affluent. As a result, it has been severely polluted leading to hazardous consequences for the city residents. The pollution of Budha Nallah has adversely affected the quality of surface water as well as ground water of the major part of the city and its environs.

Budha Nallah which once used to be a fresh water stream now carries the industrial and domestic waste water of Ludhiana city. Studies have revealed that Budha Nallah which was once the bed of river Satluj and a fresh water perennial stream used to have 56 types of fish species prior to 1965. The number fell to 18 in 1970 when Municipal Corporation started throwing domestic water into the Nallah. By the year 1984 number came down to merely 4 species due to increased level of pollution. As of now Budha Nallah has neither fish nor plankton left indicating highest level of water pollution. The loss of all its wealth can be attributed to existence of high toxicity of water involving heavy metals like Chromium, Nickel and Zinc, Dyes and Cyanide.

As per the action plan of Govt. of Punjab, Budha Nallah is to be cleaned and make the environment pollution free. PCB insisted all the textile/dyeing and electroplating units in and around Ludhiana city should set up treatment plants individually or collectively to reduce the impact of pollution due to the contaminated industrial water

### 1.3 Environmental effects of textile processes

Textile processing industry is characterized not only by the large volume of water required for various unit operations but also by the variety of chemicals used for various processes. There is a long sequence of wet processing stages requiring inputs of water, chemical and energy and generating wastes at each stage. The other feature of this industry, which is a backbone of fashion garment, is large variation in demand of type, pattern and colour combination of fabric resulting into significant fluctuation in waste generation volume and load. Textile processing generates many waste streams, including liquid, gaseous and solid wastes, some of which may be hazardous. The nature of the waste generated depends on the type of textile facility, the processes and technologies being operated, and the types of

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

fibres and chemicals used. The overview on the amounts of waste generated within the textile processes are summarized below.

**Table-1 Amounts of Waste generated within the textile processes**

Sl No	Process	Purpose	Pollutants in Waste water
1	De-sizing	To remove starch and other sizing material.	High organic content, unreacted starch, BOD, COD and solids
2	scouring	To remove impurities such as wax, fatty acids, oils etc., present in the fabric	High pH, alkalinity, BOD, COD and solids
3	Mercerizing	To add luster and to improve dye absorption	High pH, alkalinity and solids
4	Bleaching	Whitening	High TDS, bleaching liquor, alkalinity, solids, organic matter
5	Dyeing	Main purpose of dyeing is to anchor dyestuff molecule to the textile fibres	Presence of un-fixed dye stuff, high TDS, Colour, Toxicity, BOD and COD
6	Printing	To print patterns	High BOD and COD
7	Finishing	To dry before packing	High BOD and COD

The main environmental problems associated with textile industry are typically those associated with water body pollution caused by the discharge of untreated effluents. Other environmental issues of equal importance are air emission, notably Volatile Organic Compounds (VOC)'s and excessive noise or odor as well as workspace safety.

### 1.4 About PDA

Punjab Dyers Association (PDA) is a Public Company incorporated on 25 March 2010. It is classified as Indian Non-Government Company and is registered at Registrar of Companies, Chandigarh Punjab Dyers Association's Corporate Identification Number (CIN) is U93000PB2010NPL033734, and Registration Number is 033734. Its registered address is C/o Shree Balaji Processors, Kaka Road, Opp. Central Jail, Tajpur Road, LUDHIANA - 141109, Punjab INDIA.

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The Executive members of the Punjab Dyers Association are Mr. Surinder Goel , Mr. Vijay Mehtani , Mr. Harveender Singh. Mr. Kesho Ram, Mr. Rahul Verma , Mr. Devinder Kumar Rampai, Mr. Pawan Kumat Tangri, Mr Kuldeep Singh Atwal

The PDA plans to implement a textile CETP project to collect and treat the effluents from the textile units. It is planned to construct CETPs in three phases. Focal Point Module of the Punjab Dyers Association (PDA) proposes to develop phase 2, 40 Million Litre per Day (MLD) Common Effluent Treatment Plant (CETP) on Turnkey basis which will cater to effluents generated by the industrial clusters located at Focal Point Area.

**Table No. 2 List of Industries in Focal Point Module (PDA)**

SI No.	Name	Address
1	Amar Industries	C-256, Phase-8, Focal point, Ludhiana.
2	Aggarwal Scientific Dyers	D-324, Phase-8, Focal point, Ludhiana.
3	Arora Knit Fab Pvt. Ltd.	HA -51, Phase-6, Focal point, Ludhiana.
4	Ashoka Dyeing and Finishing Mill	C-133, Phase-5, Focal point, Ludhiana.
5	Bhasin & Company	E-751-752, Phase-8, Focal Point, Ludhiana.
6	Centex Fabrics	D-217, Phase-7, Focal Point, Ludhiana.
7	Dhawan Processors	E-669-670, Phase-8, Focal Point, Ludhiana.
8	Davinder Sandhu Implex Pvt. Ltd	D-340, Phase-8, Focal Point, Ludhiana.
9	Deluxe Fabrics Ltd	HB 1-2, Phase-6, Focal Point, Ludhiana.
10	Damesh Weaving & Dyeing Mill Pvt.	C-193-A, Phase-6, Focal Point, Ludhiana.
11	Essar Coating (India) Ltd	E-486, Phase-6, Focal Point, Ludhiana.
12	Fahrenheit Clothing India Pvt. Ltd.	C-190, Phase-7, Focal Point, Ludhiana.
13	Geesum (India) Inc.	D-263, Phase-8, Focal Point, Ludhiana.
14	Ganapati Industries	D-355, Phase-8, Focal Point, Ludhiana.
15	Golden Enterprises	H-24, Phase-6, Focal Point, Ludhiana.
16	Gulab Dyeing	D-83, Phase-5, Focal Point, Ludhiana.
17	Gianchand Sushilkumar	D-337, Phase-8, Focal Point, Ludhiana.

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18	Jarnail Dyeing House	E-669, Phase-8, Focal Point, Ludhiana.
19	Kudu Knit Process Pvt. Ltd	C-219, Phase-8, Focal Point, Ludhiana.
20	Lovely Fabrics & Processor	B-55, Phase-5, Focal Point, Ludhiana.
21	Megaline Enterprises	D-292, Phase-8, Focal Point, Ludhiana.
22	Mahesh Dyeing House	D- 287, Phase-8, Focal Point, Ludhiana.
23	Maharaja Processors	D-139, Phase-5, Focal Point, Ludhiana.
24	Mahadev Processors	E-276, Phase-8, Focal Point, Ludhiana.
25	M.K. Aggarwal Hosity Pvt. Ltd.	C-234 & D-338, Phase-8, Focal Point, Ludhiana.
26	Navdurga Dyeing House	C-695, Phase-8, Focal Point, Ludhiana.
27	Navayug Laminates	C-124, Phase-5, Focal Point, Ludhiana.
28	PVM Enterprises Pvt Ltd	D-341-342, Phase-8, Focal Point, Ludhiana.
29	Perfect Dyeing And Finishing Mill Pvt Ltd	C-237, Phase-8, Focal Point, Ludhiana.
30	Raghav industries	D-283, Phase-8, Focal Point, Ludhiana.
31	Duby dyeing	D-277A, Phase-8, Focal Point, Ludhiana.
32	Rainbow scientific dyers	C-211, Phase-8, Focal Point, Ludhiana.
33	Ramal industries	D-265-266, Phase-8, Focal Point, Ludhiana.
34	Raghav Woolen Mills	HB-14, Phase-6, Focal Point, Ludhiana.
35	Raghav Woolen Mills Pvt Ltd	D-168, Phase-6, Focal Point, Ludhiana.
36	R.N. Knit Fab	E-449, Phase-6, Focal Point, Ludhiana.
37	Ramson Processors	E-506, Phase-6, Focal Point, Ludhiana.
38	Rosy Spinning Mill Pvt Ltd	D-79, Phase-5, Focal Point, Ludhiana.
39	Raunaq Fabrics Pvt Ltd	C-30, Phase-2, Focal Point, Ludhiana.
40	Sky Clothing	D-351, Phase-8, Focal Point, Ludhiana.
41	Sanya Fabrics	F-155-156-157, Phase-8, Focal Point, Ludhiana.
42	S.K. Kohli Textiles	E-664, Phase-8, Focal Point, Ludhiana.
43	S.K. Udyog	D-256, Phase-8, Focal Point, Ludhiana.
44	Shyam Texchem (P) Ltd	D-228, Phase-7, Focal Point, Ludhiana.
45	Suvidhi Cotsyn	C-189/A, Phase-6, Focal Point, Ludhiana.

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46	Sachi Processor Pvt Ltd	A-3, Phase-5, Focal Point, Ludhiana.
47	Shivam Processors	A-3, Phase-5, Focal Point, Ludhiana
48	Super Texprocessors	D-121-122, Phase-5, Focal Point, Ludhiana
49	Sanjeev Dyeing Work	C-225, Phase-8, Focal Point, Ludhiana
50	Sailopal Dyeing House	D-96, Phase-5, Focal Point, Ludhiana
51	Shiva Dyeing And Finishing Mills	E-97, Phase-4, Focal Point, Ludhiana
52	Sangam Weavers Pvt Lts	D-43D44 57-58, Phase-5, Focal Point, Ludhiana
53	Triveni Knits Pvt Ltd	D-264, Phase-8, Focal Point, Ludhiana
54	Vikas ACS Industries	E-745, Phase-8, Focal Point, Ludhiana
55	V.H. Scientific Dyers	D-291, Phase-8, Focal Point, Ludhiana

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

### CHAPTER 2

#### 2.1 Process Design Basis and Treated Effluent Quality

The design, construction, erection, commissioning & performance of 40 MLD average capacity Combined effluent treatment plant (CETP) for focal point module based on sequential batch reactor technology (SBR technology).

The treatment plant scheme shall broadly comprise of coagulation, flocculation, clarification, biological process and disinfection for delivering treated effluent of specified physical, chemical, and bacteriological quality.

The quantity of effluent generated by each industry

**Table No. 3 Quantity of effluent generated by each industry**

Sl No.	Name	Discharge (m3)
1	Amar Industries	500
2	Aggarwal Scientific Dyers	150
3	Arora Knit Fab Pvt. Ltd.	1000
4	Ashoka Dyeing and Finishing Mill	1000
5	Bhasin & Company	200
6	Centex Fabrics	200
7	Dhawan Processors	500
8	Davinder Sandhu Implex Pvt. Ltd	1000
9	Deluxe Fabrics Ltd	1000
10	Damesh Weaving & Dyeing Mill Pvt. Ltd	1200
11	Essar Coating (India) Ltd	500
12	Fahrenheit Clothing India Pvt. Ltd.	100
13	Geesum (India) Inc.	1000
14	Ganapati Industries	800
15	Golden Enterprises	500
16	Gulab Dyeing	1000

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17	Gianchand Sushilkumar	100
18	Jarnail Dyeing House	375
19	Kudu Knit Process Pvt. Ltd	1000
20	Lovely Fabrics & Processor	600
21	Megaline Enterprises	800
22	Mahesh Dyeing House	500
23	Maharaja Processors	600
24	Mahadev Processors	300
25	M.K. Aggarwal Hosiery Pvt. Ltd.	500
26	Navdurga Dyeing House	300
27	Navayug Laminates	500
28	PVM Enterprises Pvt Ltd	1000
29	Perfect Dyeing And Finishing Mill Pvt Ltd	450
30	Raghav industries	500
31	Duby dyeing	400
32	Rainbow scientific dyers	900
33	Ramal industries	1400
34	Raghav Woolen Mills	500
35	Raghav Woolen Mills Pvt Ltd	200
36	R.N. Knit Fab	50
37	Ramson Processors	300
38	Rosy Spinning Mill Pvt Ltd	300
39	Raunag Fabrics Pvt Ltd	250
40	Sky Clothing	800
41	Sanya Fabrics	300
42	S.K. Kohli Textiles	400
43	S.K. Udyog	300
44	Shyam Texchem (P) Ltd	500

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

45	Suvidhi Cotsyn	1500
46	Sachi Processor Pvt Ltd	1200
47	Shivam Processors	500
48	Super Texprocessors	700
49	Sanjeev Dyeing Work	1000
50	Sailopal Dyeing House	200
51	Shiva Dyeing And Finishing Mills	500
52	Sangam Weavers Pvt Lts	1000
53	Triveni Knits Pvt Ltd	400
54	Vikas ACS Industries	300
55	V.H. Scientific Dyers	100
	Total effluent quantity per day	33075m <sup>3</sup>
	With 20% flow variation	39690m <sup>3</sup>
	Design flow considered for CETP	40000m <sup>3</sup>

The design basis considered for the CETP is as given under:

1. Average capacity for design of CETP : 40 MLD
2. Peak factor: **1.5 considered**, as the textile process involve lots of batch operations and the effluent generation will not uniform in a particular day
3. Peak factor after equalization tank: 1.0
4. The raw & treated effluent qualities considered for the design of the CETP are given below.

**Table No: 4-Raw effluent characteristics**

S. No	Parameter	Values
1	pH	5.0-10.0
2	Oil & Grease	15 mg/L
3	Colour	500 Co.pt
4.	Biological Oxygen Demand (BOD <sub>5</sub> )	500 mg/L

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

5	Chemical Oxygen Demand (COD)	1000 mg/L
6	Total Suspended Solids (TSS)	500 mg/L
7	Total Kjeldahl Nitrogen (TKN)	35 mg/L
8	Total phosphorus ( TP)	2 mg/L
9	Total dissolved solids	1900 mg/L

Table No: 5-Treated Effluent characteristics at the outlet of Chlorine contact tank

S.no	Parameters	Values
1	pH	5.5- 9.0
2	Oil and Grease	≤ 10 mg/l
3	Colour	≤ 100 Hazen units
4	Biological Oxygen Demand(BOD5)	≤ 10 mg/l
5	Chemical Oxygen Demand(COD)	≤ 100 mg/l
6	Total Suspended Solids (TSS)	≤ 50 mg/l
7	Total nitrogen (TN) as NO <sub>3</sub>	≤ 50 mg/l
8	Total phosphorus (TP)	≤ 5 mg/l
9	Ammonical nitrogen	≤ 2 mg/l
10	Total dissolved solids	Inlet TDS +/- 10 % variation
11	Bio assay test	90% (90% survival of fish in 100% of effluent during 96 hrs.)

## 2.2 TREATMENT METHODOLOGY AND TREATMENT EFFICIENCY

The main CETP plant Process for the plants shall consist of the minimum unit processes The Treatment methodology opted for CETP is listed as below

- ✓ Raw effluent collection and coarse screening
- ✓ Raw effluent pumping system
- ✓ Inlet chamber/Stilling chamber
- ✓ Fine screening

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

- ✓ Parshall flume
- ✓ Equalization tank
- ✓ Chemical dosing (Lime, FeSO<sub>4</sub>, Poly)
- ✓ Sludge Blanket Clarifier/Clariflocculator
- ✓ pH Correction Tank-I & II
- ✓ Chemical dosing (Acid and Urea & DAP provision)
- ✓ SBR Basin
- ✓ Disinfection (Chlorination) Units comprising Chlorination contact Tank
- ✓ Gas chlorination system
- ✓ Bio sludge thickener, Thickened sludge collection sump, Dewatering polymer dosing system and Bio-Centrifuge.
- ✓ Primary sludge collection sump, Dewatering polymer dosing system and Belt filter press for primary sludge

### 2.3 PROCESS CALCULATION

Process calculation is enclosed in exhibit-1.

### 2.4 TREATMENT PHILOSOPHY

#### 2.4.1 Effluent collection and conveyance:

The effluent from various textile mills i.e. 55 industries from focal point cluster is collected through gravity RCC NP2/NP3 pipe to receiving chamber of CETP.

#### 2.4.2 Receiving Chamber

One number of receiving chamber of suitable size will receive the raw effluent. Manually operated CI Sluice Gates are provided in the upstream side of receiving chamber. The function of the Receiving Chamber is to reduce the incoming velocity. ✓

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****2.4.3 Coarse Screen Channels**

Separate channel with Mechanical coarse bar screen and separate channel with Manual (standby) Coarse Bar Screens provided in upstream side of raw effluent sump for removal of floating and oversized material coming with the effluent. Each Coarse Screen Channel has been designed for Peak Flow of 60 MLD at maximum approach velocity of 1.2 m/s . The Coarse Bar Screens screen out most of the floating and oversized material more than 20 mm size such as plastic debris, weeds, paper, cloth, rags etc. which could foul the downstream treatment units. The clear opening shall be 20 mm for both Mechanical and Manual Coarse Screen. The Mechanical and Manual Screens has been made of SS 316. The Coarse Bar Screen shall be inclined Bar Screen of stainless steel flats. Conveyor Belt and Chute arrangement provided above the top of the Screen Channels to take the screenings. Screenings dropped from Chute shall be collected in a wheel Burrow. Manually operated CI Sluice Gates has been provided at the upstream and downstream ends to regulate the flow.

**2.4.4 Raw effluent (wet well) sump & Pumping station**

Raw effluent sump has been considered as circular shape and has been designed for 10 minutes retention time of peak flow (60 MLD). 5 Nos. of Horizontal Non Clog Centrifugal pumps (4 Working + 1 Standby) of capacity 15 MLD each has been provided in the dry well pump house to cater the pumping requirements.

Knife gate valves have been considered in suction and delivery line of each pump. NRV is considered on delivery line of each pump.

Suitable capacity of Electrical Hoist has been considered for the lifting of Pumps / Maintenance in the dry well pump house.

**2.4.5 Rising main from Raw Effluent Pump House to Elevated Inlet Chamber/stilling chamber of CETP**

The suitable size of transmission pipeline (CI / DI K9) considered for carrying peak flow discharge from pumping station to the inlet / stilling chamber of CETP.

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****2.4.6 Fine Screen Channels**

One Mechanical Fine Screens (Working) and one Manual Fine Screen (Standby) shall be provided at the upstream of equalization tank. Each fine screen channel shall be designed for peak flow of 60 MLD at maximum approach velocity of 1.2 m/s. The entire construction shall be in R.C.C. The screens screen out most of the floating and oversized material more than 6 mm size such as plastic debris, weeds, paper, cloth, rags etc. which could foul the downstream treatment units. The clear opening shall be 6 mm for mechanical & 10 mm for manual. The screens shall be made up of SS. Conveyor Belt and Chute arrangement provided above the top of the screen channels to take the screenings. Screenings dropped from Chute shall be collected in a wheel trolley. Electrically operated MS Gates shall be provided at the upstream and downstream ends to isolate the screen.

**2.4.7 Parshall flume**

Screened effluent from fine screen shall be taken to Parshall Flume along with ultrasonic level meter to measure effluent flow that is going to CETP. The length of the channel shall be as per site condition. Capacity of the channel should be such that it can carry peak flow.

**2.4.8 Equalization Tank**

The screened effluent from fine screen then collected into an Equalization Tank. Here, the collected effluent will be mixed thoroughly through submersible mixer to ensure homogeneous characteristics of effluent to the downstream units.

The capacity of the tank should be kept such that the detention time in the tank shall be minimum 12 hours of average flow. Pumping machinery shall be designed for 40 MLD average flows to transfer the effluent from equalization tank to pH correction tank-I for further treatment.

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****2.4.9 pH Correction tank – 1**

The homogenous effluent from Equalization tank shall be corrected for pH and will be fed to downstream process for removal of suspended solids. Hydrated Lime will be used to correct the pH. A pH indicator shall be installed inside the tank to ensure the neutralized effluent is taking primary treatment. Mechanical submersible mixers shall be provided in the tank for mixing the lime with effluents inside the tank.

**2.4.10 Sludge Blanket Clarifiers/Clariflocculator**

Sludge Blanket Clarifier/clariflocculator for removal of Suspended Solids, which also reduces the organic loads associated to suspended impurities.

The Sludge Blanket Clarifier/clariflocculator unit has an in-built Flash Mixer (Draft Tube) and Flocculator. Inside, a high recirculation rate of settled solids maintained to seed the incoming effluent and reduce the reaction time for floc formation & and also sludge will be thickened to a high concentration of 2 to 3%.

Chemical solutions - ferrous Sulphate and poly electrolyte solution would be added in the Sludge blanket clarifier with the help of dosing pumps attached to chemical dosing tanks. Chemical mixing in dosing tanks shall be done through Agitators.

In Sludge Blanket Clarifier/Clariflocculator where sludge settles at bottom and the clear effluent collected through orifice & flows into pH correction Tank-II. The sludge from the clarifier will be withdrawn into chemical sludge sump with the help of valve provided at the bottom of sludge blanket clarifier. From the chemical sludge sump, primary sludge will be pumped to dewatering unit.

**2.4.11 Chemical Sludge Sump & Sludge Pumps**

Chemical sludge sump shall be provided to collect the sludge from Sludge blanket clarifier. 2 nos. (1W+1S) Pumps shall be attached with the chemical sludge sump to primary sludge to dewatering units. Chemical sludge sump shall be RCC framed brick masonry structure. The

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

pump shall be of screw type suitable for handling biochemical sludge of 2 – 3% solids consistency.

**2.4.12 pH Correction tank – 2**

The outlet effluents from Sludge Blanket Clarifier shall be corrected for pH and will be fed to SBR Basins for biological treatment of effluents. Hydrochloric acid shall be used to correct the pH. A pH indicator shall be installed inside the tank to ensure the neutralized effluent is taking biological treatment. Suitable mechanical submersible mixer shall be provided in the tank for mixing the acid with effluents inside the tank. The tank shall be designed for Average Flow.

**2.4.13 Biological Treatment Units Based on Sequential Batch Reactor (SBR) Technology**

After primary treatment, the effluent shall be taken into 4 numbers of SBR Basins. These 4 SBR Basins shall work in sequence and influent flow is controlled using motorized Sluice Gates. SBR Basins shall be complete with Air Blowers, Diffusers, Grid Piping, Return Activated Sludge (RAS) Pumps, Surplus Activated Sludge (SAS) Pumps, Stainless Steel Decanters, Auto Valves and PLC etc. All cycles will be automatically controlled using PLC.

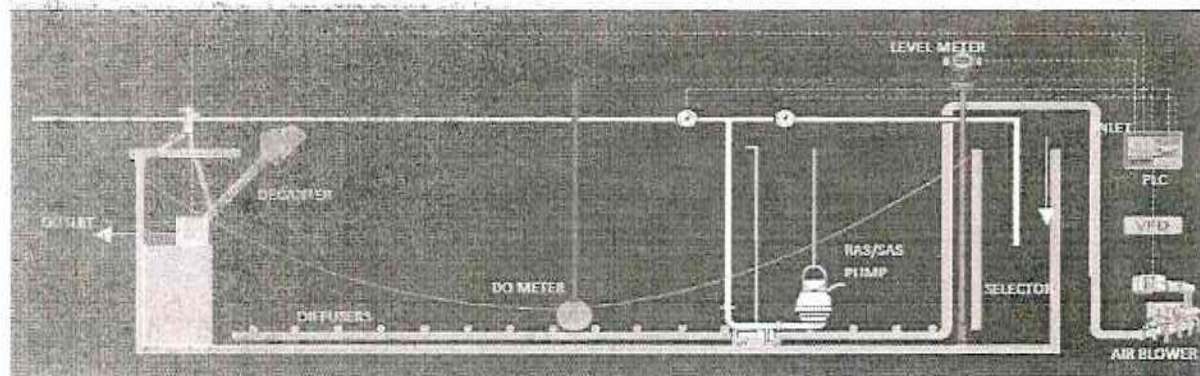
SBR is a Cyclic Activated Sludge process. It provides highest treatment efficiency possible in a single – step biological process. The SBR is operated in a batch reactor mode this eliminates all the inefficiencies of the continuous process. A batch reactor is a perfect reactor, which ensures 100% treatment. Four modules shall be provided to ensure continuous treatment. The complete process takes place in a single reactor, within which all biological treatment steps take place sequentially.

No additional Settling Unit, Secondary Clarifier is required. The complete biological treatment is divided into Cycles with each Cycle is of 2.5 – 4 hrs duration, during which all treatment steps take place. A basic Cycle comprises of the following phases which take place independently in sequence to constitute a Cycle and then gets repeated:

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

- Fill / Aeration (F/A)
- Settling (S)
- Decanting (D)

Figure- 2 SBR Process

**2.4.13 (i) Fill / Aeration (F/A):**

This refers to the process loading time in the cycle. Loading occurs outside of the designated settle and decant sequences during which time influent is received into the basin through an admixture (selector) reactor. Biomass from the main aeration zone is admixed with influent load in the biological selector hydrolysis reactor. Complete-mix reaction conditions prevail in the main reaction zone during this variable volume operational sequence, being typical of a fed-batch reactor operation. Aeration can be regulated to maximize co-current nitrification-de-nitrification that takes place and to insure the aerobic uptake of phosphorus previously released during anaerobic operation. The process typically employs a nominally constant rate of recycle from the main reaction zone that is pumped to a zone at the inlet end of the admixture reactor.

**2.4.13 (ii) Settling (S):**

The air is turned off and influent to the reactor basin is stopped. During the first five minutes of this sequence, the residual mixing energy within the reaction basin is consumed.

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

At this time gentle bio-flocculation initially takes place, a solids-liquid interface forms under partial hindered settling conditions. Rising sludge does not occur.

**2.4.13 (iii) Decanting (D):**

This sequence is an extension of the settle sequence and is also totally quiescent whereby a moving weir lowering decanter is used to take the operating liquid level in the basin to its designated bottom water level reference position. In this way treated effluent is withdrawn from a subsurface position under laminar flow conditions. This allows optimum removal over the decant depth without entrainment of settled solids or floating debris. Upon completion of the supernatant liquid removal sequence, the moving weir decanter returns to its rest position located out of liquid. Completion of the decant sequence terminates the designated use of the basin as a stratified, interrupted inflow reactor. Typically, fill sequencing begins while the decanter is travelling to its upper rest position.

Excess sludge will be pumped intermittently with the help of SAS Pumps. This can be taken further for Bio Sludge Dewatering system. Treated effluent from Sequential Batch Reactor (SBR) Units collected in Chlorination Tank for its disinfection.

**2.4.14 Return Sludge Pumps (RAS Pumps)**

Return sludge pumps shall be provided for each basin. The pump shall be of submersible type suitable for handling biological sludge. Capacity and heads shall be decided based on SBR Process requirements. Each SBR Process basin shall be provided with suitable lifting arrangements to facilitate lifting of pump, if required for maintenance.

**2.4.15 Excess Sludge Pumps (SAS Pumps)**

Excess sludge at a consistency level of 0.8% will be pumped intermittently with the help of SAS Pumps. This can be taken further for Sludge Dewatering or Drying as per process requirement. Excess sludge pumps shall be provided for each basin. The pump shall be of

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

submersible type suitable for handling biological sludge. Capacity and heads shall be decided based on SBR Process requirements.

Excess bio sludge will be pumped to dewatering unit say centrifuge.

Air Blowers will be provided to supply required air as per biological process demand. Air blowers are controlled through PLC as per OUR based control logic. Variable Frequency Drive (VFD) is provided to blower to ensure proper control of air supply there by optimizing the power consumption.

**2.4.16 Biological Sludge Sump & Pumps**

Biological Sludge sump shall be provided to collect the sludge from Bio sludge thickener. There shall be gate valves on discharge sludge pipe of sludge sump. Diameter of valve shall be same as that of sludge pipe.

2nos. (1W+1S) Pumps shall be attached with the biological sludge sump. This shall be RCC framed brick masonry structure

**2.4.17 Chlorination Units**

Treated Effluent from Sequential Batch Reactor (SBR) will be collected in a Chlorine contact tank (CCT) by RCC channel/pipe where disinfectant (chlorine gas) will be added for disinfection at suitable dosing rate. Baffle walls shall be provided in CCT to facilitate hydraulic mixing of treated Effluent with chlorine gas. Final treated effluent will be suitably disposed off.

**2.4.18 Chlorine House**

The gaseous chlorine solution shall be using chlorine tonner injected through ejector after mixing with water for prevention/control of algae and bacterial growth in the system. Ultimate chlorine solution shall be dosed in chlorine contact tank through gas chlorination system. The system shall consist 2X100% capacity chlorinators with associated ejectors and all safety equipment. Chlorine leak detection and absorption system is provided for

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

absorption and neutralizing the leaked chlorine from the chlorination system. Chlorination plant shall be located in a separate chlorination building.

**2.4.19 Sludge Dewatering Units**

Chemical Sludge from Sludge Blanket Clarifiers collected into a Chemical Sludge Sump. Then sludge shall be then pumped to Belt Filter Press (BFP) for further dewatering of sludge. Dewatering polymer (DWPE) will be dosed online prior to BFP. Filtrate from BFP will be collected and recycled to the pH correction tank-I. The sludge in the form of wet cake will be collected, stored, dried and disposed.

Bio sludge from SBR shall be pumped to Bio sludge thickener to thicken the sludge up to sludge consistency of 3 to 4%. Then thickened sludge will be collected from bottom of sludge thickener & will be taken to Dewatering unit for further treatment. Supernatant from sludge thickener will be re-circulated to CETP.

Bio Centrifuge shall be provided for further dewatering of thickened sludge from sludge thickener through Centrifuge Feed Pumps. DWPE shall be dosed online prior to Centrifuge. Both chemical sludge sump & Thickened bio sludge sump provided with submersible mixer to provide content of sump in suspension.

Concentrate from Centrifuge collected and recycled to the pH correction I. The sludge in the form of wet cake will be collected, stored, dried and disposed. The dewatered sludge shall have a minimum solids concentration of 20% or more

The DWPE Dosing System shall include one Solution Preparation Tank and one Solution Dosing Tank equipped with Slow Speed Mixers and metering pumps for both BFP & centrifuge system.

Part of Treated effluent will be used for chemical solution preparation.

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****2.4.20 Chemical Handling System**

An integrated and centralized system shall be envisaged for chemical solutions preparation & storage in Chemical House (two storied building) and dosing at various points. Chemical dosing system shall be suitably located on the first floor of the chemical house while provision for dry chemicals storage shall be made on the ground floor. Bulk storage of liquid chemicals such as HCl shall be provided outside of chemical house.

All chemical dosing system shall include one Solution Preparation Tank and one Solution Dosing Tank equipped with Slow Speed Mixers and metering pump type Positive Displacement.

All dosing tanks shall be designed for hydraulic retention time of min. 12 hrs operations. A monorail or EOT crane shall be provided for facilitating handling of chemicals.

List of chemical dosing system provided at chemical house.

- ✓ Acid dosing system
- ✓ Lime dosing system
- ✓ Ferrous Sulphate dosing system
- ✓ Poly dosing system
- ✓ DWPE for centrifuge & BFP

Nutrient dosing system provision is also envisaged.

**2.5 Factors governing biological treatment****2.5.1 MLSS**

Mixed liquor suspended solids (MLSS) would be maintained around 4500 to 5500 mg/l for effective treatment. In the initial stages of the operation of the plant the sludge excretion

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would be minimal in order to increase the solids concentration to the desired limit. At this stage, a small quantity of MLSS is wasted to maintain sufficient bacterial growth.

**2.5.2 MLVSS**

Mixed liquor volatile suspended solids (MLVSS) are the active cells present in the activated sludge. The MLVSS is expected to be 60-70 % of MLSS in a well maintained process.

**2.5.3 Sludge volume index (SVI)**

In the case of textile treatment the value of SVI that ranges between 150 and 180 may be considered normal. Sometimes a value of 200 can be reached without causing bulking problem. Despite this, the SVI value has to be controlled, and it is important to check, microscopically regarding the presence of filamentous bacteria and monitor the system carefully.

**2.5.4 Dissolved oxygen (DO)**

An on-line dissolved oxygen meter shall be provided for the aeration tank. This provides online measurement and also a means for monitoring air supply to the aeration tank. Most of the organic substances in the effluent such as dyes, detergents and starch, are synthetic substances. A DO level of about 2-3 ppm in the aeration tank is considered satisfactory. Accordingly, the operation of the blowers could be controlled through the PLC.

**2.5.5 Food-to-microorganisms ratio (F/M)**

By considering all the factors regarding BOD and also by considering the quantity of bacteria used, the value that shall result in this case from this process ranges from 0.03 and 0.06.

**2.5.6 Sludge age**

The sludge age in this treatment ranges between 60 and 150 days producing a mineralized and well stabilized sludge.

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****2.5.7 Total Dissolved Solids (TDS)**

This parameter may vary depending on the type of textile effluent. This can create imbalances to the bacteria, which impacts the cellular membrane and is forced to adapt continuous salinity changes in order to survive. All this limits the bacterial efficiency and thus the outlet parameters quality is compromised. An equalization tank helps maintain a more or less uniform TDS concentration that enters biological system.

**2.5.8 Temperature:**

The temperature of textile effluent varies according to the type of operation. Temperature can reach 70 to 80 deg C in the case of dye effluent discharge from soft flow machines, cabinet dyeing machines, winches, cone dyeing machines, jiggers, etc.,. Discharges from the other operations are under ambient conditions. At temperatures higher than 38 deg C, the process efficiency reduces. The equalization tank homogenizes the effluent and counters the effect of temperature peaks. However, cooling tower platforms will be provided on the aeration tanks so that at a later date cooling tower can be installed if necessary.

**2.5.9 Bio Chemical Oxygen Demand and Chemical Oxygen Demand (BOD/COD)**

BOD and COD are measures of the organic & inorganic contamination present in raw effluent. COD and BOD are reduced in the bio- aeration tank by bacterial action. The efficiency of the biological system depends on tank size, the oxygen present, oxygen transfer efficiency, temperature, pH and bacterial colony.

**2.5.10 Mineralization**

Mineralization of sludge takes place in processes with high sludge age. Mineralization is the transformation of the organic substance present to inorganic salts like NO<sub>3</sub>, SO<sub>4</sub>, PO<sub>4</sub>, etc. The phenomenon takes place in proposed treatment scheme where the sludge quantity produced is low on account of the high residence time, low F/M ratio and low volumetric

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load i.e., kg BOD5/m<sup>3</sup> and many factors some of which are tank size, the oxygen present, oxygen transfer efficiency, temperature, pH and bacterial colony.

**2.6 ELECTRICAL AND INSTRUMENTATION:****2.6.1 SCOPE OF WORK**

- |   |   |        |
|---|---|--------|
| 1. 22kV Overhead Transmission line  | - | 0.5 km |
| 2. 22KV HT Switchboard  | - | 1 Set  |
| 3. 22/0.433kV, Dyn11, Dry Indoor Power Transformer  | - | 2 Nos. |
| 4. 415V Diesel Generator with AMF panel   | - | 1 Set  |
| 5. 415V LT Main PMCC Panel  | - | 1 Set  |
| 6. 415V LT APFC Panel   | - | 2 Set  |
| 7. 22kV HT Power Cables   | - | 1 Lot  |
| 8. LT Power & Control Cables  | - | 1 Lot  |
| 9. Cable Trays and Accessories  | - | 1 Lot  |
| 10. Illumination System   | - | 1 Lot  |
| 11. Earthing & Lightning Protection System  | - | 1 Lot  |
| 12. Other Miscellaneous items   | - | 1 Lot  |
| 13. Non-Redundant PLC/SCADA   |   |        |
| 14. field instruments, analysers  |   |        |
| 15. Graphic screens to show the status of equipment and process parameters of the respective section. |   |        |
| 16. Facility to Pop –up alarms.   |   |        |

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17. Facility to accept, acknowledge and reset the alarms.
18. Facility to display alarm history in real time.
19. Facility to display trends for key process parameters like, Level, Flow, pressure data in real time.
20. Facility to display periodic process reports, showing the quantity & operating time of all key equipment.
21. The complete automation system is defined with following parameters
  - 1) Display of Status and the operation of CETP from SCADA screen
  - 2) Display and processing of alarms
  - 3) Display of reports
  - 4) Automatic Sequential operation or logic of operation of CETP

## 2.7 CIVIL UNITS LIST

S. No.	Unit Name	Unit's Sizes	QTY/ Nos.	MOC
1	Receiving chamber	3 m L x 3 m W x 2.5 m LD + 0.5 m FB	1	RCC with coal tar epoxy lining
2	Coarse Bar Screen	5 m L x 1.2 m W x 1.25 m LD + 0.5 m FB	2	RCC with coal tar epoxy lining
3	Raw Effluent sump	15 m dia x 2.5 m LD x 0.5 m FB	1	RCC with coal tar epoxy lining
4	Inlet chamber	2.7 m L x 2.7 m W x 3 m LD + 0.5 m FB	1	RCC with coal tar epoxy lining
5	Fine screens	4 m L x 1 m W x 1.25 m LD + 0.3 m FB	2	RCC with coal tar epoxy lining
6	Par shall flume	10 m L x 1 m W x 0.725 m LD + 0.3 m FB	1	RCC with coal tar epoxy lining
7	Equalization tank	58 m L x 58 m W x 6.0 m LD + 0.5 m FB	1	RCC with coal tar epoxy lining
8	pH correction tank -I	13.7 m L x 13.7 m W x 3 m LD + 0.5 m FB	1	RCC with coal tar epoxy lining
9	Sludge blanket clarifier/Clariflocculator	Size: 31 m dia x 5 m SWD + 0.5 m FB	1	RCC with coal tar epoxy lining
10	pH correction tank -II	7.5 m L x 7.5 m W x 2.5 m LD + 0.5 m FB	1	RCC with coal tar epoxy lining

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11	SBR tank (including selector zone)	35.40 m Lx 35.40 m W x 6 m LD + 0.5 m FB ( Including selector zone)	4	Epoxy painting
12	Chlorine contact tank	20 m L x 14.5 m W x 3.0 m LD + 0.3 m FB	1	Epoxy painting
13	Treated effluent channel	400 to 500 m Lx 1m W	1	Epoxy painting
14	Bio sludge thickener	14.3 m Dia x 3 m SWD + 0.5m FB	1	Epoxy painting
15	Bio thickened sludge sump	4.0 m L x 4.0 m W x 3 m LD+ 0.5 m FB	1	Epoxy painting
16	Chemical sludge sump	7.7 m L x 7.7 m W x 4 m LD+ 0.5 m FB	1	Epoxy painting
17	Raw effluent pump house	As required	1	Brick masonry with RCC frame
18	Equalization tank pump shed	As required	1	Brick masonry with RCC frame
19	Chemical sludge feed pump house	As required	1	Brick masonry with RCC frame
20	Chlorination building	As required	1	Brick masonry with RCC frame
21	Dewatering building	As required	1	Brick masonry with RCC frame
22	Chemical house	As required	1	Brick masonry with RCC frame
23	Admin building	As required	1	Brick masonry with RCC frame

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24	HT substation	As required	1	Brick masonry
25	DG	As required	1	Brick masonry
26	Sludge storage area	Min 625 Sqm	1	Brick masonry
27	Security Cabin	As required	1	Brick masonry with RCC frame

### 2.8 MECHANICAL EQUIPMENT LIST

S. No.	Unit Name	Type	Description	QTY/ Nos.	MOC
<b>Raw Effluent Pumping station</b>					
1	Coarse Bar Screen	Manual	Design flow :2500 m3/hr, Mechanical : 20 mm clear opening, Type: Incll-raked	1(Working )	Chamber: RCC, screen: SS 316
1a	Coarse Bar Screen	Mechanical	Design flow :2500 m3/hr, Mechanical : 20 mm clear opening, Screen type: Incll-raked ,	1(Stand by)	Chamber: RCC, screen: SS 316
2	Belt conveyor for Coarse Bar Screen		As per manufacturer design	1	
3	Raw Effluent transfer pumps	Horizontal Centrifugal -Non clog	Capacity: 625 m3/hr @ suitable head, Solid passage size: 100 mm	5(4W+1S)	Casing: CI, Impeller: SS 316
4	Valves for Raw Effluent Pumps	Knife Gate Valves	Provided in Pump Suction and Discharge Line	10	Body - CI , Gate - SS 304 & Spindle -

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					SS 410
		Check Valves	Provided in Pump Discharge Line	5	Body - CS, Internals - SS 304
5	Gate	Sluice Gate	Provided in up steam & down Steam of the Receiving chamber and Screen Channel.	5	CI
6	Dewatering Pump	Dry well Submersible Pump	Provided in Raw Effluent Pumping station (Dry well)	2(1W + 1S)	Casing - CI, Impeller - SS 316
<b>CETP</b>					
1	Fine screens	Manual	Design flow :2500 m3/hr, Mechanical : 10 mm clear opening, Type: Incl-raked	1	Chamber: RCC, screen: SS
1a	Fine screens	Mechanical,	Design flow :2500 m3/hr, Mechanical : 6 mm clear opening, Screen type: Incl-raked ,	1	Chamber: RCC, screen: SS
2	Belt conveyor for fine screen		As per manufacturer standard	1	
3	Mixer in Equalization tank	Submersible	To suit size of tank: 58 m L x 58 m W x 6. m LD+ 0.5	1 lot	SS 316

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			m FB		
4	Equalized Effluent transfer pumps	Horizontal Centrifugal -Non clog	Capacity: 555.4 m <sup>3</sup> /hr @ 8 mwc, Solid passage size: 100 mm	4(3W+1S)	Casing: CI, Impeller: SS 316
5	Mixer in pH correction tank -I	Submersible	To suit size of tank : 13.7 m L x 13.7 m W x 3 m LD+ 0.5 mFB	1	SS 316
6	Dewatering pumps	-	10 m <sup>3</sup> /hr @ 15 mwc	1	Casing: CI & Impeller: SS 316
7	Sludge blanket clarifier/Clariflocculator		Size: 31 m x 5 m SWD +0.5 m FB	1	Flash mixer: SS Flocculation Paddles: SS Scraper: SS
8	Mixer in pH correction tank -II	Submersible	To suit size of tank : 7.5 m L x 7.5 m W x 2.5 m LD+ 0.5 mFB	1	SS 316
9	SBR	As per manufacturer std.,	Total design capacity : 40 MLD	1	Decanter: SS
10	RAS pumps	Submersible	Capacity : 835 m <sup>3</sup> /hr @ 5 mwc	4W	Casing. : SS 316 Impeller. : SS

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

					316
11	SAS pumps	Submersible	Capacity : 120 m3/hr @ 10 mwc ,	4W	Casing. : SS 316 Impeller. : SS 316
12	Air Blower for Aeration	Centrifugal type Turbo/Rotors	Capacity: 4400 Nm3/hr @ 0.7 kg/cm2	6 (4W+2S)	Casing : Aluminum alloy Impeller: Aluminum alloy
13	Diffuser with Air grid in SBR tank	Fine bubble	EPDM	1lot	EPDM/PU/Silicon membrane
14	Chlorination plant	Gas chlorination-Vacuum	10 kg/hr	2(1W+1S)	-
15	Chlorine Tonners		930 kg	1 lot	
16	Chlorine booster pumps	Horizontal Centrifugal	As required	2(1W+1S)	Casing: CI, Impeller: SS
	<b>Sludge System</b>				

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

17	Bio sludge thickener	Sludge Thickener Mechanism - Central driven-Picket Fence.	14.3 m Dia x 3 m SWD + 0.5m FB	1	Tank : RCC, Sludge scrapper : SS
18	Mixer - Bio thickened sludge sump	Submersible mixer	To suit size of tank : 4.0 m L x 4.0 m W x 3 m LD+ 0.5 mFB	1	SS 316
19	Centrifuge feed pump	Positive displacement - Screw Pump	10 m <sup>3</sup> /hr @ 20 mwc,	2(1W+1S)	Casing : CI IS : 210 Gr FG260, Shaft : SS 316
20	Centrifuge for Bio sludge	Solid bowl Centrifuge	Feed flow : 10 m <sup>3</sup> /hr , min dewatered sludge solids consistency: 20 %, hours of operation: 16 hrs/d	2(1W+1S)	Frame & casing : SS 316
21	Mixer - chemical sludge sump	Submersible mixer	To suit size of tank : 7.7 m L x 7.7 m W x 4 m LD+ 0.5 mFB	1	SS 316

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

22	Chemical sludge Belt filter press feed pump	Positive displacement - Screw Pump	36 m <sup>3</sup> /hr. @ 15 mwc	2(1W+1S)	Casing : CI IS : 210 Gr FG260, Shaft : SS 316
23	Filter press	Belt filter press	Capacity : 36 m <sup>3</sup> /hr. ,Outlet sludge consistency: min 25 % hours of operation: 16 hrs./d	2(1W+1S)	Frame /Casing: SS 316
	Wash water pumps for BFP		In built with the system/as per manufacture	-	
	Air compressor for BFP		In built with the system/as per manufacture	-	
	<b>Chemical Systems</b>				
24	Ferrous Sulphate Dosing Pumps	Type; Positive Displacement	Capacity :1000 LPH	2(1W+1S)	Pump :SS 304 /PP Dosing tank : RCC
25	Agitators for Ferrous Sulphate dosing tank	Turbine	Electrically Driven. Tank Size = 2.2 m L x2.2 m W x 2 m LD +0.5 m FB ,	2	SS 316

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26	Lime Dosing Pumps	Centrifugal type /Screw type	Capacity : 1850 LPH	2(1W+1S)	Pump :SS 304 /PP Dosing tank : RCC
27	Agitators for Lime dosing tank	Turbine	Electrically Driven. Tank Size = 3.2 m L x 3.2 m W x 2 m LD +0.5 m FB	2	SS 316
28	Poly Dosing Pumps	Type; Positive Displacement	Capacity : 3500 LPH	2(1W+1S)	Pump :SS 304 /PP Dosing tank : RCC
29	Agitators for Poly dosing tank	Turbine	Electrically Driven. Tank Size = 4.5 m L x 4.5 m W x 2 m LD +0.5 m FB	2	SS 316
30	Poly Dosing Pumps for sludge thickener	Type; Positive Displacement	Capacity : 100 LPH	2(1W+1S)	SS 304 /PP
31	DWPE Dosing Pumps – Bio sludge	Type; Positive Displacement	Cap=700 LPH	2(1W+1S)	SS 304 /PP
32	DWPE Dosing Pumps - Primary(i.e chemical)	Type; Positive Displacement	Cap=2600 LPH	2(1W+1S)	SS 304 /PP

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

33	Agitators for DWPE dosing tank - Bio	Turbine	Electrically Driven. Tank Size = 2 m L x 2 m W x 2 m LD +0.5 m FB	2	SS 316
34	Agitators for DWPE dosing tank - Primary	Turbine	Electrically Driven. Tank Size = 3.7 m L x 3.7 m W x 2 m LD +0.5 m FB	2	SS 316
34	Urea Dosing Pumps	Type; Positive Displacement	Cap=200 LPH,	2(1W+1S)	SS 304 /PP
35	Agitators for Urea dosing tank	Turbine	Electrically Driven. Tank Size = 1 m L x 1 m W x 2 m LD +0.5 m FB , Gear Operated	2	SS 316
36	DAP Dosing Pumps	Type; Positive Displacement	Cap=350 LPH,	2(1W+1S)	SS 304 /PP
37	Agitators for DAP dosing tank	Turbine	Electrically Driven. Tank Size = 1.3 m L x 1.3 m W x 2 m LD +0.5 m FB , Gear Operated	2	SS 316
38	Acid dosing pump	Type; Positive Displacement	Capacity :100 LPH,	2(1W+1S)	PP/PTFE/Eq.

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

39	Acid dosing tank	Closed	Tank : 0.8 m dia x 2 m LD+ 0.5 m FB	2	HDPE/FRP /Eq.
40	Bulk acid storage tank with Fume absorber	Vertical	As required	1	FRP /MSRL
41	Bulk acid transfer pump	Non API pumps ,	15 m <sup>3</sup> /hr @ 15 mwc,	2(1W+1S)	C: PP , I: PP
42	Safety Equipment's required in chlorination building		Residual chlorine testing kit /First aid box, eye wash fountain and Safety shower, canisters	1 lot	
<b>MISCELLANEOUS</b>					
43	Electric Hoist with monorail in equalization pump house		1.5 MT, Lift: 5 m ,	1	MS
44	Electric Hoist with monorail in air blower		1 MT, Lift: 5 m ,	1	MS
45	Electric Hoist with monorail in chlorination		3 MT, lift: 5 m,	1	MS
46	EOT crane with monorail in chemical handling		3 MT, lift: 9 m,	1	MS

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	area				
47	Electric Hoist with monorail in dewatering building		3 MT, lift: 5 m,	1	MS
48	Electric Hoist with monorail in sludge pump house.		1 MT, lift: 5 m,	1	MS
49	Air conditioned in control room		As required		-
50	Lab equipment's			1 lot	
51	Ventilation		As required		
52	Overhead tank ( admin building)	-	5 m <sup>3</sup> , Sinter Tank	1	
53	Weigh bridge	-	min 20 MT	1	
54	Electric Hoist in Raw effluent pump house		Provided in Raw effluent Pump house to lift the pump & accessories	1	As per Standards & code.
55	HVAC		Provided as per the		As per Standards &

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

			requirements	code.
56	Fire Extinguishers	Portable	Provided as per the requirements	As per Standards & code.

**2.9 Other Internal Facilities**

- 1) Internal Road
- 2) Storm water drainage
- 3) Pathway
- 4) Green field development
- 5) Laboratory facilities
- 6) Administrative building
- 7) Security cabins
- 8) Drinking water facilities
- 9) Boundary wall
- 10) Street lightning

**2.10 List of Laboratory Equipment's**

Sl	Description	Quantity
1	Analytical Balance	1
2	Autoclave	1
3	Chlorine Comparator.	1
4	Colony Counters.	1
5	Demineralizer.	1
6	Dissolved Oxygen Sampler.	1
7	Drying Oven (hot air).	1
8	Fume Cup Boards. :	1
9	Hot Plates. :	1

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10	Incubator 20 o C (BOD)	1
11	Incubator 30 o C (Bacteriological) :	1
12	Magnetic Stirrers. : 1 No.	1
13	Microscope, Binocular with oil immersion & movable stage counting cell.	1
14	Membrane Filter Assembly.	1
15	Muffle Furnace. :	1
16	Turbidity Meter :	1
17	PH meter with reference & spare electrodes. :	1
18	PH Portable. :	1
19	Refrigerator	1
20	Sedgwick Rafter funnels. :	1
21	Sludge sampler. :	1
22	Air Conditioners (1.5 to 2T).	2

1	Oil free Diaphragm type vacuum cum pressure pump improved model. Free air displacement 55 lit/min. pressure 44 psi complete (1/2 HP motor)	1	
2	Laboratory thermometer Mercury in glass yellow back, range		
	10 to 500 C	2	
	10 to 1100 C	2	
3	Digital pH meter electronic indicator, model 101 E	1	
4	Portable pen type digital pH meter range 0-14 pH.	1	
5	Sox let Extraction Apparatus with six Hot plates operation, with individual sun Vic energy regulator control, indicator light, maximum surface temperature : 3500 C with horizontal rods and gut keys	2	
6	Digital Display electronic hand held stop watch with extra facility for day date and time reading 1/100 second.	1	
7	Digital fully automatic electronically controlled BOD incubator with digital indicators cum controllers temp. range 5-60 c, accuracy 0.5 c. volume: 285 liters with working space 58 x 52 x 95 (cm), with three removable and adjustable shelves, stainless steel chamber. It should be supplied with the voltage stabilizer	1	
8	Water still complete from inside & outside made of stainless steel sheet for pyrogen free distilled water, complete with self-ejecting type heating elements, wall hanging arrangements, plug and cords outputs 4 l/h.	1	

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9	Laboratory report stand rectangular heavy type with rod, base size – 7 x 5" duly painted	3	
10	Pipette stand plastic	1	
11	Set of clamp and boss head made of brass	2	
12	Burette clamp festered type made of brass	3	
13	Stainless steel tongs	2	
	6 inch	2	
	10 inch	2	
14	Asbestos hand gloves size 14	2	
15	Bottle cleaning brush Nylon	4	
16	1.5 ton capacity window type air conditioner for conference room complete with voltage stabilizes to match the capacity of AC.	2	
<b>Chemicals, Laboratory Glassware</b>			
1	Gooch crucibles disc Dia, 40mm, porosity G-3, Borosil R 50ml	2	
2	Vacuum flask i.e. filtration flask capacity 500ml. With side tubular Borosil R.	2	
3	Evaporating dishes	50	
4	Desiccators large with cover size 250mm Borosil R.	1	
5	Buchner funnel capacity 80 ml, disc Dia 40mm, porosity G-3	2	
6	Measuring cylinder graduated Borosil R		
	1000 ml capacity	2	
	500 ml capacity	4	
	100 ml capacity	6	
7	Burette with straight bore stop cock Borosil R		
	100ml capacity	2	
	50 ml capacity.	2	
8	Conical flask Borosil R		
	1000 ml capacity	2	
	500 ml capacity	10	
	100 ml capacity	15	
9	Volumetric flask		
	1000 ml capacity	4	
	500 ml capacity	8	
	100 ml capacity	8	
10	Reflux flask i.e COD flask capacity 250ml with B-24 joining Borosil	12	

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11	Volumetric pipettes i.e. Bulb pipette Borosil R		
	50 ml capacity	2	
	20 ml capacity	2	
	10 ml capacity	2	
	ml capacity	2	
	2 ml capacity	2	
12	Serological pipettes i.e. graduated pipette Borosil R.		
	25 ml capacity	2	
	10 ml capacity	4	
	ml capacity	4	
13	Beaker Borosil R		
	1000 ml capacity	2	
	500 ml capacity	8	
	250 ml capacity	8	
	100 ml capacity	6	
	50 ml capacity	2	
14	Alien condenser length 400mm with B-24 cone & socket Borosil	12	
15	Imhoff cones Borosil R		
	Sediment sharp tip	2	
	Sediment Blunt tip	1	
16	Kjeldahl apparatus	1	
17	Plastic filter funnel Dia 4	1	
	Filter funnel Dia 4 Borosil R.	8	
18	Lanoline solution. (Glaxo 5 lit.)	3	
19	Wash bottle polythene filled with stopper & delivery tube capacity 500 ml.	4	
20	Glass rod 8mm Dia length 12	4	
21	Glass beads	1	
22	Connecting tube T shape	2	
23	Sample bottle with screw cap. Borosil R cap. 30 ml.	10	
24	BOD bottles cap. 300 ml Borosil R	50	
25	Carriage of materials	1	
	<b>Laboratory Chemicals And Reagents</b>		
1	PH tables	10	
	PH = 4(10 tablets)	10	

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	PH = 7(10 tablets)		
2	Filter papers (12.5 cm Dia) what man make no.40(100 papers in one pocket)	10	
3	Filter papers (0.45cm) what man make 47 mm Dia (100 papers in one pocket)	8	
4	Concentrated sulphuric acid	5	
5	Mercuric Sulphate (Hg 2 SO 4)	2	
6	Ferrous Ammonium Sulphate	2	500gm
7	Potassium Dichromate (K2Cr2 O7)	4	500gm
8	Silver Sulphate (Ag2SO4)	4	25gm
9	Ferrous Sulphate (FeSO4. 6H2O)	2	500gm
10	1.10 phenanthroline Monohydrate GR.	2	5gm
11	Alkaline Pyrogallal Reagent	3	100gm
12	Hydrochloric acid (N/10) in ampules pkg.	10	AMP
13	Sodium hydroxide (N/10) in ampules pkg.	5	Ltrs.
14	Potassium Hydroxide	2	500gm
15	Potassium phosphate dibasic anhydrous	1	500gm
16	Potassium phosphate monobasic	1	500gm
17	Disodium hydrogen phosphate	1	500gm
18	Ammonium solution	2	500gm
19	Magnesium Sulphate	2	500gm
20	Calcium chloride	1	500gm
21	Ferric Chloride	1	500gm
22	Sodium Sulphate	1	500gm
23	2 Chloro 6 pyridine	1	250gm
24	Glucose reagent grade	1	500gm
25	Glucose acid reagent grade	1	250gm
26	Methylene Blue indicator solution	2	250ml
27	Phenolphthalein indicator solution	2	100ml

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****CHAPTER-3****Environmental management plan**

After the completion of the trial run, the CETP has to operate on a continuous 24 hours basis to treat all the flow conveyed to the works. All operation and maintenance activities by Contractor shall be carried out strictly in accordance with the approved plan. The objective of the treatment shall be

- Operating the plant with the design capacity maintaining the output quality;
- Keeping the down time of any equipment as low as possible but at least below the desired level;
- Maintaining all the plants, equipment and tools installed by him and making necessary, repairs etc. complete.
- Technical and administrative monitoring of the plant
- Communication and co-ordination with the adjacent plants and related agencies.

**3.1 Operation & maintenance**

The primary aim of CETP operation is the running and maintenance of the plant efficiently and economically so that the effluent from the plant meets the prescribed standards in terms of BOD/COD/SS/pH etc. laid down while discharging the effluent safely in public sewer, on land, in the water body or for recycling.

The basic requirements of successful operation and maintenance of CETP are:

- A thorough knowledge of the processes
- Proper and adequate tools
- Adequate stock of spare parts and chemicals
- Assignment of specific maintenance responsibilities to operating staff
- Systematic and periodic inspection and strict adherence to servicing schedules
- Training of all operating staff in proper operating procedures and maintenance practices
- Overall supervision of operation and maintenance schedules

### PDA-40 MLD CETP AT LUDHIANA, PUNJAB

- Good house keeping
- Proper logging of all operation/maintenance activities
- Observation of safety precautions & procedures
- Provision for water supply for drinking and other uses.

It is proposed to have two committee for monitoring the day to day operational activities of the CETP

**Technical committee-** Technical committee is for technical and administrative monitoring of the plant, such as the efficiency of the treatment, treated water quality and quantity, sludge handling & sludge dewatering system, Effluent Monitoring and testing for the member industries, manholes, sub header, pumping stations, final pumping station, monitoring the use of electricity, preventive maintenance, corrective actions etc.

**Commercial committee-** Commercial committee is mainly to look after the funding and other statutory requirements

#### 3.2 Manpower

Provided experienced managerial, technical, supervisory, laboratory, administrative and non-technical personnel and labor necessary to operate and maintain the Treatment plant & works properly, safely and efficiently on a continuous 24 hours basis for the full term of the O & M Period. The staff provided is fully capable of taking care all the activities related to the plant.

**Table No. 6 Minimum proposed manpower**

Man Power	Qualification	No
Plant manager	M tech/ME	1
Supervisor	B E /diploma	2
Operators	Diploma	4
Helper	SSC/ITI	4
Lab technician	MSc- Che	1
Security		2

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****3.3 Training**

The operation and maintenance staff should undergo training and refresher courses from time to time as to keep them conversant with the latest technological advances in the field. The staff should also be encouraged by sending them to other similar plants. They should also be provided with well-equipped library for references and also be sent for higher studies. • Basic technical education to be carried out during the final stages of the erection period of the Contract. Through literature, manuals, handouts etc. and demonstration at site and intensive on job/ off job training during commissioning and maintenance period.

**3.4 Chemical & consumables**

Various chemicals such as Coagulants, Chlorine, Polyelectrolyte, cleaning chemicals, lubricants, spares, cartridges etc. are either consumed continuously or replaced periodically to maintain the performance of the plant, will be procured and keep in the site. Sufficient stock level of these items will be maintained by contractor. Adequate covered space allocated for the storage of consumables, chemicals and spares

**3.5 Power**

The plant has been designed in such a way that the plant will consume minimum power during operation. Energy audits will be carried out in the regular intervals. The energy audit operations shall include, but not be limited to the following.

- Reducing electricity consumption by regulating equipment operation through suitable modifications to the operating schedules.
- Maintaining power factor and demand to avoid penalty
- Installing more efficient pumping equipment and following better maintenance practices for electrical installation

**3.6 Sludge**

Disposal of dewatered sludge, screening and plant residual will be done safely in Derabassi hazardous land fill site.

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****3.7 Laboratory services**

Fully equipped air conditioned laboratory facilities has been provided with trained staff. The proposed equipment list detailed in chapter 2

The following tests shall be carried out on regular basis:

1. Ph
2. Temp
3. BOD
4. COD
5. TSS
6. MLSS
7. DO
8. Residual chlorine

In addition to above any other test required by Pollution Control Board for grant of NOC shall be carried out by the contractor.

**3.8 Reporting**

Daily and monthly report will be prepared and submitted to PDA (technical committee) . The monthly reports will be submitted within first three days of the next month. These reports will form a valuable guide to better operation and serve as an important document in the event of a legal suit resulting from nuisance or danger attributed to the plant or for meeting the statutory requirements about the satisfactory performance of the plant, computers should be used for storing and compiling such voluminous information and to have easy access for prompt information when called for. This would also help in reviewing the performance of the various equipment's and plant as whole.

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****3.9 Preventive maintenance**

Full Operational Maintenance comprises the planned and regular maintenance carried out on a day-to day basis, including cleaning, lubricating, minor adjustment, together with preventive and corrective maintenance plan, for those items of plant and equipment within the treatment works which have been commissioned and made operational.

Standby maintenance comprises the planed and regular maintenance including cleaning, lubricating, periodic operation and minor adjustments of all items of plant and equipment within the treatment works which have been installed but have not yet been made operational.

The Maintenance shall carry out of in accordance with the requirements of the O & M Manual and to the approved Maintenance Plan and strictly adhere to the manufacturer's recommendations with respect to equipment maintenance, the types and grades of lubricants to be used, frequency of lubrication, adjustments to be made regularly and recommended spares to be held in store.

**3.10 Building and Site Maintenance**

The following activities shall be carried out regularly

- The full maintenance of building electrical, ventilation, plumbing and drainage installations.
- Building and housekeeping maintenance.
- Full maintenance of the site water and wastewater services, cabling and earthing system, together with the site road lighting system.
- Site maintenance including the upkeep of landscaped areas.
- The telephone installations in all buildings.
- Yearly painting work of all building pipes & other mechanical parts.

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

## CHAPTER-4

## PROJECT COST ESTIMATE

## 4.1 Cost summary

Table No: 7 Cost Summary

SR NO	WORK	AMOUNT (Rs.)
A	Design, Construction, Supply, Installation, Testing and Commissioning of 40 MLD Capacity Common Effluent Treatment Plant at Tajpur Road, Ludhiana based on Sequential Batch Reactor (SBR) technology including supply of all Material, Labour & T&P etc. complete	70,00,00,000
B	O&M of 40 MLD Capacity Common Effluent Treatment Plant at Tajpur Road, Ludhiana based on Sequential Batch Reactor (SBR) technology including supply of all material, chemicals & consumables, Power & Diesel for DG Set, sludge disposal, labour & T&P, etc. all complete in rupees per m3 of treated water	7.921

The breakup of the cost detailed in Exhibit 2 & 3

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

## Exhibit - 1

## Process calculation

## Process Calculation for SBR:

<b>1</b>	<b>DESIGN PARAMETERS</b>				
<b>1.1</b>	<b>FLOW.....</b>				
	Average Flow (Qav)	=	40	MLD	
		=	1666.67	m <sup>3</sup> /hr	
		=	0.463	m <sup>3</sup> /sec	
	Peak Flow Factor = (Qpk / Qav)	=	1.3		
	Peak Flow (Qpk)	=	40	MLD	
		=	1666.67	m <sup>3</sup> /hr	
		=	0.463	m <sup>3</sup> /sec	
<b>1.2</b>	<b>DESIGN QUALITY OF RAW SEWAGE</b>				
	BOD <sub>5</sub>	=	325	mg/l	
	COD	=	650	mg/l	
	TSS	=	50	mg/l	
	TKN (as N)	=	35	mg/l	
	TP (as PO <sub>4</sub> )	=	2	mg/l	
<b>1.3</b>	<b>DESIGN QUALITY OF TREATED SEWAGE.....</b>				
	BOD <sub>5</sub> @ 20° C	≤	10	mg/l	
	COD	≤	100	mg/l	
	TSS	≤	50	mg/l	
	NH <sub>3</sub> -N (as N)	≤	2	mg/l	
	NO <sub>3</sub> -N (as N)	≤	50	mg/l	
	TP (as PO <sub>4</sub> )	≤	5	mg/l	

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	(SWD) provided				
F	Length provided	=	35.4	m	
G	Width required = $C / (F \times E)$	=	5.89	m	
H	Width provided	=	5.9	m	
I	Volume provided = $F \times H \times E$	=	1253.16	m <sup>3</sup>	
<b>2.5</b>	<b>ACTUAL OXYGEN REQUIREMENT (AOR) CALCULATIONS</b>				
A	Volume of Sewage to be treated in day	=	40,000	m <sup>3</sup>	
B	Inlet BOD <sub>5</sub>	=	325	mg/l	
C	Outlet BOD <sub>5</sub>	=	10	mg/l	
D	BOD <sub>5</sub> removed = C - D	=	315	mg/l	
E	BOD <sub>5</sub> removed in a day = $A \times D / 1000$	=	12,600	Kg/day	
F	O <sub>2</sub> required for oxidation of BOD	=	1.36	Kg/Kg BOD	
G	O <sub>2</sub> required for oxidation of BOD = $E \times F$	=	17,136	Kg/day	I
H	Inlet TKN	=	35	mg/l	
I	Outlet NH <sub>3</sub> -N	=	2	mg/l	
J	Outlet NO <sub>3</sub> -N	=	10	mg/l	
K	Nitrogen assimilated during oxidation of BOD = $D \times 5\%$	=	16	mg/l	
L	NH <sub>3</sub> -N nitrified in a day = $H - I - K$	=	17	mg/l	
M	NH <sub>3</sub> -N nitrified in a day = $A \times L / 1000$	=	680	Kg/day	

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

N	O <sub>2</sub> required for nitrification of NH <sub>3</sub> -N	=	4.56	Kg/NH <sub>3</sub> -N	
O	O <sub>2</sub> required for nitrification of NH <sub>3</sub> -N = N x M	=	3,101	Kg/day	II
P	O <sub>2</sub> credit during de-nitrification of NO <sub>3</sub> -N	=	2.86	Kg/Kg NO <sub>3</sub> -N	
Q	Amount of NO <sub>3</sub> -N that is denitrified	=	680	Kg/day	
R	Kg of NO <sub>3</sub> -N in treated sewage	=	400	Kg/day	
S	NO <sub>3</sub> -N that is denitrified = Q - R	=	280	Kg/day	
T	NO <sub>3</sub> -N denitrified assuming 75% De-nitrification	=	210	Kg/day	
U	O <sub>2</sub> credit available during de-nitrification	=	601	Kg/day	III
V	Total O <sub>2</sub> required including O <sub>2</sub> credit during de-nitrification	=	19,636	Kg/day	
2.6	<b>STANDARD OXYGEN REQUIREMENT (SOR) CALCULATIONS</b>				
A	Actual Oxygen Transfer Rate (AOTR) under field conditions	=	19,636	Kg/day	
	As per Equation 5-55, Pg No 429, Wastewater	Treatment and Reuse, Metcalf & Eddy..... <b>Standard Oxygen</b>			

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	Engineering -			
B	<b>Transfer Rate (SOTR) in Tap Water at 200 C and Zero Dissolved Oxygen:</b> $= \text{AOTR} \div [(\beta C'_{s,T,H} - C_L) \div C_{s,20}] \times 1.024^{(T-20)}$ <b>x α x F]</b>			
	Where,			
	AOTR = Actual Oxygen Transfer Rate under field conditions	=	19,636	Kg/day
	As per Pg No 429, Wastewater Engineering - Treatment and Reuse, Metcalf & Eddy.....			
	C' <sub>s,T,H</sub> : Average Dissolved Oxygen Saturation Concentration in Clean Water in Aeration Tank at Temperature 'T' and Altitude 'H'			
	$= C_{s,T,H} \times (1/2) \times ((P_d / P_{atm,H}) + O_2/21)$			
	T = Field Temperature	=	35	°C
	H = Altitude of Site	=	244	m
	As per Equation B-2, Pg No 1738, Wastewater Engineering - Treatment and Reuse, Metcalf & Eddy.....			
	C <sub>s,T,H</sub> = Oxygen Saturation Concentration in Clean Water at Temperature 'T' and Altitude 'H':			
	$C_{s,T,H} = C_{s,T} \times \exp(-g \times M \times (z_b - z_a)) / (R \times T)$			
	Where,			
	C <sub>s,T</sub> = Oxygen Saturation Concentration in Clean Water at Temperature 'T'	=	6.93	mg/l
	g = Acceleration due to Gravity	=	9.81	m/s <sup>2</sup>
	M = Mole of Air	=	28.97	Kg/Kg-mole
	z <sub>b</sub> = Elevation (Altitude 'H')	=	244	m
	z <sub>a</sub> = Elevation (Altitude Zero)	=	0	m
	R = Universal Gas Constant	=	8,314	Nm/Kg-mole.K
	T = Temperature	=	308.15	Kelvin

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Hence, $C_{s,T,H}$	=	6.74	mg/l
As per Equation B-2, Pg No 1738, Treatment and Reuse, Wastewater Engineering - Metcalf & Eddy.....			
$P_{atm,H} = P_a \times \exp(-(g \times M \times (z_b - z_a)) / (R \times T))$			
Where,			
$P_a$ = Pressure at Zero Altitude	=	10.33	mWC
$g$ = Acceleration due to Gravity	=	9.81	$m/s^2$
$M$ = Mole of Air	=	28.97	Kg/Kg-mole
$z_b$ = Elevation (Altitude 'H')	=	244	m
$z_a$ = Elevation (Altitude Zero)	=	0	m
$R$ = Universal Gas Constant	=	8,314	Nm/Kg-mole.K
$T$ = Temperature	=	308.15	Kelvin
Hence, $P_{atm,H}$	=	10.06	

$P_d$ = Pressure at the Depth of Air Release	=	15.14	mWC
$O_t$ = Percentage Oxygen Concentration leaving Tank	=	19	
Hence, $C'_{s,T,H}$	=	8.13	mg/l
$C_t$ : Operating Oxygen Concentration	=	2	mg/l
$C_{s,20}$ : Dissolved Oxygen Saturation Concentration in Clean Water at 20° C and 1 atm	=	9.08	mg/l
$\alpha$ : Oxygen Transfer Correction Factor	=	0.65	
$\beta$ : Salinity - Surface Tension Correction Factor	=	0.95	
$F$ : Fouling Factor	=	0.9	
Hence, SOTR	=	37,316	Kg/day

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

C	No. of Basins	=	4	Nos.	
D	Standard O <sub>2</sub> required at Field Conditions per Basin = B / C	=	9,329	Kg/day/ Basin	
E	Top Water Level (TWL) in C-Tech Basins	=	6	m	
F	Bottom Water Level (BWL) in C-Tech Basins	=	4.67	m	
G	Aeration Depth	=	5.34	m	
H	Height at which Diffusers are kept	=	0.25	m	
I	Effective Aeration Depth = G - H	=	5.09	m	
J	SOTE for the above Effective Aeration Depth	=	30	%	
K	Fraction of O <sub>2</sub> in Air	=	23.18	%	
L	Specific Gravity of Air at Standard Condition	=	1.293		
M	Air required at Field Conditions per Basin	=	103,639	Nm <sup>3</sup> /da y/Basin	
N	Hours of Aeration per Basin per day	=	12	hr/day/ Basin	
O	Air required per hour per Basin = M / N	=	8,637	Nm <sup>3</sup> /hr /Basin	
P	No. of Operating Air Blowers per Basin	=	2	Nos.	
Q	Capacity of Air Blowers required = O / P	=	4,318	Nm <sup>3</sup> /hr	
R	Capacity of Air Blowers provided	=	4,400	Nm <sup>3</sup> /hr	
S	Number of Basins per set of Air Blowers	=	2	Nos.	
T	Number of Basins	=	4	Nos.	
U	Number of Operating Air Blowers = P x T / S	=	4	Nos.	
V	Number of Standby Air Blowers	=	2	Nos.	
<b>2.7</b>	<b>SLUDGE WASTING</b>				
A	Specific Sludge Yield	=	0.38	Kg/Kg BOD remove d	
B	BOD removed	=	12,600	Kg/day	

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

C	Excess Sludge to be wasted = B x A	=	4,788	Kg/day	
D	No. of Basins provided	=	4	Nos.	
E	Sludge to be Wasted per Basin = C / D	=	1,197	Kg/day	
F	No. of Cycles	=	6	Cycles/ day/ Basin	
G	Sludge to be Wasted per Cycle per Basin = E / F	=	200	Kg/day	
H	Solids Consistency in the Wasted Sludge	=	0.80%		
I	Specific gravity of sludge	=	1.05		
J	Volume of Sludge to be Wasted per Cycle per Basin = G / (H X I x 1000)	=	23.8	m <sup>3</sup>	
K	Considering Running Time pf Surplus Activated Sludge (SAS) Pump per Cycle	=	12	min	
L	Capacity of SAS Pump required= (I x 60) / J	=	118.8	m <sup>3</sup> /hr	
M	Capacity of SAS Pump provided	=	120	m <sup>3</sup> /hr	
<b>1</b>	<b>Raw effluent characteristics</b>				
	pH		5 to 10		
	BOD		500	mg/l	
	COD		1000	mg/l	
	TSS		500	mg/l	
	Oil & Grease		15	mg/l	
	TKN		35	mg/l	
	TP		2	mg/l	
	TDS		1900	mg/l	
<b>2</b>	<b>Treated effluent characteristics</b>				
	pH		5.5 to 9		
	BOD		< =10	mg/l	
	COD		<= 100	mg/l	
	TSS		<= 50	mg/l	
	Oil & Grease		< 10	mg/l	
	TN		< =50	mg/l	

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	TP	<=5	mg/l
	Ammonical nitrogen	<= 2	mg/l
<b>3</b>	<b>Design flow</b>		
	Design Average Flow	40	MLD
	Design Peak flow	60	MLD
<b>4</b>	<b>RECEIVING CHAMBER</b>		
	No of Receiving Chamber	1	Nos
	Peak flow to the Receiving Chamber(Qp)	60000	m3/d
		2500	m3/h
		0.6944	m3/s
	Detention period	30.0000	sec
	Volume of the receiving Chamber(V)	20.83333	m3
	Width of the receiving Chamber considered (W)	3.000	m
	Length of the receiving Chamber considered (L)	3	m
	Effective liquid Depth of the receiving Chamber (LD) = V/ (Wx L)	2.315	m
	Provided Liquid Depth of the receiving Chamber (LD)	2.5	m
	<b>RECEIVING CHAMBER SIZE</b>	<b>3 m( L) x 3 m (W) x 2.5 m(LD) + 0.5 FB(Min)</b>	
<b>5</b>	<b>MECHANICAL COARSE BAR SCREEN CHANNEL</b>		
	Type of Bar screen	Manual Coarse Bar Screen	
	No of Bar screen channel	1	Nos
	Peak Flow to Mechanical screen channel	2500	m3/h
	Screen channel designed for the Peak flow (Qp)	2500.0000	m3/h
		0.6944	m3/s
	Screen channel designed for the Avg.flow (Qa)	1666.667	m3/h
		0.463	m3/s
	Avg.Flow through velocity(Va1) as per NIT	0.6	m/s
	Avg.Flow through Area(Aa1)	0.772	m2

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Peak. Flow through velocity( $V_p$ )	1.2	m/s
Peak. Flow through Area( $A_p$ )	0.58	m <sup>2</sup>
<b>Maximum Area Required for Avg. Flow for considering design (<math>A_{a1} &gt; A_p</math>)</b>	0.771605	m <sup>2</sup>
Effective liquid Depth of the screen channel considered(LD)	1.25	m
Width of the clear opening for Avg. Flow( $W_c$ )	0.617284	m
	617.284	mm
Clear gap between Bars( $O_p$ )	20.0000	mm
No. of Bar in the screen( $n$ )	29.8642	Nos
Considered no. of Bar in the screen( $n$ )	30.0000	Nos
Bar Thickness( $T$ )	10.0000	mm
Width of screen chamber ( $W_u$ )= ( $n \times O_p$ ) + (( $n+1$ ) $\times T$ )	910.0000	mm
Considered Width of the screen chamber( $W_u$ ) as per NIT Drawing	1.2000	m
Size of the Screen Chamber	1.2 m (W) x 1.25 m(LD)	
Approach Velocity for Avg. Flow ( $U_a$ ) = ( $A_{a1}/W_u$ )	0.3	m/s
Check approach Velocity ( $U_a \leq 0.3$ m/s as per NIT)	OK	
Head Loss through the screen	0.0729( $V_{a1}^2 - U_a^2$ )	
Where Flow through velocity for Avg. Flow( $V_{a1}$ )	0.600	m/s
Where Approach velocity ( $U_a$ )	0.3	m/s
Area of flow at 50% of clogged condition	0.39	m <sup>2</sup>
Avg. Flow through velocity at 50 % of clogged condition	1.2	m/s
Head Loss through the screen	0.098032	
Head Loss considered in coarse screen chamber	100	mm
Length of screen channel at the upstream of screen ( $L_1$ ) = 2 x W	2.40	m
Angle of inclination( $\beta$ )	70	deg
Total height (H)	6.65	m
Length occupied by screen inclination( $L_2$ )	2.4204	m
Total length of screen channel( $L$ ) = $L_1 + L_2$	4.8204	m

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Total length of screen channel (L)	5.0000	m
<b>SIZE =</b>	<b>5.0 m( L) x 1.2 m (W) x 1.25 m(LD) + 0.5 FB(min)</b>	
<b><u>MANUAL COARSE BAR SCREEN CHANNEL</u></b>		
Type of Bar screen	Manual Coarse Bar Screen	
No of Bar screen channel	1	Nos.
Peak Flow to Mechanical screen channel	2500	m <sup>3</sup> /h
Screen channel designed for the Peak flow (Qp)	2500.0000	m <sup>3</sup> /h
	0.69444	m <sup>3</sup> /s
Screen channel designed for the Avg.flow (Qa)	1666.67	m <sup>3</sup> /h
	0.462963	m <sup>3</sup> /s
Avg.Flow through velocity(Va1) as per NIT	0.6	m/s
Avg.Flow through Area(Aa1)	0.771605	m <sup>2</sup>
Peak Flow through velocity(Vp)	1.2	m/s
Peak Flow through Area(Ap)	0.5787	m <sup>2</sup>
Maximum Area Required for Avg. Flow for considering design (Aa1>Ap)	0.771605	m <sup>2</sup>
Effective liquid Depth of the screen channel considered(LD)	1.25	m
<b><u>Width of the clear opening for Avg. Flow(Wc)</u></b>	0.617284	m
	617.284	mm
Clear gap between Bars(Op)	20	mm
No. of Bar in the screen(n)	29.8642	Nos.
Considered no. of Bar in the screen(n)	30.0000	Nos.
Bar Thickness(T)	10	mm
Width of screen chamber (Wu)= (nxOp)+((n+1)xT)	910.00	mm
Considered Width of the screen chamber(Wu) as per NIT Drawing	1.2	m
Size of the Screen Chamber	<b>1.2 m (W) x 1.25 m(LD)</b>	

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Approach Velocity for Avg. Flow ( $U_a$ ) = ( $Aa1/Wu$ )	0.3	m/s
Check approach Velocity ( $U_a \leq 0.3$ m/s as per NIT)	OK	
Head Loss through the screen	0.0729( $Va12-U_a2$ )	
Where Flow through velocity for Avg. Flow( $Va1$ )	0.6	m/s
Where Approach velocity ( $U_a$ )	0.30	m/s
<b>Area of flow at 50% of clogged condition</b>	0.385802	m <sup>2</sup>
Avg.Flow through velocity at 50 % of clogged condition	1.2	m/s
Head Loss through the screen	0.098032	
Head Loss considered in coarse screen chamber	100	mm
Length of screen channel at the upstream of screen ( $L1$ )= 2 x W	2.40	m
Angle of inclination( $\beta$ )	45	deg
Total height (H)	2.25	m
Length occupied by screen inclination( $L2$ )	2.25	m
Total length of screen channel( $L$ ) = $L1+L2$	4.65	m
Total length of screen channel (L)	5	m
<b>SIZE =</b>	<b>5.0 m( L) x 1.2 m (W) x 1.25 m(LD) + 0.5 FB(min)</b>	
<b>6 RAW EFFLUENT SUMP</b>		
No of Sump	1.00	no
Peak Flow per day	60000	m <sup>3</sup> /day
Peak Flow for sump	2500	m <sup>3</sup> /h
Peak per sec(Q)	0.694	m <sup>3</sup> /s
Retention Time for Design flow(T) as per	600	sec
Volume of Sump( $V$ )= $Q*T$	416.6667	m <sup>3</sup>
Considered Effective liquid depth of the sump(LD) as per NIT	2.5	m
Area of the sump(A) = $V / LD$	166.67	m <sup>2</sup>
Diameter of the sump(D)	14.5673	m

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	Provided Diameter of the sump(D)	15	m
	<b>RAW EFFLUENT SUMP SIZE</b>	<b>15 m (Dia) x 2.5 m LD + 0.5 FB(Min)</b>	
<b>7</b>	<b><u>INLET CHAMBER/STILLING CHAMBER</u></b>		
	No Of Unit	1	Nos.
	Material Of Construction	RCC	
	Design peak Flow	6000.0000	m <sup>3</sup> /d
		0.0694	m <sup>3</sup> /s
	Retention time at peak flow	30	s
	Volume of chamber	2.083	m <sup>3</sup>
	LD of chamber	3	m
	Area of chamber	0.694	m <sup>2</sup>
	Length of the chamber provided	2.7	m
	Width of chamber	2.70	m
<b>8</b>	<b><u>FINE SCREEN - MECHANICAL</u></b>		
	No. of screen chambers	1.0000	Nos.
	Design peak flow	60.0000	MLD
	Design average flow	40.0000	MLD
	Assume, Liquid depth in downstream channel	1.2500	m
	Free board	0.5000	m
	Bar width	2.0000	mm
	Spacing between bars	6.0000	mm
	No.of bars	115.0000	no.
	No.of clear spacing	116.0000	no.
	Width of the Screen Chamber	926.0000	mm
	Width of the Screen Chamber	1.0000	m
	Assume head loss under clean conditions	15.0000	mm
	Liquid depth in approach channel	1.2650	m
	Net area of flow of screen	0.9741	m <sup>2</sup>
	length of screen bar during inclination	1.3096	m
	Net area of flow of screen considering inclination	1.0084	m <sup>2</sup>
	Velocity upstream of screen, v	0.5490	m/s
		> 0.3 m/s	O.K.

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Velocity through screen, V at peak flow	0.7129	m/s
Velocity through screen, V considering inclination	0.6887	m/s
Velocity through screen, as per CPHEEO manual	0.6 - 1.2	m/s
	ok	
Head loss through screen, h		
$h = 0,0729(V^2 - v^2)$	15.0849	mm
Head loss assumed during half clogged stage	0.1073	m
Velocity through screen in peak flow condition	1.2000	m/s
Net area of flow of screen through peak	0.5787	m <sup>2</sup>
Net area of flow of screen when half clogged	0.5283	m <sup>2</sup>
Velocity through the screen when Half clogged, V	1.3144	m/s
Velocity in the approach channel during half clogged, v	0.5061	m/s
Head loss during half clogging stage calculated	107.2804	mm
Head loss through Screen ( Max.), as per CPHEEO manual	-	mm ?
Velocity through screen in average condition	0.6000	m/s
Net area of flow of screen through peak	0.7716	m <sup>2</sup>
Head loss in screen chamber considered	0.1000	m
Liquid depth in Upstream channel/approach channel	1.3500	m
Check velocity on approach channel	0.3429	m/s
Angle of inclination of the screen (tentative)	75.0000	Deg.
Liquid depth in approach channel, under clogged conditions	1.357280	m
	1.4000	m
Horizontal projection	$(1.265+0.5)/(\text{TAN } 75^\circ)$	
Horizontal projection	0.4729	m
Length of downstream channel	1.4188	m
Length of upstream channel	2.8376	m
Length of Channel	4.7293	m
Length of Channel	4.0000	m
Quantity of screenings from screens	0.0150	m <sup>3</sup> /ML
	0.9000	m <sup>3</sup> /d

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Summary	1 No. of 4 m x 1 m x 1.4 m LD	
<b>MANUAL GRIT CHAMBER (GC-02) - Standby</b>		
Design Inflow	60.0	MLD
	0.694	cum/s
No. of units	<b>1</b>	<b>Nos.</b>
Design flow per unit	0.694	cum/s
Particle size to be removed	0.15	mm
Sp. Gravity of particle	2.65	
Consider retention time (Refer pg 209 of CPHEEO manual)	60	sec
Consider SOR	959	cum/sqm.d
Approach velocity in channel	0.18	m/s
Surface area required	62.57	Sqm.
Volume of chamber	41.67	cum
Liquid depth	<b>0.67</b>	m
Provide extra depth for grit accumulation	0.23	m
Free Board	0.5	m
Total depth	<b>1.40</b>	m
Cross section area of the chamber	3.86	m
Width of channel	5.79	m
	Say	1.5 m
Length of the chamber	41.71	m
Bottom scour velocity, $V_c = K_c \{g^*(S_s-1)*d\}^{0.5}$	0.20	m/s
<b>Size : 10.5 m x 2.0 m x 0.9 m SWD + 0.5m FB - 1 Nos</b>		
<b>Grit qty for disposal : 1.5 cum/day</b>		
<b>Size of screen : 4 m Length x 1 m width x 1.25 m Liquid depth</b>		
<b>FINE SCREEN - MANUAL</b>		
No. of screen chambers	1.0000	Nos.
Design peak flow	60.0000	MLD
<b>FINE SCREEN - MANUAL</b>		

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

No. of screen chambers	1.0000	Nos.
Design flow	60.0000	MLD
Assume, Liquid depth in downstream channel	1.2500	m
Free board	0.5000	m
Bar width	3.0000	mm
Spacing between bars	10.0000	mm
No.of bars	75.0000	no.
No.of clear spacing's	76.0000	no.
Width of the Screen Chamber	985.0000	mm
Say	1.0000	m
Assume head loss under clean conditions	15.0000	mm
Liquid depth in approach channel	1.2650	m
Net area of flow of screen	0.9804	m <sup>2</sup>
length of screen bar during inclination	1.7890	m
Net area of flow of screen considering inclination	1.3865	m <sup>2</sup>
Velocity upstream of screen, v	0.5490	m/s
	> 0.3 m/s	O.K.
Velocity through screen, V at peak flow	0.7083	m/s
Velocity through screen, V considering inclination	0.5009	m/s
Velocity through screen, as per CPHEEO manual	0.6 - 1.2	m/s
	ok	
Head loss through screen, h		
$h = 0,0729(V^2 - v^2)$	14.6083	mm
Head loss assumed during half clogged stage	0.1059	m
Net area of flow of screen when half clogged	0.5312	m <sup>2</sup>
Velocity through the screen when Half clogged, V	1.3073	m/s
Velocity in the approach channel during half clogged, v	0.5066	m/s
Head loss during half clogging stage calculated	105.8769	mm
Head loss through Screen ( Max.), as per CPHEEO manual	-	mm
Angle of inclination of the screen	45.0000	Deg

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Liquid depth in approach channel, under clogged conditions	1.355877	m
	1.4000	m
Horizontal projection	$(1.265+0.5)/(\text{TAN } 45^\circ)$	
Horizontal projection	1.7650	m
Length of downstream channel	1.4120	m
Length of upstream channel	1.4120	m
Length of Channel	4.5890	m
Length of Channel	5.0000	m
Design average flow	0.0000	MLD
Assume, Liquid depth in downstream channel	1.2500	m
Free board	0.5000	m
Bar width	2.0000	mm
Spacing between bars	6.0000	mm
No. of bars	115.0000	no.
No. of clear spacing	116.0000	no.
Width of the Screen Chamber	926.0000	mm
Width of the Screen Chamber	1.0000	m
Assume head loss under clean conditions	15.0000	mm
Liquid depth in approach channel	1.2650	m
Net area of flow of screen	0.9741	m <sup>2</sup>
length of screen bar during inclination	1.7890	m
Net area of flow of screen considering inclination	1.3775	m <sup>2</sup>
Velocity upstream of screen, v	0.0457	m/s
	> 0.3	
Velocity through screen, V at peak flow	0.0594	m/s
Velocity through screen, V considering inclination	0.0420	m/s
Velocity through screen, as per CPHEEO manual	0.6 - 1.2	m/s
Head loss through screen, h		
$h = 0,0729(V^2 - v^2)$	0.1048	mm
Head loss assumed during half clogged stage	0.0009	m
Velocity through screen in peak flow condition	1.2000	m/s

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Net area of flow of screen through peak	0.0482	m <sup>2</sup>
Net area of flow of screen when half clogged	0.4874	m <sup>2</sup>
Velocity through the screen when Half clogged, V	0.1187	m/s
Velocity in the approach channel during half clogged, v	0.0457	m/s
Head loss during half clogging stage calculated	0.8755	mm
Head loss through Screen ( Max.), as per CPHEEO manual	-	mm
Velocity through screen in average condition	0.6000	m/s
Net area of flow of screen through peak	0.0000	m <sup>2</sup>
Head loss in screen chamber considered	0.1000	m
Liquid depth in Upstream channel/approach channel	1.3500	m
Check velocity on approach channel	0.0000	m/s
Angle of inclination of the screen (tentative)	45.0000	Deg.
Liquid depth in approach channel, under clogged conditions	1.250876	m
	1.3000	m
Horizontal projection	$(1.265+0.5)/(\tan 45^\circ)$	
Horizontal projection	1.7650	m
Length of downstream channel	5.2950	m
Length of upstream channel	10.5900	m
Length of Channel	17.6500	m
Length of Channel	4.0000	m
Quantity of screenings from screens	0.0150	m <sup>3</sup> /ML
	0.0750	m <sup>3</sup> /d
Summary	1 No. of 4 m x 1 m x 1.3 m LD	
<b>MANUAL GRIT CHAMBER (GC-02) - Standby</b>		
Design Inflow	5.0	mld
	0.058	cum/s
No. of units	1	Nos
Design flow per unit	0.058	cum/s

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Particle size to be removed	0.15	mm
Sp. Gravity of particle	2.65	
Consider retention time (Refer pg 209 of CPHEEO manual)	60	sec
Consider SOR	959	cum/sqm.d
Approach velocity in channel	0.18	m/s
Surface area required	5.21	sqm
Volume of chamber	3.47	cum
Liquid depth	<b>0.67</b>	m
Provide extra depth for grit accumulation	0.23	m
Free Board	0.5	m
Total depth	<b>1.40</b>	m
Cross section area of the chamber	0.32	m
Width of channel	0.48	m
Say	1.5	m
Length of the chamber	3.48	m
Bottom scour velocity, $V_c = K_c \{g^*(S_s-1)*d\}^{0.5}$	0.20	m/s
		OK as > 0.18 m/s
<b>Size : 10.5 m x 2.0 m x 0.9 m SWD + 0.5m FB - 1 Nos</b>		
<b>Grit qty for disposal : 1.5 cum/day</b>		
<b>Size of screen : 4 m Length x 1 m width x 1.25 m Liquid depth</b>		
<b><u>EQUALISATION TANK</u></b>		
Design average flow	40	MLD
No of Units	1	Nos.
Material Of Construction	RCC	
Design flow to each Equalisation tank	40.00	MLD
	1666.67	m <sup>3</sup> /hr
Detention time at average flow as per NIT	12	hours
Volume required	20000.0	m <sup>3</sup>
Liquid depth of the tank	6	m
Area of the tank	3333.33	m <sup>2</sup>
Length of equalisation tank	58	m

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Width of equalisation tank	57.4713	m
say	58.00	m
Volume provided	20184.00	m <sup>3</sup>
No of working pump as per NIT	3.00	Nos.
No of standby pumps as per NIT	1.00	Nos.
Capacity of pumps as per NIT	555.42	m <sup>3</sup> /hr
<b>Total volume of tank</b>	20000	m <sup>3</sup>
<b>Mixing required as per Metcalf &amp; eddy pg.no: 344, 4 th edition</b>		
<b>air required ( 0.004 to 0.008 kw/m<sup>3</sup>)</b>	0.008	kw/m <sup>3</sup>
	161.472	kw
no of mixer	2	Nos.
capacity of each mixer	80.736	kw
provided KW of mixer	90	kw
<b>9 pH CORRECTION TANK - I</b>		
No Of Unit	1	No
Material Of Construction	RCC	
Design average flow	40	MLD
	27.778	m <sup>3</sup> /min
Retention time at average flow	20	min
Volume of tank	555.556	m <sup>3</sup>
Liquid Depth of tank	3	m
Area of tank	185.185	m <sup>2</sup>
Length of the tank	13.7	m
then, Width	13.517	m
Width of the tank	13.70	m
<b>SLUDGE BLANKET CLARIFIER</b>		
Design Flow	40.000	MLD
Number of units provided	1.00	nos.
So, Design flow per Reactor -Clarifier	40.000	MLD
	40000	m <sup>3</sup> /d
	1666.667	m <sup>3</sup> /h
	0.4630	m <sup>3</sup> /s
<b>REACTION ZONE:</b>		
The raw water pipe enters the reaction zone at		

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	the downward zone.		
	Retention time in the Reaction Zone	20.000	min
	OD of central column (Approx.)	1	m
	Select, Liquid depth in the Reaction Zone	4.000	m
	Additional volume to be provided, for compensating central column	3.142	m <sup>3</sup>
	Total volume of Reaction zone, accounting for the volume of central column	558.697	m <sup>3</sup>
	Likely, CSA of Reaction Zone to be provided	138.999	m <sup>2</sup>
	CSA of upper zone of Reaction Zone	46.333	m <sup>2</sup>
	Approx. Diameter of the Upper Portion of the Reaction Zone, at 1 m below the TWL	7.6807	m
	<b>CLARIFICATION ZONE:</b>		
	Dia of the Upper Portion of Reaction Zone, at 1 m from TWL as per vendor data	7.68	m
	Surface loading for Clarification zone	57.6	m <sup>3</sup> /m <sup>2</sup> .d
	Retention time in the Clarification Zone	2.000	h
	Volume of Clarification Zone	3333.333	m <sup>3</sup>
	Select, SWD in the Clarification Zone	5	m
	CSA of Clarification Zone to be provided	666.67	m <sup>2</sup>
	Diameter of the Clarification Zone to be provided, taking into account the area occupied by the Upper portion of Reactor Zone & central column	31	m
	CSA of Clarification Zone, provided	708.4346	m <sup>2</sup>
	Corresponding Surface loading	40000/708.435	
		56.46	m <sup>3</sup> /m <sup>2</sup> .d
		> 57.6	m <sup>3</sup> /m <sup>2</sup> .d
		Hence O.K.	
	Total retention time to be provided in the Reactor- Clarifier, inclusive of		
	Reaction Zone & Clarification Zone	2.33	h
<b>10</b>	<b>pH CORRECTION TANK - II</b>		
	No Of Unit	1	
	Material Of Construction	RCC	
	Design average flow	40.0000	MLD

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		27.7778	m3/min
	Retention time	5	min
	Volume of tank	138.889	m3
	Liquid Depth of tank	2.5	m
	Area of tank	55.556	m2
	Length of tank	7.5	m
	then, Width	7.407	m
	Width of tank	7.50	m
11	<b>CHLORINE CONTACT TANK</b>		
	No Of Unit	1	no
	Material Of Construction	RCC	
	Design flow	40.0000	MLD
		27.7778	m3/min
	Retention time	30	min
	Volume	833.333	m3
	Liquid Depth of chamber	3	m
	Area	277.778	m2
	No of compartment	1.000	Nos.
	Length of the tank	20	m
	then, Width	13.889	m
	Width of the tank required	13.90	m
	Width of the tank provided	14.50	m
	<b>CHLORINATOR</b>		
	No Of Unit	1	Nos.
	Design flow	40.0000	MLD
		27.7778	m3/min
	Max chlorine dosage	5	ppm
	Capacity chlorinator required	8.333	kg/hr
	Capacity chlorinator provided	10.00	kg/hr
12	<b>SLUDGE TREATMENT</b>		
	<b>BIO SLUDGE</b>		
	Inlet BOD to CETP	500	mg/l
	BOD removed in sludge blanket reactor	35	%
	BOD entering sludge blanket	325	mg/l
	Design flow to SBR	40000.000	m3/d

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	Bio sludge produced from SBR	4788.00	kg sludge/d
	Sludge consistency	0.80	%
	Biolsudge flow	598.50	m <sup>3</sup> /d
		24.94	m <sup>3</sup> /hr
	<b>BIO SLUDGE THICKENER</b>		
	No. of Thickeners	1	Nos.
	Flow per Thickener (normal)	598.50	m <sup>3</sup> /day
		24.938	cum/hr
	Surface loading rate considered ( As per CPHEEO : 20- 25 m <sup>3</sup> /d/m <sup>2</sup> )	20	m <sup>3</sup> /m <sup>2</sup> /d
	Area of thickener required as per SOR	29.925	m <sup>2</sup>
	Diameter of sludge thickener required	6.1742	m
	Inlet solids to thickener	4788.00	kg/day
	Solid loading rate considered ( as per CPHEEO : 25- 30 kg/d/m <sup>2</sup> )	30	kg/m <sup>2</sup> /d
	Area required as per SOLID loading	159.600	m <sup>2</sup>
	Diameter of sludge thickener required	14.26	m
	Diameter of sludge thickener provided	14.30	m
	Corrected Surface area	160.525	m <sup>2</sup>
	Corrected Solid Loading Rate	29.827	kg/m <sup>2</sup> /d
	SWD considered for sludge thickener	3	m
	RT	19.31124	Hrs.
	Efficiency of sludge thickener		
	Solids entering Sludge Thickener	4788	Kgs/day
	% removal in sludge thickener	90	%
	Solids in settled in Sludge Thickener	4309.2	Kgs/day
	Solids consistency at the outlet of thickener	3	%
	Density of sludge from sludge thickener	1020	kg/m <sup>3</sup>
	Thickener underflow	140.82	m <sup>3</sup> /day
		5.868	cum/hr
	Solids in the supernatant	478.8	Kgs/day
	Supernatant flow from thickener	457.68	m <sup>3</sup> /day
13	<b>THICKENED BIO-SLUDGE SUMP &amp; PUMP</b>		
	Thickened sludge flow	140.82	m <sup>3</sup> /day
		5.87	m <sup>3</sup> /hrs

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	Retention time as per NIT	8	Hrs.
	Volume of tank	46.941	m <sup>3</sup>
	Liquid depth of tank	3	m
	Width of tank	4.00	m
	Length of tank	4.00	m
	Centrifuge feed pump		
	Thickened sludge	140.82	m <sup>3</sup> /d
	Operating hours of centrifuge as per NIT	16.00	hrs/d
	Capacity of pump required	8.801471	m <sup>3</sup> /hr
	Capacity of pump provided	10	m <sup>3</sup> /hr
14	<b>BIO-CENTRIFUGE</b>		
	Thickener underflow	140.82	m <sup>3</sup> /day
	Solids entering to centrifuge	4309.2	Kgs/day
	Desired cake consistency	25	%
	Density of cake	1100	kg/m <sup>3</sup>
	Solids recovery in centrifuge	95	%
	Solids removed by centrifuge	4093.74	kg/d
	Volume of cake, handled per day	14.8863	m <sup>3</sup> /d
	Operating hours of centrifuge as per NIT	16	hrs/d
	Capacity of centrifuge provided	10	m <sup>3</sup> /hr
	No of centrifuge provided	2(1W+1S)	Nos.
	Shed for dewatering cake		
	design flow	14.8863	m <sup>3</sup> /d
	storage days	10	
	volume	148.8633	m <sup>3</sup>
	LD	1.7	m
	area	87.56663	m <sup>2</sup>
	<b>OPTION- SLUDGE DRYING BED</b>		
	Quantity of dry solids to be dewatered	4309.2	kg/d
	Sludge consistency	3	%
	Density of sludge	1020	kg/m <sup>3</sup>
	to be dewatered per day	140.8235	m <sup>3</sup> /d
	Desired cake consistency	20	%
	Density of cake	1200	kg/m <sup>3</sup>
	Solids recovery	96	%
		4136.832	kg/d

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		17.2368	m <sup>3</sup> /d
	Filtrate from SDB	123.5867	m <sup>3</sup> /d
	Dewatering , drying & sludge removal cycle	10.00	d
	Depth of application of sludge	0.30	m
	Volume of sludge for days	1408.2353	m <sup>3</sup>
	Depth of application of sludge	0.30	m
	Plan area of drying beds	4694.1176	m <sup>2</sup>
	No of bed	5.0000	Nos.
	Area of each bed	938.8235	m <sup>2</sup>
	Width	6	m
	Length	156.47	m
		156.5	m
15	<b>CHEMICAL DOSING SYSTEM</b>		
	<b>LIME DOSING TANKS</b>		
	Raw water flow for chemical dosing	1666.667	m <sup>3</sup> /h
		40000	m <sup>3</sup> /d
	Max dosage of chemical	50	mg/l
	Chemical required	2352.941	kg/d
	Solution strength in %	5	%
	Density of diluted solution	1100	kg/m <sup>3</sup>
	Volume of solution required	42.78	m <sup>3</sup> /d
		1.78	m <sup>3</sup> /h
		1782.53	LPH
	No of dosing pump working	1.00	Nos.
	No of dosing pump standby	1.00	Nos.
	Dosing pump capacity	1850	LPH
	Retention time in dosing tank	12	Hrs.
	No of tank	2	Nos.
	Capacity of dosing tank	21.39	m <sup>3</sup>
	Liquid depth	2.00	m
	Area of tank	10.70	m <sup>2</sup>
	Length/width of tank	3.2 x 3.2	m

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	1 kg of lime produce 1.2 kg of $Fe(OH)_3$	2823.529	kg/d
	Storage days		
	Assumed	20	days
	area for storage days	47058.82	kg
	Bulk density	880	kg/m <sup>3</sup>
	Volume	53.47594	m <sup>3</sup>
	Depth	2	m
	Area	26.73797	m <sup>2</sup>
16	<b>FERRIC SULPHATE DOSING TANKS</b>		
	Raw water flow for chemical dosing	1666.667	m <sup>3</sup> /h
		40000	m <sup>3</sup> /d
	Max. dosage of chemical	50	mg/l
	chemical required	2000	kg/d
	Solution strength in %	10	%
	Density of diluted solution	1100	kg/m <sup>3</sup>
	Volume of solution required	18.18	m <sup>3</sup> /d
		0.76	m <sup>3</sup> /h
		757.58	LPH
	No of dosing pump working	1.00	Nos.
	No of dosing pump standby	1.00	Nos.
	Dosing pump capacity	1000	LPH
	Retention time in dosing tank	12	Hrs.
	Volume of tank required for 12 hours	9.0909	m <sup>3</sup>
	No. of tanks	2	Nos.
	Liquid depth of tank	2.00	m
	Area of tank	4.55	m <sup>2</sup>
	Length/width of tank	2.132	m
	Apr. 1 kg of ferric Sulphate precipitate 0.54 mg of $Fe(OH)_2$	1080	kg/d
	Storage days	20	days
	Chemical required	40000	kg
	Bulk Density	881	kg/m <sup>3</sup>
	space	45.40295	m <sup>3</sup>
	stock depth	2	m

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area	22.70148	m <sup>2</sup>
Length/width of tank	2.2 x 2.2	m
POLY DOSING SYSTEM		
Raw water flow for chemical dosing	1666.667	m <sup>3</sup> /h
	40000	m <sup>3</sup> /d
Max. dosage for chemical	2	mg/l
chemical required	80	kg/d
Solution strength in %	0.1	%
Density of diluted solution	1000	kg/m <sup>3</sup>
Volume of solution required	80.00	m <sup>3</sup> /d
	3.33	m <sup>3</sup> /h
	3333.33	LPH
No of dosing pump working	1.00	Nos.
No of dosing pump standby	1.00	Nos.
Dosing pump capacity	3500	LPH
Retention time in dosing tank	12	Hrs.
Volume of tank required for 12 hours	40.000	m <sup>3</sup>
Liquid depth of tank	2.00	m
Area of tank	20.00	m <sup>2</sup>
Length/width of tank	4.472	m
Length/width of tank	4.5 x 4.5	m
No of dosing tank	2	Nos.
Storage days	20	days
Chemical required	1600	kg
Bulk Density	800	kg/m <sup>3</sup>
space	2	m <sup>3</sup>
stock depth	2	m
area	1	m <sup>2</sup>
ACID DOSING TANKS		
Raw water flow for chemical dosing	1666.667	m <sup>3</sup> /h
	40000	m <sup>3</sup> /d

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Max. dosage for chemical	50	mg/l
Chemical required	2000	kg/d
Density of 33 % solution	1156	kg/m <sup>3</sup>
Volume of solution required	1.73	m <sup>3</sup> /d
	0.07	m <sup>3</sup> /h
	72.09	LPH
No of dosing pump working	1.00	Nos.
No of dosing pump standby	1.00	Nos.
Dosing pump capacity	100	LPH
Retention time in dosing tank	12	Hrs.
Volume of solution tank required for 12 hours	0.865	m <sup>3</sup>
Liquid depth of tank	2.00	m
Area of tank	0.43	m <sup>2</sup>
Diameter of tank	0.7	m
No of dosing tank	2	Nos.
Storage days	20	days
Chemical required	40000	Kg
Bulk Density	1156	kg/m <sup>3</sup>
space	34.60208	m <sup>3</sup>
stock depth	2	m
area	17.30104	m <sup>2</sup>
<b>PRIMARY SLUDGE</b>		
TSS entering to CETP	500	mg/l
Efficiency of sludge blanket clarifier for TSS removal	70	%
TSS removed by sludge blanket clarifier	350	mg/l
	14000	kg/d
TSS load due to chemical addition	3000.000	kg/d
Total primary + chemical	17000.000	kg/d
Consistency of chemical sludge	3	%
Density of chemical sludge	1020	kg/m <sup>3</sup>
Total primary Sludge flow	555.56	m <sup>3</sup> /d
<b>PRIMARY/CHEMICAL SLUDGE SUMP</b>		
Retention time as per NIT	8.00	hrs
Volume as per NIT , min	185.19	m <sup>3</sup>

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Liquid depth of sump	4.00	m
Area of sludge sump	46.30	m <sup>2</sup>
Width of sump	7.70	m
Length required	6.01	m
Length of sump provided	7.70	m
Bio Filter press feed pump		
Primary thickened sludge	555.56	m <sup>3</sup> /d
Operating hours of centrifuge	16.00	hrs
Capacity of pump required	34.7225	m <sup>3</sup> /hr
Capacity of pump provided	36	m <sup>3</sup> /hr
PRIMARY BELT FILTER PRESS		
Sludge flow entering Belt filter press (BFP)	555.56	m <sup>3</sup> /day
Solid load entering BFP	17000.00	Kgs/day
Min cake consistency	25	%
Operating hours per day	16	hrs/d
Capacity of BFP	36	m <sup>3</sup> /hr
No of BFP	2(1W+1S)	Nos.
POLY DOSING PUMP FOR BIO SLUDGE THICKENER		
For Bio sludge thickener		
Sludge flow for chemical dosing	24.94	m <sup>3</sup> /h
	598.56	m <sup>3</sup> /d
Max. dosage for chemical	2	mg/l
chemical required	1.19712	kg/d
Solution strength in %	0.1	%
Density of diluted solution	1000	kg/m <sup>3</sup>
Volume of solution required	1.20	m <sup>3</sup> /d
	0.05	m <sup>3</sup> /h
	49.88	LPH
Capacity of dosing pumps	100.00	LPH
No of dosing pumps	2(1W+1S)	Nos.
DWPE DOSING SYSTEM- BIO SLUDGE		
Thickened bio sludge entering centrifuge	4309.20	kg/d
Max. dosage for chemical	2	kg/MT
Chemical required	8.62	kg/d
Solution strength in %	0.1	%
Density of diluted solution	1000	kg/m <sup>3</sup>

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

Volume of solution required	8.62	m <sup>3</sup> /d
	0.54	m <sup>3</sup> /h
	540.00	LPH
No of dosing pump working	1.00	Nos.
No of dosing pump standby	1.00	Nos.
Dosing pump capacity	650	LPH
Total volumetric flow of DWPE for bio sludge	0.540	m <sup>3</sup> /hr
Volume of solution required for 12 hours	6.480	m <sup>3</sup>
No of tanks	2	Nos.
Liquid depth of tank	2.00	m
Area of tank	3.24	m <sup>2</sup>
Length/width of tank	2 x 2	m
<b>DWPE DOSING SYSTEM- PRIMARY SLUDGE</b>		
Thickened chemical sludge entering centrifuge	17000.00	kg/d
Max. dosage for chemical	2	kg/MT
Chemical required	34	kg/d
Solution strength in %	0.1	%
Density of diluted solution	1000	kg/m <sup>3</sup>
Volume of solution required	34.00	m <sup>3</sup> /d
	2.13	m <sup>3</sup> /h
	2130.00	LPH
No of dosing pump working	1.00	Nos.
No of dosing pump standby	1.00	Nos.
Dosing pump capacity	2600	LPH
Total volumetric flow of DWPE for chemical sludge	2.130	m <sup>3</sup> /hr
Volume of solution required for 12 hours	25.560	m <sup>3</sup>
No of tanks	2	Nos.
Liquid depth of tank	2.00	m
Area of tank	12.78	m <sup>2</sup>
Length/width of tank	3.7 x 3.7	m

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

## EXHIBIT 2

## CAPITAL COST

## 4.2 Capital cost

The capital cost includes the following components.

- Design and detailed engineering
- Civil works
- Supply, Installation and Commissioning of mechanical, electrical, instrumentation equipment's and other Services

The total cost including packing and forwarding, loading and unloading, transportation up to respective Site, insurance, octroi if applicable, all applicable taxes, duties and any other costs required completing the project.

## EPC cost break up

No	Items	Approx cost in Lakhs
1.	Design & detailed engineering -(5% of total cost )	350
2.	Civil works	2845
3.	Mechanical	2702
4.	Electrical	567
5.	Instrumentation Works.	74
6.	Erection and commissioning ( 5% of electro mechanical cost)	156
7.	Compound wall	
8.	Statutory deposit	50
9.	Contingencies- (3% of total cost)	210
10.	Admin expenses	35
11.	Testing charges	11
	<b>Total capital cost</b>	<b>7000</b>

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

## 4.3 Break up cost - Design &amp; detailed engineering:

Design & detailed engineering				
SL No.	Description	UOM	Qty	Amount (In Lakhs)
1	Basic Engineering Package including preparation of DPR & Obtaining consent to establishment	LS	1	140
2	Detailed Engineering Package	LS	1	210

## 4.4 Break up cost- Civil works

Civil Work Cost				
SL No.	Description	UOM	Qty	Amount (In Lakhs)
1	Receiving chamber along with Raw effluent sump	LS	1	212.91
2	Raw effluent Pump house	LS	1	37.40
3	Inlet Chamber along with Screen, Parshall flume and Grit Chamber	LS	1	24.93
4	Equalization tank cum Pump shed	LS	1	549.70
5	PH-correction Tank -I	LS	1	74.79
6	sludge blanket clarifier /Clariflocculator	LS	1	235.58
7	PH correction tank II	LS	1	24.93
8	SBR distribution chamber /selector channel/SBR	LS	1	848.11

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

9	Chlorine Contact Tank and inlet channel	LS	1	124.65
10	Chlorination building	LS	1	37.39
11	Chemical sludge sump	LS	1	24.93
12	Chemical feed pump house	LS	1	24.93
13	Dewatering unit building	LS	1	49.86
14	Biological sludge thickener	LS	1	37.39
15	Biological thickened sludge sump	LS	1	24.93
16	Chemical house	LS	1	18.69
17	Admin building with underground tank	LS	1	56.09
19	DG room, HT substation room	LS	1	149.58
20	Security cabin	LS	1	24.93
21	Sludge storage area	LS	1	49.86
22	Channel for disposal of treated effluent-500 m	LS	1	24.93
23	Miscellaneous	LS	1	188.50

## 4.5 Break up cost - Mechanical, Electrical and Instrumentation Works.

## 4.5.1 Mechanical

<i>Supply Installation &amp; Commissioning Cost</i>				
<i>SL No.</i>	<i>Description</i>	<i>UOM</i>	<i>Qty</i>	<i>Amount (In Lakhs)</i>
	<b>Electromechanical &amp; Process</b>			
1	Pump	Lot.	1	319.10

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

2	Belt filter Press	Lot.	1	113.45
3	Agitators	Lot.	1	141.82
4	Screen	Lot.	1	124.10
5	Sluice gate	Lot.	1	77.73
6	Valves	Lot.	1	51.53
7	Cranes & Hoist	Lot.	1	50.69
8	HVAC	Lot.	1	16.89
9	Fire Protection	LS	1	0.32
10	Compressor	Lot.	1	23.60
11	Bio Sludge Thickener	Lot.	1	106.37
12	Centrifuge	Lot.	1	127.64
13	Tank	Lot.	1	6.70
14	Chlorination Plant & Tonner	Lot.	1	33.79
15	Clarifier	Lot.	1	135.17
16	Conveyor System	Lot.	1	8.44
17	Mixer	Lot.	1	152.07
18	Pipes & fittings	Lot.	1	148.91
19	Supply of SBR System ( C Tech )	Lot.	1	709.12
20	Turbo Blowers ( C Tech )	Lot.	1	354.56

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

## 4.5.2 Electrical

21	Transmission Line	Lot	1	6.42
22	HT Switchgear	Nos.	1	17.57
23	Transformer 22/.433 KV 1600 KVA	Nos.	2	67.59
24	Transformer and DG Bus duct	Set	1	8.11
25	LT Main PMCC panel	Set	1	135.18
26	DG Set 415 V 1600 KVA	Nos.	1	248.19
27	APFC Panel, VDB, LDB, ACDB, Battery & Battery charger	Set	1	33.79
28	HT Cable and LT cable termination	Lot	1	33.79
29	Steel Cable Trays and accessories	Lot	1	8.25
30	Earthing and Lighting system	Lot	1	8.11

## 4.5.3 Instrumentation

	Instrumentations.			
31	PLC/SCADA, UPS (20kVA) system	lot	1	16.90
32	Analyzers	lot	1	16.69
33	Level measuring instruments	lot	1	10.11
34	Flow measuring instruments	lot	1	10.14
35	Pressure & temperature measuring instruments	lot	1	3.36
36	Cables, cable trays, JB, Fire alarm system, telephone system & SS tubing, fitting accessories	lot	1	16.80

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB****4.5.4 Others**

37	Erection & Commissioning	Ls.	1	108.1
38	Spares	Lot.	1	16.90
39	Misc.	Ls.	1	31.00

**Note 1-** The above costs are inclusive of Packing and Forwarding, Loading and Unloading, Transportation up to respective Site, Insurance, Entry tax, if applicable, Trade Tax, Income Tax, Works Contract Tax, any Surcharge, Sales Tax and all other Central Govt. and State Govt. Taxes and Duties as applicable .

The following prevailing rate has been considered for taxes:

Excise Duty – 12.36% / 10.30%  
 CST- 2% against C form  
 VAT- 4.95 % /6.05 % / 14.30 %  
 Service Tax- 12.36%

**Note 2-** The above costing has been done based on the current market rate

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

## Exhibit 3

## OPERATION AND MAINTENANCE COST

## 4.6 Operation &amp; Maintenance (O &amp; M) cost.

The O & M cost comprises of chemical consumption cost, manpower cost, sludge disposal cost, power and diesel charges ,administration cost and cost of (repairs & rectification) normal maintenance etc. O&M cost consists of two components, fixed and variable.

Manpower costs have been worked on the basis of monthly remuneration for various categories of employees as would be appropriate for a project of this magnitude.

In order to estimate the O & M costs prices for chemicals have been obtained from the market. The dosage of various chemicals has been based on in house experience and the general industrial practice

The cost of sludge transportation and disposal to secure landfill has been considered as Rs 4000/ per ton.

## 4.6.1 O&amp;M COST SUMMARY

Items/components	Rs/m <sup>3</sup>
<b>Manpower</b>	0.631
<b>Other admin expenses</b>	0.071
<b>Chemical</b>	2.252
<b>Sludge disposal</b>	1.960
<b>Lubrications</b>	0.007
<b>Painting</b>	0.007
<b>Preventive maintenance</b>	0.010
<b>Consumables</b>	0.015
<b>Spares</b>	0.232
<b>Power</b>	2.358
<b>Total cost for first year</b>	7.544
<b>contingencies- 3%</b>	0.226
<b>Admin expense - PDA</b>	0.151
<b>Total cost for O&amp;M in first year ( Rs/m<sup>3</sup>)</b>	<b>7.921*</b>

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

\* Note 1- Above cost is exclusive of escalation and depreciation and inclusive of all applicable taxes in the current prevailing rate

\*Note 2 – All the above values has been corrected to three decimal place

**4.7 Break up cost for O&M****4.7.1 Manpower cost**

1	Man Power	No	CTC/month	Total salary/month
	Plant manager	1	144000	144000
	Supervisor	2	87600	175200
	Operators	4	56640	226560
	Helper	4	18880	75520
	Lab technician	1	59000	59000
	Security	2	43800	87600
(A)			<b>Sub Total</b>	<b>767880</b>
(B)	Total cost per year		A * 12	9,214,560
(C)	Total cost per day		B /365	25,245.37
	<b>Cost in Rs/m3</b>		<b>C / 40000</b>	<b>0.631</b>
2	<b>Other expenses</b>			
	Admin expenses	1	15000	15000

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	Consumables	1	8000	8000
	Maintenance exp	1	5000	5000
	Tools & Tackles	1	500	500
	Computer + printer	1	500	500
	Phone	3	800	2400
	Safety Equipment	1	4000	4000
	vehicles	1	30000	30000
	Laboratory running expenses	1	12000	12000
	Piping maintenance	1	9000	9000
(A)			<b>Subtotal</b>	<b>86400</b>
(B)	Total cost per year		A * 12	1036800
(C)	Total cost per day		B /365	2840.5
	<b>Cost in Rs/m3</b>		<b>C / 40000</b>	<b>0.071</b>

## 4.7.2 Chemical cost

Sr. No.	Name of the chemical	Qty. (per day)	Qty. (30 days)	Rate (% available in mkt.)	Value per 30 days
				Rs./kg	Rs./ 30 days
1	Ferrous Sulphate	2021	60618	12.00	727418
2	Lime	2501	75015	8.00	600120
3	Poly Electrolyte (Flocculent)	20	600	300.00	180000
4	Poly Electrolyte (Dewatering)	12	360	350.00	126000
5	Poly Electrolyte (Dewatering)	17	510	350.00	178500
6	Hydrochloric acid	970	29097	12.00	349161

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

7	Chlorine	120	3601	24.00	86417
8	Urea	280	8400	20.00	168000
9	DAP	240	7200	45.00	324000
(A)				Sub Total	2739616
(B)	Total cost per year			A * 12	32875392
(C)	Total cost per day			B /365	90070
	<b>Cost in Rs/m3</b>			<b>C / 40000</b>	<b>2.252</b>

**4.7.3 Sludge disposal charges**

Sludge disposal charges	Per day sludge generation (T)	disposal cost	Total cost/Day	Total cost/year
Chemical + bio sludge	20	4,000	78,400	28,616,000
			<b>Rs/m3</b>	<b>1.96</b>

**4.7.4 Power cost**

	Estimated Rate
Total operating power – KWH*	13476
Cost of power considered – Rs	7
Total power cost per day- Rs/day	94332
Power cost per year- Rs/year	34431180
<b>Power cost /m3 of effluent treated</b>	<b>2.358</b>

Refer Exhibit - 4

**4.7.5 Other**

Items	Estimated Rate
Lubrications per year	100000
Painting once in five years	1200000
Preventive maintenance per month	150000

**PDA-40 MLD CETP AT LUDHIANA, PUNJAB**

Consumables per month	225000
Estimated spares cost per year	3387200

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

## EXHIBIT-4

## Electrical Load List &amp; Power Consumption

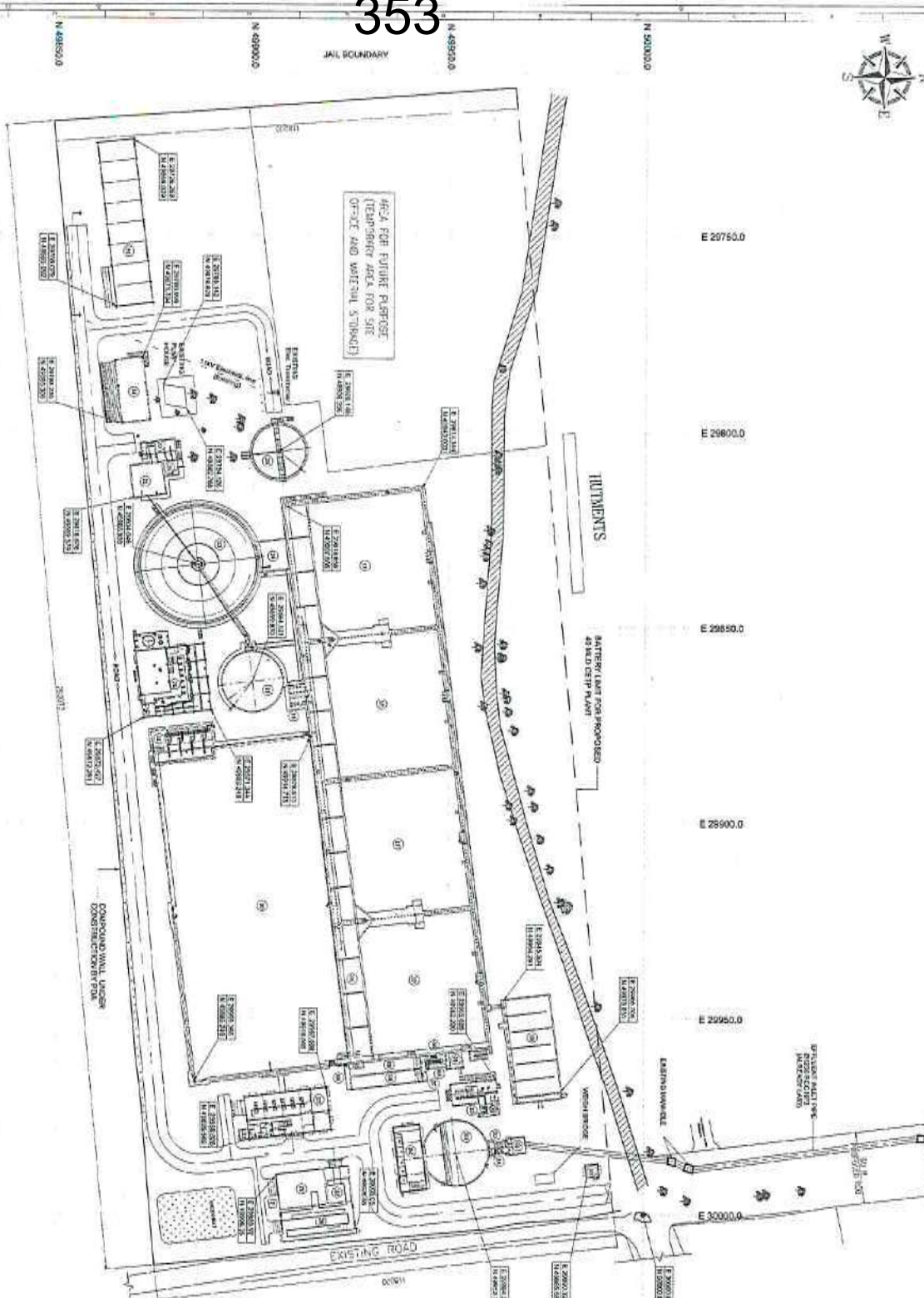
S. No	Equipment Name	Quantity			Rated KW	Duty Requirement
		Total	Working	Standby		
<b>Raw effluent pumping station</b>						
1	Raw effluent pumps	5	4	1	45.00	Continuous
2	Dewatering Pump in Raw effluent Pumping station.	2	1	1	3.70	Intermittent
3	Mechanical Coarse Screens	1	1	0	2.2	Intermittent
4	Conveyor Belt and Chute arrangement for Mechanical Screens	1	1	0	1.1	Intermittent
<b>Ventilation &amp; Air Conditioning</b>						
5	Raw Effluent Pumping station	5	5	0	1.1	Continuous
6	HT Panel Room	2	2	0	0.37	Continuous
7	Transformer Room	2	2	0	0.37	Continuous
8	DG Room	3	3	0	0.37	Continuous
9	LT Panel Room	3	3	0	0.37	Continuous
10	Equalisation effluent transfer pumping station	2	2	0	0.37	Continuous
11	Chlorination Building	2	2	0	0.37	Continuous
12	Sludge pump house	2	2	0	0.37	Continuous
13	Chemical house (Floor 1)	5	5	0	0.37	Continuous
14	Admin building	1	1	0	0.37	Continuous
15	Control Room	2	2	0	7.5	Continuous
16	Office and Conference Room	3	3	0	7.5	Continuous
17	Laboratory	2	2	0	7.5	Continuous
18	Blower Room	3	3	0	9.5	Continuous
<b>CETP</b>						
19	Fine screen	1	1	0	3.7	Intermittent
20	Belt Conveyor system	1	1	0	1.1	Intermittent
21	Mixer for Equalisation	4	4	0	11	Continuous
22	Equalized Effluent Pump	4	3	1	30	Continuous
23	Mixer for pH correction tank-I	1	1	0	1.5	Continuous
24	Sludge blanket	1	1	0	11	Continuous

## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

	reactor/Clariflocculator					
25	Mixer for pH correction tank-II	1	1	0	3.7	Continuous
26	Air blower in SBR	6	4	2	110	Continuous
27	SBR-Decanter	4	4	0	0.75	Intermittent
28	RAS pump	5	4	1	18.5	Intermittent
29	WAS pump	5	4	1	7.5	Intermittent
30	Chlorine booster pumps	2	1	1	2.2	Continuous
31	Bio- Sludge Thickener	1	1	0	2.2	Continuous
32	Mixer in bio thickened sludge sump	1	1	0	1.5	Intermittent
33	Centrifuge feed pump	2	1	1	3.7	Intermittent
34	Centrifuge	2	1	1	18.5	Intermittent
35	Mixer in chemical sludge sump	1	1	0	2.5	Intermittent
36	Primary- Belt Filter press (BFP) feed pump	2	1	1	5.5	Intermittent
37	Primary- Belt Filter Press	2	1	1	1.5	Intermittent
38	Wash water pump for BFP	2	1	1	2.2	Intermittent
39	Air compressor for BFP	1	1	0	2.2	Intermittent
40	Agitator in Ferrous Sulphate dosing tank	2	2	0	1.5	Continuous
41	Ferrous Sulphate dosing pump	2	1	1	1.1	Continuous
42	Agitator in Lime dosing tank	2	2	0	1.5	Continuous
43	Lime dosing pump	2	1	1	2.2	Continuous
44	Agitator in Poly dosing tank-clarifier	2	2	0	2.2	Continuous
45	Poly dosing pump	2	1	1	3.7	Continuous
46	Agitator in Urea dosing tank	2	2	0	1.1	Intermittent
47	Urea dosing pump	2	1	1	0.55	Intermittent
48	Agitator in DAP dosing tank	2	2	0	1.1	Intermittent
49	DAP dosing pump	2	1	1	1.1	Intermittent
50	Agitator in Poly dosing tank for thickener	2	2	0	1.1	Continuous
51	Poly dosing pump for thickeners	2	1	1	0.55	Continuous
52	Agitator in DWPE dosing tank	2	2	0	2.2	Intermittent
53	DWPE dosing pump for centrifuge	2	1	1	1.1	Intermittent
54	DWPE dosing pump for BFP	2	1	1	2.2	Intermittent
55	Acid dosing pump	2	1	1	0.55	Intermittent
56	HCL unloading pumps	2	1	1	2.2	Intermittent
57	Caustic recirculation pumps	2	1	1	0.75	Intermittent
58	Air blower in chlorination	2	1	1	7.5	Intermittent

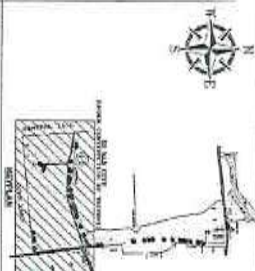
## PDA-40 MLD CETP AT LUDHIANA, PUNJAB

59	Dewatering pumps	2	1	1	2.2	Intermittent
60	Portable pumps/Service water pumps	2	1	1	1.1	Intermittent
61	Electrical Hoist in Raw effluent Pumping station.	1	1	0	2.2	Intermittent
62	Hoist in Equalization pump house	1	1	0	1.5	Intermittent
63	Hoist in air blower room	1	1	0	1.5	Intermittent
64	Hoist in chlorination building	1	1	0	2.2	Intermittent
65	Hoist in chemical sludge / bio sludge pump house	1	1	0	1.5	Intermittent
66	Hoist in dewatering unit	1	1	0	2.2	Intermittent
67	EOT crane in chemical house	1	1	0	2.2	Intermittent
68	Plant lighting load	1	1	0	37	Continuous
69	Instrumentation load	1	1	0	16	Continuous
70	Miscellaneous load	1	1	0	18.5	Intermittent
	<b>Continuous load</b>	<b>11882.56</b>	<b>KWH/d</b>			
	<b>Intermittent load</b>	<b>1593.77</b>	<b>KWH/d</b>			
	<b>Total power demand for 40 MLD CETP</b>	<b>13476.33</b>	<b>KWH/d</b>			



PLAN - LAYOUT

TOTAL AREA AVAILABLE : 34245 m<sup>2</sup>  
 AREA FOR FUTURE PURPOSE : 6937 m<sup>2</sup>  
 AREA FOR CETP : 28208 m<sup>2</sup>



NO.	DESCRIPTION OF WORK	SIZE (M <sup>2</sup> )	NO.
1	Proposed structure	448.41 x 101.14 x 4.00	100
2	Proposed structure	8.0 x 12.0 x 4.0	1
3	Proposed structure	8.0 x 12.0 x 4.0	1
4	Proposed structure	8.0 x 12.0 x 4.0	1
5	Proposed structure	8.0 x 12.0 x 4.0	1
6	Proposed structure	8.0 x 12.0 x 4.0	1
7	Proposed structure	8.0 x 12.0 x 4.0	1
8	Proposed structure	8.0 x 12.0 x 4.0	1
9	Proposed structure	8.0 x 12.0 x 4.0	1
10	Proposed structure	8.0 x 12.0 x 4.0	1
11	Proposed structure	8.0 x 12.0 x 4.0	1
12	Proposed structure	8.0 x 12.0 x 4.0	1
13	Proposed structure	8.0 x 12.0 x 4.0	1
14	Proposed structure	8.0 x 12.0 x 4.0	1
15	Proposed structure	8.0 x 12.0 x 4.0	1
16	Proposed structure	8.0 x 12.0 x 4.0	1
17	Proposed structure	8.0 x 12.0 x 4.0	1
18	Proposed structure	8.0 x 12.0 x 4.0	1
19	Proposed structure	8.0 x 12.0 x 4.0	1
20	Proposed structure	8.0 x 12.0 x 4.0	1
21	Proposed structure	8.0 x 12.0 x 4.0	1
22	Proposed structure	8.0 x 12.0 x 4.0	1
23	Proposed structure	8.0 x 12.0 x 4.0	1
24	Proposed structure	8.0 x 12.0 x 4.0	1
25	Proposed structure	8.0 x 12.0 x 4.0	1
26	Proposed structure	8.0 x 12.0 x 4.0	1
27	Proposed structure	8.0 x 12.0 x 4.0	1
28	Proposed structure	8.0 x 12.0 x 4.0	1
29	Proposed structure	8.0 x 12.0 x 4.0	1
30	Proposed structure	8.0 x 12.0 x 4.0	1
31	Proposed structure	8.0 x 12.0 x 4.0	1
32	Proposed structure	8.0 x 12.0 x 4.0	1
33	Proposed structure	8.0 x 12.0 x 4.0	1

- NOTES:
1. ALL CONSTRUCTION WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
  2. ALL CONSTRUCTION WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
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  33. ALL CONSTRUCTION WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

**LAT Construction**  
 Water & Sewerage Dept.

PROJECT: 40 MW CETP PLANT TREATMENT PLANT/STATION/STORAGE

CLIENT: PUNJAB POWER CORPORATION, STATE POWER BOARD

DATE: 15/08/2023

SCALE: AS SHOWN

DESIGNER: [Signature]

CHECKER: [Signature]

APPROVER: [Signature]

*Handwritten signature*

TRUE COPY  
ADVOCATE

**ANNEXURE - R4/4**

**PUNJAB POLLUTION CONTROL BOARD**  
**Zonal Office-II, 3rd Floor, Savitri Complex-I, Dholewal Chowk, G.T. Road,**  
**Ludhiana.**

Website:- [www.ppcb.gov.in](http://www.ppcb.gov.in)

Industry ID:R15LDH32539341

Date :20/05/2015

Application No :2549370

**To**

M/s Punjab dyers association (focal point module)  
 8.65 acre land, tajpur road, jamalpur awana  
 Ludhiana east  
 141008  
 Tehsil: Ludhiana east  
 District: Ludhiana iii

**Subject : Grant of 'Consent to Establish' (NOC) for an industrial unit u/s 25 of Water(Prevention & Control of Pollution)Act, 1974 and u/s 21 of Air(Prevention & Control of Pollution)Act,1981.**

With reference to your application for 'Consent to Establish'(NOC) an industrial plant u/s 25 of Water(Prevention & Control of Pollution)Act, 1974 and u/s 21 of Air(Prevention & Control of Pollution)Act, 1981, you are, hereby, permitted to establish the industrial or an expansion addition to discharge the effluent(s) & emission(s) arising out of your premises subject to the following conditions:

**A. Particulars of the Industry**

Name of the Applicant	Vijay Mehtani
Address of industrial premises	M/s Punjab dyers association (focal point module) 8.65 acre land, tajpur road, jamalpur awana Ludhiana east 141008 Tehsil :Ludhiana east District :Ludhiana iii
Capital investment of the industry	7135.0 lakhs
Scale of the industry	Large
Office District	zonal Office-II, Ludhiana
NOC fee details	-

Fee For	Bank Name	Branch Name	Draft No./Money Receipt No.	Date	Amount (In Rupees)																																							
CTE	State Bank of India	SME Focal Point Branch,	343607	02/04/2015	70005.0																																							
Raw Materials name with quantity per day				Waste water (Discharge from various dyeing industries) @ 40000 KLD																																								
Products with quantity per day				Treated Water @ 40000 KLD																																								
By-Products, if any, with quantity per day				-																																								
Details of machinery and process				CETP for Dyeing units																																								
Details of Effluent Treatment plant				-																																								
Mode of Disposal				Trade effluent from CETP @ 40 MLD through dedicated conveyance system leading upto the outlet of STP, Jamalpur installed by Municipal Corporation, Ludhiana for mixing with treated domestic waste water of STP. Domestic Effluent @ 20 KLD into sewer.																																								
Standards to be achieved under Water(Prevention & Control of Pollution) Act, 1974				<table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>pH</td> <td>6.5-8.5</td> </tr> <tr> <td>2.</td> <td>TSS, mg/l</td> <td>20</td> </tr> <tr> <td>3.</td> <td>BOD, mg/l</td> <td>10</td> </tr> <tr> <td>4.</td> <td>COD, mg/l</td> <td>50</td> </tr> <tr> <td>5.</td> <td>TDS, mg/l</td> <td>2100</td> </tr> <tr> <td>6.</td> <td>Oil &amp; grease, mg/l</td> <td>Nil*</td> </tr> <tr> <td>7.</td> <td>Total Chromium, mg/l</td> <td>Nil*</td> </tr> <tr> <td>8.</td> <td>Phenolic Compounds, mg/l</td> <td>Nil*</td> </tr> <tr> <td>9.</td> <td>Sulphide, mg/l</td> <td>0.01</td> </tr> <tr> <td>10.</td> <td>Bio-assay- Survival of fish after 96 hours of 100% effluent</td> <td>90</td> </tr> <tr> <td>11.</td> <td>SAR</td> <td>7</td> </tr> <tr> <td>12.</td> <td>RSC meq/l</td> <td>3</td> </tr> </tbody> </table>		Sr. No.	Parameter	Value	1.	pH	6.5-8.5	2.	TSS, mg/l	20	3.	BOD, mg/l	10	4.	COD, mg/l	50	5.	TDS, mg/l	2100	6.	Oil & grease, mg/l	Nil*	7.	Total Chromium, mg/l	Nil*	8.	Phenolic Compounds, mg/l	Nil*	9.	Sulphide, mg/l	0.01	10.	Bio-assay- Survival of fish after 96 hours of 100% effluent	90	11.	SAR	7	12.	RSC meq/l	3
Sr. No.	Parameter	Value																																										
1.	pH	6.5-8.5																																										
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11.	SAR	7																																										
12.	RSC meq/l	3																																										
Sources of emissions and type of pollutants				One DG set of 1600 KVA capacity with canopy																																								
Mode of disposal of emissions with stack height				-																																								
Quantity of fuel required in TPD				-																																								
Type of Air Pollution Control Devices to be installed				-																																								

Standards to be achieved under Air(Prevention & Control of Pollution) Act, 1981	-
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## B. Particulars of Consent to Establish (NOC) granted to the industry

No. R15LDH3CTE2549370	Date of issue :20/05/2015
	Date of expiry :19/05/2016

## C. Main Conditions :

- 1 There shall be no discharge into Budha Nallah.
- 2 The farmers shall be made aware that the water supplied to them is treated effluent.
- 3 The Association shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision.
- 4 The funds earmarked for environment management plan shall be included in the budget and this shall not be diverted for any other purposes.
- 5 The Association should develop green belt all along the periphery of the site with plant species that are significant and used for the pollution abatement.
- 6 All the recommendation of the EMP shall be complied with letter and spirit.
- 7 All the mitigation measures submitted in the EIA report shall be prepared in a matrix format and the compliance for each mitigation plan shall be submitted to MoEF along with half yearly compliance report to MoEF-RO.
- 8 The Association shall comply with all the conditions imposed in the environmental clearance granted by MoEF vide F.No. 10-92/2010-IA.III dated 03-05-2013.

## D. General Conditions :

The Punjab Pollution Control Board, has "No Objection" for setting up of 40 MLD capacity Common Effluent Treatment Plant (CETP) for treatment of waste water from the cluster of textile dyeing and printing industries located in Phase I to Phase VIII, Ludhiana with Regd. office at 341/342-D, Phase-VIII, Focal Point, Ludhiana, subject to the following conditions:-

1. The NOC is valid only for registration of application and issue of demand notice for electric connection by P.S.P.C.L./Water supply connection/loans etc. However, The Association shall obtain a clearance certificate from the Board to the effect that it has installed proper and adequate pollution control equipments for the purposes of release of electric connection by P.S.P.C.L. and drawing the last installment of loan from financial institutions.
2. The N.O.C. is valid for period of one year from the date of its issue or till the commissioning of the CETP whichever is earlier.
3. The Association shall apply for consents of the Board as required under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981 along with the application for authorization under the provision of Hazardous Waste (Management and Handling) Rules, 2003 two months before the commissioning of the plant or at the time of submission of clearance application for the release of load, whichever is applicable.
4. The Association shall provide adequate arrangements for fighting the accidental leakages/discharge of any air pollutant/gas/liquids from the vessels, mechanical equipments etc. which are likely to cause environmental pollution.

5. The Association shall comply with any other conditions laid down or directions issued by the Board under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981 from time to time.
6. Nothing in this N.O.C. shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities or penalties to which the applicant is or may be subjected under the provisions of the Water/Air Acts respectively.
7. The project has been approved by the Board from pollution angle and The Association shall obtain the approval of site from other concerned departments, if need be.
8. The Association shall plant two rows of suitable varieties of trees along the boundary of the premises as green coner.
9. The Association shall operate pollution control devices (common effluent treatment plant) regularly so as to achieve the standards prescribed by the Board for such discharges.
10. The Association shall ensure that the effluent discharged by it, is toxicity free.
11. The Association shall provide terminal manhole at the end of each collecting system and a manhole upstream of final outlet (s) out of the premises of the common effluent treatment plant for measurement of flow and for taking samples.
12. The Association shall, for the purpose of measuring and recording of quantity of water consumed, affix meters of such standards at such places as approved by the Environmental Engineer, Pollution Control Board, Regional Office-III, Ludhiana
13. The Association shall keep the height of exhaust pipes with ventilation equipments etc. at least 3 meters above the roof level.
14. The association shall discharge all gases through a stack of minimum height as specified in the standards laid down by the Board.  
For industrial furnaces and kilns, the criteria for selection of stack height would be based on fuel used for the corresponding steam generation.

Stack height for diesel generating sets:

Capacity of diesel Generating set	Height of the Stack
0-50 KVA	Height of the building + 1.5 mt.
50-100 KVA	-do- + 2.0 mt.
100-150 KVA	-do- + 2.5 mt.
150-200 KVA	-do- + 3.0 mt.
200-200 KVA	-do- + 3.5 mt.
250-300 KVA	-do- + 3.5 mt.

For higher KVA rating stack height H (in meter) shall be worked out according to the formula:

$$H = h + 0.2 (KVA)^{0.5}$$

Where h = height of the building in meters where the generator set is installed.

15. The association will provide canopy and adequate stacks to the D.G sets so as to comply with the provision of EPA 1986 & GOI notification No GSR-371 E dated 17-5-2002(amended from time to time) issued by MOEF, New Delhi.
16. All amendments/revisions made by the Board in the effluent and/or emission/stack height standards shall be applicable to The Association from the date of such amendments/revisions.
- 15 The Association shall install separate energy meter for its effluent treatment plant / air pollution control device and maintain the record on daily basis regarding consumption of energy for the running and maintenance of effluent

treatment plant/recirculation system.

16 The adequacy and efficacy of the effluent treatment plant and air pollution control devices will be the entire responsibility of the Association.

17 The Association will make adequate arrangements for regular operation of common effluent treatment plant in case of the failure of power.

18 The Association shall put up display Board indicating Environmental Data at its main gate.

19 The Association will monitor its common effluent treatment plant regularly on daily basis.

20 The Association will develop environmental page on its web site to display the results of the common effluent treatment plant regularly.

21 The Association shall install the common effluent treatment plant as per the feasibility report submitted by it.

22 The Association shall submit the name & addresses of its member units and the name of responsible person of each member unit.

23 It will be the combined responsibility of the Association and the individual member units for the proper operation and maintenance of the common effluent treatment plant to achieve the prescribed standards.

24 The Association shall establish a lab with full facilities for the analysis of the effluent.

25 The Association shall appoint an Environmental Engineer and competent staff for the operation of common effluent treatment plant.

26 The Association shall install common effluent treatment plant based on zero liquid discharge (ZLD) technology in second Phase and reuse the treated effluent back into the process of member dyeing industries.

27 The Association shall provide rain water harvesting system in its premises to carry roof top rain water into underground strata.

28 No surface run off or any other rain water flowing in lawns/ garden be allowed to enter into the rain water harvesting system.

29 All the pipes provided for the recharging system should be visible and properly coloured with light blue colour.

30 The CETP shall achieve the following standards:-

Sr. No. Parameter Value

1. pH 6.5-8.5
2. TSS, mg/l 20
3. BOD, mg/l 10
4. COD, mg/l 50
5. TDS, mg/l 2100
6. Oil & grease, mg/l Nil\*
7. Total Chromium, mg/l Nil\*
8. Phenolic Compounds, mg/l Nil\*
9. Sulphide, mg/l 0.01
10. Bio-assay- Survival of fish after 96 hours of 100% effluent 90
11. SAR 7
12. RSC meq/l 3

31 The Association shall discharge its treated trade effluent of CETP with above said standards at the outlet of STP, Jamalpur installed by the Municipal Corporation, Ludhiana.

The following parameters as mentioned below shall be maintained after mixing of treated waste water from the CETP and treated domestic waste water of STPs of Ludhiana so that the values of SAR, EC and RSC as mentioned below is achieved at all the times. The Association shall ensure the achievement of the parameters namely SAR and RSC at all

the times at the confluence point of treated domestic sewage and treated CETP effluent:-

Parameters Concentration

Sodium absorption ration (SAR) 3.5

Residual Sodium Carbonate (RSC) meg/ltr 2.5

However, the Electrical Conductivity (EC) shall be maintained 2,000  $\mu$ S/cm.

32 The treated effluent of the CETP shall be mixed with the treated sewage of STPs and finally it shall be utilized for irrigation purposes in an area of about 80,000 Acres.

33 The Board reserves the right to revoke the NOC granted to the Association at any time in case the Association is found violating any of the conditions of NOC or any provision of Air (Prevention & Control of Pollution) Act, 1981 & Water (Prevention & Control of Pollution) Act 1974 as amended time to time.

-  
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ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਕੰਟਰੋਲ ਬੋਰਡ  
PUNJAB POLLUTION CONTROL BOARD

Zonal Office-II, E-648-B, Backside CICU Office, Phase-5, Focal Point, Ludhiana.

Ph:- 0161-2670141

E-Mail: seezo2ldhppcb@yahoo.com

No..... 7726.....

Date..... 19/11/15

To

The Secretary to the Govt. of India,  
Ministry of Environment, Forest & Climate Change,  
New Delhi.

Sub:

**Regarding recommending the application to avail Grant-In-Aid for installation of 40 MLD Common Effluent Treatment Plant by Punjab Dyers Association (Focal Point Module) at Tajpur Road to Ministry of Environment, Forest & Climate Change, Govt. of India, New Delhi under Centrally Sponsored Scheme of CETPs.**

Ref:

**Govt. of Punjab, Deptt. of Science, Technology & Environment memo no. 10/87/2015 (STE-5)/620686/1 dated 04-11-2015.**

In continuation to above referred letter, it is submitted that Punjab Pollution Control Board has technically vetted and recommended the proposal to setup a Common Effluent Treatment Plant (CETP) of 40 MLD capacity to the Secretary, Govt. of Punjab, Deptt. of Science, Technology & Environment as under:-

"There are 266 no. of dyeing industries situated in Ludhiana City and discharging about 117 MLD of effluent into M.C. sewer leading to Budha Nallah and ultimately River Satluj. The Govt. of Punjab took initiative for installation of CETP for dyeing industries to check the pollution of Budha Nallah and River Satluj. A SPV of dyeing industries was framed under the name and style of M/s Punjab Dyers Association, Ludhiana for installation of CETP of 117 MLD, accordingly a DPR of 117 MLD has prepared by ILFS. Environmental Clearance was granted to the Punjab Dyers Association for the construction of 117 MLD CETP vide MoEF, Govt. of India letter no. F. No. 10-92/2010-IA.III dated 03-05-2013. The Govt. of Punjab took initiative and allotted 32 acre land on lease for installation of CETP of 117 MLD. The cost of CETP was estimated for Rs. 400 Crores. But, due to the huge cost involved, the CETP project could not took off. Thereafter, the Govt. of Punjab along with Punjab Dyers Association, Ludhiana has decided to install the CETP in small modules as per the location of cluster of dyeing industries.

In compliance, the Punjab Dyers Association was bifurcated in 2 Modules under the name and style of M/s Punjab Dyers Association (Tajpur Road Module) and M/s Punjab Dyers Association (Focal Point Module). The Punjab Dyers Association (Tajpur Road, Module) is installing CETP of 50 MLD capacity comprising of two modules of 25 MLD capacity each on separate land measuring 9.75 acres. Grant in Aid case for

discharge at outlet of Sewage Treatment Plant at Focal Point, which will be used for irrigation purpose. The sludge generated from CETP would be disposed off to a Treatment Storage and Disposal Facility (TSDF), Nimbua. The DPR for establishment of the CETP has been technically evaluated by the Testing and Consultancy Cell, Guru Nanak Dev Engineering College, Ludhiana. The Punjab Pollution Control Board has granted NOC to the Association, which is valid upto 19-05-2016 for the establishment of 40 MLD capacity CETP.

Punjab Dyers Association (Focal Point Module) has applied for obtaining Grant-in-Aid for establishment of Common Effluent Treatment Plant of 40 MLD capacity based on SBR technology under the Centrally Sponsored Scheme of CETPs of Ministry of Environment, Forest & Climate Change. The Common Effluent Treatment Plants involving Primary/Secondary /Tertiary treatment and financial assistance would be provided by Govt. of India to the tune of 50% of maximum Rs. 1.50 crore/MLD capacity, subject to ceiling of Central Assistance of Rs. 15 crore per Common Effluent Treatment Plant. The ratio proposed in respect of Central Share: State Share: Project Proponents Share will be 50:25:25. Out of Proponents Share, at least 40% of the Contribution has to be from the Proponent & balance 60 % is to be raised from Banks & Financial Institutions by the Proponent.

Punjab Dyers Association (Focal Point Module) has also proposed dedicated conveyance system to carry the untreated effluent from the industries located in Focal Point, Phase-I-VIII to the CETP and to carry treated trade effluent from the CETP to the outlet of STP. The total length of dedicated conveyance system will be 16.9 km at estimated cost of Rs. 15.95 Crore. Necessary approval for laying the dedicated conveyance system has been given by the Municipal Corporation, Ludhiana.

The Board has gone through the technical evaluation report on detailed project report for establishment of 40 MLD CETP based on SBR technology for textile and knitwear industries of Focal Point, Phase-I-VIII, Ludhiana. The treatment scheme of CETP broadly comprises of screening, oil & grease removal, pH correction, coagulation, flocculator, clarification, biological process and disinfection. This SBR based CETP Plant will have following treatment methodology:-

1. Preliminary Treatment

- (i) Raw effluent collection sump and coarse screening,
- (ii) Raw effluent pumping system,
- (iii) Inlet chamber/stilling chamber,
- (iv) Fine screening,
- (v) Civil chambers & oil grease trap,
- (vi) Equalization tank.

2. Primary Treatment

- (i) pH correction Tank-I & II,
- (ii) Chemical dosing - (Lime, FeSO<sub>4</sub>, Polyelectrolyte & acid),
- (iii) Sludge Blanket Clarifier.

3. Secondary Treatment
  - (i) Chemical dosing (Urea and DAP provision)
  - (ii) Sequential Batch Reactor (SBR) Basin
4. Disinfection
  - (i) Chlorine Contact Tank with Gaseous Chlorination System
5. Sludge Dewatering (Chemical)
  - (i) Primary Sludge Collection sump & Pump House
  - (ii) Dewatering polymer dosing system
  - (iii) Belt filter press for primary sludge
6. Sludge Dewatering (Biological)
  - (i) Bio sludge thickener & Thickened sludge collection sump
  - (ii) Dewatering Polymer dosing system
  - (iii) Bio-centrifuge.

Treated Effluent Characteristics at the outlet of CETP will be as under:-

Sr. No.	Parameters	Concentration in mg/l except pH, SAR, RSC & Bio-assay
1.	pH	6.5-8.5
2.	TSS	20
3.	BOD (3 Days at 27°C)	10
4.	COD	50
5.	TDS	2100
6.	Oil & Grease	Nil
7.	Total Chromium	Nil
8.	Phenolic Compounds	Nil
9.	Sulfide	0.01
10.	Bio-assay	90% survival of fish after 96 hours of 100% effluent.
11.	SAR	7
12.	RSC (meq/litre)	4

However, the following parameters as mentioned below shall be maintained after mixing of treated wastewater from the CETP and treated domestic wastewater:

Sr. No.	Parameters	Concentration
1.	Sodium absorption ratio (SAR)	3.5
2.	Electrical Conductivity (EC) μS/cm	2000
3.	Residual Sodium Carbonate (RSC) meq/litre	2.5

Grant-In-Aid

Treatment Plants (CETPs). The comments of Punjab Pollution Control Board on the checklist have been added.

- The Punjab Dyers Association (Focal Point Module) has got the Financial Appraisal of the project from Punjab National Bank for Rs. 49.55 crore. The bank has considered the overall financial liquidity and profitability parameters for the project as reasonable, satisfactory and economically viable. As per the DPR submitted by the Punjab Dyers Association (Focal Point Module), the cost of the project is Rs. 79 crore, which includes Rs. 71.35 crore as cost of CETP as well as dedicated conveyance system and Rs. 7.65 crore as miscellaneous expenses. So as per the Scheme, the Govt. of India will give Rs. 15 crore as Central Subsidy (50% Share), State Govt. will give Rs. 7.5 crore as State Subsidy (25% Share) & S.P.V. Punjab Dyers Association (Focal Point Module) will contribute 56.5 crores (60% as Loan from Banks= 22.6 crores & 40% Self Contribution by the Proponent= 33.9 crores).
- The construction work of CETP has been allotted to M/s L&T Company Ltd. and the SPV has spent Rs. 10 crore for installation of some components of CETP at site. About 50% of civil work has been completed at site.

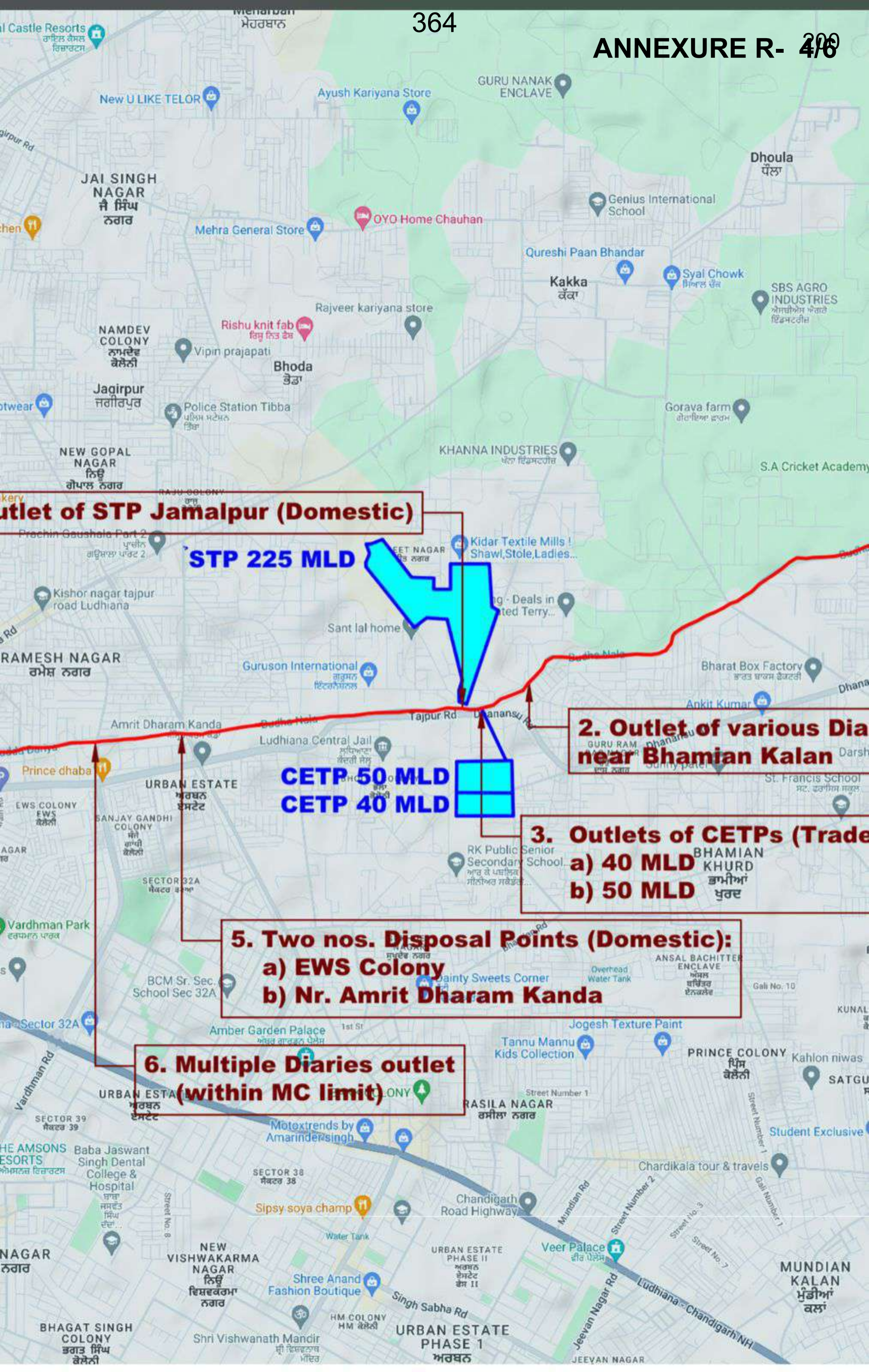
It has been observed that the DPR submitted by the Punjab Dyers Association is technically satisfactory. Hence, the application for Grant in Aid under the Centrally Sponsored Scheme of Common Effluent Treatment Plants (CETPs) from Ministry of Environment, Forest & Climate Change, Govt. of India is in line as per the scheme."

The design is evaluated technically and found to be adequate for the intended purpose of treatment and the treated effluent is expected to meet with the standards prescribed for the CETP as mentioned above. Therefore, it is again recommended that the requisite sanction may kindly be accorded to the project and the funds may be released, please.

  
Senior Environmental Engineer,  
PPCB, ZO-II, Ludhiana



TRUE COPY  
ADVOCATE



**Outlet of STP Jamalpur (Domestic)**

**STP 225 MLD**

**CETP 50 MLD  
CETP 40 MLD**

**2. Outlet of various Diaries near Bhamian Kalan**

**3. Outlets of CETPs (Trade)**  
a) 40 MLD  
b) 50 MLD

**5. Two nos. Disposal Points (Domestic):**  
a) EWS Colony  
b) Nr. Amrit Dharam Kanda

**6. Multiple Diaries outlet (within MC limit)**

F. No. Q-15017/22/2014-CPW  
 Government of India  
 Ministry of Environment, Forest and Climate Change  
 (CP Division)

**ANNEXURE R-4/7**



2<sup>nd</sup> Floor, Prithvi Wing  
 Indira Paryavaran Bhawan  
 Aliganj, Jor Bagh Road  
 New Delhi-110 003  
 E-mail: h.kharkwal@nic.in  
 Telefax: 01124695384

Dated: 18<sup>th</sup> March, 2016

To,  
 The Member Secretary  
 Punjab State Pollution Control Board  
 Vatavaran Bhawan, Nabha Road,  
 Patiala – 147001  
 Punjab

**Subject: Follow-up of the Minutes of the Appraisal Committee meeting on CETPs held on 03/03/2016- regarding.**

Sir,

I am directed to enclose the Minutes of the Appraisal Committee Meeting on CETPs held on 03/03/2016 under the Chairmanship of Dr. Manoranjan Hota, Adviser (CP), MoEF&CC.

2. A copy of the minutes is enclosed. The Committee approved the following proposals:

- i. 40 MLD CETP of M/s Punjab Dyers Association (PDA)–Focal Point Module Ludhiana, Punjab.
- ii. 15 MLD CETP by M/s Bahadur Ke Textile & Knitwear Association (BKTKA) at Bahadur Ke Road, Ludhiana, Punjab.

3. The State Pollution Control Board may indicate the status of release of State subsidy to above said CETPs, so as to enable us to take further necessary action for processing the release of Central share as per the CETP Guidelines.

This may be treated as most urgent.

**Encl. as above.**

Yours faithfully,

Sd/-

(Dr. H. Kharkwal)  
 Joint Director (S)

**Copy to:**

The Chairman/Managing Director  
 M/s Bahadur Ke Textile &  
 Knitwear Association (BKTKA)  
 C/o Jain Shawls, Bahdur Ke Road,  
 Industrial Zone, Ludhiana- 141008, Punjab.

**Minutes of the Appraisal Committee meeting on Common Effluent Treatment Plants (CETPs) held in the Ministry of Environment, Forest & Climate Change on 03/03/2016.**

A meeting of the Appraisal Committee on Common Effluent Treatment Plants was held in the Ministry of Environment, Forest and Climate Change at New Delhi on 03/03/2016 under the Chairmanship of Dr. Manoranjan Hota, Adviser (CP). The list of participants is annexed. At the outset the Chairman of the Committee welcomed the Members of the Committee attended the meeting and gave a brief background of the revised guidelines for central assistance to CETPs, procedures etc. invited the proponents to make presentation of their CETP proposals.

2. Joint Director (HK), MoEF&CC informed that the Appraisal Committee meeting was convened to discuss two new proposals of CETPs submitted as per revised guidelines on CETPs which has been duly recommended and forwarded by the Punjab State Pollution Control Board.

3. The following new proposals of CETP were presented and discussed in the meeting:

**3.1 40 MLD CETP of M/s Punjab Dyers Association (PDA)-Focal Point Module Ludhiana, Punjab**

- i. The proposal was duly recommended and forwarded by Punjab State Pollution Control Board (PPCB) for financial assistance for 40 MLD CETP of the SPV, M/s Punjab Dyers Association (PDA) - Focal Point Module, Ludhiana, Punjab. The CETP is based on Physico-Chemical followed by Advanced Biological treatment systems which is further followed by disinfection systems. The treated effluent will be discharged at the outfall of Ludhiana Sewage Treatment Plant (STP) and will be utilized for irrigation of agricultural land.
- ii. The presentation on the project was made by Shri John Thomas, Consultant/ Environmental Advisor to PDA- Focal Point Module.
- iii. There are currently 55 industries who are members of the 40 MLD PDA Focal Point CETP.
- iv. Ludhiana has been identified as one of the Critical Polluted Areas and has also been recently been selected for the first 20 Smart Cities to be developed in the country. The Member Secretary, Punjab Pollution Control Board (PPCB) also clarified that the environmental standards were set for the said CETP after detailed deliberations with experts from CPCB, Punjab Agricultural University, PPCB. Apart from the Real Time Effluent Monitoring Systems; PPCB will be also regularly monitor the CETP performance.

- v. The Project DPR has been technically appraised by Guru Nanak Engineering College, Ludhiana and IIT Madras, Chennai; as well as been assessed for Techno Economic Viability by Punjab National Bank.
- vi. The proponent has mentioned that the treated effluent shall be discharged and utilized for irrigation purpose. Member Secretary, PPCB also confirmed that Government of Punjab has approved the project for providing conveyance system for carrying treated effluents from the STPs and CETPs in Ludhiana for irrigation and also stated that they have stipulated a condition in the Consent To Establish as the farmers shall be made aware that the water supplied to them is treated effluent.
- vii. The Member Secretary, PPCB has informed that a Special Purpose Vehicle (SPV) will be constituted for the CETP with the Director of Industries, Government of Punjab who will be by default be part of the Managing Board of the SPV apart from other State Government nominees.
- viii. The Member Secretary, PPCB has stated that the basic construction activities of the CETP of the Punjab Dyers Association, Ludhiana has been taken up by the project proponent to demonstrate PDA-Focal Point Module's commitment to the project and does not have much bearing on assistance component on the overall scale and cost of the project.
- ix. The Overall cost of the 40 MLD CETP and laboratory is ₹55.40 crores as per the following details:

<b>CETP &amp; Laboratory</b>	
Civil works	₹24.93 crores
Electro Mechanical Components	₹27.70 crores
Design & Drawing	₹2.77 crores
<b>Sub Total</b>	<b>₹55.40 crores</b>

- x. The Source of Funding for the project as indicated by the Project Proponent are as per the following details:

<b>CETP &amp; Laboratory</b>	
Central Assistance	₹15.00 crores
State Govt. Assistance	₹7.50 crores
PDA's own funds	₹7.50 crores
Additional funding to be sourced by PDA from Financial institutions	₹25.40 crores
<b>Sub Total</b>	<b>₹55.40 crores</b>

- xi. The Proponent indicated that Punjab National Bank (PNB) has appraised the financial viability of the project and has indicated its in-principle

willingness to finance upto an amount of ₹49.55 crores to cover the project and associated costs.

- xii. The proponent informed that the current 22 km long conveyance system is based on gravity with the CETP at a lower level. The logistics, infrastructure costs – CAPEX and OPEX do not support economic viability of recycle / reuse of treated effluent within industries under current circumstances. The same would cause further environmental burden linked to high energy consumption towards pumping, evaporation etc.
- xiii. The project has an Environment and Sludge Management Plan and has confirmed that it is Member of the Common Hazardous Waste TSDF at Nimbua, Derabassi and has an agreement already signed up for disposal of sludge into this facility.
- xiv. The proponent has confirmed that a legal agreement has been made between the SPV and its 55 Members regarding their roles, responsibilities and the sharing of the capital and O&M costs; as specified under the CSS guidelines.
- xv. The project would be completed in 18 months.
- xvi. As per the revised Central Sector Schemes guidelines for CETPs involving primary, secondary and tertiary treatment; financial assistance would be provided by GoI to the tune of 50% of maximum project cost or ₹1.5 crore/MLD capacity, subject to a ceiling of ₹15 crores per CETP. Considering the project is eligible for Central subsidy, the Committee approved Central subsidy of ₹15 crores for the project.

**3.2** After a detailed deliberations, the Committee recommend/approved the 40 MLD /CETP of M/s Punjab Dyers Association, Ludhiana, Punjab.

**4. 15 MLD CETP by M/s Bahadur Ke Textile & Knitwear Association (BKTKA) at Bahadur Ke Road, Ludhiana, Punjab.**

- i) The proponent has informed that there are currently 23 industries, which are Members of the CETP Association.
- ii) A presentation of the proposal was made by Sh. Pardeep Kumar of M/s JBR Technologies Pvt. Ltd., Ludhiana and the consultant of the BKTKA.
- iii) Earlier, the proposal of CETP was based on Zero Liquid Discharge (ZLD) Technology was duly recommended and forwarded by Punjab Pollution Control Board (PPCB) for financial assistance for 15 MLD CETP. But due to reluctance of Bankers for the disbursement of finance for ZLD, the proposal was reformulated/ recommended for financial assistance which is based on

- aerobic biological system for tertiary treatment in the Phase-I. The ZLD will be considered in Phase-II.
- iv) The project proponent has indicated their intention to initiate the CETP based on conventional treatment system in Phase-I. They may adopt ZLD in the Phase-II for which they will apply to the MoEF&CC at a later stage as an up-gradation case.
  - v) The Association informed that a dedicated piped conveyance system will be laid to carry the effluent from 23 units to the CETP and this conveyance system has been approved by the Municipal Corporation, Ludhiana.
  - vi) The Association also informed that the sludge generated from the CETP be transported to the Common Hazardous Waste Treatment and Disposal Facility, Nimbua, Dera Bassi, Punjab, which is a scientifically designed disposal site duly approved by the Govt. of Punjab. The Association has obtained the Membership of the facility.
  - vii) The financial appraisal for the CETP which is based on aerobic biological system has been done by the Bank of Baroda, MID Corporate Branch, Ludhiana.
  - viii) Member Secretary, Punjab State Pollution Control Board has confirmed that the Consent to Establish (CTE) has been issued by PPCB based on the ZLD.
  - ix) The proponent in response to the query regarding adoption of an Ion Exchange in tertiary phase of non-ZLD based CETP, stated that Ion Exchange would help in increasing the life of RO membranes when ZLD will be adopted in Phase-II.
  - x) The proponent informed the Committee that they have already got commitment from the State Government for assistance to the tune of ₹10 crores and requested GOI to provide financial assistance and permission to initiate a non-ZLD based CETP in Phase-I and then upgrade to ZLD based CETP subject to support from the financial institutions. However, the Committee recommended that the Association should submit a fresh proposal for Zero Liquid Discharge at a later stage so that the CETP is installed in a phased manner. The CETP shall treat the effluents to meet the norms prescribed for CETP.
  - xi) The total project cost of the 15 MLD CETP is ₹51.11 crores as per the following:

Sr. No.	Item	Total Cost (₹in Crores)
1	Land	Leased
2	Land development cost (already incurred)	₹1.25
3	Building & Civil works	₹28.76

4	Water pipeline cost	₹2.25
5	Road Repair (Lumpsum)	₹0.15
6	Mechanical & Electrical	₹12.69
7	Interest during construction period	₹1.98
8	Misc. fixed assets (Lumpsum)	₹0.25
9	Electricity security (1400 KW @ ₹2000 /KW)	₹0.28
10	Preliminary & Pre-operative expenditure	₹1.00
11	Working capital margin	₹1.25
12	Contingency	₹1.22
<b>TOTAL</b>		<b>₹51.11</b>

- xii) The source of funding for the project as indicated by the proponent are as follows:

1	MOEF&CC subsidy (50%)	₹15.00 crores
2	State Govt. Subsidy (25%)	₹ 7.50 crores
3	Members contribution (25%)	₹ 7.50 crores
4	Members contribution by way of loan from bank	₹21.11 crores
<b>TOTAL</b>		<b>₹51.11 crores</b>

The Association has already taken the approval from the Bank of Baroda, a Nationalized Bank, for a loan of ₹37.35 crores out of which an amount of ₹21.11 crores will be available by the proponent.

- xiii) With regard to the high cost of the CETP project, the proponent clarified that the CETP is to be constructed in vertical horizon with lot of civil work depending upon the soil bearing capacity of the area. The Techno Economic Viability (TEV) study has included all the aspects before giving financial approval to the project. The total cost of Plant & Machinery of CETP is ₹41.75 crores and the cost of sewerage line & disposal line & other misc. is ₹9.36 crores. The proponent however clarified that the Committee may approve the funds as per the CETP guidelines. The SPCB also supported their proposition and also stated the State Board has committed for the State share of ₹10 crores as per the CETP guidelines.
- xiv) As per the revised Central Sector Schemes guidelines for CETPs involving primary/ secondary/ tertiary treatment; financial assistance would be provided by GoI to the tune of 50% of maximum cost of the project or ₹1.5 crore/MLD capacity, or subject to a ceiling of ₹15 crores per CETP maximum. Considering the project is of 15 MLD capacity, the Committee approved for Central subsidy of ₹11.25 crores for the project.
- xv) The Govt. of Punjab has already given a commitment letter vide letter Memo No.10/87/2015 (STE-5) in October, 2015 for ₹10.00 crores as State share of the project.

xvi) The project would be completed in 18 months.

**4.1** After a detailed deliberation, the Committee has recommended/approved the CETP proposal of M/s Bahadur Ke Textile & Knitwear Association at Bahadur Ke Road, Ludhiana, Punjab.

The meeting ended with a Vote of Thanks to the Chair.

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**List of the Participants who attended the meeting of the Appraisal Committee Meeting of Common Effluent Treatment Plants (CETPs) held on 03/03/2016 in Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi.**

S. No.	Name & Address	Designation
1.	Dr. Manoranjan Hota, Adviser, Ministry of Environment, Forest & Climate Change, New Delhi	Chairman
2.	Dr. Neelam, Scientist 'E' of Ministry of Science & Technology, New Delhi	Member
3.	Sheri Ankush Tewari (EE) of Central Pollution Control Board, Delhi.	Member
4.	Ms. Pratima Gupta, Director, Niti Ayog, New Delhi	Member
5.	Dr. Babu Ram, Member Secretary, Punjab Pollution Control Board (SPCB), Punjab	Member
6.	Sheri Abhijit Roy, Under Secretary, IFD, MoEF&CC, New Delhi	Member
7.	Dr. H. Kharkwal, Joint Director/Scientist 'D', C.P. Division, MoEF&CC, New Delhi	Member Secretary
8.	Sheri Prithipal Bhalla, Punjab Dyers Association Ludhiana, Punjab.	Proponent
9.	Shri Vijay Mehtani, Vice President.....Dyers Association Focal Point Module Ludhiana, Punjab.	Proponent
10.	Shri Ajit Maruthe, Technical Adviser, Punjab Dyers Association, Ludhiana, Punjab.	Proponent
11.	Shri John Thomas, Consultant, Punjab Dyers Association Ludhiana, Punjab.	Proponent
12.	Prof. Vivek Dhawan, Punjab Dyers Association, Ludhiana, Punjab.	Proponent
13.	Sheri Er. Harbir Singh, SEE, Punjab, Pollution Control Board, Zonal Officer, Ludhiana, Punjab.	Proponent
14.	Shri Vishal Jain, Director, Amar Ind. Ltd. Ludhiana, Punjab.	Proponent
15.	Sheri Pradeep Singh, Technical Director, JBR Technologies Pvt. Ltd. Ludhiana, Punjab.	Proponent
16.	Shri Lalit Jain, MD, Bahadur Ke Knit wears & Textiles Association, Ludhiana, Punjab.	Proponent
17.	Sheri Rajueer Gupta, Director, Bahadur Ke Knit wears & Textiles Association, Ludhiana, Punjab.	Proponent
18.	Sheri Arun Jain, Director, Jain Shawals, Ludhiana, Punjab.	Proponent

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*Asimk*

**TRUE COPY  
ADVOCATE**

## ANNEXURE - R4/8

रजिस्ट्री सं० डी० एल०-33004/99

REGD. NO. D. L.-33004/99

  
**भारत का राजपत्र**  
**The Gazette of India**

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)

PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित

PUBLISHED BY AUTHORITY

सं. 4]

नई दिल्ली, शुक्रवार, जनवरी 1, 2016/पौष 11, 1937

No. 4]

NEW DELHI, FRIDAY, JANUARY 1, 2016/ PAUSA 11, 1937

## पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

## अधिसूचना

नई दिल्ली, 1 जनवरी, 2016

**का.आ. 4(अ).**-- केन्द्रीय सरकार, पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 6 और धारा 25 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, पर्यावरण (संरक्षण) नियम, 1986 का और संशोधन करने के लिए निम्नलिखित नियम बनाती है, अर्थात् :-

1. संक्षिप्त नाम और प्रारम्भ.—(1) इन नियमों का संक्षिप्त नाम (पर्यावरण) संशोधन नियम, 2015 है।

(2) ये राजपत्र में प्रकाशन की तारीख को प्रवृत्त होंगे।

2. पर्यावरण (संरक्षण) नियम, 1986 की अनुसूची 1 में,-

(क) क्रम संख्या 41 और उससे संबंधित प्रविष्टियों का लोप किया जाएगा;

(ख) क्रम संख्या 55 और उससे संबंधित प्रविष्टियों के स्थान पर, निम्नलिखित क्रम संख्या और प्रविष्टियां रखी जाएंगी:-

क्रम संख्या	उद्योग	पैरामीटर	मानक
(1)	(2)	(3)	(4)
“55.	सामान्य वहिःस्त्राव उपचार संयंत्र (सीईटीपी)		
	क. अंतर्गम क्वालिटी मानक	प्रत्येक सामान्य वहिःस्त्राव उपचार संयंत्र (सीईटीपी) के लिए, राज्य बोर्ड सामान्य वहिःस्त्राव उपचार संयंत्र (सीईटीपी) तथा स्थानीय आवश्यकताओं और दशाओं की अभिकल्पना के अनुसार साधारण पैरामीटर, अमोनियम - नाइट्रोजन और भारी धातुओं के लिए अंतर्गम क्वालिटी मानक विहित करेगा।	

6 GI/2016

(1)

ख. उपचारित बहिःस्राव क्वालिटी मानक	अधिकतम अनुज्ञेय मान (पीएच और तापमान के सिवाय मिलीग्राम/लीटर में)		
	अंतर्देशीय भूपृष्ठ-जल में	सिंचाई के लिए भूमि पर	समुद्र में
साधारण पैरामीटर			
पीएच	6-9	6-9	6-9
जैव आक्सीजन मांग, वीओडी <sub>5</sub> , 27 <sup>0</sup> सेंटीग्रेड	30	100	100
रामायनिक आक्सीजन मांग (सीओडी)	250	250	250*
कुल निलंबित ठोस पदार्थ (टीएसएस)	100	100	100
नियत विघटित ठोस पदार्थ (एफडीएस)	2100*	2100*	एनएस*
<b>विनिर्दिष्ट पैरामीटर</b>			
तापमान, <sup>0</sup> सेंटीग्रेड	परिवेशी जल तापमान के ऊपर 5 <sup>0</sup> सेंटीग्रेड से अधिक नहीं होगा	परिवेशी जल तापमान के ऊपर 5 <sup>0</sup> सेंटीग्रेड से अधिक नहीं होगा	परिवेशी जल तापमान के ऊपर 5 <sup>0</sup> सेंटीग्रेड से अधिक नहीं होगा
तेल और ग्रीज	10	10	10
अमोनियामय नाइट्रोजन	50	एनएस*	50
कुल जेलडेहल नाइट्रोजन (टीकेएन)	50	एनएस*	50
नाइट्रेट नाइट्रोजन	10	एनएस*	50
फास्फेट, पी के रूप में	5	एनएस*	एनएस*
क्लोराइड	1000	1000	एनएस*
सल्फेट एसओ <sub>4</sub> के रूप में	1000	1000	एनएस*
फ्लोराइड	2	2	15
सल्फाइड, एस के रूप में	2	2	5
फैनोलिक यौगिक मिश्रण	1	1	5

(सी <sub>6</sub> एच <sub>5</sub> ओएच) के रूप में				
योग अवशिष्ट क्लोरीन	1	1	1	1
जस्त	5	15	15	
लौहा	3	3	3	
तांबा	3	3	3	
त्रिसंयोजक क्रोमियम	2	2	2	
मैगनीज	2	एनएस*	2	
निकिल	3	एनएस*	3	
आर्सेनिक	0.2	एनएस*	0.2	
साइनाइड सीएन के रूप में	0.2	एनएस*	0.2	
वेनेडियम	0.2	एनएस*	0.2	
सीसा	0.1	एनएस*	0.1	
हैक्सावैलेंट क्रोमियम	0.1	एनएस*	0.1	
सेलेनियम	0.05	एनएस*	0.05	
कैडमियम	0.05	एनएस*	0.05	
पारा	0.01	एनएस*	0.01	
जैव आमापन परीक्षण	उद्योग विनिर्दिष्ट मानकों के अनुसार	उद्योग विनिर्दिष्ट मानकों के अनुसार	उद्योग विनिर्दिष्ट मानकों के अनुसार	
<p>एनएस* विनिर्दिष्ट नहीं है टिप्पणः</p> <p>1. *समुद्र में उपचारित बहिःस्राव का निस्सरण उचित समुद्री मुहाने के माध्यम से होगा। विद्यमान अपतट निस्सरण समुद्री मुहाने में संपरिवर्तित किया जाएगा। उन मामलों में जहां निस्सरण के बिंदु पर समुद्री मुहाना 150 गुणा न्यूनतम आरंभिक तनुकरण का और निस्सारण बिंदु से 100 मीटर दूर किसी बिंदु पर 1500 गुणा न्यूनतम तनुकरण का उपबंध करता है वहां राज्य बोर्ड सीओडी सीमा में छूट दे सकेगा।</p> <p>परंतु उपचारित बहिःस्राव में रासायनिक आक्सीजन मांग के लिए अधिकतम अनुज्ञेय मान 500 मिलिग्राम/लीटर से अधिक नहीं होगा।</p> <p>2. सामान्य बहिःस्राव उपचार संयंत्र (सीईटीपी) की संघटक युनिटों द्वारा अधिकतम अनुज्ञेय योगदान नियत विघटित ठोस पदार्थ (एफडीएस) 1000 मिली ग्राम/लीटर होगा। उन मामलों में जहां संघटक युनिटों द्वारा प्रयोग किए गए कच्चे पानी में नियत विघटित ठोस पदार्थ (एफडीएस) पहले से ही अधिक है (अर्थात् यह 1100 मिली ग्राम/लीटर से अधिक है) वहां उपचारित बहिःस्राव में नियत विघटित ठोस पदार्थ (एफडीएस) के लिए अधिकतम अनुज्ञेय मान राज्य बोर्ड द्वारा तदनुसार उपांतरित किया जाएगा।</p> <p>3. सिंचाई के लिए भूमि पर उपचारित बहिःस्राव के निस्सरण की दशा में, मृदा और भूजल क्वालिटी पर समाघात सामान्य बहिःस्राव उपचार संयंत्र (सीईटीपी) प्रबंध द्वारा वर्ष में दो बार (मानसून से पूर्व और उसके पश्चात्) मानीटर किया जाएगा। सिंचाई के लिए भूमि पर उपचारित बहिःस्राव और मल जल के संयुक्त निस्सरण के लिए, मलजल के साथ मिश्रण अनुपात राज्य बोर्ड द्वारा विहित किया</p>				

जाणूगा ।	
4. सेक्टर विनिर्दिष्ट मानकों से चयनित कुछ महत्वपूर्ण सेक्टरों के लिए विनिर्दिष्ट पैरामीटर ।	
सेक्टर	विनिर्दिष्ट पैरामीटर
टैक्सटाइल	जैव आपन परीक्षण, कुल क्रोमियम, सल्फाइड, फैनोलिक यौगिक मिश्रण
इलैक्ट्रोप्लेटिंग उद्योग	तेल और ग्रीज, अमोनिया, नाइट्रोजन, निकिल, हैक्सावैलेंट क्रोमियम, कुल क्रोमियम, तांबा, जस्त, सीसा, लोहा, कैडमियम, सायनाइड, फ्लोराइड, सल्फाइड, फास्फेट, सल्फेट
चर्म शोधनशाला	सल्फाइड, कुल क्रोमियम, तेल और ग्रीज, क्लोराइड
रंजक और रंजक इंटरमिडिएट	तेल और ग्रीज, फैनोलिक यौगिक मिश्रण, कैडमियम, तांबा, मैगनीज, सीसा, पारा, निकिल, जस्त, हैक्सावैलेंट क्रोमियम, कुल क्रोमियम, जैव-आमापन परीक्षण, क्लोराइड, सल्फेट
जैविक रासायनिक विनिर्माण उद्योग	तेल और ग्रीज, जैव-आमापन परीक्षण, नाइट्रेट, आर्सेनिक, हैक्सावैलेंट क्रोमियम, कुल क्रोमियम, सीसा, साइनाइड, जस्त, पारा, तांबा, निकिल, फैनोलिक यौगिक मिश्रण, सल्फाइड
भेषजी उद्योग	तेल और ग्रीज, जैव-आमापन परीक्षण, पारा, आर्सेनिक, हैक्सावैलेंट क्रोमियम, सीसा, साइनाइड, फैनोलिक यौगिक मिश्रण, सल्फाइड, फास्फेट

[फा.सं. क्यू-15017/18/2014-सीपीडब्ल्यू]

डा. राशिद हसन, सलाहकार

**टिप्पण:** मूल नियम भारत के राजपत्र, असाधारण, भाग II, खंड 3, उपखंड (i) में का.आ. सं. 844(अ), तारीख 19 नवंबर, 1986 द्वारा प्रकाशित किए गए थे और तत्पश्चात उनमें निम्नलिखित अधिसूचनाओं के द्वारा संशोधन किए गए:

का.आ. सं. 433(अ), तारीख 18 अप्रैल, 1987; सा.का.नि. सं. 176(अ), तारीख 2 अप्रैल, 1996; सा.का.नि. सं. 97(अ), तारीख 18 फरवरी, 2009; सा.का.नि. सं. 149(अ), तारीख 4 मार्च, 2009; सा.का.नि. सं. 543(अ), तारीख 22 जुलाई, 2009; सा.का.नि. सं. 739(अ), तारीख 9 सितंबर, 2010; सा.का.नि. सं. 809(अ), तारीख 4 अक्टूबर, 2010; सा.का.नि. सं. 215(अ), तारीख 15 मार्च, 2011; सा.का.नि. सं. 221(अ), तारीख 18 मार्च, 2011; सा.का.नि. सं. 354(अ), तारीख 2 मई, 2011; सा.का.नि. सं. 424(अ), तारीख 1 जून, 2011;

सा.का.नि. सं. 446(अ), तारीख 13 जून, 2011; सा.का.नि. सं. 152(अ), तारीख 16 मार्च, 2012; सा.का.नि. सं. 266(अ), तारीख 30 मार्च, 2012; सा.का.नि. सं. 277(अ), तारीख 31 मार्च, 2012; सा.का.नि. सं. 820(अ), तारीख 9 नवंबर, 2012; सा.का.नि. सं. 176(अ), तारीख 18 मार्च, 2013; सा.का.नि. सं. 535(अ), तारीख 7 अगस्त, 2013; सा.का.नि. सं. 771(अ), तारीख 11 दिसंबर, 2013; सा.का.नि. सं. 2(अ), तारीख 2 जनवरी, 2014; सा.का.नि. सं. 229(अ), तारीख 28 मार्च, 2014; सा.का.नि. सं. 232(अ), तारीख 31 मार्च, 2014; सा.का.नि. सं. 325(अ), तारीख 7 मई, 2014; सा.का.नि. सं. 612(अ), तारीख 25 अगस्त, 2014; सा.का.नि. सं. 789(अ), तारीख 11 नवंबर, 2014; और अंत में अधिसूचना का.आ. सं. 3305(अ), तारीख 7 दिसंबर, 2015 द्वारा संशोधन किए गए थे।

**MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE**

**NOTIFICATION**

New Delhi, the 1st January, 2016

**S.O. 4(E).**—In exercise of the powers conferred by sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986, namely:—

1. **Short title and Commencement.**—(1) These rules may be called the Environment (Protection) Amendment Rules, 2015.  
(2) They shall come into force on the date of their publication in the Official Gazette.
2. In the Environment (Protection) Rules, 1986, in Schedule-I,—  
(a) the serial number 41 and the entries relating thereto, shall be omitted;  
(b) for serial number 55 and the entries relating thereto, the following serial number and entries shall be substituted, namely:—

S. No.	Industry	Parameter	Standards		
(1)	(2)	(3)	(4)		
55.	<b>Common Effluent Treatment Plants (CETP)</b>				
	<b>A. Inlet Quality Standards</b>	For each Common Effluent Treatment Plant (CETP), the State Board will prescribe Inlet Quality Standards for General Parameters, Ammonical-Nitrogen and Heavy metals as per design of the Common Effluent Treatment Plant (CETP) and local needs & conditions.			
	<b>B: Treated Effluent Quality Standards</b>		Max. permissible values (in milligram/litre except for pH and Temperature)		
			Into inland surface water	On land for irrigation	Into sea
		<b>General Parameters</b>			
		pH	6 - 9	6 - 9	6 - 9
		Biological Oxygen Demand, BOD <sub>3</sub> , 27 °C	30	100	100
		Chemical Oxygen Demand (COD)	250	250	250*
Total Suspended Solids (TSS)	100	100	100		
Fixed Dissolved Solids (FDS)	2100*	2100*	NS*		

<b>Specific parameters</b>			
Temperature, °C	Shall not exceed more than 5°C above ambient water temperature	Shall not exceed more than 5°C above ambient water temperature	Shall not exceed more than 5°C above ambient water temperature
Oil & Grease	10	10	10
Ammonical –Nitrogen	50	NS*	50
Total Kjeldahl Nitrogen (TKN)	50	NS*	50
Nitrate- Nitrogen	10	NS*	50
Phosphates, as P	5	NS*	NS*
Chlorides	1000	1000	NS*
Sulphates, as SO <sub>4</sub>	1000	1000	NS*
Flouride	2	2	15
Sulphides, as S	2	2	5
Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	1	1	5
Total Res. Chlorine	1	1	1
Zinc	5	15	15
Iron	3	3	3
Copper	3	3	3
Trivalent Chromium	2	2	2
Manganese	2	NS*	2
Nickel	3	NS*	3
Arsenic	0.2	NS*	0.2
Cyanide, as CN	0.2	NS*	0.2
Vanadium	0.2	NS*	0.2
Lead	0.1	NS*	0.1
Hexavalent Chromium	0.1	NS*	0.1
Selenium	0.05	NS*	0.05
Cadmium	0.05	NS*	0.05
Mercury	0.01	NS*	0.01
Bio-assay test	As per industry-specific standards	As per industry-specific standards	As per industry-specific standards

\*NS-Not specified

**Notes:**

1. \*Discharge of treated effluent into sea shall be through proper marine outfall. The existing shore discharges shall be converted to marine outfalls. In cases where the marine outfall provides a minimum initial dilution of 150 times at the point of discharge and a minimum dilution of 1500 times at a point 100 m away from discharge point, then, the State Board may relax the Chemical Oxygen Demand (COD) limit:

<p>Provided that the maximum permissible value for Chemical Oxygen Demand (COD) in treated effluent shall be 500 milligram/litre.</p> <p>2. *Maximum permissible Fixed Dissolved Solids (FDS) contribution by constituent units of a Common Effluent Treatment Plant (CETP) shall be 1000 milligram/litre. In cases where Fixed Dissolved Solids (FDS) concentration in raw water used by the constituent units is already high (i.e. it is more than 1100 milligram/litre) then the maximum permissible value for Fixed Dissolved Solids (FDS) in treated effluent shall be accordingly modified by the State Board.</p> <p>3. In case of discharge of treated effluent on land for irrigation, the impact on soil and groundwater quality shall be monitored twice a year (pre- and post-monsoon) by Common Effluent Treatment Plants (CETP) management. For combined discharge of treated effluent and sewage on land for irrigation, the mixing ratio with sewage shall be prescribed by State Board.</p>	
4. Specific parameters for some important sectors, selected from sector-specific standards	
Sector	Specific Parameters
Textile	Bio-assay test, Total Chromium, Sulphide, Phenolic compounds
Electroplating Industries	Oil & Grease, Ammonia-Nitrogen, Nickel, Hexavalent Chromium, Total Chromium, Copper, Zinc, Lead, Iron, Cadmium, Cyanide, Fluorides, Sulphides, Phosphates, Sulphates.
Tanneries	Sulphides, Total Chromium, Oil & Grease, Chlorides
Dye & Dye Intermediate	Oil & Grease, Phenolic compounds, Cadmium, Copper, Manganese, Lead, Mercury, Nickel, Zinc, Hexavalent Chromium, Total Chromium, Bio-assay test, Chlorides, Sulphates.
Organic chemicals manufacturing industry	Oil & Grease, Bio-assay test, Nitrates, Arsenic, Hexavalent Chromium, Total Chromium, Lead, Cyanide, Zinc, Mercury, Copper, Nickel, Phenolic compounds, Sulphides
Pharmaceutical industry	Oil & Grease, Bio-assay test, Mercury, Arsenic, Hexavalent Chromium, Lead, Cyanide, Phenolic compounds, Sulphides, Phosphates."

[F. No. Q-15017/18/2014-CPW]

Dr. RASHID HASAN, Advisor

**Note-** The principal rules were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i) *vide* number S.O. 844(E), dated the 19th November, 1986 and subsequently amended *vide* the following notifications:—

S.O. 433(E), dated the 18<sup>th</sup> April 1987; G.S.R. 176(E) dated the 2<sup>nd</sup> April, 1996; G.S.R. 97(E), dated the 18<sup>th</sup> February, 2009; G.S.R. 149(E), dated the 4<sup>th</sup> March, 2009; G.S.R. 543(E), dated the 22<sup>nd</sup> July, 2009; G.S.R. 739(E), dated the 9<sup>th</sup> September, 2010; G.S.R. 809(E), dated the 4<sup>th</sup> October, 2010; G.S.R. 215(E), dated the 15<sup>th</sup> March, 2011; G.S.R. 221(E), dated the 18<sup>th</sup> March, 2011; G.S.R. 354(E), dated the 2<sup>nd</sup> May, 2011; G.S.R. 424(E), dated the 1<sup>st</sup> June, 2011; G.S.R. 446(E), dated the 13<sup>th</sup> June, 2011; G.S.R. 152(E), dated the 16<sup>th</sup> March, 2012; G.S.R. 266(E), dated the 30<sup>th</sup> March, 2012; and G.S.R. 277(E), dated the 31<sup>st</sup> March, 2012; and G.S.R. 820(E), dated the 9<sup>th</sup> November, 2012; G.S.R. 176(E), dated the 18<sup>th</sup> March, 2013; G.S.R. 535(E), dated the 7<sup>th</sup> August, 2013; G.S.R. 771(E), dated the 11<sup>th</sup> December, 2013; G.S.R. 2(E), dated the 2<sup>nd</sup> January, 2014; G.S.R. 229 (E), dated the 28<sup>th</sup> March, 2014; G.S.R. 232(E), dated the 31<sup>st</sup> March, 2014; G.S.R. 325(E), dated the 07<sup>th</sup> May, 2014; G.S.R. 612(E), dated the 25<sup>th</sup> August, 2014; G.S.R. 789(E), dated the 11th November, 2014 and lastly amended *vide* notification S.O. 3305(E), dated the 7th December, 2015.



## PUNJAB POLLUTION CONTROL BOARD

Zonal Office-II, E-648-B, Backside CICU Office, Phase-5, Focal Point, Ludhiana

Website:- www.ppcb.gov.in

Office Dispatch No :

Registered/Speed Post

Date:

Industry Registration ID: R15LDH32539341

Application No : 17501808

To,

Harvinder Singh  
341/342-d, Phase VIII, Focal Point  
Ludhiana, Punjab-141010

Subject: Grant of 'Consent to Operate' an outlet u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974 for discharge of effluent.

With reference to your application for obtaining 'Consent to Operate' an outlet for discharge of the effluent u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974, you are, hereby, authorized to operate an industrial unit for discharge of the effluent(s) arising out of your premises subject to the Terms and Conditions as mentioned in this Certificate.

## 1. Particulars of Consent to Operate under Water Act, 1974 granted to the industry

Consent to Operate Certificate No.	CTOW/Fresh/LDH4/2022/17501808
Date of issue :	16/05/2022
Date of expiry :	15/05/2023
Certificate Type :	Fresh

## 2. Particulars of the Industry

Name & Designation of the Applicant	Mr. Vijay Mehtani, (Vice President)
Address of Industrial premises	Punjab Dyers Association (focal Point Module), 8.65 Acre Land, Tajpur Road, Jamalpur Awana, Ludhiana East, Ludhiana Iv-141008
Capital Investment of the Industry	4191.39 lakhs
Category of Industry	Red
Type of Industry	Common effluent treatment plant.
Scale of the Industry	Small
Office District	Ludhiana Iv
Consent Fee Details	Rs. 3,60,000/- vide R.No. HDFCR52022011089136605 dated 10.01.2022.
Raw Materials (Name with quantity per day)	Effluent Waste Water (Discharge from various dyeing industries) @ 40,000 Kilo Liters/Day
Products (Name with quantity per day)	Treated Water @ 40,000 Kilo Liters/Day
By-Products, if any, (Name with quantity per day)	--
Details of the machinery and processes	CETP for Dyeing units
Details of the Effluent Treatment Plant	Trade Effluent @ 40000.0 KLD Domestic Effluent @ 1.5 KLD

"This is computer generated document from OCMMS by PPCB"

Punjab Dyers Association (focal Point Module), 8.65 Acre Land, Tajpur Road, Jamalpur Awana, Ludhiana East, Ludhiana Iv-141008

Page 1

Mode of Disposal	Trade Effluent : into Budha Nallah after treatment through CETP of 40 MLD (Focal Point Module)  Domestic Effluent : onto land for plantation through septic tank
Standards to be achieved under Water(Prevention & Control of Pollution) Act, 1974	As prescribed by PPCB/CPCB/MoEF&Ce (as applicable).



16/05/2022

(Pardeep Balu)  
Environmental Engineer

For &amp; on behalf

of

(Punjab Pollution Control Board)

Endst. No.:

Dated:

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

Environmental Engineer, Punjab Pollution Control Board, Regional Office-4, Ludhiana with request to report w.r.t the compliance of specific conditions.



16/05/2022

(Pardeep Balu)  
Environmental Engineer

For &amp; on behalf

of

(Punjab Pollution Control Board)



## PUNJAB POLLUTION CONTROL BOARD

Zonal Office-II, E-648-B, Backside CICU Office, Phase-5, Focal Point, Ludhiana

Website:- www.ppcb.gov.in



Office Dispatch No :

Registered/Speed Post

Date:

Industry Registration ID: R15LDH32539341

Application No : 22538966

To,

Harvinder Singh  
341/342-d, Phase VIII, Focal Point  
Ludhiana, Punjab-141010

**Subject:** Renewal of 'Consent to Operate' an outlet u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974 for discharge of effluent.

With reference to your application for obtaining Renewal of 'Consent to Operate' an outlet for discharge of the effluent u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974, you are, hereby, authorized to operate an industrial unit for discharge of the effluent(s) arising out of your premises subject to the Terms and Conditions as mentioned in this Certificate.

### 1. Particulars of Consent to Operate under Water Act, 1974 granted to the industry

Consent to Operate Certificate No.	CTOW/Renewal/LDH4/2023/22538966
Date of issue :	24/06/2023
Date of expiry :	23/09/2023
Certificate Type :	Renewal
Previous CTO No. & Validity :	CTOW/Fresh/LDH4/2022/17501808 From:16/05/2022 To:15/05/2023

### 2. Particulars of the Industry

Name & Designation of the Applicant	Harvinder Singh, (Js)
Address of Industrial premises	Punjab Dyers Association (focal Point Module), 8.65 Acre Land, Tajpur Road, Jamalpur Awana, Ludhiana East, Ludhiana Iv-141008
Capital Investment of the Industry	6559.7 lakhs
Category of Industry	Red
Type of Industry	Common effluent treatment plant.
Scale of the Industry	Large
Office District	Ludhiana Iv
Consent Fee Details	Rs. 3,60,000/- vide R.No. HDFCR52022011089136605 dated 10.01.2022.
Raw Materials(Name with quantity per day)	CETP of capacity 40 MLD (Focal Point Module), Ludhiana
Products (Name with quantity per day)	CETP of capacity 40 MLD (Focal Point Module), Ludhiana
By-Products, if any,(Name with quantity per day)	-
Details of the machinery and processes	As per application no. 22538966

\*This is computer generated document from OCMMS by PPCB\*

Punjab Dyers Association (focal Point Module), 8.65 Acre Land, Tajpur Road, Jamalpur Awana, Ludhiana East, Ludhiana Iv, 141008

Page 1

Details of the Effluent Treatment Plant	CETP for the treatment of trade effluent @ 40 MLD (Focal Point Module)
Mode of Disposal	Into Budha Nallah after treatment through CETP. Finally the effluent shall be used for plantation / irrigation purpose Domestic effluent @ 1.5 KLD : Onto land for plantation after passing through septic tank
Standards to be achieved under Water (Prevention & Control of Pollution) Act, 1974	As prescribed by PPCB/CPCB/MoEF&Cc (as applicable)



24/06/2023

(Shiv Kumar)  
Environmental Engineer

For &amp; on behalf

of

(Punjab Pollution Control Board)

Endst. No.:

Dated:

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

- 1) The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-1, Ludhiana for information and further necessary action.
- 2) The Environmental Engineer, Punjab Pollution Control Board, Regional Office-1/4, Ludhiana for information and to de-seal the boilers/ wet machinery of the member units sealed in compliance to proceedings issued by the Board on dated 12.06.2023.



24/06/2023

(Shiv Kumar)  
Environmental Engineer

For &amp; on behalf

of

(Punjab Pollution Control Board)



## PUNJAB POLLUTION CONTROL BOARD

Zonal Office-1, E-648-B, Focal Point, Phase-5, Ludhiana

Website:- www.ppcb.gov.in



Office Dispatch No :

Registered/Speed Post

Date:

Industry Registration ID: *R15LDH32539341*

Application No : *23519336*

To,

Harvinder Singh  
341/342-d, Phase VIII, Focal Point  
Ludhiana, Punjab-141010

Subject: Renewal of consent to operate granted under the Water (Prevention & Control of Pollution) Act, 1974.

### 1. Particulars of Consent to Operate under Water Act, 1974 granted to the industry

Consent to Operate Certificate No.	<i>CTOW/Renewal/LDH1/2024/23519336</i>
Date of issue :	<i>28/06/2024</i>
Date of expiry :	<i>30/06/2026</i>
Certificate Type :	<i>Renewal</i>
Previous CTO No. & Validity :	<i>CTOW/Renewal/LDH4/2023/22538966</i> <i>From:24/06/2023 To:23/09/2023</i>

### 2. Particulars of the Industry

Name & Designation of the Applicant	<i>Harvinder Singh, (Js)</i>
Address of Industrial premises	<i>Punjab Dyers Association (focal Point Module), 8.65 Acre Land, Tajpur Road, Jamalpur Awana, Ludhiana East, Ludhiana 1-141008</i>
Capital Investment of the Industry	<i>6559.7 lakhs</i>
Category of Industry	<i>Red</i>
Type of Industry	<i>Common effluent treatment plant.</i>
Scale of the Industry	<i>Large</i>
Office District	<i>Ludhiana I</i>

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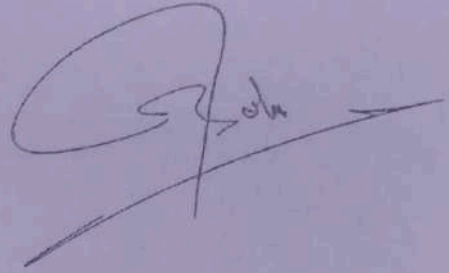
*Punjab Dyers Association (focal Point Module), 8.65 Acre Land, Tajpur Road, Jamalpur Awana, Ludhiana East, Ludhiana 1-141008*

Page 1

## SPECIAL CONDITIONS:-

1. The PDA shall operate its CETP of 40 MLD capacity regularly and efficiently so as to achieve the prescribed standards.
2. The PDA shall submit the time bound proposal for up-gradation and augmentation of the CETP along with PERT Chart so as to achieve the prescribed standards as well as the standards as mentioned in the DPR appraised at the time of approval of financial aid received from the Government for this CETP, within 15 days.
3. The PDA shall submit the proposal for discharge of treated effluent onto land for plantation / irrigation to the Board in time bound manner.

All the other contents and conditions of consent will remain same as mentioned in consent no. CTOW/Renewal/LDH4/2023/22538966 dated 24.06.2023 valid upto 23.09.2023 granted under the Water (Prevention & Control of Pollution) Act, 1974.



28/06/2024

**(Pardeep Balu)**  
Environmental Engineer

For &amp; on behalf

of

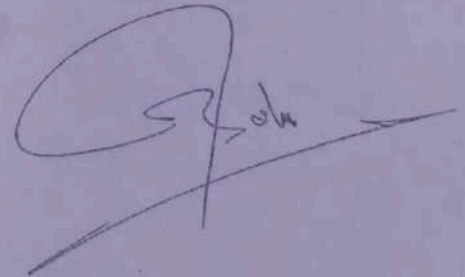
**(Punjab Pollution Control Board)**

Endst. No.:

Dated:

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

The Environmental Engineer, Punjab Pollution Control Board, Regional Office-1, Ludhiana for information and necessary action.

28/06/2024

**(Pardeep Balu)**  
Environmental Engineer

For &amp; on behalf

of

**(Punjab Pollution Control Board)**

**GOVERNMENT OF PUNJAB**  
**WATER RESOURCES DEPARTMENT**  
**(DRAINAGE ADMINISTRATION)**

**Project Estimate for Utilizing Treated Waste Water of  
BudhaDariya by STP's for Irrigation through Lower  
BudhaDariya**



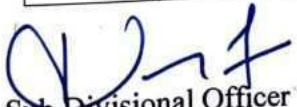
**(Rs.35.97 Crore)**


**INDEX -OUTLINE OF DPR**

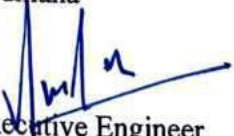
1. Salient features
2. Executive Summary of the Project
3. Design Criteria for Project
4. Ecological and Environmental Aspects
5. Organizational Structure of Implementing Department
6. Design Calculations
7. Abstract of Costs
8. Detail of Quantity
9. Difference in Rates
10. Earth Work Statement
11. Cross-Sections
12. Proposed L-Section.

**CHAPTER 1: SALIENT FEATURES OF THE PROJECT**

Sr. no.	Items	Remarks
1.	Name of work	Project Estimate for Utilizing Treated Waste Water of BudhaDariya by STP's for Irrigation through Lower BudhaDariya.
2.	Estimate Cost	3596.82 Lacs.
3.	Master plan for the Dariya, fitment of the project and priority	Remodelling of Lower BudhaDariya from RD 0-85000 including capacity enhancement from RD 0-45000, Rehabilitation of BudhaDariya from RD 145000-150000, Cross and Head Regulator Structures at RD 150000 of BudhaDariya, 4 Nos. Regulator structures at Lower BudhaDariya, Lift pumps for irrigation.
4.	Name of State	Punjab
5.	Name of District	Ludhiana
6.	Source of Water	Treated Water from STPs, catchment area water of BudhaDariya & Lower BudhaDariya.
7.	Latitude & Longitude of the Project	
9.	Benefitted Area	Approx. 12000 acre CCA
10.	Details of proposed works along with reach length	Capacity enhancement from RD 0-45000, Rehabilitation of BudhaDariya from RD 145000-150000, Cross and Head Regulator Structures at RD 150000 of BudhaDariya, 4 Nos. Regulator structures at Lower BudhaDariya.
11	Embankments	Rehabilitation/Restoring and Raising and Strengthening of embankments of Lower BudhaDariya RD 0-85000, BudhaDariya RD 145000-150000.
13	Pucca structures	17 no. Bridges/Culverts to be remodelled/reconstructed. 07 no. bridges to be upgraded/modernised.
16.	Area to be benefited	Approx. 12000 acre of CCA of Sidhwan Bet Block of Ludhiana District.
17.	Ecological and environmental aspects	It will reduce underground water extraction in the benefitted area thus recharging groundwater, Reduction in polluted water outfall in Sutlej River.

  
Sub-Divisional Officer  
Sidhwan Drainage Sub Division  
Ludhiana

  
Sub-Divisional Officer  
Phillaur Bandh Sub Division  
Ludhiana

  
Executive Engineer  
Ludhiana Drainage Division  
Ludhiana

## CHAPTER 2: EXECUTIVE SUMMARY OF THE PROJECT

### Project Estimate for Utilizing Treated Waste Water of BudhaDariya by STP's for Irrigation through Lower BudhaDariya.

#### Introduction:

Ludhiana being the biggest city and often referred to as Manchester, is the industrial hub in the Indian state of Punjab. Located near the Sutlej River, it is one of the oldest city. Originating from Koomkalan village is the natural drain named Budhadariya, which passes within Ludhiana city reach and then eventually outfalls into river Sutlej near village Walipur Kalan. As BudhaDariya passes from city reach it gets polluted by numerous identified and non-identifiable sources.

With every passing year, the condition of this BudhaDariya drain is deteriorating and people residing in the areas near it are facing health problems, as there is stench in the air and also poses threat of jaundice outbreak.

The Lower BudhaDariya currently acts as a drainage channel off-taking at RD 150000/L of BudhaDariya and has length 107000 feet and finally outfalls in the River Sutlej. This drainage channel also carries the catchment area rainwater during the flood season.

Hence, this project proposal has been created in which Sewage Treatment Plants (STPs) will treat the unfit water of BudhaDariya which will be then diverted in Lower BudhaDariya which offtakes from RD 150000/L of BudhaDariya.

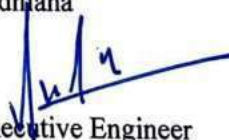
The diverted water in Lower BudhaDariya will provide the irrigation facilities in more than 15 villages in the vicinity. As, Lower budhadariya is lower than NSL, hence irrigation facilities will be provided by lifting water by use of Diesel Lift Pumps.



Sub Divisional Officer  
Sidhwan Drainage Sub Division  
Ludhiana



Sub Divisional Officer  
Phillaur Bandh Sub Division  
Ludhiana



Executive Engineer  
Ludhiana Drainage Division  
Ludhiana



### CHAPTER-3: DESIGN CRITERIA FOR PROJECT:

Remodelling of Lower BudhaDariya is proposed from RD 0-85000 including capacity enhancement from RD 0-45000, Rehabilitation of BudhaDariya from RD 145000-150000, Cross and Head Regulator Structures at RD 150000 of BudhaDariya, 4 Nos. Regulator structures at Lower BudhaDariya, Lift pumps for irrigation.

The abstracts of regulator structures have been prepared on the reference of Cross Regulator Structure of Sirhind Feeder at RD 416000 recently sanctioned by office of Chief Engineer/Design Water System, Punjab and this structure has been proportioned as per site conditions and design section of Lower BudhaDariya&BudhaDariya. (Annexure -I )

The abstracts of new bridges have been prepared on the reference of bridge estimate of Sidhwan Canal Division, Ludhiana sanctioned by competent authority, and the bridge abstract has been proportioned as per site conditions and design section of Lower BudhaDariya&BudhaDariya. (Annexure -II ). Whereas the upgradation of old bridges have been provisioned on a lumpsum basis.

The abstracts of Lift pump schemes have been prepared on the lumpsum basis and has been proportioned as per site conditions and design section of Lower BudhaDariya&BudhaDariya.

#### A-PRELIMINARY

This project is having rough cost of 3596.82 Lacs. For preliminary works such as project preparation, survey, field tests, estimate preparation, etc. Rs. 2,50,000/- cost has been provisioned.

#### B-LAND

For Re-sectioning and capacity enhancement of Lower BudhaDariya: Cross sections at 5000' interval has been plotted showing the proposal of Re-sectioning for its enhanced discharge capacity at head of 210 cusecs from RD 0-45000. Existing capacity of Lower BudhaDariya is less than new proposed section. The land for the whole Lower BudhaDariya is government owned, except from RD 85000-90750 which has been currently left out for any rehabilitation/remodelling and due to which the proposed project is limited from RD 0-85000 and the next reach from RD 90750-107000 is only to be rehabilitated. Hence, no land will be acquired for the aforesaid work.

#### C-WORKS

No provision has been done.

#### D- REGULATORS

01 No. Cross regulator at RD 150000 of BudhaDariya, 01 No. Head Regulator of Lower BudhaDariya off-taking at RD 150000/L of BudhaDariya, and also 04 no. regulator structures at RDs

**E- EARTHWORK**

For Rehabilitation/Remodelling of Lower BudhaDariya from RD 0-85000, RD 90750-107000 including capacity enhancement from RD 0-45000, rehabilitation of BudhaDariya from RD 145000-150000 by raising/strengthening of embankments, Rs.301.6 Lacs is provisioned for earthwork.

**F-FALLS**

In this project, as Lower BudhaDariya will be used as a strip reservoir/ponding structure and no flow irrigation is to be done, hence, no fall has been provisioned.

**G- BRIDGES/CULVERTS**

17 no. of bridges/culverts have been proposed for reconstruction/remodelling. For this Rs.1090.36 Lacs has been provisioned.

07 no. of bridges/culverts have been proposed for repair/upgradation. For this Rs.105 Lacs is provisioned.

**H- CROSS DRAINAGE WORKS**

No provision has been done.

**K- BUILDINGS**

01 no. gauge hut is provisioned to monitor and control the water regulation. For this Rs.5 Lacs is provisioned.

**L- LIFT PUMP**

25 no. lift pumps have been provisioned, as the NSLs around the channel are high and most of the channel is in cutting. For this Rs.59.8 Lacs has been provisioned.

**M- MISCELLANEOUS**

Under this sub-head various minor works such as desilting, diversions bandhs, etc. will be taken up. For this Rs.20 lacs has been provisioned.

**P- MAINTENANCE**

Under this sub-head various maintenance works for the provisioned works has been done. For this Rs.32.5 lacs has been provisioned.

**Q- SPECIAL T & P**

Under this sub-head purchase of inspection commute vehicle is provisioned for which Rs.12 Lacs is provisioned. Also, for the purchase of DGPS system Rs.6 lacs. is provisioned.

**S- LOSSES ON STOCK & UNFORESEEN ITEMS**

Under this sub-head Rs.8.05 lacs is provisioned.



Sub Divisional Officer  
Sidhwan Drainage Sub Division  
Ludhiana



Sub Divisional Officer  
Phillaur Bandh Sub Division  
Ludhiana



Executive Engineer  
Ludhiana Drainage Division  
Ludhiana

#### CHAPTER-4: ECOLOGICAL AND ENVIRONMENTAL ASPECTS

This proposal is to provide irrigation facilities to more than 15 villages of Sidhwan Bet block of district Ludhiana. These villages do not have any source of irrigation other than groundwater, so this project will help reduce the extraction of groundwater and help in reviving it.

Also, this project will reduce the water pollution of Budhadariya as STPs will treat the water of this which will be then used for the purpose of irrigation through lower budhadariya. The measures, proposed to be taken, will help in improving the environment and reduce the health hazard caused due to water pollution.

The implementation of this project will not cause any adverse effect on ecology and environment.

#### BENEFITS

The implementation of this project would accrue the following benefits:

- i) Improve the irrigation and drainage of the area and increase the CCA under natural water resources irrigation.
- ii) Improve the condition of water of Budhadariya and to reduce foul smell for living people near it.
- iii) Improve the environment of the area and reduce the health hazards.
- iv) Improve the living standard of the people in this effected area.



Sub-Divisional Officer  
Sidhwan Drainage Sub Division  
Ludhiana



Sub-Divisional Officer  
Phillaur Bandh Sub Division  
Ludhiana



Executive Engineer  
Ludhiana Drainage Division  
Ludhiana

## CHAPTER-5: ORGANIZATIONAL STRUCTURE OF THE IMPLEMENTING DEPARTMENT

This project inblock Sidhwan bet, District Ludhiana comes under the jurisdiction of Drainage cum mining and geology Circle, Ferozepur and Drainage cum mining and geology division Ludhiana.

Executive Engineer Drainage cum mining and geology division, Ludhiana will be Engineer-in Charge for execution and implementation of this project along with 02 No. Sub Division Officer. Operation and Maintenance of the works executed under this project will be carried out by subordinate technical & Non technical staff working under Executive Engineer, Drainage cum mining and geology division, Ludhiana.

There is an independent Vigilance & Quality control wing of the Punjab Water Resources Department under the supervision of Chief Engineer/Vigilance which looks after the quality and quantum of work, before starting the work, during the execution of work and after the Completion of work at site. Sometimes, the work is also being checked by the Technical Vigilance wing of Vigilance Bureau of the State.

Design of new structures & L-section will be formulated by office of Chief Engineer/Design Water System, Punjab, Chandigarh.

Labour Works under this project will be executed through Contractors, Construction companies & Labour Construction Societies after calling open tenders in a transparent manner and by giving wide publicity. Tenders are issued to only those contractors, companies & Societies which are having required capacity, labour and machinery to execute similar type of project works.

Sub Divisional Officer  
Sidhwan Drainage Sub Division  
Ludhiana

Sub Divisional Officer  
Phillaur Bandh Sub Division  
Ludhiana

Executive Engineer  
Ludhiana Drainage Division  
Ludhiana

**LUDHIANA DRAINAGE DIVISION, LUDHIANA**

Project Estimate for Utilizing Treated Waste Water of Budha Dariya by STP's for  
Irrigation through Lower Budha Dariya

**GENERAL ABSTRACT OF COST**

<b>DIRECT CHARGES [I-WORKS]</b>		
<b>Sr. No.</b>	<b>Sub Head</b>	<b>Amount (in Lacs)</b>
<b>DIRECT CHARGES [I-WORKS]</b>		
1	A- PRELIMINARY	
2	B- LAND	2.50
3	C- WORKS	-NIL-
4	D- REGULATORS	0.00
5	F- FALLS	1897.77
6	H CROSS DRAINAGE WORKS	0.00
7	G- BRIDGES	-NIL-
8	K- BUILDINGS	1195.36
9	E- EARTHWORK	5.00
10	L LIFT PUMPS	301.65
11	M MISCELLANEOUS	59.78
12	P- MAINTENANCE	20.00
13	Q- SPECIAL T&P	34.80
14	Y- LOSSES ON STOCK AND UNFORESEEN ITEMS	18.00
15	Z- ESTABLISHMENT CHARGES	8.64
	<b>TOTAL DIRECT CHARGES [A-Z]</b>	<b>3543.50</b>

<b>INDIRECT CHARGES</b>		
1	Capitalization of abatement of land revenue	-NIL-
2	Audit & Accounts charges @1% of I-Works	35.43
	<b>TOTAL INDIRECT CHARGES [1-2]</b>	<b>35.43</b>

**TOTAL DIRECT AND INDIRECT CHARGES = 3578.93**  
**Add 0.50% Contingency charges = 17.89**  
**G. TOTAL = 3596.82 Lacs**

  
 SUB DIVISIONAL OFFICER  
 SIDHWAN DRAINAGE SUB DIVISION  
 LUDHIANA

  
 SUB DIVISIONAL OFFICER  
 PHILLAUR BANDH SUB DIVISION  
 LUDHIANA

  
 EXECUTIVE ENGINEER  
 LUDHIANA DRAINAGE DIVISION  
 LUDHIANA

**Government of Punjab**  
**Department of Science, Technology & Environment**

To

**Principal Secretary,**  
Department of Water Resources  
**Govt. of Punjab**

**No.** DECC/2024/202943/427

**Date:** 02.02.2024

**Subject: Project for utilizing treated waste water of STP for irrigation through Lower Budha Dariya.**

This is in reference to your letter No. 33/CE/Drainage/603955 dated 9.01.2024 regarding issuing directions to PPCB to provide funds amounting to Rs. 35.96 Crores to execute the subject cited project and also to accord the administrative approval for taking further necessary action in the matter.

The said matter was taken up with Punjab Pollution Control Board, wherein it has been informed by the board that no funds are available with the Board for funding said scheme.

This is for your kind information and necessary action please.

  
**Secretary** 2.2.24

# AVERAGE Report - Punjab Dyers Association (Focal Point Module)

233

From: 01 Sep 2023, 10:00 to 21 Sep 2024, 13:52

Generated on: 21 Sep 2024, 13:52

\* All the times are in 24 Hours time format

## ANNEXURE - 4/12

Asset: ETP Inlet

Make - NA | Model - NA

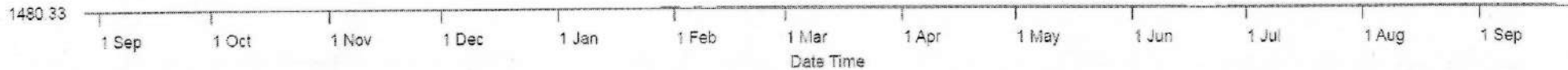
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COD (mg/l)	588.03	-99999.00	25 Feb 2024, 12:35	787.88	06 Mar 2024, 06:55
TSS (mg/l)	102.96	-99999.00	25 Feb 2024, 12:35	196.77	06 Mar 2024, 06:55
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397

### Flow

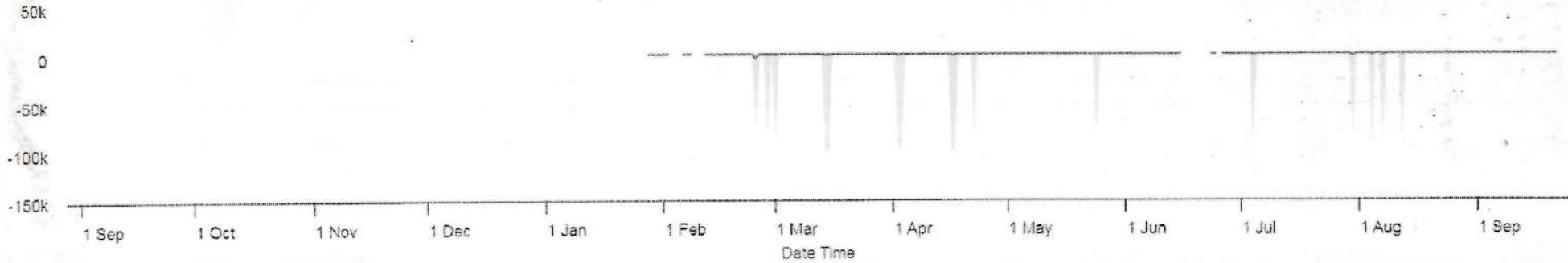
m<sup>3</sup>/hr



◆ Avg ◆ Min-max range

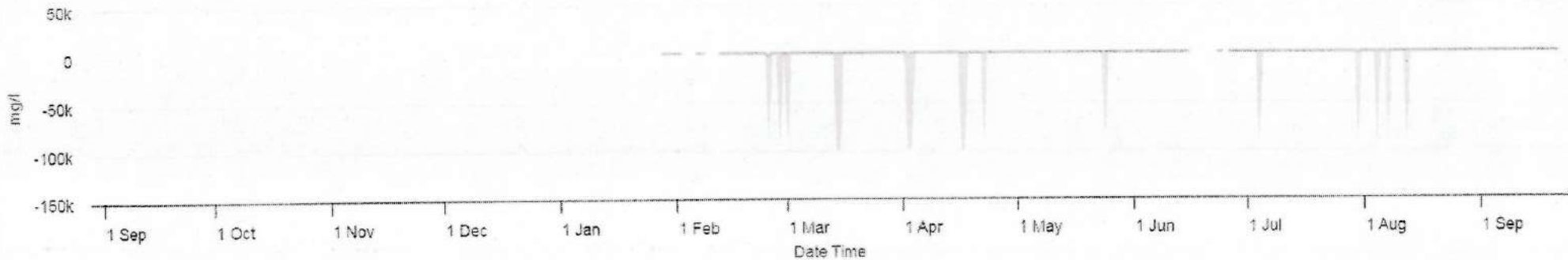
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398  
mg/l



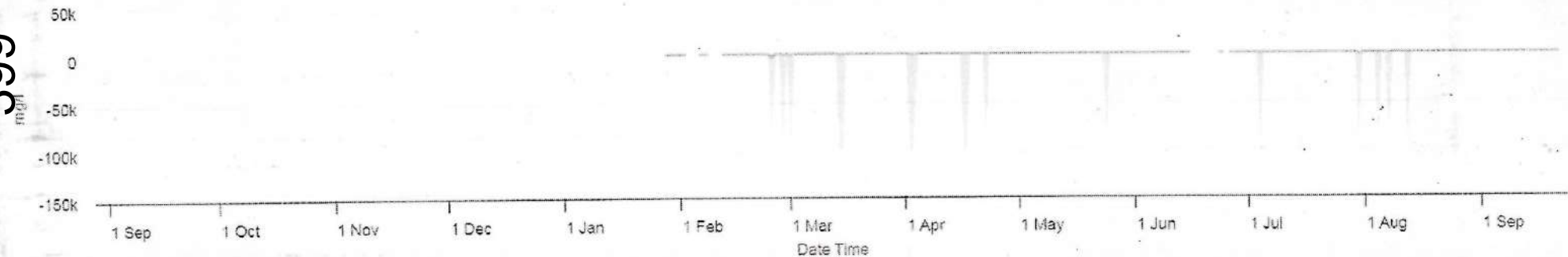
◆ Avg ◆ Min-max range

### COD



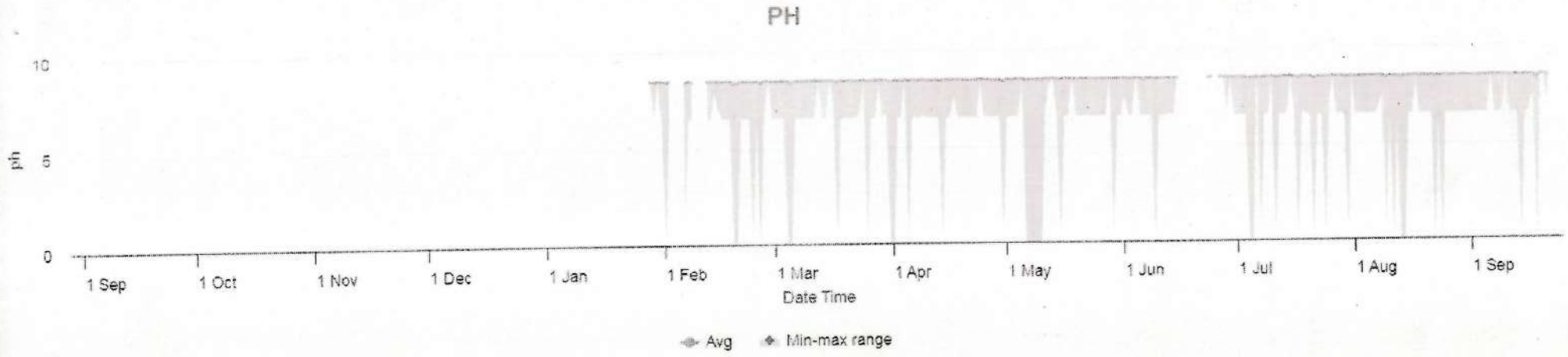
◆ Avg ◆ Min-max range

### TSS



◆ Avg ◆ Min-max range

399



400

Detailed Data

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
21 Sep 2024	1480.33	139.70	658.25	164.46	8.42
20 Sep 2024	1480.33	135.92	640.41	160.00	8.50
19 Sep 2024	1480.33	140.54	662.40	165.47	8.50
18 Sep 2024	1480.33	133.25	627.64	156.81	8.26
17 Sep 2024	1480.33	136.57	643.45	160.76	8.49
16 Sep 2024	1480.33	137.66	648.83	162.10	8.46
15 Sep 2024	1480.33	136.70	644.33	160.98	8.47
14 Sep 2024	1480.33	137.98	650.17	162.45	8.42
13 Sep 2024	1480.33	139.10	655.30	163.73	8.47
12 Sep 2024	1480.33	137.86	649.51	162.28	8.46
11 Sep 2024	1480.33	136.10	641.17	160.20	8.45
10 Sep 2024	1480.33	137.60	648.46	162.00	8.50
09 Sep 2024	1480.33	134.32	632.96	158.13	8.48
08 Sep 2024	1480.33	135.30	637.58	159.29	8.49
07 Sep 2024	1480.33	137.73	649.03	162.15	8.48
06 Sep 2024	1480.33	137.65	648.74	162.07	8.50
05 Sep 2024	1480.33	136.41	642.82	160.62	8.46
04 Sep 2024	1480.33	138.82	654.15	163.43	8.48
03 Sep 2024	1480.33	141.37	666.10	166.42	8.47
02 Sep 2024	1480.33	136.79	644.47	161.01	8.46

401

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
01 Sep 2024	1480.33	133.00	626.73	156.58	8.47
31 Aug 2024	1480.33	133.79	630.36	157.48	8.44
30 Aug 2024	1480.33	136.41	642.67	160.57	8.48
29 Aug 2024	1480.33	142.12	669.73	167.33	8.48
28 Aug 2024	1480.33	137.42	647.57	161.79	8.45
27 Aug 2024	1480.33	139.25	656.16	163.94	8.48
26 Aug 2024	1480.33	134.72	634.77	158.59	8.46
25 Aug 2024	1480.33	137.45	647.68	161.82	8.49
24 Aug 2024	1480.33	136.51	643.29	160.73	8.46
23 Aug 2024	1480.33	133.70	630.10	157.42	8.46
22 Aug 2024	1480.33	130.68	615.75	153.84	8.43
21 Aug 2024	1480.33	133.95	631.21	157.70	8.49
20 Aug 2024	1480.33	134.02	631.61	157.80	8.45
19 Aug 2024	1480.33	137.33	647.29	161.72	8.49
18 Aug 2024	1480.33	134.13	632.16	157.93	8.47
17 Aug 2024	1480.33	134.60	634.42	158.49	8.50
16 Aug 2024	1480.33	133.64	629.81	157.34	8.47
15 Aug 2024	1480.33	134.51	633.76	158.33	8.47
14 Aug 2024	1480.33	132.77	625.64	156.30	8.44
13 Aug 2024	1480.33	134.97	635.94	158.88	8.39

402

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
12 Aug 2024	1480.33	-343.33	166.71	-318.98	8.45
11 Aug 2024	1480.33	141.79	668.05	166.91	8.41
10 Aug 2024	1480.33	136.20	641.92	160.37	8.46
09 Aug 2024	1480.33	132.19	622.97	155.65	8.35
08 Aug 2024	1480.33	139.56	657.38	164.26	8.48
07 Aug 2024	1480.33	-566.44	-54.75	-541.96	8.49
06 Aug 2024	1480.33	132.70	625.18	156.20	8.49
05 Aug 2024	1480.33	133.30	628.04	156.90	8.48
04 Aug 2024	1480.33	-433.26	55.67	-409.91	8.48
03 Aug 2024	1480.33	133.77	630.42	157.50	8.49
02 Aug 2024	1480.33	133.08	627.06	156.65	8.48
01 Aug 2024	1480.33	137.70	648.69	162.07	8.44
31 Jul 2024	1480.33	125.40	591.04	147.67	8.50
30 Jul 2024	1480.33	-1464.42	-1008.16	-1442.60	8.42
29 Jul 2024	1480.33	130.66	615.58	153.80	8.47
28 Jul 2024	1480.33	129.51	610.31	152.47	8.49
27 Jul 2024	1480.33	129.58	610.59	152.54	8.48
26 Jul 2024	1480.33	129.27	609.32	152.23	8.50
25 Jul 2024	1480.33	131.73	620.85	155.11	8.48
24 Jul 2024	1480.33	129.27	609.17	152.18	8.45

403

404

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
23 Jul 2024	1480.33	132.64	625.15	156.19	8.46
22 Jul 2024	1480.33	131.64	620.18	154.94	8.45
21 Jul 2024	1480.33	128.20	604.11	150.93	8.38
20 Jul 2024	1480.33	128.63	606.02	151.41	8.47
19 Jul 2024	1480.33	128.57	606.00	151.40	8.49
18 Jul 2024	1480.33	130.65	615.90	153.87	8.48
17 Jul 2024	1480.33	130.24	613.79	153.34	8.39
16 Jul 2024	1480.33	129.41	609.81	152.34	8.47
15 Jul 2024	1480.33	128.85	607.32	151.72	8.50
14 Jul 2024	1480.33	129.93	612.33	152.98	8.49
13 Jul 2024	1480.33	134.08	631.79	157.84	8.49
12 Jul 2024	1480.33	135.32	637.73	159.32	8.47
11 Jul 2024	1480.33	127.17	599.44	149.76	8.43
10 Jul 2024	1480.33	128.53	605.66	151.32	8.50
09 Jul 2024	1480.33	130.79	616.32	153.97	8.48
08 Jul 2024	1480.33	130.59	615.37	153.74	8.47
07 Jul 2024	1480.33	132.98	626.71	156.57	8.43
06 Jul 2024	1480.33	139.11	655.39	163.74	8.50
05 Jul 2024	1480.33	130.37	614.28	153.47	8.44
04 Jul 2024	1480.33	-417.77	82.21	-393.91	8.42

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
03 Jul 2024	1480.33	136.30	642.27	160.47	8.46
02 Jul 2024	1480.33	134.40	633.41	158.25	8.48
01 Jul 2024	1480.33	137.03	645.79	161.35	8.48
30 Jun 2024	1480.33	136.12	641.58	160.28	8.46
29 Jun 2024	1480.33	137.02	645.83	161.35	8.50
28 Jun 2024	1480.33	135.64	639.12	159.68	8.47
27 Jun 2024	1480.33	141.93	668.83	167.12	8.50
26 Jun 2024	1480.33	138.13	650.71	162.53	8.50
24 Jun 2024	1480.33	135.84	640.19	159.94	8.50
23 Jun 2024	1480.33	129.15	608.40	152.02	8.50
22 Jun 2024	1480.33	125.14	590.11	147.43	8.50
21 Jun 2024	1480.33	127.02	598.43	149.51	8.46
20 Jun 2024	1480.33	122.18	575.80	143.85	8.48
19 Jun 2024	1480.33	126.09	594.35	148.48	8.48
18 Jun 2024	1480.33	128.20	604.04	150.92	8.48
17 Jun 2024	1480.33	129.46	609.99	152.40	8.46
16 Jun 2024	1480.33	130.02	612.74	153.09	8.43
15 Jun 2024	1480.33	136.82	644.82	161.11	8.48
14 Jun 2024	1480.33	137.88	649.77	162.35	8.47
13 Jun 2024	1480.33	136.93	645.28	161.21	8.36

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
05 Jun 2024	1480.33	133.65	629.75	157.33	8.47
04 Jun 2024	1480.33	139.12	655.64	163.81	8.50
03 Jun 2024	1480.33	128.09	603.65	150.81	8.46
02 Jun 2024	1480.33	129.18	608.90	152.12	8.48
01 Jun 2024	1480.33	124.05	584.61	146.06	8.49
31 May 2024	1480.33	126.70	597.07	149.15	8.49
30 May 2024	1480.33	125.05	589.35	147.24	8.47
29 May 2024	1480.33	122.49	577.37	144.24	8.42
28 May 2024	1480.33	125.29	590.75	147.57	8.50
27 May 2024	1480.33	123.07	579.94	144.88	8.47
26 May 2024	1480.33	123.83	583.50	145.77	8.47
25 May 2024	1480.33	130.54	615.34	153.73	8.49
24 May 2024	1480.33	-382.54	91.46	-359.89	8.45
23 May 2024	1480.33	126.46	595.89	148.88	8.48
22 May 2024	1480.33	127.56	601.10	150.17	8.48
21 May 2024	1480.33	128.09	603.63	150.80	8.47
20 May 2024	1480.33	125.14	589.85	147.36	8.47
19 May 2024	1480.33	116.08	547.37	136.73	8.46
18 May 2024	1480.33	122.81	578.97	144.64	8.50
17 May 2024	1480.33	124.75	587.88	146.87	8.46

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
16 May 2024	1480.33	129.36	609.70	152.31	8.49
15 May 2024	1480.33	127.61	601.29	150.22	8.41
14 May 2024	1480.33	129.02	608.07	151.91	8.48
13 May 2024	1480.33	129.70	611.31	152.72	8.50
12 May 2024	1480.33	134.93	635.90	158.87	8.50
11 May 2024	1480.33	134.64	634.66	158.56	8.48
10 May 2024	1480.33	133.13	627.39	156.74	8.42
09 May 2024	1480.33	132.54	624.68	156.07	8.43
08 May 2024	1480.33	129.50	610.34	152.48	8.46
07 May 2024	1480.33	128.44	605.25	151.22	8.44
06 May 2024	1480.33	121.82	574.22	143.45	8.41
05 May 2024	1480.33	126.28	595.11	148.68	8.50
04 May 2024	1480.33	127.33	599.98	149.90	8.46
03 May 2024	1480.33	134.70	634.60	158.54	8.48
02 May 2024	1480.33	140.78	663.42	165.74	8.44
01 May 2024	1480.33	141.83	668.49	167.03	8.45
30 Apr 2024	1480.33	139.18	655.61	163.80	8.36
29 Apr 2024	1480.33	146.74	691.43	172.75	8.48
28 Apr 2024	1480.33	129.68	611.40	152.76	8.42
27 Apr 2024	1480.33	136.57	643.60	160.80	8.46

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
26 Apr 2024	1480.33	123.02	579.93	144.88	8.47
25 Apr 2024	1480.33	128.04	603.73	150.81	8.47
24 Apr 2024	1480.33	142.23	669.98	167.40	8.50
23 Apr 2024	1480.33	141.24	665.54	166.29	8.49
22 Apr 2024	1480.33	-456.34	45.99	-432.39	8.45
21 Apr 2024	1480.33	134.92	635.98	158.89	8.46
20 Apr 2024	1480.33	136.87	644.80	161.10	8.45
19 Apr 2024	1480.33	136.52	643.57	160.79	8.49
18 Apr 2024	1480.33	133.79	630.41	157.50	8.48
17 Apr 2024	1480.33	-367.88	131.94	-343.99	8.50
16 Apr 2024	1480.33	-331.38	173.25	-307.25	8.48
15 Apr 2024	1480.33	137.45	647.83	161.85	8.48
14 Apr 2024	1480.33	142.84	672.96	168.13	8.43
13 Apr 2024	1480.33	140.23	660.83	165.11	8.45
12 Apr 2024	1480.33	132.52	624.34	155.98	8.48
11 Apr 2024	1480.33	136.43	642.94	160.64	8.46
10 Apr 2024	1480.33	135.07	636.58	159.04	8.45
09 Apr 2024	1480.33	134.72	634.96	158.65	8.49
08 Apr 2024	1480.33	134.23	632.48	158.02	8.48
07 Apr 2024	1480.33	134.96	635.95	158.88	8.48

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
06 Apr 2024	1480.33	136.69	644.03	160.90	8.48
05 Apr 2024	1480.33	134.88	635.61	158.80	8.44
04 Apr 2024	1480.33	134.98	636.11	158.92	8.50
03 Apr 2024	1480.33	-471.18	43.18	-446.62	8.45
02 Apr 2024	1480.33	-441.62	77.38	-416.81	8.45
01 Apr 2024	1480.33	138.60	652.96	163.15	8.43
31 Mar 2024	1480.33	139.75	658.60	164.55	8.38
30 Mar 2024	1480.33	143.36	675.47	168.76	8.49
29 Mar 2024	1480.33	136.72	644.31	160.98	8.49
28 Mar 2024	1480.33	138.85	654.34	163.49	8.50
27 Mar 2024	1480.33	137.08	645.95	161.40	8.48
26 Mar 2024	1480.33	137.37	647.19	161.70	8.48
25 Mar 2024	1480.33	135.61	639.05	159.66	8.44
24 Mar 2024	1480.33	143.09	674.25	168.47	8.50
23 Mar 2024	1480.33	140.05	659.85	164.86	8.48
22 Mar 2024	1480.33	142.84	672.93	168.13	8.43
21 Mar 2024	1480.33	143.63	676.86	169.11	8.48
20 Mar 2024	1480.33	139.01	654.98	163.65	8.48
19 Mar 2024	1480.33	141.12	664.92	166.12	8.44
18 Mar 2024	1480.33	143.19	674.60	168.54	8.49

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
17 Mar 2024	1480.33	145.52	685.61	171.30	8.38
16 Mar 2024	1480.33	144.49	680.90	170.12	8.49
15 Mar 2024	1480.33	-481.95	63.59	-455.89	8.50
14 Mar 2024	1480.33	-516.43	24.87	-490.57	8.49
13 Mar 2024	1480.33	147.77	696.17	173.95	8.48
12 Mar 2024	1480.33	142.92	673.47	168.25	8.50
11 Mar 2024	1480.33	146.38	689.58	172.30	8.49
10 Mar 2024	1480.33	146.00	687.93	171.88	8.49
09 Mar 2024	1480.33	149.54	704.54	176.03	8.47
08 Mar 2024	1480.33	152.87	720.41	180.00	8.47
07 Mar 2024	1480.33	155.70	733.83	183.35	8.44
06 Mar 2024	1480.33	158.85	748.38	186.99	8.45
05 Mar 2024	1480.33	155.14	730.98	182.63	8.33
04 Mar 2024	1480.33	156.50	737.37	184.24	8.42
03 Mar 2024	1480.33	153.33	722.38	180.49	8.48
02 Mar 2024	1480.33	151.35	712.99	178.15	8.46
01 Mar 2024	1480.33	-408.67	136.50	-382.64	8.44
29 Feb 2024	1480.33	148.76	700.96	175.14	8.46
28 Feb 2024	1480.33	-319.41	245.82	-292.42	8.50
27 Feb 2024	1480.33	154.15	726.32	181.48	8.47

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
26 Feb 2024	1480.33	152.12	716.74	179.09	8.37
25 Feb 2024	1480.33	-3504.11	-2951.96	-3477.78	8.47
24 Feb 2024	1480.33	155.27	731.64	182.81	8.41
23 Feb 2024	1480.33	156.76	738.80	184.59	8.48
22 Feb 2024	1480.33	154.95	730.29	182.47	8.46
21 Feb 2024	1480.33	149.99	706.48	176.52	8.48
20 Feb 2024	1480.33	145.15	683.62	170.79	8.34
19 Feb 2024	1480.33	147.08	693.20	173.20	8.36
18 Feb 2024	1480.33	151.87	715.71	178.83	8.47
17 Feb 2024	1480.33	150.47	708.84	177.12	8.48
16 Feb 2024	1480.33	151.15	712.09	177.92	8.44
15 Feb 2024	1480.33	149.78	705.85	176.36	8.49
14 Feb 2024	1480.33	149.94	706.48	176.51	8.49
13 Feb 2024	1480.33	150.91	711.14	177.66	8.48
12 Feb 2024	1480.33	153.61	723.73	180.83	8.48
08 Feb 2024	1480.33	159.64	752.21	187.96	8.46
07 Feb 2024	1480.33	159.93	753.25	188.21	8.48
06 Feb 2024	1480.33	156.10	735.37	183.74	8.38
02 Feb 2024	1480.33	156.82	738.80	184.60	8.48
01 Feb 2024	1480.33	155.81	733.94	183.38	8.44

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
31 Jan 2024	1480.33	152.54	718.81	179.60	8.49
30 Jan 2024	1480.33	155.35	731.91	182.87	8.50
29 Jan 2024	1480.33	152.44	718.16	179.44	8.46
28 Jan 2024	1480.33	148.74	700.86	175.11	8.50

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# AVERAGE Report - Punjab Dyers Association (Focal Point Module)

From: 01 Sep 2023, 10:00 to 21 Sep 2024, 13:54

Generated on: 21 Sep 2024, 13:54

\* All the times are in 24-Hours time format

## Asset: ETP Outlet

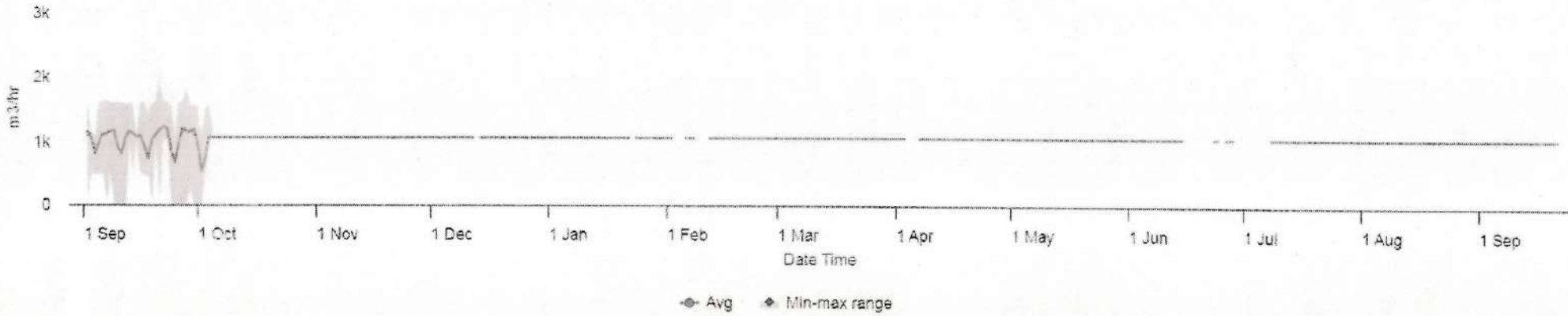
Make - NA | Model - NA

### Summary Data

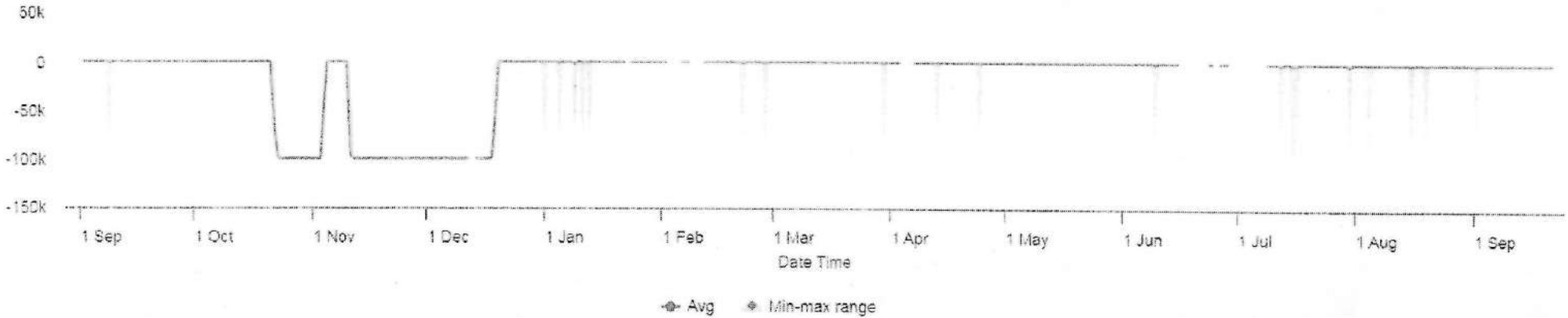
Parameter	Avg	Min	Min at.	Max	Max at.
Flow (m3/hr)	1037.26	0.00	02 Sep 2023, 06:04	2016.84	21 Sep 2023, 22:19
BCD (mg/l)	-14183.75	-99999.00	09 Sep 2023, 10:09	28.90	05 Sep 2023, 23:40
COD (mg/l)	-14084.85	-99999.00	09 Sep 2023, 10:09	196.80	13 Oct 2023, 03:56
TSS (mg/l)	-14174.01	-99999.00	09 Sep 2023, 10:09	49.00	19 Sep 2023, 21:05
PH (ph)	-14197.40	-99999.00	09 Sep 2023, 10:09	8.22	02 Sep 2023, 06:22

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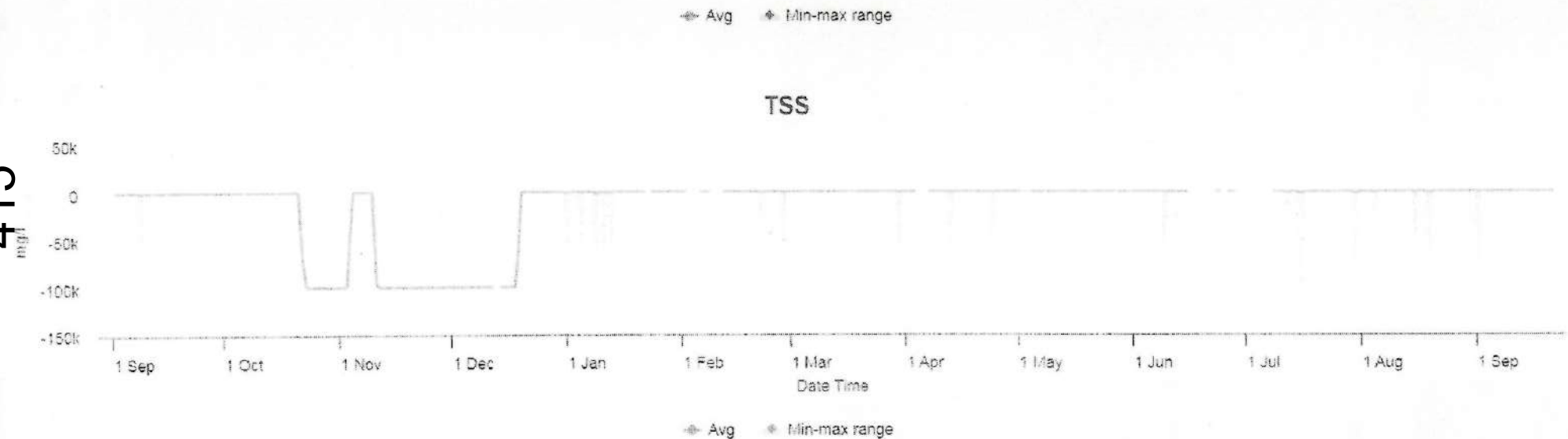
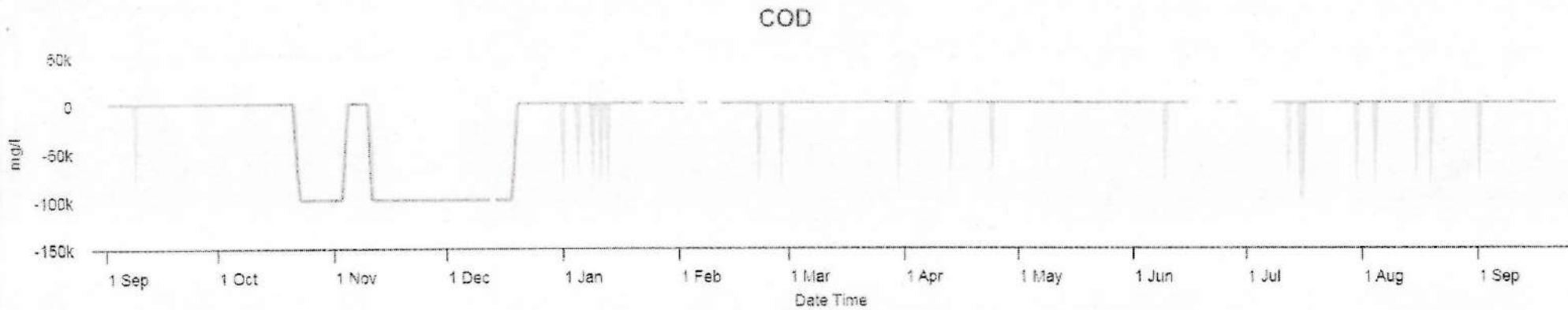
### Flow



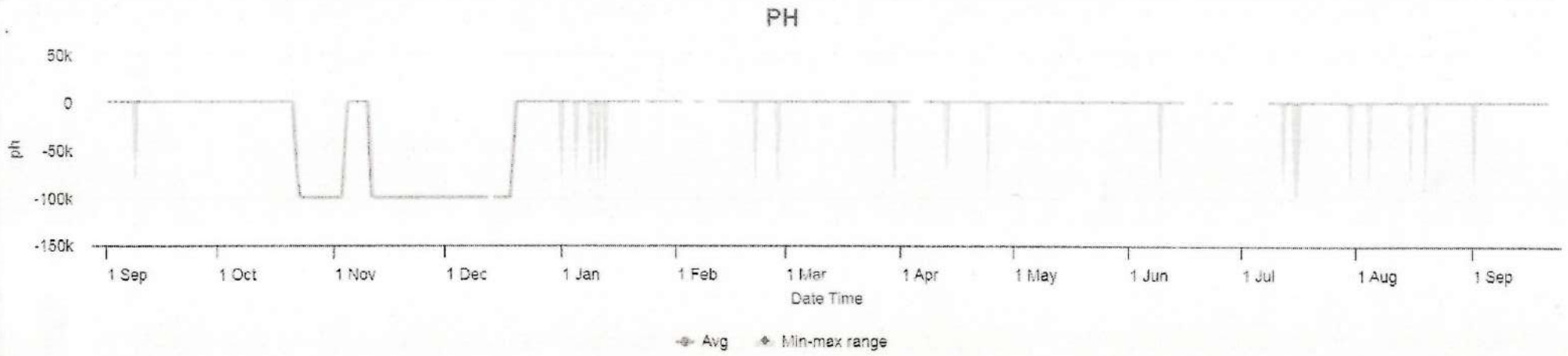
### BOD



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Detailed Data

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
21 Sep 2024	1040.80	26.23	144.73	36.07	7.26
20 Sep 2024	1040.80	26.48	144.55	36.03	7.22
19 Sep 2024	1040.80	26.18	143.82	35.85	7.19
18 Sep 2024	1040.80	26.49	145.38	36.23	7.21
17 Sep 2024	1040.80	26.49	145.75	36.34	7.19
16 Sep 2024	1040.80	26.25	152.56	38.04	7.21
15 Sep 2024	1040.80	26.47	159.37	39.74	7.29
14 Sep 2024	1040.80	26.27	157.87	39.37	7.24
13 Sep 2024	1040.80	26.33	190.05	47.41	7.18
12 Sep 2024	1040.80	26.27	190.54	47.54	7.26
11 Sep 2024	1040.80	26.34	174.26	43.47	7.26
10 Sep 2024	1040.80	26.55	153.50	38.27	7.11
09 Sep 2024	1040.80	26.48	152.65	38.06	7.33
08 Sep 2024	1040.80	26.49	153.13	38.18	7.24
07 Sep 2024	1040.80	26.30	153.16	38.19	7.17
06 Sep 2024	1040.80	26.38	153.48	38.27	7.17
05 Sep 2024	1040.80	26.16	152.62	38.06	7.23
04 Sep 2024	1040.80	26.22	152.59	38.05	7.16
03 Sep 2024	1040.80	26.40	151.84	37.86	7.28
02 Sep 2024	1040.80	26.50	152.15	37.94	7.23

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
01 Sep 2024	1040.80	-422.09	-299.23	-411.23	-441.26
31 Aug 2024	1040.80	26.39	149.42	37.25	7.21
30 Aug 2024	1040.80	26.36	149.47	37.26	7.22
29 Aug 2024	1040.80	26.28	149.53	37.28	7.28
28 Aug 2024	1040.80	26.32	167.00	41.64	7.30
27 Aug 2024	1040.80	26.20	160.67	40.06	7.12
26 Aug 2024	1040.80	26.45	151.53	37.78	7.28
25 Aug 2024	1040.80	26.59	152.54	38.03	7.22
24 Aug 2024	1040.80	26.25	152.62	38.06	7.24
23 Aug 2024	1040.80	26.32	152.49	38.02	7.26
22 Aug 2024	1040.80	26.36	150.51	37.52	7.31
21 Aug 2024	1040.80	26.27	151.76	37.83	7.25
20 Aug 2024	1040.80	26.31	151.99	37.90	7.22
19 Aug 2024	1040.80	-497.25	-372.01	-485.78	-516.38
18 Aug 2024	1040.80	26.29	150.69	37.58	7.18
17 Aug 2024	1040.80	26.30	152.73	38.08	7.16
16 Aug 2024	1040.80	26.31	153.64	38.31	7.17
15 Aug 2024	1040.80	-432.56	-306.09	-420.65	-451.57
14 Aug 2024	1040.80	26.42	153.33	38.22	7.24
13 Aug 2024	1040.80	26.55	154.10	38.42	7.19

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
12 Aug 2024	1040.80	26.35	153.95	38.38	7.25
11 Aug 2024	1040.80	26.24	153.72	38.33	7.21
10 Aug 2024	1040.80	26.53	154.25	38.45	7.23
09 Aug 2024	1040.80	26.33	155.14	38.68	7.19
08 Aug 2024	1040.80	26.41	154.47	38.51	7.22
07 Aug 2024	1040.80	26.24	153.14	38.19	7.17
06 Aug 2024	1040.80	26.54	153.30	38.22	7.24
05 Aug 2024	1040.80	26.22	152.80	38.10	7.22
04 Aug 2024	1040.80	-452.13	-327.02	-440.70	-471.18
03 Aug 2024	1040.80	26.29	156.77	39.09	7.34
02 Aug 2024	1040.80	26.30	153.97	38.39	7.25
01 Aug 2024	1040.80	26.37	152.61	38.05	7.26
31 Jul 2024	1040.80	26.36	152.22	37.95	7.26
30 Jul 2024	1040.80	-1869.97	-1742.83	-1857.60	-1888.60
29 Jul 2024	1040.80	26.40	156.65	39.06	7.20
28 Jul 2024	1040.80	26.57	155.36	38.74	7.25
27 Jul 2024	1040.80	26.35	158.34	39.48	7.28
26 Jul 2024	1040.80	26.26	155.46	38.76	7.22
25 Jul 2024	1040.80	26.45	155.60	38.80	7.24
24 Jul 2024	1040.80	26.48	155.11	38.67	7.15

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
23 Jul 2024	1040.80	26.51	155.94	38.89	7.18
22 Jul 2024	1040.80	26.34	156.30	38.98	7.23
21 Jul 2024	1040.80	26.27	155.52	38.78	7.28
20 Jul 2024	1040.80	26.30	153.90	38.38	7.32
19 Jul 2024	1040.80	26.37	155.71	38.83	7.18
18 Jul 2024	1040.80	26.53	156.34	38.98	7.25
17 Jul 2024	1040.80	26.49	158.86	39.62	7.31
16 Jul 2024	1040.80	-963.90	-832.64	-950.83	-982.89
15 Jul 2024	1040.80	-1055.00	-924.63	-1042.06	-1073.92
14 Jul 2024	1040.80	26.31	156.77	39.10	7.30
13 Jul 2024	1040.80	26.29	156.55	39.03	7.24
12 Jul 2024	1040.80	-870.52	-737.63	-857.15	-889.68
11 Jul 2024	1040.80	26.21	173.01	43.15	7.26
10 Jul 2024	1040.80	26.17	155.69	38.83	7.21
09 Jul 2024	1040.80	26.29	156.33	38.98	7.19
08 Jul 2024	1040.80	26.38	156.47	39.02	7.23
28 Jun 2024	1040.80	26.25	167.22	41.70	7.35
27 Jun 2024	1040.80	26.38	162.75	40.58	7.16
26 Jun 2024	1040.80	28.50	148.80	37.00	8.11
24 Jun 2024	1040.80	25.59	173.47	43.29	7.23

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
23 Jun 2024	1040.80	26.31	174.13	43.43	7.31
15 Jun 2024	1040.80	26.65	170.16	42.45	7.26
14 Jun 2024	1040.80	26.33	171.47	42.78	7.18
13 Jun 2024	1040.80	26.42	169.25	42.21	7.29
12 Jun 2024	1040.80	26.48	167.71	41.83	7.27
11 Jun 2024	1040.80	26.21	167.57	41.79	7.20
10 Jun 2024	1040.80	26.41	169.04	42.16	7.20
09 Jun 2024	1040.80	-420.21	-277.23	-404.23	-439.21
08 Jun 2024	1040.80	26.48	171.57	42.79	7.16
07 Jun 2024	1040.80	26.26	171.62	42.80	7.22
06 Jun 2024	1040.80	26.23	173.36	43.25	7.38
05 Jun 2024	1040.80	26.17	176.33	43.98	7.31
04 Jun 2024	1040.80	26.36	178.72	44.58	7.19
03 Jun 2024	1040.80	26.42	169.02	42.17	7.27
02 Jun 2024	1040.80	26.12	165.89	41.37	7.17
01 Jun 2024	1040.80	26.30	166.84	41.61	7.15
31 May 2024	1040.80	26.24	168.86	42.10	7.22
30 May 2024	1040.80	26.38	169.33	42.23	7.21
29 May 2024	1040.80	26.45	168.95	42.13	7.22
28 May 2024	1040.80	26.35	168.41	42.00	7.27

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
27 May 2024	1040.80	26.60	167.27	41.72	7.25
26 May 2024	1040.80	26.42	169.18	42.20	7.25
25 May 2024	1040.80	26.39	170.27	42.47	7.24
24 May 2024	1040.80	26.33	175.14	43.68	7.16
23 May 2024	1040.80	26.61	172.55	43.03	7.21
22 May 2024	1040.80	26.44	172.55	43.04	7.20
21 May 2024	1040.80	26.54	165.59	41.29	7.19
20 May 2024	1040.80	26.36	165.46	41.26	7.28
19 May 2024	1040.80	26.33	165.81	41.35	7.23
18 May 2024	1040.80	26.35	166.34	41.48	7.23
17 May 2024	1040.80	26.53	167.51	41.78	7.23
16 May 2024	1040.80	26.51	169.87	42.36	7.20
15 May 2024	1040.80	26.33	179.32	44.73	7.17
14 May 2024	1040.80	26.42	185.66	46.32	7.20
13 May 2024	1040.80	26.31	185.15	46.18	7.19
12 May 2024	1040.80	26.50	186.75	46.58	7.22
11 May 2024	1040.80	26.21	186.00	46.40	7.25
10 May 2024	1040.80	26.25	187.03	46.66	7.23
09 May 2024	1040.80	26.32	186.59	46.55	7.28
08 May 2024	1040.80	26.35	186.53	46.53	7.23

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
07 May 2024	1040.80	26.26	185.63	46.30	7.26
06 May 2024	1040.80	26.44	185.46	46.27	7.25
05 May 2024	1040.80	26.32	185.62	46.31	7.20
04 May 2024	1040.80	26.32	185.09	46.17	7.18
03 May 2024	1040.80	26.38	186.44	46.50	7.22
02 May 2024	1040.80	26.42	185.86	46.37	7.23
01 May 2024	1040.80	26.36	185.36	46.24	7.21
30 Apr 2024	1040.80	26.31	185.76	46.34	7.28
29 Apr 2024	1040.80	26.13	186.40	46.50	7.23
28 Apr 2024	1040.80	26.24	185.05	46.16	7.15
27 Apr 2024	1040.80	26.32	185.98	46.39	7.16
26 Apr 2024	1040.80	26.12	185.20	46.20	7.16
25 Apr 2024	1040.80	26.49	186.34	46.48	7.26
24 Apr 2024	1040.80	-408.66	-247.75	-388.13	-427.71
23 Apr 2024	1040.80	26.28	191.59	47.80	7.21
22 Apr 2024	1040.80	26.29	190.77	47.59	7.21
21 Apr 2024	1040.80	26.45	190.74	47.58	7.28
20 Apr 2024	1040.80	26.27	190.18	47.45	7.26
19 Apr 2024	1040.80	26.36	190.55	47.54	7.22
18 Apr 2024	1040.80	26.35	191.11	47.68	7.26

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
17 Apr 2024	1040.80	26.41	191.47	47.76	7.24
16 Apr 2024	1040.80	26.51	191.82	47.84	7.26
15 Apr 2024	1040.80	26.09	192.42	48.00	7.25
14 Apr 2024	1040.80	26.28	192.40	48.00	7.30
13 Apr 2024	1040.80	-395.76	-231.14	-374.34	-414.76
12 Apr 2024	1040.80	26.38	191.05	47.65	7.25
11 Apr 2024	1040.80	26.34	192.10	47.92	7.29
10 Apr 2024	1040.80	26.27	191.29	47.72	7.25
09 Apr 2024	1040.80	26.44	191.35	47.73	7.29
08 Apr 2024	1040.80	26.57	191.37	47.74	7.21
07 Apr 2024	1040.80	26.27	191.48	47.77	7.24
03 Apr 2024	1040.80	26.58	192.45	48.00	7.07
02 Apr 2024	1040.80	26.16	192.27	47.96	7.20
01 Apr 2024	1040.80	26.39	192.69	48.06	7.21
31 Mar 2024	1040.80	26.39	193.31	48.22	7.26
30 Mar 2024	1040.80	-412.27	-246.21	-390.60	-431.40
29 Mar 2024	1040.80	26.49	192.07	47.92	7.14
28 Mar 2024	1040.80	26.48	192.36	47.98	7.19
27 Mar 2024	1040.80	26.45	192.07	47.92	7.25
26 Mar 2024	1040.80	26.47	191.53	47.78	7.20

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
25 Mar 2024	1040.80	26.29	192.40	48.00	7.25
24 Mar 2024	1040.80	26.59	192.36	48.00	7.22
23 Mar 2024	1040.80	26.43	193.43	48.25	7.27
22 Mar 2024	1040.80	26.42	193.44	48.26	7.28
21 Mar 2024	1040.80	26.53	193.08	48.16	7.24
20 Mar 2024	1040.80	18.57	95.66	23.82	7.31
19 Mar 2024	1040.80	17.22	81.77	20.35	7.22
18 Mar 2024	1040.80	17.34	82.39	20.50	7.22
17 Mar 2024	1040.80	16.89	80.39	20.00	7.25
16 Mar 2024	1040.80	16.94	80.40	20.00	7.25
15 Mar 2024	1040.80	17.15	81.47	20.27	7.18
14 Mar 2024	1040.80	17.65	83.82	20.86	7.27
13 Mar 2024	1040.80	16.95	80.38	20.00	7.21
12 Mar 2024	1040.80	17.10	81.33	20.23	7.27
11 Mar 2024	1040.80	17.42	82.80	20.60	7.22
10 Mar 2024	1040.80	17.45	83.06	20.67	7.13
09 Mar 2024	1040.80	17.22	81.91	20.38	7.22
08 Mar 2024	1040.80	16.97	80.86	20.11	7.22
07 Mar 2024	1040.80	17.33	82.36	20.48	7.24
06 Mar 2024	1040.80	17.77	84.40	21.00	7.26

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
05 Mar 2024	1040.80	17.78	84.39	21.00	7.24
04 Mar 2024	1040.80	17.75	84.40	21.00	7.34
03 Mar 2024	1040.80	17.76	84.36	21.00	7.30
02 Mar 2024	1040.80	17.74	84.34	20.99	7.24
01 Mar 2024	1040.80	17.68	84.04	20.91	7.23
29 Feb 2024	1040.80	17.39	82.70	20.58	7.36
28 Feb 2024	1040.80	-408.28	-343.61	-405.14	-418.35
27 Feb 2024	1040.80	16.81	80.06	19.91	7.23
26 Feb 2024	1040.80	16.95	80.43	20.01	7.17
25 Feb 2024	1040.80	16.83	80.21	19.95	7.16
24 Feb 2024	1040.80	17.77	84.42	21.00	7.24
23 Feb 2024	1040.80	17.68	84.08	20.91	7.14
22 Feb 2024	1040.80	-402.61	-336.85	-399.43	-413.02
21 Feb 2024	1040.80	17.51	83.24	20.71	7.24
20 Feb 2024	1040.80	16.99	80.71	20.07	7.17
19 Feb 2024	1040.80	24.83	176.51	44.02	7.23
18 Feb 2024	1040.80	24.52	171.94	42.90	7.30
17 Feb 2024	1040.80	18.00	90.08	22.43	7.26
16 Feb 2024	1040.80	17.74	84.17	20.95	7.25
15 Feb 2024	1040.80	17.75	84.38	21.00	7.18

Date & time  
(DD MMM, HH:mm - DD MMM YYYY, HH:mm)

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
14 Feb 2024	1040.80	17.61	83.83	20.86	7.18
13 Feb 2024	1040.80	17.33	82.26	20.46	7.23
12 Feb 2024	1040.80	16.99	80.94	20.14	7.26
08 Feb 2024	1040.80	17.56	83.63	20.80	7.16
07 Feb 2024	1040.80	17.65	83.91	20.88	7.23
06 Feb 2024	1040.80	17.33	82.34	20.48	7.23
02 Feb 2024	1040.80	16.90	80.38	20.00	7.20
01 Feb 2024	1040.80	16.78	79.94	19.88	7.15
31 Jan 2024	1040.80	16.81	79.89	19.88	7.24
30 Jan 2024	1040.80	16.87	80.40	20.00	7.23
29 Jan 2024	1040.80	16.91	80.39	20.00	7.20
28 Jan 2024	1040.80	16.91	80.41	20.00	7.25
27 Jan 2024	1040.80	16.88	80.44	20.00	7.28
26 Jan 2024	1040.80	16.90	80.41	20.00	7.19
25 Jan 2024	1040.80	16.92	80.43	20.00	7.24
24 Jan 2024	1040.80	17.55	83.66	20.81	7.23
22 Jan 2024	1040.80	17.52	83.42	20.76	7.25
21 Jan 2024	1040.80	16.86	79.99	19.91	7.21
20 Jan 2024	1040.80	16.83	80.06	19.91	7.20
19 Jan 2024	1040.80	16.83	80.06	19.91	7.22

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
18 Jan 2024	1040.80	21.41	134.69	33.57	7.17
17 Jan 2024	1040.80	17.78	84.42	21.00	7.17
16 Jan 2024	1040.80	17.72	84.20	20.96	7.28
15 Jan 2024	1040.80	17.69	84.04	20.91	7.28
14 Jan 2024	1040.80	17.43	82.95	20.65	7.18
13 Jan 2024	1040.80	-427.59	-364.38	-424.53	-437.26
12 Jan 2024	1040.80	16.93	80.41	20.00	7.32
11 Jan 2024	1040.80	-416.08	-352.85	-412.98	-425.66
10 Jan 2024	1040.80	17.38	82.59	20.56	7.17
09 Jan 2024	1040.80	-1545.10	-1479.85	-1541.92	-1555.40
08 Jan 2024	1040.80	17.77	84.39	21.00	7.30
07 Jan 2024	1040.80	17.73	84.41	21.00	7.29
06 Jan 2024	1040.80	17.67	83.88	20.37	7.26
05 Jan 2024	1040.80	-592.08	-525.90	-598.88	-602.43
04 Jan 2024	1040.80	17.78	84.41	21.00	7.24
03 Jan 2024	1040.80	17.76	84.36	21.00	7.26
02 Jan 2024	1040.80	17.65	83.88	20.87	7.13
01 Jan 2024	1040.80	-550.49	-484.24	-547.30	-560.97
31 Dec 2023	1040.80	17.63	83.88	20.88	7.21
30 Dec 2023	1040.80	17.76	84.40	21.00	7.27

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
29 Dec 2023	1040.80	17.72	84.41	21.00	7.26
28 Dec 2023	1040.80	17.76	84.41	21.00	7.21
27 Dec 2023	1040.80	17.67	83.96	20.89	7.15
26 Dec 2023	1040.80	17.75	84.40	21.00	7.32
25 Dec 2023	1040.80	17.71	84.02	20.91	7.21
24 Dec 2023	1040.80	17.77	84.38	21.00	7.25
23 Dec 2023	1040.80	17.77	84.43	21.00	7.21
22 Dec 2023	1040.80	17.67	83.98	20.89	7.24
21 Dec 2023	1040.80	17.78	85.21	21.21	7.26
20 Dec 2023	1040.80	17.74	84.65	21.07	7.20
19 Dec 2023	1040.80	-58092.53	-58064.59	-58091.17	-58096.92
18 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
17 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
16 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
15 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
14 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
12 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
11 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
10 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
09 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
08 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
07 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
06 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
05 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
04 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
03 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
02 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
01 Dec 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
30 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
29 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
28 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
27 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
26 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
25 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
24 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
23 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
22 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
21 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
20 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
19 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
18 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
17 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
16 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
15 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
14 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
13 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
12 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
11 Nov 2023	1040.80	-97699.60	-97695.65	-97699.05	-97700.00
10 Nov 2023	1040.80	26.31	193.67	48.32	7.20
09 Nov 2023	1040.80	26.32	191.57	47.79	7.15
08 Nov 2023	1040.80	26.37	192.90	48.12	7.26
07 Nov 2023	1040.80	26.12	193.07	48.17	7.22
06 Nov 2023	1040.80	26.34	193.84	48.36	7.32
05 Nov 2023	1040.80	26.16	192.75	48.08	7.20
04 Nov 2023	1040.80	-44040.61	-43947.88	-44028.65	-44051.44
03 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
02 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
01 Nov 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
31 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
30 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00

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Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
29 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
28 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
27 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
26 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
25 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
24 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
23 Oct 2023	1040.80	-99999.00	-99999.00	-99999.00	-99999.00
22 Oct 2023	1040.80	-71506.99	-71458.49	-71500.48	-71512.34
21 Oct 2023	1040.80	26.30	194.20	48.45	7.17
20 Oct 2023	1040.80	26.24	194.82	48.60	7.27
19 Oct 2023	1040.80	26.34	190.04	47.40	7.16
18 Oct 2023	1040.80	26.28	176.83	44.11	7.16
17 Oct 2023	1040.80	26.10	189.22	47.20	7.17
16 Oct 2023	1040.80	25.74	187.32	46.73	7.23
15 Oct 2023	1040.80	25.15	172.42	43.01	7.14
14 Oct 2023	1040.80	23.33	132.84	33.12	7.22
13 Oct 2023	1040.80	25.38	158.62	39.55	7.32
12 Oct 2023	1040.80	20.54	110.01	27.40	7.18
11 Oct 2023	1040.80	19.83	101.14	25.19	7.30
10 Oct 2023	1040.80	18.89	93.68	23.32	7.28

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m <sup>3</sup> /hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
09 Oct 2023	1040.80	16.88	80.59	20.06	7.24
08 Oct 2023	1040.80	19.14	92.86	23.11	7.17
07 Oct 2023	1040.80	17.76	85.81	21.35	7.21
06 Oct 2023	1040.80	17.45	83.39	20.75	7.26
05 Oct 2023	1040.80	16.71	79.53	19.78	7.24
04 Oct 2023	1052.78	16.22	77.16	19.19	7.28
03 Oct 2023	726.29	16.39	77.83	19.36	7.23
02 Oct 2023	528.57	16.95	81.04	20.17	7.23
01 Oct 2023	919.91	16.42	77.95	19.40	7.18
30 Sep 2023	1164.61	18.15	86.30	21.46	7.22
29 Sep 2023	1129.81	18.91	89.74	22.34	7.19
28 Sep 2023	1151.54	20.96	107.04	26.66	7.19
27 Sep 2023	1176.50	17.48	84.70	21.08	7.29
26 Sep 2023	967.11	19.39	92.14	22.94	7.21
25 Sep 2023	657.10	24.08	137.23	34.21	7.26
24 Sep 2023	842.98	25.53	150.58	37.55	7.17
23 Sep 2023	1191.54	23.21	123.23	30.71	7.18
22 Sep 2023	1209.78	18.71	89.61	22.30	7.25
21 Sep 2023	1159.66	17.93	85.27	21.22	7.14
20 Sep 2023	1092.01	18.21	86.83	21.61	7.20

Date & time (DD MMM, HH:mm - DD MMM YYYY, HH:mm)	Flow (m3/hr)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	PH (ph)
19 Sep 2023	1002.81	23.16	137.49	34.27	7.20
18 Sep 2023	723.62	25.63	143.45	35.76	7.19
17 Sep 2023	933.65	25.38	148.50	37.02	7.23
16 Sep 2023	1075.24	21.43	102.57	25.54	7.27
15 Sep 2023	1053.09	19.19	93.71	23.33	7.26
14 Sep 2023	1102.10	21.96	126.10	31.43	7.25
13 Sep 2023	1139.31	26.41	175.43	43.75	7.20
12 Sep 2023	1029.91	26.02	141.95	35.38	7.38
11 Sep 2023	786.53	26.16	151.60	37.80	7.26
10 Sep 2023	685.11	25.45	140.67	35.07	7.18
09 Sep 2023	1149.29	-572.49	-499.59	-588.78	-504.53
08 Sep 2023	1139.17	19.89	106.33	26.49	7.21
07 Sep 2023	1103.62	17.43	83.02	20.65	7.27
06 Sep 2023	1087.51	21.66	106.03	26.40	7.17
05 Sep 2023	955.79	23.41	119.49	29.77	7.23
04 Sep 2023	791.22	23.24	118.72	29.58	7.15
03 Sep 2023	1017.71	20.86	99.87	24.87	7.20
02 Sep 2023	1131.72	22.19	106.57	26.54	7.25

*Amie*

**TRUE COPY  
ADVOCATE**

**ANNEXURE R - 4/13**

**CALIBRATION REPORT**

Date of Calibration: 26-03-2024

Calibration Due Date: 25-03-2025

<b>CUSTOMER:</b>	<b>Instrument Details:</b>	
M/s PUNJAB DYERS ASSOCIATION (FOCAL POINT MODULE)	Parameters	Range
8.65 Acre land, Tajpur Road, Jamalpur Awana, Ludhiana, Punjab-141008	pH	0-14 pH
	COD	0-1000 mg/l
	BOD	0-500 mg/l
	TSS	0-1000 mg/l

Instrument Name	Online Water Monitoring Analyzer
Instrument Make	Eram Solutions
Instrument Model No.	EE-WA404A
Instrument Sr. No.	2201007100557

**Environmental Condition**

Temperature (°C)	25±3	Humidity (%RH)	35-70
------------------	------	----------------	-------

<b>pH</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	7.25
2.	26-03-24	11:00	7.29
3.	26-03-24	12:00	7.31

<b>COD</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	192.39
2.	26-03-24	11:00	192.50
3.	26-03-24	12:00	192.25

<b>BOD</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	26.90
2.	26-03-24	11:00	26.86
3.	26-03-24	12:00	27.00

<b>TSS</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	48.00
2.	26-03-24	11:00	48.10
3.	26-03-24	12:00	46.00

TESTED BY



CHECKED BY

**CALIBRATION REPORT**

Date of Calibration: 26-03-2024

Calibration Due Date: 25-03-2025

<b>CUSTOMER:</b>	<b>Instrument Details:</b>	
M/s PUNJAB DYERS ASSOCIATION (FOCAL POINT MODULE)	Parameters	Range
8.65 Acre land, Tajpur Road, Jamalpur Awana, Ludhiana, Punjab-141008	pH	0-14 pH
	COD	0-1000 mg/l
	BOD	0-500 mg/l
	TSS	0-1000 mg/l

Instrument Name	Online Water Monitoring Analyzer
Instrument Make	Eram Solutions
Instrument Model No.	EE-WA404A
Instrument Sr. No.	2202007100680

**Environmental Condition**

Temperature (°C)	25±3	Humidity (%RH)	35-70
------------------	------	----------------	-------

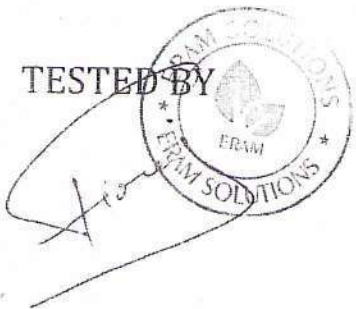
<b>pH</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	8.50
2.	26-03-24	11:00	8.41
3.	26-03-24	12:00	8.50

<b>COD</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	573.16
2.	26-03-24	11:00	557.84
3.	26-03-24	12:00	539.44

<b>BOD</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	121.66
2.	26-03-24	11:00	118.24
3.	26-03-24	12:00	114.40

<b>TSS</b>			
Sr. No.	Date	Time	Value
1.	26-03-24	10:00	143.23
2.	26-03-24	11:00	139.46
3.	26-03-24	12:00	134.70

TESTED BY



CHECKED BY

# EFFLUENT ANALYSIS REPORT CARRIED BY PPCB

ANNEXURE - R4/14 273

SR NO.	PARAMETERS	01-01-2024	25-02-2024	21-03-2024	03-04-2024	05-04-2024	02-05-2024	06-06-2024	01-07-2024	02-08-2024	03-09-2024	PBTI REPORT 16.9.24	Standard
		OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	MoEF& CC
1	BOD	17	22	27	22	20	28	27	14	26	27	13	30
2	COD	120	140	152	148	136	148	139	76	142	156	140	250
3	PH	8.1	8.2	8.2	8	8	8.2	8.2	8	8.26	7.2	7.85	6-9
4	TSS	12	85	39	20	49	34	59	50	43	33	28	100
5	TDS	2409	4636	5688	3341	3993	3639	3984	2923	4074	3280	4322	2100
6	OIL & GREASE	8	4.8	7.2	6.2	6.6	5.8	5.4	5.6	6.2	7.9	1.9	10
7	PHENOLIC COMPOUND	BDL	BDL	0.8	1.5	BDL	1	BDL	BDL	1.1	BDL	BDL	1
8	SULPHATE	280	376	459	110	288	308	379	180	292	208	468	1000
9	AMMONICAL NITROGEN	2.5	5.4	BDL	3.4	2.8	2.8	1.2	BDL	1.6	7	BDL	50
10	TOTAL CHROMIUM	BDL	BDL	0.14	0.15	BDL	BDL	BDL	BDL	BDL	BDL		

*Ahmed*

TRUE COPY  
ADVOCATE

437



# Punjab Biotechnology Incubator

Department of Science, Technology & Environment.  
Govt. of Punjab

Notified State Analytical Agency

ANNEXURE R - 4/15

FSSAI Empanelled | EIC Approved | APEDA Approved | Notified State Water Lab - GoP | Notified Under EPA - GoI



No.PBTIENV/171024/000697

Dated :

## TEST REPORT

Sample Registration No. : PBTI/ENV/171024/000697  
Sample code given by customer : Site- Untreated Water from Collection tank

### Issued to:

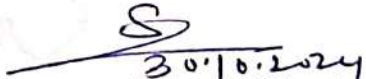
M/s Punjab Dyers Association (40 MLD CETP)  
SCF-36, First Floor, Commercial Site, Phase --5,  
Focal Point, 141010  
Ludhiana  
Punjab

### SAMPLE PARTICULARS

Your Ref. No. : Email dt. 09/10/2024  
Date & Time of Sample Collection : 17/10/2024 at 2:11pm  
Date & Time of Sample Receipt in Lab : 17/10/2024 at 5:30pm  
Sample Identification No. : PBTI/171024/31, dt. 17/10/2024  
Site of Sample Collection : 40 MLD CETP Ludhiana.  
Name/Nature of sample : Untreated Effluent  
Type of Sample : Grab  
Point of Sample Collection : Inlet  
Condition of the sample on Receipt : Intact coded sample under refrigerated & preserved condition  
Qty/Pkg. : 6L approx in plastic cans & glass bottles  
Sampling Method : Sample drawn by PBTI (Mr.Arinder Singh) as per APHA guidelines  
Test Start Date : 17/10/2024  
Test Completion Date : 30/10/2024

Report for Self Monitoring of the  
Industry on Request basis

PBTI, Mohali

  
30/10/2024  
Authorized Signatory

Punjab Biotechnology Incubator Lab  
Employee Code : Employee Code: 12

### Note:

1. The above results pertain only to the sample tested
2. There is no addition, deviation or exclusion from the method mentioned
3. The report shall not be used for advertising or any legal purpose without written permission from the Chief Executive Officer, Punjab Biotechnology Incubator
4. This report cannot be re-produced, except when in full, without the written permission from the Chief Executive Officer, Punjab Biotechnology Incubator.
5. Perishable samples will be destroyed after testing, others after one month from the date of issue of the report, unless otherwise agreed with the customer or as required by the applicable regulations

Format No : PBTI/F/7.8/04  
Issue No & Date : 02 & 03.10.23

Page No. 1/2



Dated :

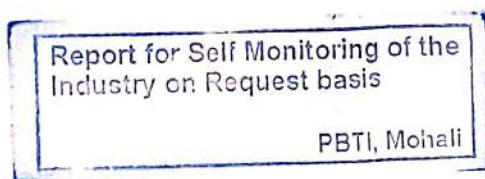
Sample Registration No. : PBTI/ENV/171024/000697  
 Sample code given by customer : Site- Untreated Water from Collection tank

### Test Results

S.No.	Parameter	Results	Units	Test Method
1	pH	7.65		IS 3025 (Part 11) 2022
2	Total Suspended Solids (TSS)	108	mg/l	IS 3025 (Part 17) 2022
3	Total Dissolved Solids (TDS)	4950	mg/l	IS 3025 (Part 16) :2023
4	Biochemical Oxygen Demand (BOD3 at 27oC)	636	mg/l	IS 3025 (Part 44) : 2023
5	Chemical Oxygen Demand (COD) Total	965	mg/l	IS 3025 (Part 58) 2023
6	Oil & Grease	9.1	mg/l	IS 3025 (Part 39) (A) 2021

  
 30.10.2024  
 Authorized Signatory

Punjab Biotechnology Incubator Lab  
 Employee Code : Employee Code: 12





# Punjab Biotechnology Incubator

Department of Science, Technology & Environment,  
Govt. of Punjab  
Notified State Analytical Agency

FSSAI Empanelled | EIC Approved | APEDA Approved | Notified State Water Lab - GoP | Notified Under EPA - GoI

No.PBTI/ENV/171024/000698

Dated :

## TEST REPORT

Sample Registration No. : PBTI/ENV/171024/000698  
Sample code given by customer : Site- Treated Water from Final Outlet

### Issued to:

M/s Punjab Dyers Association (40 MLD CETP)  
SCF-36, First Floor, Commercial Site, Phase --5,  
Focal Point, 141010  
Ludhiana  
Punjab

### SAMPLE PARTICULARS

Your Ref. No. : Email dt. 09/10/2024  
Date & Time of Sample Collection : 17/10/2024 at 2:30pm  
Date & Time of Sample Receipt in Lab : 17/10/2024 at 5:30pm  
Sample Identification No. : PBTI/171024/32, dt. 17/10/2024  
Site of Sample Collection : 40 MLD CETP Ludhiana.  
Name/Nature of sample : Treated Effluent  
Type of Sample : Grab  
Point of Sample Collection : Outlet  
Condition of the sample on Receipt : Intact coded sample under refrigerated & preserved condition  
Qty/Pkg. : 11L approx in plastic cans & glass bottles  
Sampling Method : Sample drawn by PBTI (Mr.Arvinnder Singh) as per APHA guidelines  
Test Start Date : 17/10/2024  
Test Completion Date : 30/10/2024

Report for Self Monitoring of the  
Industry on Request basis

PBTi, Mohali

30.10.2024  
Authorized Signatory

Punjab Biotechnology Incubator Lab  
Employee Code : Employee Code: 12

### Note:

1. The above results pertain only to the sample tested.
2. There is no addition, deviation or exclusion from the method mentioned.
3. The report shall not be used for advertising or any legal purpose without written permission from the Chief Executive Officer, Punjab Biotechnology Incubator.
4. This report cannot be re-produced, except when in full, without the written permission from the Chief Executive Officer, Punjab Biotechnology Incubator.
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Format No : PBTI/F/7.8/04  
Issue No & Date : 02 & 03.10.23

Page No. 1/2

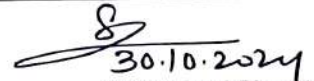


Dated :

Sample Registration No. : PBTI/ENV/171024/000698  
 Sample code given by customer : Site- Treated Water from Final Outlet

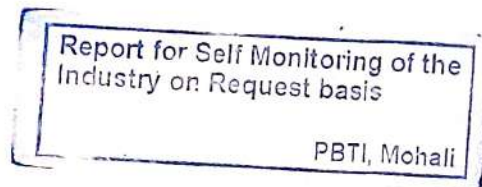
### Test Results

S.No.	Parameter	Results	Units	Test Method
1	pH	7.72		IS 3025 (Part 11) 2022
2	Total Suspended Solids (TSS)	18.9	mg/l	IS 3025 (Part 17) 2022
3	Total Dissolved Solids (TDS)	4412	mg/l	IS 3025 (Part 16) :2023
4	Biochemical Oxygen Demand (BOD <sub>3</sub> at 27oC)	9.2	mg/l	IS 3025 (Part 44) : 2023
5	Chemical Oxygen Demand (COD) Total	95	mg/l	IS 3025 (Part 58) 2023
6	Oil & Grease	1.7	mg/l	IS 3025 (Part 39) (A) 2021
7	Total Fixed Dissolved Solids	4267	mg/l	IS 3025 (Part 18)
8	Bio Assay	100% survival in 100% effluent after 96hr of test		IS 6582 (Part 2) : 2001

  
30.10.2024

Authorized Signatory

Punjab Biotechnology Incubator Lab  
 Employee Code : Employee Code: 12





# 442 Punjab Biotechnology Incubator

Department of Science, Technology & Environment,  
Govt. of Punjab



An NABL Accredited State Analytical Agency

FSSAI Empanelled | EIC Approved | APEDA Approved | Notified State Water Lab - GoP | Notified Under EPA - Gol



No.PBTI/ENV/081124/000806 / 1001

Dated : 16/11/24

ULR : TC127622400002028F

## TEST REPORT

Sample Registration No. : PBTI/ENV/081124/000806  
Sample code given by customer : Site- Inlet Tank Area

Issued to:  
M/s Punjab Dyers Association (40 MLD CETP)  
SCF-36, First Floor, Commercial Site, Phase --5,  
Focal Point, 141010  
Ludhiana  
Punjab

### SAMPLE PARTICULARS

Your Ref. No. : Email dt. 07/11/2024  
Date & Time of Sample Collection : 08/11/2024 at 1:05pm  
Date & Time of Sample Receipt in Lab : 08/11/2024 at 3:50pm  
Sample Identification No. : PBTI/081124/01, dt. 08/11/2024  
Site of Sample Collection : 40 MLD CETP, Ludhiana  
Name/Nature of sample : Untreated Effluent  
Type of Sample : Grab  
Point of Sample Collection : Inlet  
Condition of the sample on Receipt : Intact coded sample under refrigerated & preserved condition  
Qty/Pkg. : 3.5L approx in plastic can & glass bottles  
Sampling Method : Sample drawn by PBTI (Mr.Deerghayu) as per APHA guidelines  
Test Start Date : 08/11/2024  
Test Completion Date : 16/11/2024

Report for Self Monitoring of the  
Industry on Request basis  
PBTI, Mohali

*[Signature]*  
16/11/2024

Authorized Signatory  
Punjab Biotechnology Incubator Lab  
Employee Code : Employee Code: 16

- Note:
1. The above results pertain only to the sample tested.
  2. There is no addition, deviation or exclusion from the method mentioned.
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Format No : PBTI/F/7.8/04  
Issue No & Date : 02 & 03.10.23

Page No. 1/2



Dated :

ULR : TC127622400002028F

Sample Registration No.

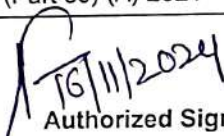
: PBTI/ENV/081124/000806

Sample code given by customer

: Site- Inlet Tank Area

## Test Results

S.No.	Parameter	Results	Units	Test Method
1	pH	7.45		IS 3025 (Part 11) 2022
2	Total Suspended Solids (TSS)	165	mg/l	IS 3025 (Part 17) 2022
3	Total Dissolved Solids (TDS)	5062	mg/l	IS 3025 (Part 16) :2023
4	Biochemical Oxygen Demand (BOD3 at 27oC)	351	mg/l	IS 3025 (Part 44) : 2023
5	Chemical Oxygen Demand (COD) Total	1160	mg/l	IS 3025 (Part 58) 2023
6	Oil & Grease	2.1	mg/l	IS 3025 (Part 39) (A) 2021


 16/11/2024  
 Authorized Signatory

 Punjab Biotechnology Incubator Lab  
 Employee Code : Employee Code: 16

 Report for Self Monitoring of the  
 industry on Request basis

  
 PBTI, Mohali



# 444 Punjab Biotechnology Incubator

Department of Science, Technology & Environment,  
Govt. of Punjab



An NABL Accredited State Analytical Agency

TC-12762

FSSAI Empanelled | EIC Approved | APEDA Approved | Notified State Water Lab - GoP | Notified Under EPA - GoI



No.PBTIENV/081124/000807/1002

Dated : 16/11/24

## TEST REPORT

ULR : TC127622400002029F

Sample Registration No.

: PBTI/ENV/081124/000807

Sample code given by customer

: Site- CCT Area Final Outlet

### Issued to:

M/s Punjab Dyers Association (40 MLD CETP)  
SCF-36, First Floor, Commercial Site, Phase --5,  
Focal Point, 141010  
Ludhiana  
Punjab

### SAMPLE PARTICULARS

Your Ref. No.	:	Email dt. 07/11/2024
Date & Time of Sample Collection	:	08/11/2024 at 12:40pm
Date & Time of Sample Receipt in Lab	:	08/11/2024 at 3:50pm
Sample Identification No.	:	PBTI/081124/02, dt. 08/11/2024
Site of Sample Collection	:	40 MLD CETP, Ludhiana
Name/Nature of sample	:	Treated Effluent
Type of Sample	:	Grab
Point of Sample Collection	:	Outlet
Condition of the sample on Receipt	:	Intact coded sample under refrigerated & preserved condition
Qty/Pkg.	:	10L 500ml approx in plastic cans & glass bottles
Sampling Method	:	Sample drawn by PBTI (Mr.Deerghayu) as per APHA guidelines
Test Start Date	:	08/11/2024
Test Completion Date	:	16/11/2024

Report for Self Monitoring of the  
Industry on Request basis

PBTI, Mohali

16/11/2024

Authorized Signatory

Punjab Biotechnology Incubator Lab  
Employee Code : Employee Code: 16

- Note:
1. The above results pertain only to the sample tested.
  2. There is no addition, deviation or exclusion from the method mentioned.
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Format No : PBTI/F/7.8/04  
Issue No & Date : 02 & 03.10.23

Page No. 1/2

National Referral Lab for LMO/GMO Detection under Seeds Act | Approved NRL by FSSAI | Referral Lab under FSSA 2006

Knowledge City, Sector-81, SAS Nagar (Mohali) Punjab - 140 306, India

Phone : +91-172-2998601, 2998602, 2998603

Website : www.pbttilabs.com ☒ /pbti\_dst



Dated :

ULR : TC127622400002029F

Sample Registration No.

: PBTI/ENV/081124/000807

Sample code given by customer

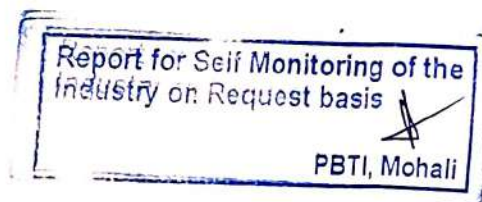
: Site- CCT Area Final Outlet

## Test Results

S.No.	Parameter	Results	Units	Test Method
1	pH	7.86		IS 3025 (Part 11) 2022
2	Total Suspended Solids (TSS)	32	mg/l	IS 3025 (Part 17) 2022
3	Total Dissolved Solids (TDS)	4335	mg/l	IS 3025 (Part 16) :2023
4	Biochemical Oxygen Demand (BOD3 at 27oC)	11	mg/l	IS 3025 (Part 44) : 2023
5	Chemical Oxygen Demand (COD) Total	98	mg/l	IS 3025 (Part 58) 2023
6	Oil & Grease	1.2	mg/l	IS 3025 (Part 39) (A) 2021
7	Total Fixed Dissolved Solids	4194	mg/l	IS 3025 (Part 18)
8	Bio Assay	100% survival in 100% effluent after 96hr of test		IS 6582 (Part 2) : 2001

16/11/2024  
 Authorized Signatory

Punjab Biotechnology Incubator Lab  
 Employee Code : Employee Code: 16



# Punjab Biotechnology Incubator

Department of Science, Technology & Environment,  
Govt. of Punjab

An NABL Accredited State Analytical Agency



TC-12762

FSSAI Empanelled | EIC Approved | APEDA Approved | Notified State Water Lab - GoP | Notified Under EPA - GoI

No.PBTI/ENV/221124/000965

Dated :

ULR : TC127622400002235F

## TEST REPORT

Sample Registration No. : PBTI/ENV/221124/000965  
Sample code given by customer : Site- CETP Inlet Area

### Issued to:

M/s Punjab Dyers Association (40 MLD CETP)  
SCF-36, First Floor, Commercial Site, Phase --5,  
Focal Point, 141010  
Ludhiana  
Punjab

### SAMPLE PARTICULARS

Your Ref. No. : Email dt. 12/11/2024  
Date & Time of Sample Collection : 22/11/2024 at 12:35pm  
Date & Time of Sample Receipt in Lab : 22/11/2024 at 5:20pm  
Sample Identification No. : PBTI/221124/03, dt. 22/11/2024  
Site of Sample Collection : 40 MLD CETP Ludhiana  
Name/Nature of sample : Untreated Effluent  
Type of Sample : Grab  
Point of Sample Collection : Inlet  
Condition of the sample on Receipt : Intact coded sample under refrigerated & preserved condition  
Qty/Pkg. : 3.5L approx in plastic cans & glass bottles  
Sampling Method : Sample drawn by PBTI (Mr.Deerghayu) as per APHA guidelines  
Test Start Date : 22/11/2024  
Test Completion Date : 29/11/2024

Report for Self Monitoring of the  
Industry on Request basis  
PBTI, Mohali

29/11/2024  
Authorized Signatory

Punjab Biotechnology Incubator Lab  
Employee Code : Employee Code: 16

### Note:

1. The above results pertain only to the sample tested.
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Format No : PBTI/F/7.8/04  
Issue No & Date : 02 & 03.10.23

Page No. 1/2



Dated :

ULR : TC127622400002235F

Sample Registration No. : PBTI/ENV/221124/000965

Sample code given by customer : Site- CETP Inlet Area

## Test Results

S.No.	Parameter	Results	Units	Test Method
1	pH	8.48		IS 3025 (Part 11) 2022
2	Total Suspended Solids (TSS)	105	mg/l	IS 3025 (Part 17) 2022
3	Total Dissolved Solids (TDS)	5248	mg/l	IS 3025 (Part 16) :2023
4	Biochemical Oxygen Demand (BOD <sub>3</sub> at 27°C)	346	mg/l	IS 3025 (Part 44) : 2023
5	Chemical Oxygen Demand (COD) Total	910	mg/l	IS 3025 (Part 58) 2023
6	Oil & Grease	2.8	mg/l	IS 3025 (Part 39) (A) 2021

29/11/2024

Authorized Signatory  
Punjab Biotechnology Incubator Lab  
Employee Code : Employee Code: 16

Report for Self Monitoring of the  
Industry on Request basis

PBTI, Mohali



# Punjab Biotechnology Incubator

Department of Science, Technology & Environment,  
Govt. of Punjab

An NABL Accredited State Analytical Agency



FSSAI Empanelled | EIC Approved | APEDA Approved | Notified State Water Lab - GoP | Notified Under EPA - GoI



No.PBTI/ENV/221124/000966

Dated :

ULR : TC127622400002236F

## TEST REPORT

Sample Registration No. : PBTI/ENV/221124/000966  
Sample code given by customer : Site- CETP CCT Tank Area

Issued to:	
M/s Punjab Dyers Association (40 MLD CETP) SCF-36, First Floor, Commercial Site, Phase --5, Focal Point, 141010 Ludhiana Punjab	
<b>SAMPLE PARTICULARS</b>	
Your Ref. No.	: Email dt. 12/11/2024
Date & Time of Sample Collection	: 22/11/2024 at 12:15pm
Date & Time of Sample Receipt in Lab	: 22/11/2024 at 5:20pm
Sample Identification No.	: PBTI/221124/02, dt. 22/11/2024
Site of Sample Collection	: 40 MLD CETP Ludhiana
Name/Nature of sample	: <b>Treated Effluent</b>
Type of Sample	: Grab
Point of Sample Collection	: Outlet
Condition of the sample on Receipt	: Intact coded sample under refrigerated & preserved condition
Qty/Pkg.	: 8.5L approx in plastic cans & glass bottles
Sampling Method	: Sample drawn by PBTI (Mr.Deerghayu) as per APHA guidelines
Test Start Date	: 22/11/2024
Test Completion Date	: 29/11/2024



29/11/2024

Authorized Signatory

Punjab Biotechnology Incubator Lab  
Employee Code : Employee Code: 16

**Note:**

1. The above results pertain only to the sample tested.
2. There is no addition, deviation or exclusion from the method mentioned.
3. The report shall not be used for advertising or any legal purpose without written permission from the Chief Executive Officer, Punjab Biotechnology Incubator.
4. This report cannot be re-produced, except when in full, without the written permission from the Chief Executive Officer, Punjab Biotechnology Incubator.
5. Perishable samples will be destroyed after testing, others after one month from the date of issue of the report, unless otherwise agreed with the customer or as required by the applicable regulations.

Format No : PBTI/F/7.8/04  
Issue No & Date : 02 & 03.10.23

Page No. 1/2



Dated :

ULR : TC127622400002236F

Sample Registration No. : PBTI/ENV/221124/000966

Sample code given by customer : Site- CETP CCT Tank Area

## Test Results

S.No.	Parameter	Results	Units	Test Method
1	pH	7.93		IS 3025 (Part 11) 2022
2	Total Suspended Solids (TSS)	20	mg/l	IS 3025 (Part 17) 2022
3	Total Dissolved Solids (TDS)	4434	mg/l	IS 3025 (Part 16) :2023
4	Biochemical Oxygen Demand (BOD <sub>3</sub> at 27°C)	18	mg/l	IS 3025 (Part 44) : 2023
5	Chemical Oxygen Demand (COD) Total	125	mg/l	IS 3025 (Part 58) 2023
6	Oil & Grease	2.1	mg/l	IS 3025 (Part 39) (A) 2021
7	Total Fixed Dissolved Solids	4279	mg/l	IS 3025 (Part 18)
8	Bio Assay	90% survival in 100% effluent after 96hr of test		IS 6582 (Part 2) : 2001

129/11/2024  
 Authorized Signatory

Punjab Biotechnology Incubator Lab  
 Employee Code : Employee Code: 16

Report for Self Monitoring of the  
 Industry on Request basis

PBTI, Mohali



**Government of Punjab**  
**Department of Science, Technology & Environment**  
**(STE Branch)**

**ANNEXURE R - 4/16**

No. STE-STEB010/534/2024-STE4-Part(1) | ORDER  
783

Dated, Chandigarh: 13.11.2024

1. This refers to the decisions taken in the review meeting related to Buddha Nallah rejuvenation Project of Ludhiana held on 07.10.2024 under the chairmanship of Secretary to Government of India, D/o Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, New Delhi. Minutes of the meeting were received from the Ministry by OM no. J-24018/1/2022-NRCD-II dated 21 October, 2024.
2. During the meeting, in order to address the challenges of pollution in Buddha Nallah, it was desired to constitute a Group comprising representatives of the Central Government, all line departments of the State Govt. of Punjab with Punjab Pollution Control Board (PPCB) to be the nodal agency / secretariat. The Group would be required to diagnose the issues concerning persisting pollution in Buddha Nallah, evaluation of existing pollution abatement infrastructure to ensure optimization and suggest corrective actions in order of priority. The Group shall complete the task and submit its report in a time period of one month.
3. In pursuance of the decisions, the Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India vide letter dated 24.10.2024 addressed to the Secretary to Government of Punjab, Department of Science, Technology and Environmental has informed that following members have been nominated as representatives of the concerned departments of the Central Government:

Sr No.	Organization	Nominee/Representative
1.	National Mission for Clean Ganga (NMCG)	ED (Technical) or the officer not below the rank of Director
2.	Central Pollution Control Board (CPCB)	Member Secretary or the officer not below the rank of Scientist F / Director
3.	National River Conservation Directorate (NRCD)	Scientist F
4.	National Institute of Hydrology (NIH), Roorkee	Officer not below the rank of Scientist F / Director

4. Accordingly, in compliance of the above, following are being nominated on behalf of the Government of Punjab for the purpose of above-mentioned group:

Sr No.	Organization	Nominee/Representative
1.	Department of Science, Technology & Environment	Mr. Manish Kumar, IFS Director Environment and Climate Change, - <b>Chairman</b>
2.	Punjab Pollution Control Board (PPCB)	Mr. G.S. Majithia, Member Secretary, PPCB as <b>Member Convener</b>
3.	Department of Local Government	
	Punjab Water Supply and Sewerage Board (PWSSB)	Mr. Mukesh Garg, Chief Engineer
	Municipal Corporation, Ludhiana	Sh Paramjit Khaira, Additional Commissioner, Municipal Corporation, Ludhiana
4.	Department of Industries & Commerce	General Manager, District Industries Centre, Ludhiana
5.	Department of Water Resources	Chief Engineer

Sr No.	Organization	Nominee/Representative
6.	Department of Soil & Water Conservation	Chief Engineer
7.	Department of Water Supply and Sanitation	Chief Engineer
8.	Punjab Energy Development Authority (PEDA)	Director PEDA
9.	District Administration, Ludhiana	ADC (Development)
10.	Industrial Association / Representatives	To be nominated in due course of meeting by the Department of Industries
11.	Expert members	To be nominated in due course of meeting by the committee

5. The committee can co-opt any other members, if they deem fit during the course of their deliberations.

6. This is issued with the approval of Chief Secretary, Punjab.

Dated: 13.11.2024

Chandigarh

Priyank Bharti, IAS


Secretary to Government of Punjab

Department of Science, Technology & Environment

Endst. No. STE-STEB010/534/2024-STE4-Part(1) / 784

Chandigarh, dated the 13.11.2024

A copy of the above is forwarded to the Secretary to Government of India, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti for information and necessary action.

  
Krishan Gopal

Superintendent, Grade-1

Endst. No. STE-STEB010/534/2024-STE4-Part(1) / 785-798

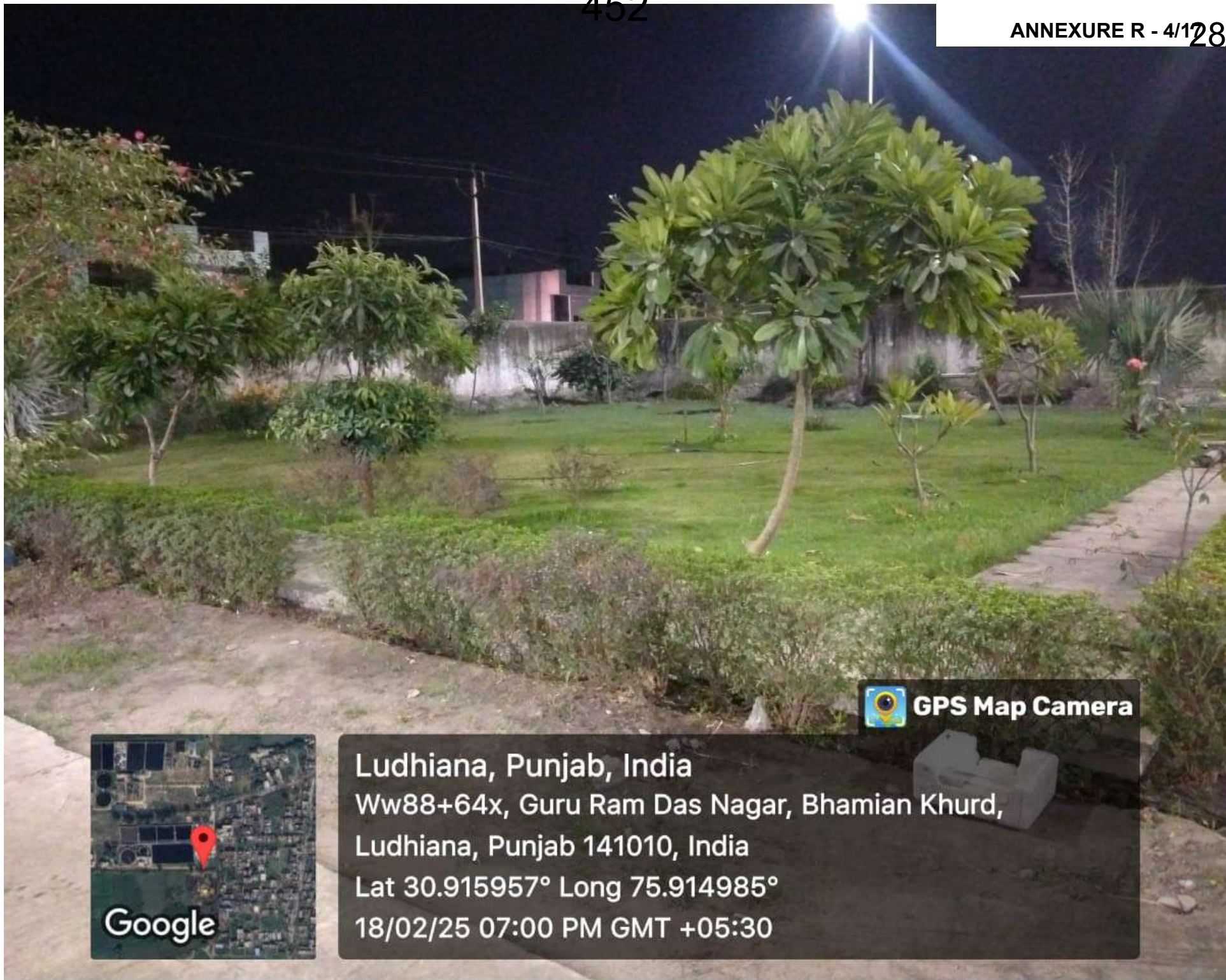
Chandigarh, dated the 13.11.2024


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

1. The Chief Secretary to Government of Punjab.
2. The Addl. Chief Secretary, Department of Local Government, Punjab
3. The Addl. Chief Secretary, Department of Industries & Commerce, Punjab
4. The Principal Secretary, Department of Water Resources, Punjab
5. The Administrative Secretary, Department of Rural Development and Panchayats, Punjab
6. The Administrative Secretary, Department of Soil & Water Conservation, Punjab
7. The Administrative Secretary, Department of Water Supply and Sanitation, Punjab
8. The Director, Directorate of Environment and Climate Change, Punjab
9. Chairman, Punjab Pollution Control Board, Patiala
10. The CEO, Punjab Water Supply and Sewerage Board (PWSSB)
11. The CEO, Punjab Energy Development Authority (PEDA), Punjab
12. The Deputy Commissioner, Ludhiana
13. The Commissioner, Municipal Corporation, Ludhiana
14. The Member Secretary, Punjab Pollution Control Board, Patiala

  
Krishan Gopal

Superintendent, Grade-1

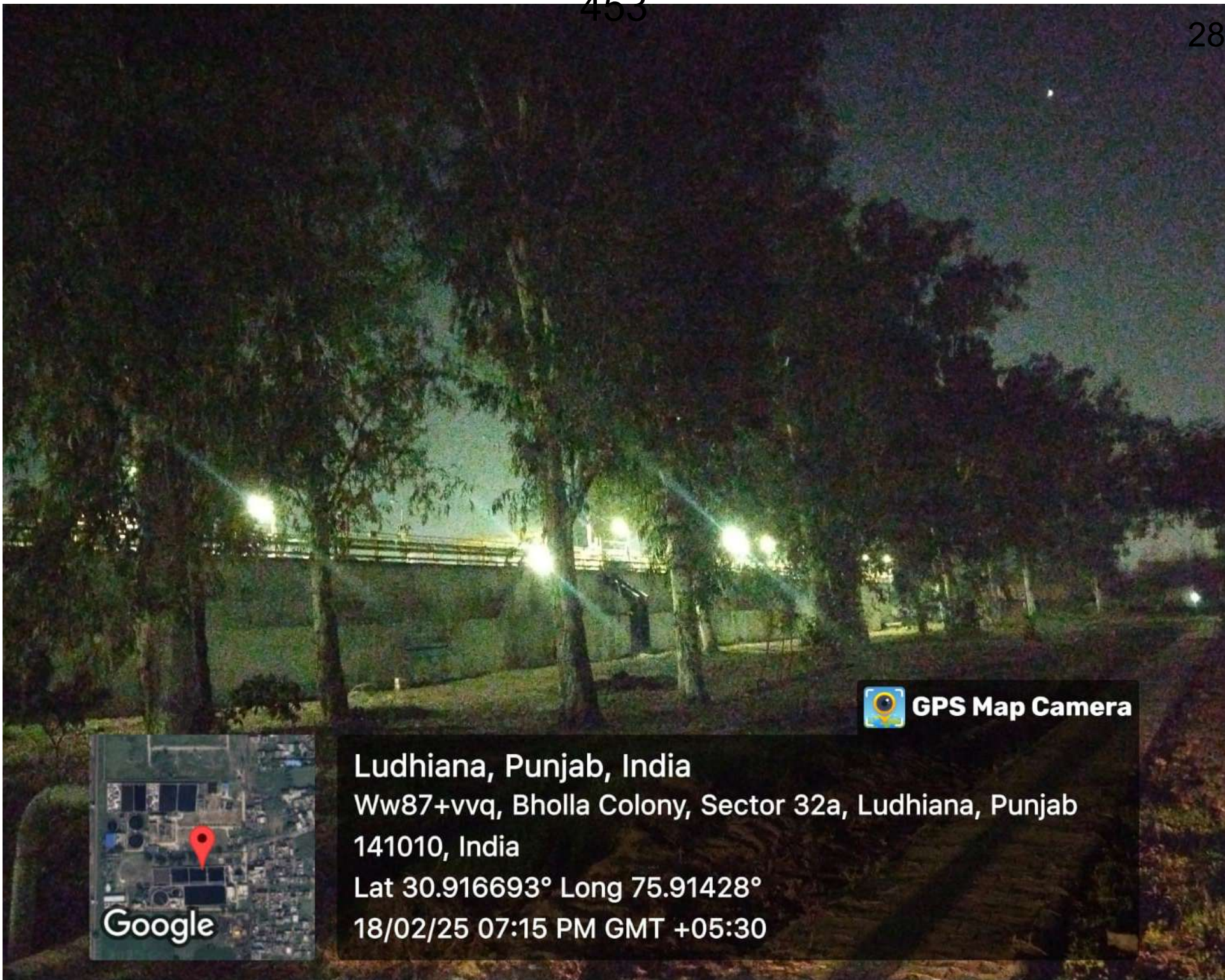



 **GPS Map Camera**



Ludhiana, Punjab, India  
Ww88+64x, Guru Ram Das Nagar, Bhamian Khurd,  
Ludhiana, Punjab 141010, India  
Lat 30.915957° Long 75.914985°  
18/02/25 07:00 PM GMT +05:30

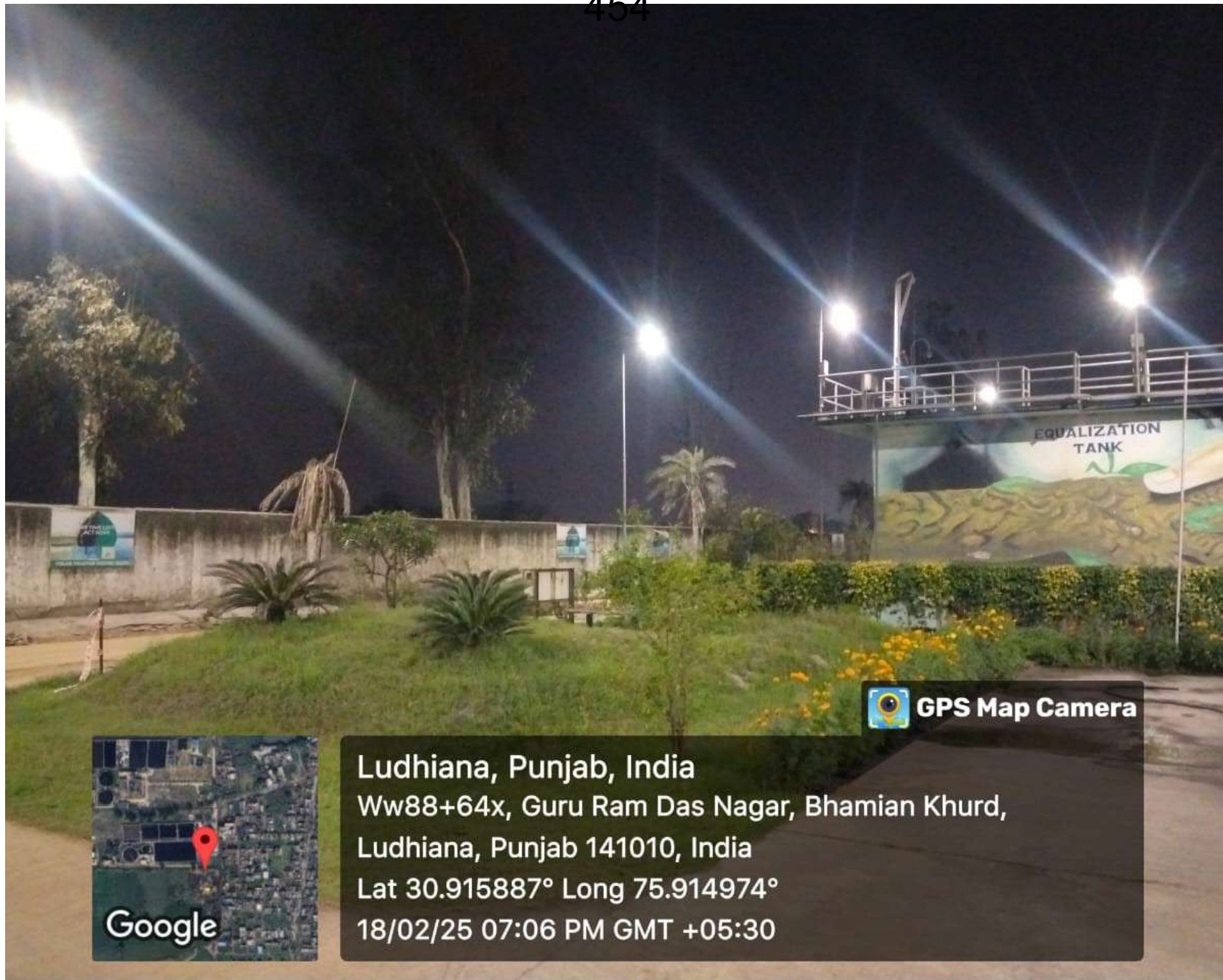


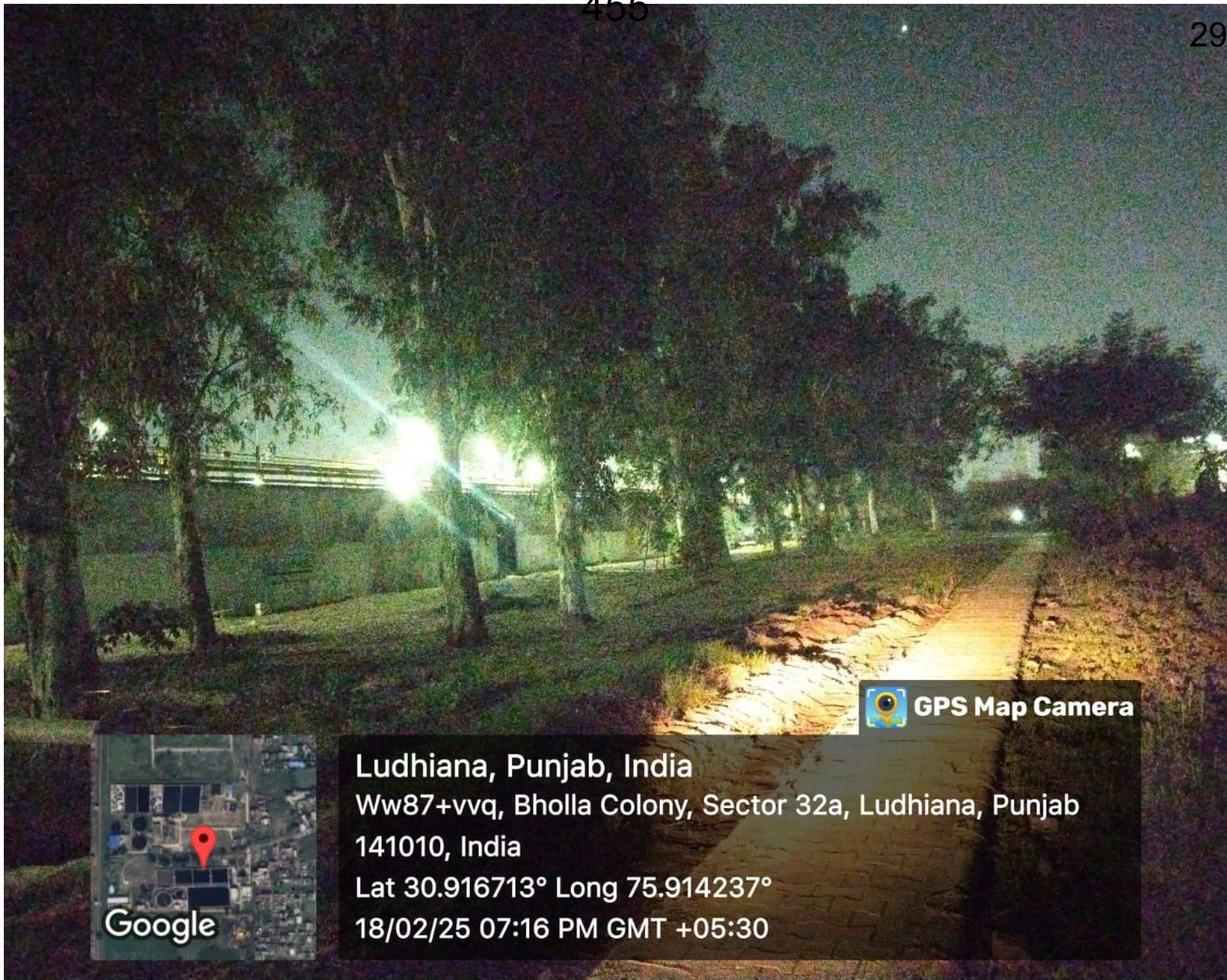


 **GPS Map Camera**



Ludhiana, Punjab, India  
Ww87+vvq, Bholla Colony, Sector 32a, Ludhiana, Punjab  
141010, India  
Lat 30.916693° Long 75.91428°  
18/02/25 07:15 PM GMT +05:30

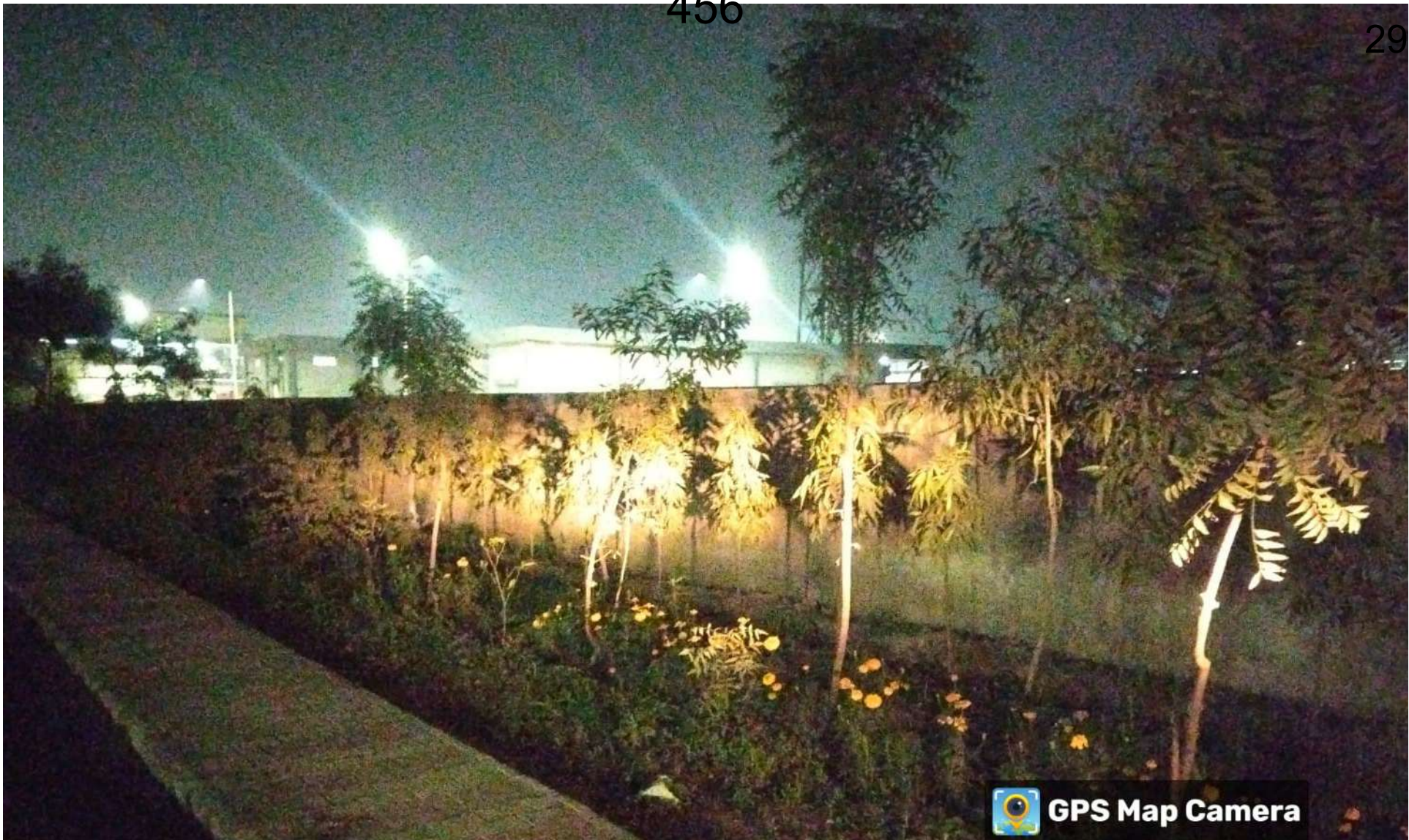





 **GPS Map Camera**



Ludhiana, Punjab, India  
Ww87+vvq, Bholla Colony, Sector 32a, Ludhiana, Punjab  
141010, India  
Lat 30.916713° Long 75.914237°  
18/02/25 07:16 PM GMT +05:30



 **GPS Map Camera**



Ludhiana, Punjab, India  
Ww87+vvq, Bholla Colony, Sector 32a, Ludhiana, Punjab  
141010, India  
Lat 30.916723° Long 75.914331°  
18/02/25 07:14 PM GMT +05:30

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL  
BENCH, NEW DELHI**

OA NO 1326 OF 2024

**IN THE MATTER OF:**

**PUBLIC ACTION COMMITTEE AND ORS**

...APPLICANT

**VERSUS**

**UNION OF INDIA & ORS.**

...RESPONDENTS

KNOW ALL to whom these present shall come that I/We the above named RESPONDENT NO 4 (MR. VISHAL JAIN, DIRECTOR OF PUNJAB DYERS ASSOCIATION) hereby appoint, M/S ARTLO, MR. A.R. TAKKAR AND BELOW MENTIONED ADVOCATES to be the Advocates in the above noted case

To act, appear and plead in the above-noted case in this Court or in any other Court in which the same may be tried or heard and also in the appellate Court including High Court subject to payment of fees separately for each Court by me/ us.

To sign, file verify and present pleadings, appeals cross objections or petitions for execution review, revision, withdrawal, compromise or other petitions or affidavits or other documents as may be deemed necessary or proper for the prosecution of the said case in all its stages.

To file and take back documents to admit and/or deny the documents of opposite party.

To withdraw or compromise the said case or submit to arbitration any differences or disputes that may arise touching or in any manner relating to the said case. To take execution proceedings case.

To appoint and instruct any other Legal Practitioner, authorizing him to exercise the power and authority hereby conferred upon the Advocate whenever he may think it to do so and to sign the Power of Attorney on our behalf.

And I/We the undersigned do hereby agree to ratify and confirm all acts done by the Advocate or his substitute in the matter as my/our own acts, as if done by me/us to all intents and purposes.

And I/We undertake that I / we or my /our duly authorized agent would appear in the Court on all hearings and will inform the Advocates for appearance when the case is called.

And I /we undersigned do hereby agree not to hold the advocate or his substitute responsible for the result of the said case. The adjournment costs whenever ordered by the Court shall be of the Advocate which he shall receive and retain himself

And I /we the undersigned do hereby agree that in the event of the whole or part of the fee agreed by me/us to be paid to the Advocate remaining unpaid he shall be entitled to withdraw from the prosecution of the said case until the same is paid up. The fee settled is only for the above case and above Court. I/We hereby agree that once the fee is paid. I /we will not be entitled for the refund of the same in any case whatsoever. If the case lasts for more than three years, the advocate shall be entitled for additional fee equivalent to half of the agreed fee for every addition three years or part thereof

IN WITNESS WHEREOF I/We do hereunto set my /our hand to these presents the contents of which have been understood by me/us on this 13 day of February, 2025

**Accepted**

(A.R. TAKKAR, SHRIYA TAKKAR, MANAN TAKKAR)

ASMITA DUGGAL, AASTHA TYAGI, PRINCE SHARMA, UDIT SAINI,

*Sruviti*  
*Devika*  
**SMRITI SRIVASTAVA & DEVIKA SINGH ROY CHOWDHURY)**  
**ADVOCATES**  
**M/S ARTLO**  
**# P-6/2-E, DLF PHASE 2,**  
**GURGAON – 122002**  
**9582209633**

For Punjab Dyers Association  
*[Signature]*  
DIRECTOR

PUNJAB DYERS ASSOCIATION  
THROUGH ITS DIRECTOR MR. VISHAL JAIN

---

(No subject)

---

From Aastha Tyagi <aastha@artlo.in>

Date Wed 2/19/2025 11:51 AM

To Prince <prince@artlo.in>

Dear Sir,

Please find attached herewith the advance copy of the reply on behalf of Respondent No. 4 in OA No. 1326 of 2024 titled as Public Action Committee & Ors. vs. Union of India & Ors.

Kindly acknowledge receipt.

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