

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
PB AT NEW DELHI**

**O.A. NO. 225 OF 2022**

IN THE MATTER OF:

Nitin Dhiman

...APPLICANT

VERSUS

State Of Punjab

...RESPONDENTS

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**LUDHIANA DATED: 5.8.2023**

**FILED BY:**



**Respondent No 9**  
**E mail: pdafocalpoint@gmail.com**  
**Mob: 9814127356**

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PB AT NEW DELHI

O.A. NO. 225 OF 2022

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**STATUS REPORT/RESPONSE OF THE RESPONDENT NO 9,  
PUNJAB DYERS ASSOCIATION (MANAGING 40 MLD  
CAPACITY CETP AT LUDHIANA) , IN THE MATTER OF OA  
225/2022**

**MOST RESPECTFULLY SHOWETH:**

1. That certain matter with which applicant herein is concerned is pending before this Hon'ble Tribunal in the matter of OA 225/2022. The Hon'ble Tribunal was pleased to observe following in the order dated 10.10.2022 before seeking report from various authorities on the subject matter

"1. The grievances in the present letter petition sent by Mr. Nitin Dhiman resident of 1203, Princeton Tower, Omaxe, Pakhowal Road, Ludhiana are that around 400 dyeing units are operating in Ludhiana district. The above said units are consuming about 3 crore liters ground water for washing and dyeing daily and discharging approximately 300 MLD chemical mixed untreated water directly in Buddha Nullah through local Municipal Sewerage which finally goes to River Satluj thereby causing dangerous diseases like cancer and skin problems. Ludhiana dyeing industry allegedly installed 3 CETP plants with

the capacity of 105 MLD in different locations. MOEF & CC had issued the environment clearance for setting up of one CETP on the basis of Zero Liquid Discharge (ZLD) technology but said CETP has been installed without ZLD Technology. Other two CETPs are under construction for more than one decade. Around 125 dyeing units are situated in scattered area which do not have CETP."

2. That upon hearing the matter on 20.4.2023 the Hon'ble Tribunal was pleased to implead Punjab Dyers Association ( Focal Point) Ludhiana, who are managing 40 MLD CETP at Ludhiana, as Respondent No 9 in the matter of OA 225/2022 vide order dated 24.1.2023 and notice was accordingly issued. A copy of the order dated 20.4.2023 is enclosed herewith as **Annexure R9-1**. Vide order dated 26.5.2023 Hon'ble Tribunal was pleased to direct the Respondent to file response within two months. Vide the same order Hon'ble Tribunal was pleased to direct duly authorised representative of District Magistrate and Commissioner, Municipal Corporation, Ludhiana and Regional Officer PSPCB, Ludhiana to remain present before Hon'ble Tribunal through VC on date of hearing fixed.
3. That the Respondent is a company registered under sec 25 of Companies Act. It is specifically formed to construct and operate/ manage 40mldCETP for its member dyeing units located at Focal Point,Ludhiana.40 MLD CETP has been

built and being operated by M/S L&T LTD. The SPV of the Respondent has been formed as per guidelines of Punjab Pollution Control Board dated 12.7.2017 as further amended vide order dated 20.12.2019. The officers of Board and other Govt organisations are accordingly the members of SPV as per the guidelines. The Respondent has 72 members presently of which only 65 are presently operational and connected to CETP.

4. That as directed by Hon'ble Tribunal during the hearing on 20.4.2023, a chart of all member units showing their name, discharge as **Annexure R9-2**. The CETP has been commissioned in 04/01/ 2022. All member units are connected to 40 MLD CETP through a 25 KM dedicated sewer network constructed by the Respondent at its own cost.
  
5. That it is pertinent to submit here that the 40 MLD CETP have been constructed under the Govt of India ( MoEFCC) scheme for assistance for construction of CETPs after getting Environmental Clearance from MoEFCC under EIA notification of 2006 issued by the ministry under provisions of EP Act 1986. The sanction of the MoEFCC permits use of CETP effluent for irrigation purpose. Accordingly CETP effluent is being discharged in to Buddha Nala for its use for agricultural purpose for which State Govt is yet to implement its scheme for use of water for irrigation. The Respondent has laid carrier line from

CETP outlet to Buddha Nala with due permission from all concerned authorities. A copy of MoEFCC sanction for CETP project of 40 MLD is enclosed here with as **Annexure R9- 3**

6. That the 40 MLD CETP is presently being operated with due consent of Punjab Pollution Control Board and the effluent from CETP is meeting standards prescribed by MoEFCC in Environmental Protection Rules under EP Act 1986. A copy each of consent under Water Prevention & Control of Pollution Act 1974 issued by State Board, copy of CETP effluent Standards notified under EP Act 1986 and a copy of latest CETP effluent test report is enclosed herewith as **Annexure R9-4, Annexure R9-5** and **Annexure R9-6** respectively. The consent order permits discharge of CETP effluent in to Buddha Nala. As per latest test report of 24/07/2023, BOD and COD in the effluent is found to be 15 mg/l and 120 mg/l respectively. TDS in the effluent is found to be 2220 mg/l. SAR is 10. Total Chrome, Nickel, Arsenic, Sulphide, Phenolic Compound are also found below prescribed limit.
7. That it is pertinent to submit here that TDS of Cotton Dyeing is usually found exceeding prescribed limit for TDS (FTDS) under EP Act 1886. One of the principle reason for same is reduction in water consumption by replacement of winch machines with new high tech Low Liquor Ratio Soft Flow machines as per instructions of State Pollution Control Board. The water consumption thus reduced to

less than one third, leading to higher concentration of pollutants in the effluent. It is pertinent to add here that the members units of 40 MLD CETP are engaged in dyeing of a mixture of Cotton, Polyester/Cotton blend, Polyester and Acrylic Dyeing and are mostly small & medium Job Work units. In Cotton Dyeing process salt is used and in Polyester and in Acrylic dyeing process salt is not used. Additionally, some experiments are currently underway at some dyeing units at Ludhiana to use some specialised chemicals that could reduce salt consumption during cotton dyeing by up to 50 % as claimed by manufacturers of specialised chemicals. Once the experiments succeed , member units shall be in a position to adopt such option too to reduce TDS load.

8. That it may also not be out of place to mention that about 250 MLD treated sewage from Two STPs, namely Baloke and Jamalpur is discharged in to Buddha Nallah. Apart from it, about 260 MLD untreated sewage from 5 pumping stations is being directly pumped in to Buddha Nallah. Waste water from dairy complex at U/S and D/S end of Buddha Nallah and electroplating industries treated effluent is also discharged in to Buddha Nallah. A copy of the report of PPCB dated 4.5.2020 is enclosed herewith as **Annexure R9-7**. It is further evident from this Annexure that contrary to misconception that industries are responsible for polluting Buddha Nallah, it is possible to broadly demonstrate that Buddha Nallah pollution gets reduced by discharge of treated industrial effluent. Monitoring carried out during covid times when all industries

were shut down, show that COD concentration increased by 25 % while BOD concentration increased by about 20 %. Presently about 70 MLD treated CETP effluent from about 200 industries is discharged in to Buddha Nallah. Other scattered dyeing industries, not connected to CETPs, discharge their effluent in to municipal STPs through municipal sewer system after treatment up to prescribed industry specific standards with BOD < 30 mg/l.

9. That the Govt of Punjab has prepared a project of use of treated water at CETP and STPs of Ludhiana irrigation of agricultural land falling between Buddha Nala at Satluj River at Ludhiana. The same is relied by MoEFCC while granting EC for the CETP for dyeing units at Ludhiana. A copy of salient features of the State Govt project for use of treated waste water for irrigation purpose at Ludhiana through Buddha Nala is enclosed as **Annexure R9-8**.

10. That Sh Gaurav Agarwal, Amicus Curae along with Sh Nitin Dhiman, Applicant/Complainant and officials of Punjab Pollution Control Board thoroughly inspected the 40 MLD CETP on 21.7.2023. The plant was found functioning satisfactory. No adverse comments were made by the team during said inspection.



**Respondent No 9**

**PDA (Focal Point)**

**Ludhiana**

**LUDHIANA**  
**DATED: 5.8.2023**

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
PB AT NEW DELHI**

**O.A. NO. 225 OF 2022**

IN THE MATTER OF:

Nitin Dhiman

...APPLICANT

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...RESPONDENTS

**AFFIDAVIT**

I, Vishal Jain, a Director of Punjab Dyers Association (Focal Point), do hereby solemnly affirm and declare as under: -

1. That I am presently a director of Punjab Dyers Association (Focal Point), a Company registered under company Act having registered office at 50 MLD CETP, Near Central Jail, Tajpur Road, Ludhiana PUNJAB, and duly authorized by the Company to file accompanying application.
2. That I am fully conversant with case as derived from office record and competent to swear to this affidavit.
3. That I have read the accompanying report and have understood the contents thereof. The facts stated there in are true and correct to the best of my knowledge and nothing has been concealed there from.
4. That the Annexures are true copy of the originals.



Certified that the affidavit/S.P.A /G.P.A. has been readover & explained to the deponent executant who seemed directly to understand the same at the time making thereof

*[Signature]*  
DEPONENT

**VERIFICATION:**

Verified at Ludhiana on this 05 day of Aug 2023, I the above named deponent do hereby verify that the contents of the above affidavit are true and correct. No part of it is false and nothing material has been concealed there from.

Attested as Identified

NOTARY PUBLIC  
LUDHIANA (Pb.) Indt

10 5 AUG 2023

*[Signature]*  
DEPONENT

Item No.2

(Court No. 2)

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

(Through Physical Hearing with Hybrid VC Option)

Original Application No. 225/2022

Nitin Dhiman

...Applicants

Versus

State of Punjab &amp; Ors.

...Respondents

Date of hearing: 20.04.2023

**CORAM: HON'BLE MR. JUSTICE ARUN KUMAR TYAGI, JUDICIAL MEMBER  
HON'BLE DR. AFROZ AHMAD, EXPERT MEMBER**

Applicant: Ms. Unnati Anand, Advocate.

Respondent: Mr. Ankit Siwach, Advocate for respondent no. 3-  
Municipal Corporation, Ludhiana.  
Mr. I.K. Kapila, Advocate for respondent no. 7 and 8.  
None for respondents no. 1,2,4, 5 and 6.**Application is registered based on a complaint received by Post****ORDER**

1. In compliance of order dated 24.01.2023, replies have been filed by respondent no. 1-State of Punjab vide email dated 17.04.2023, by respondent no. 2-PSPCB vide email dated 29.03.2023, by respondent no. 3- Municipal Corporation, Ludhiana vide email dated 19.04.2023, by respondent no. 4- District Magistrate, Ludhiana vide email dated 20.04.2023 and by respondent no. 6-Principal Secretary, Environment and Forest, Government of Punjab vide email dated 18.04.2023.

2. As per the information furnished by the respondent no. 2-PSPCB in its reply about 300 dyeing units are operating in the area of Ludhiana



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District, out of which about 252 units fall in the catchment area of Budha Nallah. 03 Common Effluent Treatment Plants (CETPs) of total capacity 105 MLD (15 MLD CETP for the dyeing cluster of Bahadurke road, 50 MLD CETP for the dyeing cluster of Tajpur road and 40 MLD CETP for the dyeing cluster of Focal Point) have been setup at Ludhiana by the Special Purpose Vehicles (SPVs). 54 dyeing units which could not join the CETPs are having their own captive effluent treatment plants for the treatment of wastewater.

3. In the reply filed on behalf of respondent no. 3-Municipal Corporation, Ludhiana It has been mentioned that as per information received from Punjab Pollution Control Board, CETP of 50 MLD capacity situated at Tajpur road has been commissioned and 108 units have taken their connections into the dedicated sewer system of CETP and 40 MLD CETP at focal point Ludhiana has been commissioned on 04.01.2022 and 67 number of dyeing units have taken their connections into the dedicated sewer system of CETP. 15 MLD capacity CETP has been commissioned at Bahadur Ke Road dyeing complex and all the 26 member units have taken their connection into dedicated sewer system of CETP. It has been further mentioned that 201 units were checked and it was found that 54 dyeing units of Focal Point area. 34 dyeing units of Kaka Dhola Road and Jaiswal dyeing complex were also found to have connected their dyeing units with main sewer of Municipal Corporation, Ludhiana. During the checking 27 dyeing units were found violating the norms. List regarding the same is also stated to have been provided to the PSPCB.

4. In the reply filed by the respondent no. 4- District Magistrate, Ludhiana, it has been mentioned that about 300 dyeing units are

operating in the area of Ludhiana District, out of which about 252 units fall in the catchment area of Budha Nallah. For the treatment of wastewater of the dyeing industries, 03 Common Effluent Treatment Plants (CETPs) of total capacity 105 MLD have been installed at Ludhiana by the Special Purpose Vehicles (SPVs). About 54 dyeing units are such which could not join the CETPs due to geographical reasons and scale of the industries. Out of these 54 dyeing units, 12 units are of large scale category, 16 units are of small category scattered at different places and 26 units are situated at Industrial Area-A. All these 54 dyeing units are having their own captive effluent treatment plants for the treatment of wastewater and discharge their treated wastewater into public sewer for which standards have been laid down by the MOEF&CC, Government of India. samples were collected from all the three CETPs in January 2023 and the sample collected from 50 MLD CETP was found to exceed the parameter of TDS, sample collected from 40 MLD CETP was found to exceed the parameter of TDS and BDO while the sample collected from 15 MLD CETP was found not to comply with the standards prescribed by MOEF & CC. Environmental Compensation of Rs. 77,62,500/- is stated to have been imposed on M/s Bahadurke Textile and Knitwear Association, 15 MLD CETP for violation of environmental norms.

5. Respondent no. 3-Municipal Corporation, Ludhiana and respondent no. 4-District Magistrate, Ludhiana are directed to file additional replies specifically mentioning (i) compliance status of all the three CETPs, (ii) compliance status of all the dyeing units connected with the CETPs, (iii) compliance status of all the 54 dyeing units which are not connected with the CETPs, (iv) present status of the dyeing industries connected with CETPs which were previously found to have connected



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their dyeing units with main sewer of the Municipal Corporation, Ludhiana, (v) number of dyeing units which are connected with sewer of the Municipal Corporation, Ludhiana and (vi) where the industrial effluent after treatment by CETPs is discharged. The information be given in tabular form which shall include status of all dyeing units setup in Ludhiana.

6. Additional replies by respondent no. 3-Municipal Corporation, Ludhiana and respondent no. 4-District Magistrate, Ludhiana be filed **within one month** by email at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in) preferably in the form of searchable PDF/OCR Supported PDF and not in the form of Image PDF.

7. M/s Punjab Dyers Association who is running 50 MLD CETP and M/s Bahadurke Textiles and Knitwear Association who is running 15 MLD CETP have already been impleaded as respondents no. 7 and 8. In view of the facts and circumstances of the case, we consider presence of M/s Punjab Dyers Association (Focal Point) who is running 40 MLD CETP to be essential for just and proper adjudication of the questions involved in the case. Accordingly, M/s Punjab Dyers Association (Focal Point), SFC 36, First Floor Commercial Site, Phase V, Focal Point, Ludhiana is impleaded as respondent no. 9. The Registry is directed to carry out requisite amendment in the memo of parties and to issue notice to respondent no. 9.

8. Notice be served on M/s Punjab Dyers Association (Focal Point), SFC 36, First Floor Commercial Site, Phase V, Focal Point, Ludhiana through the District Magistrate, Ludhiana and for this purpose notice issued to the M/s Punjab Dyers Association (Focal Point), SFC 36, First Floor Commercial Site, Phase V, Focal Point, Ludhiana be sent to the District Magistrate, Ludhiana by E-mail for getting service of the same effected on it and sending his report in this regard.

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9. No Counsel has appeared on behalf of respondents no. 1, 2, 4, 5 and 6.

10. The proceedings before this Tribunal cannot be treated as part of adversarial litigation where the concerned defendants may opt out to remain absent and suffer *ex-parte* proceedings. On the other hand, the State and its instrumentalities are under constitutional and statutory obligations to ensure compliance with environmental norms and, therefore, the State and its instrumentalities have to ensure submission of their replies/response with relevant details and also their representation through duly authorised representatives/Counsel before this Tribunal. Since, State of Punjab and some of its instrumentalities are not generally appearing before this Tribunal and filing their replies/response in response to the notices served on them, we consider it appropriate that the matter be brought to the notice of the Chief Secretary, Government of Punjab and learned Advocate General, Government of Punjab for issuance of appropriate instructions for compliance with notices issued by this Tribunal and submission of reply/response and ensuring representation through their authorized representative/counsel before this Tribunal, as may be required.

11. In view of the serious nature and magnitude of the environmental questions involved in the present case, we consider it appropriate to have the assistance of some Advocate as *amicus curie* to assist this Tribunal in just and fair adjudication of the questions involved. Accordingly, Mr. Gaurav Agarwal, Advocate is appointed as *amicus curie* to assist this Tribunal in just and fair adjudication of the questions involved. The PSPCB shall pay Rs. 50,000/- to the *amicus curie* and also bear expenses related to the economy

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class Air Ticket, Transportation, Boarding/Lodging, Photography etc. incurred by the amicus curie.

12. List the matter for further consideration on 26.05.2023.

13. In view of the facts and circumstance of the case, we also consider personal appearance of officers duly authorised by the District Magistrate, Ludhiana and Commissioner, Municipal Corporation, Ludhiana and Regional Officer, PSPCB, Ludhiana before this Tribunal **physically** on the date of hearing fixed to be essential for assisting this Tribunal in just and proper adjudication of the questions involved in the case and they are accordingly directed to remain present **physically** before this Tribunal on that date.

14. A copy of this order be sent to the Chief Secretary, Government of Punjab, learned Advocate General, Government of Punjab by email for requisite instructions; a copy of this order along-with notice issued to the M/s Punjab Dyers Association (Focal Point) be sent to the District Magistrate, Ludhiana for requisite compliance for effecting service of notice on the M/s Punjab Dyers Association (Focal Point) and sending his report to this Tribunal; a copy of this order along with the paper book be sent to Mr. Gaurav Agarwal, Advocate, *amicus curie* for his record and to the Secretary, MoEF&CC, Member Secretary, PSPCB, Member Secretary, Punjab State Legal Service Authority and Commissioner, Municipal Corporation, Ludhiana for information/compliance.

Arun Kumar Tyagi, JM

Dr. Afroz Ahmad, EM

April 20 2023  
AG

Sr.	UNIT	STATUS WITH CETP	CETP MEMBERSHIP (KLD)	FEB-APR23 AVERAGE DISCHARGE (KLD)	CAPITAL INVESTMENT (IN LAKHS)	REMARKS
1	Amar Industries Ltd	CONNECTED	650	483	679.75	
2	Aggarwal scientific dyers	CONNECTED	150	117	88	
3	Arora Knit Fab Pvt Ltd	CONNECTED	1000	582	644.25	
4	Ashoka Dyeing	CONNECTED	1000	279	992.67	
5	Bhasin Industries	CONNECTED	200	155	566	
6	Blue Star Processor P Ltd	CONNECTED	350	189	773.69	
7	BM PROCESSOR	CONNECTED	200	139	139.09	
8	BPR Zippers	CONNECTED	10	7	163.68	
9	Dashmesh	CONNECTED	2000	1488	2751.94	
10	Davinder Sandhu Impex	CONNECTED	1000	767	5172.858	
11	Dhawan Processors	CONNECTED	975	788	557.31	
12	Essar Coatings India Ltd	CONNECTED	500	351	968.54	
13	Fahrenheit Clothing India Pvt Ltd	CONNECTED	100	28	1625.8668	
14	Ganpati Industry	CONNECTED	1000	477	497.52	
15	Geesun (India) Inc	CONNECTED	1300	977	1230.66	
16	Gian Chand Shushil Kumar Jain	CONNECTED	340	171	469.5	
17	GNC DYEING	CONNECTED	1275	1002	2402.93	
18	Golden Enterprises	CONNECTED	500	372	93.42	
19	Jai Mata Di Dyeing	CONNECTED	500	218	362	
20	Jain Dyeing Works	CONNECTED	500	7	72.21	
21	Kaur sain Spinning mills	CONNECTED	800	703	924.55	
22	Keshav Scientific Dyers	CONNECTED	100	95	256.41873	
23	Kudu Knit Process PVT LTD	CONNECTED	1000	613	2401.92	
24	Lovely Fabrics	CONNECTED	300	243	873	
25	M K Aggarwal Hosiery P Ltd	CONNECTED	500	146	474	
26	Mahadev Processor	CONNECTED	300	205	78.63	
27	Maharaja Processors	CONNECTED	800	503	790.33	
28	Mahesh Dyeing House	CONNECTED	600	421	221.44	
29	Megaline Enterprises	CONNECTED	500	358	992.98	
30	Nanak Dyeing	CONNECTED	200	145	59.8	
31	Nav Durga Dyeing House	CONNECTED	300	182	119.02	
32	Navyug Laminates	CONNECTED	500	306	978.51	
33	P I Cottex	CONNECTED	1000	902	2651.082	
34	Pacific Dyers	CONNECTED	300	266	328	
35	Perfect Dyeing	CONNECTED	450	325	470.7733	
36	Punjab Wool Syndicate	CONNECTED	35	25	43.24021	

Sr.	UNIT	STATUS WITH CETP	CETP MEMBERSHIP (KLD)	SB-APR23 AVERAGE DISCHARGE (KLD)	CAPITAL INVESTMENT (IN LAKHS)	REMARKS
37	PVM Enterprises Pvt Ltd	CONNECTED	1000	762	2520.74	
38	R K Rajindera Deying House	CONNECTED	300	232	195	
39	R N Knit Fab	CONNECTED	50	14	143.74118	
40	Raghav Industry	CONNECTED	500	340	618.2	
41	Raghav Woollen Mills Pvt Ltd	CONNECTED	200	48	43.99	
42	Rainbow Scientific Dyers	CONNECTED	900	658	982.82	
43	Ramal Industries Private Limited	CONNECTED	1400	887	861.01	
44	Ramson Processors	CONNECTED	300	72	105.12	
45	Raunaq Fabrics Pvt Ltd	CONNECTED	500	241	90.9	
46	Riddhi Processors Pvt Ltd	CONNECTED	1000	815	411.19	
47	Rosy Spinning Mills Pvt Ltd	CONNECTED	300	206	42.63	
48	Ruby Dyeing & Finishing Mills	CONNECTED	600	388	571.15	
49	S k Kohli Textile Inds	CONNECTED	400	144	79.44	
50	S.S Processors	CONNECTED	160	107	24.95	
51	Saachi Processors Pvt Ltd	CONNECTED	1200	648	1482.55	
52	Sailopal Dyeing works	CONNECTED	235	82	40.73	
53	Samrat Dyeing House	CONNECTED	150	34	82.42	
54	Sanya Fabric	CONNECTED	350	175	798.74	
55	Shiva Dyeing and Finishing Mills	CONNECTED	650	315	162	
56	Shivam Processors	CONNECTED	500	431	152.18837	
57	Shree Parshwanath Threads	CONNECTED	100	35	294.43973	
58	Shree Ramal Industry Pvt Ltd	CONNECTED	900	22		
59	Shyam Tex Chem Pvt Ltd	CONNECTED	700	512	987.0561	
60	SK Udyog	CONNECTED	300	268	180.86	
61	Sky Clothing	CONNECTED	1000	595	969.16	
62	Superfine Knitters Ltd	CONNECTED	125	123	613.35	
63	Suvidhi Cotsyn	CONNECTED	1500	915	1594.3845	
64	V H Scientific Dyers	CONNECTED	1000	899	406.33	
65	Vishnu	CONNECTED	50	19	39.35808	
66	TRIVENI KNITS	NOT CONNECTED	100			Not operational
67	SANJEEV DYEING	NOT CONNECTED	1000		374.2	Not operational
68	NEELAM DYEING	NOT CONNECTED	100			Not operational
69	POONAM TEXTILES	NOT CONNECTED	50			Green Catogry share for sale
70	SANDEEP WEAVERS	NOT CONNECTED	20		996.22	Green Catogry share for sale
71	CENTEX FABRICS	NOT CONNECTED	125		396	Not Joined share for surrender
72	CENTEX INTERNATIONAL	NOT CONNECTED	1000		1496	Sewerage not possible to connect, share for surrender. Large Scale Industry.
			37705	24022	46410.027	

F. No. Q-15017/33/2015-CPW  
Government of India  
Ministry of Environment, Forest and Climate Change  
(CP Division)



2nd Floor, Prithvi Wing  
Indira Paryavaran Bhawan  
Allganj, 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,

*Handwritten signature*

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

Copy to:

The Vice President,  
M/s Punjab Dyers Association (PDA)-  
Focal Point Module 341/342-D,  
Phase VIII, Focal Point,  
Ludhiana-141010, Punjab.

*Handwritten notes:*  
2-19/3/16  
2/10/2016

**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. Perdeep 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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## Annexure

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 Rajveer 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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## 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, (Is)
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

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

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)

## TERMS AND CONDITIONS

## A. GENERAL CONDITIONS

1. This consent is not valid for getting power load from the Punjab State Power Corporation Limited or for getting loan from the financial institutions.
2. The industry shall apply for renewal/further extension in validity of consent atleast two months before expiry of the consent.
3. The industry shall ensure that the effluent discharging through the authorized outlet shall conform to the prescribed standards as applicable from time to time.
4. The industry shall plant minimum of three suitable varieties of trees at the density of not less than 1000 trees per hectare all along the boundary of the industrial premises.
5. The achievement of the adequacy and efficiency of the effluent treatment plant/pollution control devices/recirculation system installed shall be the entire responsibility of the industry.
6. The industry shall ensure that the Hazardous Wastes generated from the premises are handled as per the provisions of the Hazardous Wastes(Management, Handling and Trans boundary Movement) Rules, 2008 as amended time to time , without any adverse effect on the environment, in any manner
7. The responsibility to monitor the effluent discharged from the authorized outlet and to maintain a record of the same rests with the industry. The Board shall only test check the accuracy of these reports for which the industry shall deposit the samples collection and testing fee with the Board as and when required.
8. The industry shall submit balance sheet of every financial year to the concerned Regional Office by 30th June of every year.
9. The industry shall submit a yearly certificate to the effect that no addition/up-gradation/ modification/modernization has been carried out during the previous year otherwise the industry shall apply for the varied consent.
10. During the period beginning from the date of issuance and the date of expiration of this consent, the applicant shall not discharge floating solids or visible foam.
11. Any amendments/revisions made by the Board in the tolerance limits for discharges shall be applicable to the industry from the date of such amendments/revisions.
12. The industry shall not change or alter the manufacturing process(es) so as to change the quality and/or quantity of the effluents generated without the written permission of the Board.
13. Any upset conditions in the plant/plants of the factory, which is likely to result in increased effluent and/or result in violation of the standards lay down by the Board shall be reported to the Environmental Engineer, Punjab Pollution Control Board of concerned Regional Office immediately failing which any stoppage and upset conditions that come to the notice of the Board/its officers, will be deemed to be intentional violation of the conditions of consent.
14. The industry shall provide terminal manhole(s) at the end of each collection system and a manhole upstream of final outlet (s) out of the premises of the industry for measurement of flow and for taking samples.
15. The industry shall for the purpose of measuring and recording the quantity of water consumed and effluent discharged, affix meters of such standards and at such places as approved by the Environmental Engineer, Punjab Pollution Control Board of the concerned Regional Office.
16. The industry shall maintain record regarding the operation of effluent treatment plant i.e. record of quantity of chemicals and energy utilized for treatment and sludge generated from treatment so as to satisfy the Board regarding regular and proper operation of pollution control equipment.
17. The industry shall provide online monitoring equipment 1/2 for the parameters as decided by concerned Regional Office with the effluent treatment plant/air pollution control devices installed, if applicable.
18. The pollution control devices shall be interlocked with the manufacturing process of the industry.
19. The authorized outlet and mode of disposal shall not be changed without the prior written permission of the Board.
20. The industry shall comply with the conditions imposed by the SEIAA / MOEF in the environmental clearance granted to it as required under EIA notification dated 14/9/06, if applicable.
21. The industry shall obtain and submit Insurance cover as required under the Public Liability Insurance Act, 1991.
22. The industry shall not use any unauthorized out-let(s) for discharging effluents from its premises. All unauthorized outlets, if any, shall be connected to the authorized outlet within one month from the date of issue of this consent.

23. The industry shall make necessary arrangements for the monitoring of effluent being discharged by the industry and shall monitor its effluents:-
  - (i) Once in Year for Small Scale Industries.
  - (ii) Four in a Year for Large/Medium Scale Industries.
  - (iii) The industry will submit monthly reading/ data of the separate energy meter installed for running of effluent treatment plant/re-circulation system to the concerned Regional Office of the Board by the 5th of the following month.
24. The industry shall provide electromagnetic flow meters at the source of water supply, at inlet/outlet of effluent treatment plant within one month and shall maintain the record of the daily reading and submit the same to the concerned Regional Office by the 5th of the following month.
25. The Board reserves the right to revoke this consent at any time in case the industry is found violating any of the conditions of this consent and/or the provisions of Water (Prevention & Control of Pollution) Act, 1974 as amended from time to time.
26. The issuance of this consent does not convey any property right in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or Local Laws or Regulations.
27. The consent does not authorize or approve the construction of any physical structures or facilities for undertaking of any work in any natural watercourse.
28. Nothing in this consent shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities or penalties to which the applicant is or may be subjected under this or any other Act.
29. The industry shall make necessary and adequate arrangements to hold back the effluent in case of failure of septic tank.
30. The diversion or bye pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this consent is prohibited except.
  - (i) Where unavoidable to prevent loss of life or some property damage or
  - (ii) Where excessive storm drainage or run off would damage facilities necessary for compliance with terms and conditions of this consent. The applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.
31. The industry shall ensure that no water pollution problem is created in the area due to discharge of effluents from its industrial premises.
32. The industry shall comply with the code of practice as notified by the Government/ Board for the type of industries where the siting guidelines/ code of practice have been notified.
33. Solids, sludge, filter backwash or other pollutant removed from or resulting from treatment or control of waste waters shall be disposed off in such a manner to prevent any pollutants from such materials from entering into natural water.
34. The industry shall re-circulate the entire cooling water and shall also re-circulate/reuse to the maximum extent the treated effluent in processes
35. The industry shall make necessary and adequate arrangements to hold back the effluent in case of failure of re-circulation system/ effluent treatment plant.
36. The industry shall make proper disposal of the effluent so as to ensure that no stagnation occurs inside and outside the industrial premises during rainy season and no demand period.
37. Where excessive storm water drainage or run off, would damage facilities necessary for compliance with terms and conditions of this consent, the applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.
38. The industry shall submit a detailed plan showing therein the distribution system for conveying waste-water for application on land for irrigation along with the crop pattern for the year.
39. The industry shall ensure that the effluent discharged by it is toxicity free.
40. The industry shall not irrigate the vegetable crops with the treated effluents which are used/ consumed as raw.
41. Drains causing oil & grease contamination shall will be segregated. Oil & grease trap shall be provided to recover oil & grease from the effluent.

42. The industry shall establish sufficient number of piezometer wells in consultation with the concerned Regional Office, of the Board to monitor the impact on the Ground Water Quantity due to the industrial operations, and the monitoring shall be submitted to the Environmental Engineer of the concerned Regional Office by the 5th of every month.
43. The industry shall ensure that its production capacity & quantity of trade effluent do not exceed the quantity mentioned in the consent and shall not carry out any expansion without the prior permission/NOC of the Board.

#### B. SPECIAL CONDITIONS

1. This consent is valid for the operation of CETP for 15 MLD capacity as the CETP is to be stabilized after cleaning and maintenance. Initially 15 MLD effluent from the member units is allowed to be released and received CETP for treatment. Further effluent discharge will be allowed after checking the performance of the CETP in coming days.
2. The Board shall reserve the right to shutdown the CETP, member units and to revoke consent to operate granted in case the effluent exceeds the 15 MLD without the prior permission from the Board as per its undertaking dated 23.06.2023.
3. No member unit shall discharge effluent from its final outlet leading to the CETP beyond the quantity as agreed by the SPV in its commitment dated 23.06.2023 received vide email dated 23.06.2023. In case of noncompliance of by any member unit, PDA will ensure that outlet of that member leading to the dedicated sewer shall be plugged and its membership be suspended/cancelled with immediate effect under intimation of the Board.
4. The SPV shall submit consolidated report of the total disposed quantity of effluent by its member unit on daily basis through email to Regional Office-4, Ludhiana.
5. SPV shall get its treated effluent at CETP outlet monitored on periodic basis from the PBTI till the CETP stabilized and achieve the prescribed standards.
6. PDA shall ensure to store, handle and dispose off entire sludge generated from the cleaning and maintenance process carried out at CETP in an environmentally sound manner and to get the entire sludge lifted through TSDF, Nimbua immediately. In case of failure, action deemed fit in the matter will be initiated against the SPV for not complying with the above.
7. SPV shall submit the time bound proposal for up-gradation and augmentation of the CETP, as committed during the hearing 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.
8. Cheque amounting to Rs. One Crore bearing no. 001285 dated 22.06.2023 submitted as an assurance to bank guarantee will be en-cashed, in case the SPV failed to deposit the bank guarantee within 07 days.
9. The SPV shall provide CCTV camera arrangement at the final outlet into Buddha Nallah to monitor its 24x7 and construct a proper outlet before discharge into Buddha Nallah from where effluent sample can be collected, within 07 days and also install one set of additional OCEMS at the said location, within 15 days.
10. The SPV shall submit feasibility report to reuse treated effluent onto land for irrigation immediately.
11. SPV shall comply with the previous decisions of the hearing given by the Board from time to time in past as well as conditions earlier imposed by the Board in the previous consent in addition to the special conditions.
12. Conditions as imposed earlier for CETP at the time of previous consents shall remain applicable.
13. SPV shall comply with the decisions of Board given in earlier hearing as well as of hearing dated 12.06.2023.



24/06/2023

(Shiv Kumar)  
Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)



# 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 बहिःस्त्राव उपचार संयंत्र (सीईटीपी)		
	क. अंतर्गम क्वालिटी मानक	प्रत्येक सामान्य बहिःस्त्राव उपचार संयंत्र (सीईटीपी) के लिए, राज्य बोर्ड सामान्य बहिःस्त्राव 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।	

ख. उपचारित बहिःस्वाव स्वालिटी 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, बीओडी <sub>5</sub> , 27° सेटीग्रेड	30	100	100
रासायनिक आक्सीजन मांग (सीओडी)	250	250	250 <sup>a</sup>
कुल निलंबित ठोस पदार्थ (टीएसएस)	100	100	100
नियत विघटित ठोस पदार्थ (एफडीएस)	2100 <sup>b</sup>	2100 <sup>b</sup>	एनएस <sup>c</sup>
विनिर्दिष्ट पैरामीटर			
तापमान, ° सेटीग्रेड	परिवेशी जल तापमान के ऊपर 5°सेटीग्रेड से अधिक नहीं होगा	परिवेशी जल तापमान के ऊपर 5°सेटीग्रेड से अधिक नहीं होगा	परिवेशी जल तापमान के ऊपर 5°सेटीग्रेड से अधिक नहीं होगा
तेल और ग्रीज	10	10	10
अमोनियामय नाइट्रोजन	50	एनएस <sup>c</sup>	50
कुल जेलडेहल नाइट्रोजन (टीकेएन)	50	एनएस <sup>c</sup>	50
नाइट्रेट नाइट्रोजन	10	एनएस <sup>c</sup>	50
फस्फेट, पी के रूप में	5	एनएस <sup>c</sup>	एनएस <sup>c</sup>
क्लोराइड	1000	1000	एनएस <sup>c</sup>
सल्फेट एसओ <sub>4</sub> के रूप में	1000	1000	एनएस <sup>c</sup>
फ्लोराइड	2	2	15
सल्फाइड, एस के रूप में	2	2	5
फेनोलिक यौगिक मिश्रण	1	1	5

	(सी <sub>6</sub> एच <sub>5</sub> ओएच) के रूप में			
	योग अवशिष्ट क्लोरीन	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
	आर्गेनिक	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
	हैक्सावैलेट 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 बहिःस्त्राव 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 बहिःस्त्राव में रासायनिक आक्सीजन मांग के लिए अधिकतम अनुज्ञेय मान 500 मिलिग्राम/लीटर से अधिक नहीं होगा।</p> <p>2. सामान्य बहिःस्त्राव उपचार संयंत्र (सीईटीपी) की संघटक यूनिटों द्वारा अधिकतम अनुज्ञेय योगदान नियत विघटित ठोस पदार्थ (एफडीएस) 1000 मिली ग्राम/लीटर होगा। उन मामलों में जहां संघटक यूनिटों 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 बहिःस्त्राव 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 बहिःस्त्राव के निस्सारण की दशा में, मृदा और भूजल क्वालिटी पर समाघात सामान्य बहिःस्त्राव उपचार संयंत्र (सीईटीपी) प्रबंध द्वारा वर्ष में दो बार (मानसून से पूर्व और उसके पश्चात्) मानीटर किया जाएगा। सिंचाई के लिए भूमि पर उपचारित बहिःस्त्राव और मल जल के संयुक्त निस्सारण के लिए, मलजल के साथ मिश्रण अनुपाल राज्य बोर्ड द्वारा विहित किया</p>				

जाएगा।	
4. सेक्टर विनिर्दिष्ट मानकों से चयनित कुछ महत्वपूर्ण सेक्टरों के लिए विनिर्दिष्ट पैरामीटर।	
सेक्टर	विनिर्दिष्ट पैरामीटर
टेक्सटाइल	जैव आपन परीक्षण, कुल क्रोमियम, सल्फाइड, फैनोलिक यौगिक मिश्रण
इलेक्ट्रोप्लेटिंग उद्योग	तेल और ग्रीज, अमोनिया, नाइट्रोजन, निकिल, हैक्सावैलेंट क्रोमियम, कुल क्रोमियम, तांबा, जस्त, सीसा, लोहा, कैडमियम, सायनाइड, क्लोराइड, सल्फाइड, फास्फेट, सल्फेट
चर्म शोधनशाला	सल्फाइड, कुल क्रोमियम, तेल और ग्रीज, क्लोराइड
रंजक और रंजक इंटरमिडिएट	तेल और ग्रीज, फैनोलिक यौगिक मिश्रण, कैडमियम, तांबा, मैंगनीज, सीसा, पारा, निकिल, जस्त, हैक्सावैलेंट क्रोमियम, कुल क्रोमियम, जैव-आमापन परीक्षण, क्लोराइड, सल्फेट
वैविक 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 हुसैन, 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.	Common Effluent Treatment Plants (CETP)	A. Inlet Quality Standards	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: Treated Effluent Quality Standards	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>5</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 <sup>o</sup>	2100 <sup>o</sup>	NS*	

3

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

1253  
DEC 24/23  
8

1. Laboratory Sample No. E-116 2118/T/O Lab. Monitoring/2023  
2. I.R. No. DEP-DC/045/KG/000006462  
3. Name of Industry M/S CETP-40MLD, Focal Point Module, Tejpur Road, Ludhiana  
4. Name of Sample collecting Officer Pr. Gaurdarpal Singh, AEE, PPCB  
5. Designation of the officer with signing Pr. Environmental Engineer, Regional Office-IV, Ludhiana  
6. Type of Sample Grab  
7. Date & Time of Sample collection 11.05.2023  
8. Date & Time of Sample receipt in Lab 15.05.2023  
9. Period of Analysis 11.05.2023 to 19.05.2023  
10. Test Method As per relevant parts of IS-3025/18:1622 & Methods of APHA

### Results

Sr. No.	Parameter	Inlet	Outlet	Aeration Tank
1	pH	8.6	7.9	-
2	Total Suspended Solids mg/l	136	20	-
3	Total Dissolved Solids mg/l	3660	2992	-
4	Phosphate mg/l	89	BDL	-
5	Sulphate mg/l	419	115	-
6	Chemical Oxygen Demand mg/l	689	22	-
7	Bio-chemical Oxygen Demand mg/l	221	22	-
8	Ammonical Nitrogen mg/l	12.6	4.3	-
9	Total Chrome mg/l	BDL	BDL	-
10	Sulphide mg/l	5.3	BDL	-
11	Phenolic Compound mg/l	BDL	BDL	-
12	SAR	8.8	4.9	-
13	RSC	0.20	0.16	-
14	Oil & Grease mg/l	27.3	3.3	-
15	Bio-Assay mg/l	-	Zero% survival of fish in 100% of effluent after 96 hours	-
16	MI-SS mg/l	-	-	2490
17	MI-VSS mg/l	-	-	1740
18	Zinc mg/l	-	0.9	-
19	Iron mg/l	-	1.1	-
20	Nickel mg/l	-	BDL	-
21	Arsenic mg/l	-	BDL	-

Remarks: (No Specific Standard) Prescribed as per I.C.A. However, Heavy strings of other standards have been imposed by the Board. The same shall prevail.

Note: BDL means Below Method Detection Limit.

---End of Report---

Scientific Officer  
22/5/23

Encl. No: 11823-25

Dt. 23-5-23

A copy of the above is forwarded to the:-

1. The Chief Environmental Engineer (Water), Punjab Pollution Control Board, Ludhiana.
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II, Ludhiana.
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office-IV, Ludhiana.

P. V. Kataria  
23/5/23  
Asst. Scientific Officer

PUNJAB POLLUTION CONTROL BOARD VATAVARAN BHAVAN,  
NABHA ROAD, PATIALA  
WATER ANALYSIS REPORT

हिवरम

- |  |  |
|--|--|
| 1. Laboratory Sample No.                       | E-3531-3532/ H.O.Lab. Monitoring/2023                      |
| 2. Name of Industry                            | M/s CETP-40 MLD, Focal Point Module, Tajpur Road, Ludhiana |
| 3. Name of Sample collecting Officer           | Er. Kuldeep Singh, EE, Er. Bhisham, AEE                    |
| 4. Designation of the officer authorizing Test | Environmental Engineer, Regional Office-III, Ludhiana      |
| 5. Type of Sample                              | Grab   |
| 6. Date & Time of Sample collection            | 30.06.2023   |
| 7. Date & Time of Sample receipt in Lab.       | 01.07.2023   |
| 8. Period of Analysis                          | 01.07.2023 to 07.07.2023                                   |
| 9. Test Methods                                | As per relevant parts of IS:3025/IS:1622 & Methods of APHA |

**Results**

Sr. No.	Parameters	Inlet of CETP	Outlet of CETP
1	pH	7.3	8.2
2	Total Suspended Solids mg/l	192	27
3	Total Dissolved Solids mg/l	4110	3115
4	Chemical Oxygen Demand mg/l	1085	158
5	Bio-chemical Oxygen Demand mg/l	330	21
6	Color (P.C.U)	120	40
7	Ammonical Nitrogen mg/l	4.9	BDL
8	Phenolic Compound mg/l	BDL	BDL
9	Sulphide mg/l	19.6	1.6
10	Total Chrome mg/l	BDL	BDL
11	Oil & Grease mg/l	10.7	BDL
12	SAR	59.9	14.6
13	RSC	0.47	0.27
14	Bio-Assay mg/l	-	Zero% survival of Fish in 100% effluent after 96 hours

Remarks: 1. No specific prescribed standards are as per EPA. However, if any stringent/other standards have been imposed by the Board, the same shall prevail.

Note: 2. BDL means Below Method Detection Limit.

---End of Report---

Scientific Officer

Dt. 07/7/23

Endst. No: 15670-72

A copy of the above is forwarded to the:-

1. The Chief Environmental Engineer (Water), Punjab Pollution Control Board, Ludhiana.
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II, Ludhiana.
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office-III, Ludhiana.

Asst. Scientific Officer



# Punjab Pollution Control Board

Zonal Laboratory, E-648-B, 2<sup>nd</sup> Floor,  
Phase-5, Focal Point, Ludhiana.

Ph. 0181-2678226

Email: [info@punjabpollution.com](mailto:info@punjabpollution.com)

## Water Analysis Report

1. Laboratory Sample no.: E 10/Zonal Lab/2023
2. Name of Industry : M/s CETP - 40 MLD, Tajpur *Discharge*
3. Name of Sample Collecting Officer : Er. Gurinderpal Singh Chhinna, Assistant Environment Engineer
4. Type of Sample : Grab
5. Date of Sample Collection : 24.07.2023
6. Date of Receiving: 25.07.2023
7. Method Followed IS 3025/ methods of APHA

### Results:

Sr. No.	Parameters	Inlet	Outlet	Aeration Tank
1.	pH	7.8	7.9	-
2.	Total Suspended Solids (mg/l)	238	54	-
3.	Total Dissolved Solids (mg/l)	5389	2228	-
4.	Chemical Oxygen demand (mg/l)	704	120	-
5.	Bio-chemical Oxygen Demand (mg/l)	230	15	-
6.	Oil & Grease (mg/l)	9.2	BDL	-
7.	Sulphides (mg/l)	8.6	BDL	-
8.	Phenolic Compound (mg/l)	BDL	BDL	-
9.	Ammonical Nitrogen (mg/l)	8.4	1.8	-
10.	Total Chromium (mg/l)	BDL	BDL	-
11.	Sodium Absorption Ratio (SAR)	19.3	30.0	-
12.	Residual Sodium Carbonate (RSC) meq/l	0.73	0.28	-
13.	MLSS (mg/l)	-	-	1020
14.	MLVSS (mg/l)	-	-	1080

### Remarks :-

1. BDL means Below Method Detection Limit.
2. No specific standards are prescribed as per EPA, However if any stringent/other standards have been imposed by the board, the same shall prevail.

*Sham*  
1/8/23  
Junior Scientific Officer,  
Zonal Lab, Ludhiana

Ends. No. 780-386

Dated 01/08/2023

A copy of the above is forwarded to the following for information and necessary action please along with data sheet:-

1. The Chief Environmental Engineer, Punjab Pollution Control Board, Ludhiana.
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-2, Ludhiana.
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office-4, Ludhiana.

*ms*



# Punjab Pollution Control Board

Regional Office-III

Savitri Complex-1, (Dada Motors), Third Floor, Dholewal Chowk, G.T. Road, Ludhiana

ppcbro3@yahoo.com

No. / R.O/LDH-III/ SPL-6 (Due to curfew, through email only)

Date 04.05.2020

To

The Senior Environmental Engineer,  
Punjab Pollution Control Board,  
Zonal Office-II, Ludhiana.

**Sub: Quality of Budha Nallah and non-utilization of the designed capacities of the Sewage Treatment Plants installed at Ludhiana.**

The Ludhiana City is an industrial town and has mainly two types of effluent i.e. domestic/ commercial effluent and industrial effluent. The domestic and industrial effluents of the city are discharged into sewerage system laid by Municipal Corporation, Ludhiana. In addition, two dairy complexes located at Tajpur Road and at Halbowal discharge their effluent directly into Buddha Nallah. A major part of the effluent of the city is discharged into Buddha Nallah leading to River Sutlej near village Walpur and other part is discharged directly into River Sutlej near village Kasabaad from the outlet of STPs at Bhattian.

In the year 2019, the effluent of the city was assessed as under:

- |  |                 |
|--|-----------------|
| 4. Discharge from Budha Nallah into river Satluj               | = About 600 MLD |
| 5. Discharge from outlet of STPs at Bhattian into river Satluj | = About 161 MLD |
| 6. Total Discharge of the city into river Satluj               | = About 761 MLD |

Now, due to COVID-19 situation, the Govt. of Punjab has imposed curfew/ lockdown from 23<sup>rd</sup> March, 2020 and the industries & the commercial establishments are closed from the same day. Presently the source of effluent generation in the city, during this period, is domestic only. Effluent samples from the outlets of all the STPs & from the outfall of Buddha Nallah into River Sutlej were collected on 03.04.2020 and results of the same are received through email from Zonal Lab. To assess the change in the water quality at the above outlets, the analysis results for the month of April, 2020 have been compared with the average results of the months of Jan, 2020 to March, 2020 and are as under:-

### STP Balloke, 152 MLD

Sr. no.	Parameters	Jan, 2020	Feb, 2020	March, 2020	Average results of these three months	April, 2020	Permissible limits
1.	pH	7.4	7.26	7.2	7.3	6.5	6.5-9.0
2.	Bio-Chemical Oxygen Demand mg/l	30	40	48	39.33	42	<30 mg/l
3.	Chemical Oxygen Demand mg/l	152	200	240	197.33	184	..
4.	Total Suspended Solid mg/l	56	120	128	101.33	65	<100 mg/l
5.	Fecal Coliform MPN/100 ml	<1.8	1200	2100	1650.00	1700	<1000

### STP Balloke, 105 MLD

Sr. no.	Parameters	Jan, 2020	Feb, 2020	March, 2020	Average results of these three months	April, 2020	Permissible limits
1.	pH	7.8	7.63	7.6	7.7	7.3	6.5-9.0
2.	Bio-Chemical Oxygen Demand mg/l	25	18	22	21.67	26	<30 mg/l

3.	Chemical Oxygen Demand mg/l	96	122	120	112.67	140	--
4.	Total Suspended Solid mg/l	78	104	110	97.33	42	<100 mg/l
5.	Fecal Coliform MPN/100 ml	830	930	820	860.00	930	<1000

## STP Jamalpur, 48 MLD

Sr. no.	Parameters	Jan, 2020	Feb, 2020	March, 2020	Average results of these three months	April, 2020	Permissible limits
1.	pH	7.82	7.7	7.9	7.8	7.3	6.5-9.0
2.	Bio-Chemical Oxygen Demand mg/l	320	210	170	233.33	195	<30 mg/l
3.	Chemical Oxygen Demand mg/l	922	620	546	696.00	560	--
4.	Total Suspended Solid mg/l	336	312	208	285.33	384	<100 mg/l
5.	Fecal Coliform MPN/100 ml	120000	700000	150000	323333.33	430000	<1000

## STP Bhattian, 111 MLD

Sr. no.	Parameters	Jan, 2020	Feb, 2020	March, 2020	Average results of these three months	April, 2020	Permissible limits
1.	pH	7.6	6.9	7.5	7.3	6.9	6.5-9.0
2.	Bio-Chemical Oxygen Demand mg/l	50	55	105	70.00	40	<30 mg/l
3.	Chemical Oxygen Demand mg/l	224	230	360	271.33	180	--
4.	Total Suspended Solid mg/l	188	90	156	144.67	85	<100 mg/l
5.	Fecal Coliform MPN/100 ml	3500000	12000	70000	1194000.00	4900	<1000

## STP Bhattian, 50 MLD

Sr. no.	Parameters	Jan, 2020	Feb, 2020	March, 2020	Average results of these three months	April, 2020	Permissible limits
1.	pH	8	8.4	7.7	8.0	7.3	6.5-9.0
2.	Bio-Chemical Oxygen Demand mg/l	6	40	20	22.00	16	<30 mg/l
3.	Chemical Oxygen Demand mg/l	44	148	88	93.33	80	--
4.	Total Suspended Solid mg/l	20	34	32	28.67	42	<100 mg/l
5.	Fecal Coliform MPN/100 ml	45	600	2100	915.00	410	<1000

## Budha Nallah at Walipur

Point of Sample Collection	Month of sampling	pH	COD mg/l	BOD mg/l	T. Coll (MPN/ 100 ml)	F. Coll (MPN/100 ml)
Point source Budhha Nallah at Walipur	Jan 2020	7.3	500	170	9400000	3300000
	Feb 2020	6.6	500	180	11000000	2100000
	Mar 2020	7.6	344	120	3200000	1700000
	Average results of these three months	7.2	448	157	7866667	2366667
	April 2020	7.3	608	190	1,20,00,000	38,00,000

Month of sampling	Na mg/l	Fe mg/l	Zn mg/l	T.Cr. mg/l	H.Cr. mg/l	Ni mg/l	Cd mg/l	Pb mg/l
Jan 2020	160	18.6	1.53	0.29	0.24	BDL	0.39	BDL
Feb 2020	129	9.82	0.94	0.15	BDL	BDL	BDL	BDL
Mar 2020	366	10.8	0.63	0.17	BDL	BDL	BDL	BDL
Average results of these three months	218.33	13.07	1.03	0.20	0.08	BDL	0.13	BDL
April 2020	71	6.7	0.75	0.19	BDL	BDL	0.06	BDL

**Flow of Budha Nallah (as per data of Deptt of Water Resources)**

Sr. no.	Parameters	Jan, 2020	Feb, 2020	Mar, 2020	Average results of these three months	April, 2020
1.	Average per day Flow (MLD)	586	575	576	579	469.75

The BOD is taken as a main parameter for classification of Rivers and drains. Wallpur is the final confluence point of the Buddha Nallah with river Satluj, the quality of which is being monitored by the Board on monthly Basis. So as to assess the pollution level, pollution load is required to be assessed in terms of BOD. The flow data of Budha Nallah is taken from the drainage department. The BOD load calculated is as under:-

Sr. no.	Parameters	Average result of (Jan 20, Feb 20 & March 2020)	April, 2020
1	Flow (MLD)	579	469.75
2	BOD at Wallpur (mg/l)	157	190
<b>Total BOD Load (kg/day)</b>		<b>90903</b>	<b>89252.5</b>

From the above, it is concluded that during the month of April, 2020 the:

1. Discharge of the city has reduced to about 19% due to closure of the industrial and commercial activities.
2. Level of BOD has increased in the Budha Nallah by about 21%.
3. BOD load in the Budha Nallah has decreased by about 2% due to less quantity of flow in it.
4. Due to less quantity of flow in it, the flow in Budha Nallah looks better.

It is further intimated that the following sewage treatment plants are installed at Ludhiana:

Sr No.	Location	Capacity in MLD	Operational Status
1	Jamalpur	48	Non operational
2	Bhattian	111	Operational
3		50	Operational
4	Balloke	152	Operational
5		105	Operational

Thus, the operational capacity of STPs at Ludhiana is 418 MLD.

As per the data available from the Department of Water Resources and Municipal Corporation Ludhiana, for the month of April, 2020, it has been found that:

Discharge of effluent of the city into river Satluj through Budha Nallah	About 470 MLD
Discharge of effluent of the city into river Satluj through outlets of STPs at Bhattian STP	About 141 MLD
<b>Total Discharge of the city</b>	<b>About 611 MLD</b>

Record of the effluent treated at the various STPs at Ludhiana reveals as under:

Present working STPs	Cap MLD	Utilised cap MLD	Unutilised Capacity MLD
48 MLD Jamaipur	48	0	48
111 MLD Bhattian	111	90.9	20.57
50 MLD Bhattian	50	50.2	-0.08
152 MLD Balloke	152	107.45	43.81
105 MLD Balloke	105	103.37	2.19
<b>Total</b>	<b>466</b>	<b>351.92</b>	<b>114.49</b>

This data shows that in the month of April, 2020 the whole effluent generation in the city is domestic only. Out of 611 MLD of total effluent generated in this month, about 352 MLD of effluent has been treated and about 259 MLD was discharged untreated. Out of this untreated 259 MLD, about 66 MLD is due to non utilization of the full capacities of the STPs while about 193 MLD is due to gap in the treatment capacities of the STPs.

Keeping in view of the above it is recommended that the matter may be taken up with the Municipal Corporation Ludhiana to utilize the full capacities of the existing STPs.

*Environmental Engineer*  
Environmental Engineer



## ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ

## PUNJAB POLLUTION CONTROL BOARD

Zonal Office-II, 3<sup>rd</sup> Floor, Savitri Complex-I, Dholewal Chowk, G.T. Road, Ludhiana.  
Ph. 0161-2533350 E-Mail: seezo2ldhppcb@yahoo.com

No. 7483

Date: 03/9/12

To

The General Secretary,  
Punjab Dyers Association,  
24, Navrattan Complex,  
Cheema Chowk,  
Ludhiana.

**Sub:** **100% Treatment of Wastewater at Ludhiana (Project estimate for the domestic sewer of Ludhiana City after treatment at sewage treatment plant through Budha Nallah and by constructing net work of distributing / water courses).**

It is intimated that the Government of Punjab, Dept. of Science, Technology & Environment, Chandigarh has forwarded a scheme on the subject cited matter, as prepared by Department of Irrigation, Punjab.

A copy of the said report is enclosed for your record and further necessary action in the matter relating to Environmental Clearance of the proposed CETP.

DA/As above

*Debi Singh*  
Environmental Engineer  
Senior Environmental Engineer

**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	Furnished (Yes/No)
<b>1</b>	<b>General</b>		
<b>i</b>	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
<b>ii</b>	Whether the project submitted through the Nodal Dept.	Through PID	No.
<b>iii</b>	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>		
<b>i</b>	Ministry of welfare (involving rehabilitation & resettlement)	No rehabilitation & resettlement is involved	No
<b>ii</b>	Administrative Approval	Yes, required	No
<b>iii</b>	Technical Sanction	Yes, Required	No
<b>iv</b>	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.</u> - Poor	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.		
ii	<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.	
6	<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

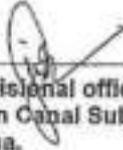
		irrigation purposes for approximately 13543 Ha CCA and to increase the agricultural production of Punjab State.	
		After the completion the project SOCIO-ECOLOGICAL AND ENVIRONMENTAL condition of the people of the State living long side the proposed disty. and Budha Nalla will be improved considerably 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	<b>Budget provision</b>		
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

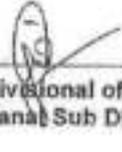
i	Land acquisition	No problem anticipated at present.	No
ii	Rehabilitation and resettlement	Not required.	No
iii	Forest clearance	Will be obtained, if required at the time of execution.	No
iv	Railway/road crossings	Not involved.	No
v	Construction hazards	No problem anticipated	No
vi	Any other risk.	No.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

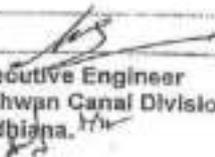
**SALIENT FEATURES**

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, Ghamneweal, 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, Kanlan 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  
Ludhlana.

  
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 PROJECT COST		13767 Lacs
2 Annual Interest @ 6.5%		894.86
3 Depreciation charges @2%		275.34
<b>TOTAL</b>		<b>1170.2</b>
Economics of the project/benefits cost ratio $1782.18/1170.20$		1.52:1
Required benefit cost ratio		1.5:1



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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.	18.78
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-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 dyeing industry in particular will be utilized for irrigation after treatment by STP/CETP plants at Balloke, Jamallpur, Tajpur and Bahadar ke villages. This proposed distributary will be constructed 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 257 MLD (102.80 Cs.), similarly the capacity of Jamallpur STP will be increased from 48 MLD (19.20 Cs.) to 98 MLD ie 40 Cs. Apart from that 112 MLD and 38 MLD discharge of CETP Tajpur and Bhaderke respectively will be treated. The discharge of all STPs & CETPs 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 provision 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 fall 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.

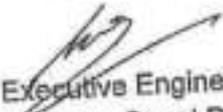
The analysis of rates of various items have been prepared and attached. Rates provided are as per common schedule of rates 2010 plus sanctioned zonal premium operative w.e.f. 5.12.2011.

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° C in summer months and as low as 5° 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, Ferozpur, 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 regeosity 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.

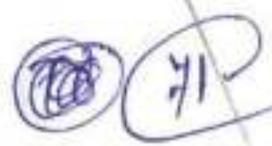
### 3.5 CONSTRUCTION METHOD

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 on 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
<b>Total</b>	<b>13543 Ha</b>

#### 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 existin9ng 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



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## 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

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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. Pls, Chandigarh.

Memo No.2009/( ) 3-5 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.

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

8.9932 36 / 13-3

दिनांक 25/11/09

उपरोक्त सूची में सूचीबद्ध नगरों के लिए सिंचन योजना (ए) तैयार करने के लिए संबंधित नगरों के अधिकारियों को सूचित किया जाता है कि वे अपने-अपने नगरों में स्थित STP के स्थानों का विवरण और सिंचन योजना तैयार करके 1/12/09 तक जमा करा दें।

15/11/09  
मुख्यालय

*A. S. Singh*  
निदेशक सिंचनी/अतिरिक्त  
सिंचनी विभाग, मुख्य कार्यालय।

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SIX- ) = TEND ORNL E FOR NO. : 01722724879

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 → PPTA	4
2.	Begowal	STP from Kapurthala → 16.25 MLD	2.50
3.	Phagwara	Kapurthala	38
4.	Dhillwan	STP from Kapurthala	2
5.	Sultanpur Lodhi	Kapurthala → 18.5 MLD	2.60
6.	Kapurthala	Kapurthala → 25 MLD	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	Ferozepur Moga	3
15.	Dharamkot	Ferozepur Moga	3
16.	Zira	Ferozepur Moga	8
17.	Taiwandi Bhai	Ferozepur Moga	3
18.	Moga	Moga	27
19.	Machiwara	Ludhlana	3.5
20.	Balloke	Ludhlana	257
21.	Bhattian	Ludhlana	161
22.	Jamalpur	Ludhlana	48
23.	Jalandhar	Jalandhar	185
24.	Pathankot	Gurdaspur	20
25.	Nangal	Ropar	5
26.	Ropar - Treatment Plant (STP)	Ropar	14.50
27.	Kurali	Ropar	5

Seven days

Jalandhar: 100 MLD, 1.5 MLD, 6 MLD } 21.84 Crores 8000 acres - STA Under Construct

Dasuya = 26.47 lac received and utilized work in progress. 7.5 MLD. 600 acres, 130 ha

Table T**PROJECT COST AND PROPOSED PHASING OF FUNCTIONING**

The total cost of the project proposed to be funded out of RIDF- XVIII works out of the Rs 137.67 Crores as per guidelines of NABARD bank. New schemes would be provided loan assistance to the extent 95% of the total financial outlay, whereas the balance 5% of the cost would be state share.

Total Financial Outlay (TFO)	:	Rs .137.67 Crores
Loan From NABARD	(i.e. 95% of TFO under RIDF XVIII)	Rs. 130.79 Crores
5% States Share of new scheme	:	Rs. 6.88 Crores.
Time required to complete the project	:	3.0 Years (Subjected to availability of funds)

**IMPLEMENTATION OF SCHEDULE**

The work included in the project will be completed within 3 years from the date of receipt of funds.

The cost of this project works out to Rs. 137.67 Crores. As the work is of Public interest so an early approval of the scheme is requested please.



Table T-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.

METEOROLOGICAL DATA

Average of 10 Years (From 1998-2008)

District	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>MEAN RAINFALL (MM)</b>												
LUDHIANA	30.48	38.66	33.92	17.8	32.17	88.49	99.26	187.3	98.04	23.11	3.49	16.11
<b>MEAN WIND SPEED (KM/HOUR)</b>												
LUDHIANA	3.71	4.1	4.6	4.92	6.08	6.41	5.27	4.41	3.45	2.57	2.48	2.07
<b>MEAN TEMPERATURE (DEGREE CENTIGRADE)</b>												
LUDHIANA	12.68	15.14	19.99	26.88	31.06	31.57	30.05	29.8	28.06	24.5	19.3	13.68
<b>MEAN RELATIVE HUMIDITY (%)</b>												
LUDHIANA	79.18	75.34	66.26	45.09	41.7	58.6	76.7	80.01	75.1	65.3	64.1	75



Table T-2

**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.**

**PUNJAB IRRIGATION PROJECT**

**CROP CALENDER**

S.No.	Name of Crop	Optimum Time for		Days of Maturity
		Sowing	Harvesting	
A	Kharif Crop			
1	Paddy	10-20 Jan	Oct	115
2	Cotton	April-May	Dec	180
3	Maize	May-June	Sept	90
4	Pulses (Moong Mash)	June-July	Oct	90
5	Ground Nuts	25 May-10 June	Nov	120
6	Fodder (Jawar)	Mid June-Mid July	Mid Sept-Mid Oct	90
B	Rabi Crops			
1	Wheat	Oct-Nov	15-Apr	145
2	Oilseed	Oct	March	150
3	Grams	10-25 Oct	March End	160
4	Barley	Oct-Nov	March End	130
5	Pulses (Masur)	Oct-Nov	March	155
6	Fodder (Barseem)	15 Sept.	15-May	240
7	Sugar cane	March	Nov-Dec	280



Table T-3 (P-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.**

**ABSTRACT OF CANAL STRUCTURE TO BE CONSTRUCTED**

S.No.	Description	Unit	Number of structures
1	Bridges	Nos	47
2	Syphon Crossings	Nos	11
3	Syphon Aquaduct	Nos	4
4	Escape	No.	1
5	Fall	No.	1
6	Head Regulator	Nos	2

Table-3  
(P-2)

**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.**

**LIST OF PUGCA STRUCTURE**

**BRIDGES**

1	SINGLE V.R. BRIDGE AT RD	=	4492
2	SINGLE V.R. BRIDGE AT RD	=	6692
3	SINGLE V.R. BRIDGE AT RD	=	112545
4	SINGLE V.R. BRIDGE AT RD	=	114530
5	SINGLE V.R. BRIDGE AT RD	=	117650
6	SINGLE V.R. BRIDGE AT RD	=	122244
7	SINGLE V.R. BRIDGE AT RD	=	123989
8	SINGLE V.R. BRIDGE AT RD	=	128105
9	SINGLE V.R. BRIDGE AT RD	=	130655

10	SINGLE V.R. BRIDGE AT RD	=	132000
11	SINGLE V.R. BRIDGE AT RD	=	134800
12	SINGLE V.R. BRIDGE AT RD	=	135234
13	SINGLE V.R. BRIDGE AT RD	=	138400
14	SINGLE V.R. BRIDGE AT RD	=	164265
15	SINGLE V.R. BRIDGE AT RD	=	166645
16	SINGLE V.R. BRIDGE AT RD	=	173375
17	COMBINED V.R. BRIDGE AT RD	=	14380
18	COMBINED V.R. BRIDGE AT RD	=	17285
19	COMBINED V.R. BRIDGE AT RD	=	19978
20	COMBINED V.R. BRIDGE AT RD	=	22948
21	COMBINED V.R. BRIDGE AT RD	=	34390
22	COMBINED V.R. BRIDGE AT RD	=	35285
23	COMBINED V.R. BRIDGE AT RD	=	37723
24	COMBINED V.R. BRIDGE AT RD	=	41205
25	COMBINED V.R. BRIDGE AT RD	=	45485
26	COMBINED V.R. BRIDGE AT RD	=	47330
27	COMBINED V.R. BRIDGE AT RD	=	52030
28	COMBINED V.R. BRIDGE AT RD	=	53123
29	COMBINED V.R. BRIDGE AT RD	=	54800
30	COMBINED V.R. BRIDGE AT RD	=	58766
31	COMBINED V.R. BRIDGE AT RD	=	60510
32	COMBINED V.R. BRIDGE AT RD	=	63989
33	COMBINED V.R. BRIDGE AT RD	=	66452
34	COMBINED V.R. BRIDGE AT RD	=	69477
35	COMBINED V.R. BRIDGE AT RD	=	73251
36	COMBINED V.R. BRIDGE AT RD	=	80389
37	COMBINED V.R. BRIDGE AT RD	=	85110
38	COMBINED V.R. BRIDGE AT RD	=	86600
39	COMBINED V.R. BRIDGE AT RD	=	89291
40	COMBINED V.R. BRIDGE AT RD	=	93000
41	COMBINED V.R. BRIDGE AT RD	=	97850
42	COMBINED V.R. BRIDGE AT RD	=	98731
43	COMBINED V.R. BRIDGE AT RD	=	104838
44	COMBINED V.R. BRIDGE AT RD	=	145430
45	COMBINED V.R. BRIDGE AT RD	=	148875
46	COMBINED V.R. BRIDGE AT RD	=	151840
47	COMBINED V.R. BRIDGE AT RD	=	152930

SYPHON CROSSING

1	SYPHON CROSSING AT RD	=	21000
2	SYPHON CROSSING AT RD	=	30000
3	SYPHON CROSSING AT RD	=	40000
4	SYPHON CROSSING AT RD	=	58000
5	SYPHON CROSSING AT RD	=	67500
6	SYPHON CROSSING AT RD	=	70000
7	SYPHON CROSSING AT RD	=	75500
8	SYPHON CROSSING AT RD	=	93300
9	SYPHON CROSSING AT RD	=	102000
10	SYPHON CROSSING AT RD	=	112000
11	SYPHON CROSSING AT RD	=	118000

SYPHON AQUEDUCT CROSSING

- 1 Syhon Aquueduet at RD 45285 crossing Pijrlan Drain
- 2 Syhon Aqueduct crossing Jassowal Drain at RD 110000
- 3 Syhon Aqueduct Cum Bridge at RD 156305 crossing Kishan pura disty
- 4 Syhon Aqueduct at RD 159750 crossing of Kishan pura Drain.

ESCAPE

- 1 Escape Regulators at RD 110000 Proposed Disty.

FALLS

- 1 Fall at RD 132200

HEAD REGULATOR

- 1 R.D. 150000 of Budha Nala/ R.D. 0 of Proposed Channel
- 2 R.D. 2300 of 6-R Distributory/ R.D. 175600 of Proposed Channel

Table I-4

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.

ESTIMATED VALUE OF PRODUCE AND COST OF CULTIVATION POST PROJECT AND NET CROP BENEFITS

Crop	Area Ha	PRODUCE			INPUTS VALUE			Net Crop benefits (Col 6-8) (In Lac)
		Yield per ha(Qtl)	Total Yield (Qtl)	Rate Rs./Qtl.	Total (Rs. Lac) Col 4 x 5	Rate Rs.Ha refer Table T-15	Total Value Rs.Lac Col.2 x 7	
1	2	3	4	5	6	7	8	9
Paddy	5417	74	400858.00	1030	4128.8374	28419	1539.45723	2589.38017
Pwheat	6772	57	386004.00	1285	4960.1514	25823	1748.73356	3211.41784
Oil Seeds	1354	21	28434.00	2425	689.5245	18080	244.8032	444.7213
Total	13543		815296		0		3532.99399	6245.51931
<b>BY PRODUCT</b>								
Paddy	0	0	0	0	0	0	0	0
Wheat	6772	54	365688.00	250	914.22			914.22
Oil Seeds	1354	18	24372.00	110	26.8092			26.8092
Total			390060		0			941.0292
G.Total			1205356		0		3532.99399	7186.54851

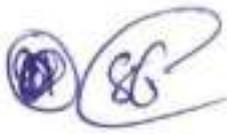


TABLE-T-5

**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**

**LATEST CROP YIELDS IN PUNJAB FOR MAIN CROPS AND THEIR  
PRICES IN 2011**

S.No.	Crop	Type	Crop yield qtls ha.Main Product	Price per Qtl.Rs.
1	Paddy	Irrigated	74	1030
2	Paddy	Un-Irrigated	67	1030
3	Wheat	Irrigated	57	1285
4	Wheat	Un-Irrigated	52	1285
5	Oil Seeds.	Irrigated	21	2425
6	Oil Seeds.	Un-Irrigated	20	2425
7	By product of wheat	Irrigated	54	250
8	By product of wheat	Un-Irrigated	49	250
9	By product of Oil seeds.	Irrigated	18	110
10	By product of Oil seeds.	Un-Irrigated	8	110
11	Pulses	Irrigated	12	2800
12	Pulses	Un-Irrigated	11	2800

Table -6

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

Average Crop cultivation costs per Hectare in Punjab for the Year 2018-19 (Irrigation)

(PRE-Project)

S.No.	Name of crop and type	Seeds	Human labour & bullock charges Rs./Ha	Farm Yard manure & fertilizers Rs./Ha	Chemicals (insecticides & pesticides Rs./Ha)	Other Charges Rs./Ha	Total Charges (Col.3 to 7) Rs./Ha
1	2	3	4	5	6	7	8
1	Paddy	1013	6941	5064	2347	13054	28419
2	Wheat	2099	7682	5940	2099	8003	25823
2	Oil Seeds	840	4792	2519	1210	8719	18080



Table -7

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

Average Crop cultivation costs per Hectare in Punjab for the Year 2014-15 (Irrigation)

(Post-Project)

S.No.	Name of crop and type	Seeds	Human labour & bullock charges Rs./Ha	Farm Yard manure & fertilizers Rs./Ha	Chemicals (Insecticides & pesticides Rs./Ha)	Other Charges Rs./Ha	Total Charges (Col.3 to 7) Rs./Ha
		2	3	4	5	6	7
							8
1	Paddy	1013	6941	5064	2347	13054	28419
2	Wheat	2099	7682	5940	2099	8003	25823
2	Oil Seeds	840	4792	2519	1210	8719	18080

Table-8

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

CROP BUDGET FOR IRRIGATED POST PROJECT CROPS

S.No.	Name of crop and type	Yield/hectare in Qtl.	Rate for qtl	Gross Value Rs	Total inputs/ha Refer table 15	Net value col (5-6) Rs./ha
1	2	3	4	5	6	7
1	Paddy	74	1030	76220	28419	47801
2	Wheat	57	1285	73245	25823	47422
2	Oil Seeds	21	2425	50925	18080	32845
BY PRODUCTS						
1	Paddy	0	0	0	0	0
2	Wheat	54	250	13500	0	13500
2	Oil Seeds	18	110	1980	0	1980

Table T-9

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

## CROP BUDGET FOR UNIRRIGATED /RAINFED PRE PROJECT CROPS

S.No.	Name of crop and type	Yield/hectare in Qtl.	Rate for qtl	Gross Value Rs	Total inputs/ha Refer table 15	Net value col (5-6) Rs./ha
1	2	3	4	5	6	7
1	Paddy	67	1030	69010	28419	40591
2	Wheat	52	1285	66820	25823	40997
2	Oil Seeds	20	2425	48500	18080	30420
BY PRODUCTS						
1	Paddy	0	0	0	0	0
2	Wheat	25	250	6250	0	6250
2	Oil Seeds	8	110	880	0	880

Table-10

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.

S.No.	Crop	Area(Ha)	PRODUCE			Rate Rs./QTL	Total (Rs.Lac)	INPUTS VALUE			Net crop benefits (Col.6-8) Rs.Lacs.
			Yield per ha (QTL)	Total Yield(QTL)	Rate Rs./QTL			Rate Rs.Ha	Total Value (Rs.Lc)		
1		2	3	4	5	6	7	8	9		
1	Paddy	2708	67	181436	1030	1868.7908	28419	769.58652	1099.204		
2	Wheat	3386	52	176072	1285	2262.5252	25923	874.36678	1388.158		
2	Oil Seeds	677	20	13540	2425	328.345	18080	122.4016	205.9434		
	Total	3385.5	139	371048	4740	4459.661	72322	1766.3549	2693.306		
	BY PRODUCT										
1	Paddy	0	0	0	0	0	0	0	0		
2	Wheat	3386	25	84650	250	211.625	0	0	211.625		
2	Oil Seeds	1354	8	10832	110	11.9152	0	0	11.9152		
	Total			95482		223.5402	0	0	223.5402		
	G.Total			466530		4683.2012		1766.3549	2916.846		

Table 11

**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**

**POST PROJECT NET VALUE OF FARM PRODUCE  
(IRRIGATED)**

S.No.	GROSS RECEIPTS ( From table T-12)				(Rs.in lac)
i	Gross value of farm produce				9778.51
	Gross value of by products receipt				941.03
	Total receipts				10719.5
ii	<b>EXPENSES</b>				
3	Total cost of cultivation				3532.97
4	Depreciation of implements @ 2.70% of Gross value of peroduce.				289.43
5	Share and cash rent @ 5% total gross produce.				535.98
6	Land revenue @ 2% gross value of farm produce				195.57
	Total				4553.95
iii)	<b>NET VALUE OF PRODUCE</b>				
	<b>RECEIPTS</b>		<b>EXPENSES</b>		
	10719.54		4553.97		6165.57

Table 12

**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**

**PRE PROJECT NET VALUE OF FARM PRODUCE (UN-IRRIGATED)**

S.No.	GROSS RECEIPTS ( From table T-18)				(Rs.in lac)
i	Gross value of farm produce				4480
	Gross value of by products receipt				223.55
	Total receipts				4683.22
ii	<b>EXPENSES</b>				
3	Total cost of cultivation				1766.36
4	Depreciation of implements @ 2.70% of Gross value of peroduce.				126.45
5	Share and cash rent @ 5% total gross produce.				234.16
6	Land revenue @ 2% gross value of farm produce				89.19
	Total				2216.16
iii)	<b>NET VALUE OF PRODUCE</b>				
	<b>RECEIPTS</b>		<b>EXPENSES</b>		
	4683.22		2216.16		2467.06

TABLE-13 (P-1)

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

ECONOMICS IN CROP PRODUCTION ( 100 Ha MODEL )

S. No.	Crop	Without Project										With Project					
		Yield Qtl Ha	Area In Ha	Production In Qtl	Value of Production	Cost of Cultivation	Yield Qtl	Area In Ha	Production In Qtl	Value of Production	Cost of Cultivation	Yield Qtl	Area In Ha	Production In Qtl	Value of Production	Cost of Cultivation	
		3	4	5	6	7	8	9	10	11	12	13	14	15	16		
1	Paddy	67.00	80.00	5360.00	1030.00	55.21	28419.00	22.74	74.00	80.00	5920.00	1030.00	60.98	28419.00	22.74		
2	Fodder	700.00	12.00	8400.00	70.00	5.88	14000.00	1.68	800.00	12.00	9600.00	70.00	6.72	14000.00	1.68		
3	Repe-seed/Oil Seeds	20.00	1.00	20.00	2475.00	0.49	18080.00	0.18	21.00	1.00	21.00	2425.00	0.51	18080.00	0.18		
4	Vegetables	60.00	0.50	30.00	1000.00	0.30	15000.00	0.08	70.00	0.50	35.00	1000.00	0.35	15000.00	0.08		
5	Cotton	28.00	2.50	70.00	2800.00	1.96	32826.00	0.82	31.00	2.50	78.00	2800.00	2.18	32826.00	0.82		
6	Sugar Cane	803.00	1.50	1204.50	139.12	1.68	53227.00	0.80	880.00	1.50	1320.00	139.12	1.84	53227.00	0.80		
7	Maize	49.00	0.50	24.50	960.00	0.24	15437.00	0.08	54.00	0.50	27.00	960.00	0.26	15437.00	0.08		
8	Pulses	11.00	2.00	22.00	2800.00	0.62	19192.00	0.38	12.00	2.00	24.00	2800.00	0.67	19192.00	0.38		
	Total	1738.00	100.00	15131.00	11224.12	66.36	196181.00	26.75	1942.00	100.00	17025.00	11224.12	79.51	196181.00	26.75		

TABLE-13

S. No.	Crop	Without Project										With Project					
		Rabi	Yield Qtl Ha	Area in Ha	Production in Qtl	Value of Production		Cost of Cultivation		Yield Qtl	Area in Ha	Production in Qtl	Value of Production		Cost of Cultivation		
						Rate	Amount	Rate/Ha	Amount				Rate	Amount	Rate	Amount	Rate/Ha
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	Wheat		57.00	84.00	4368.00	1285.00	56.13	25823.00	21.69	57.00	84.00	4783.00	1285.00	61.53	25823.00	21.69	
2	Rabi Fodder		690.00	12.00	8280.00	70.00	5.80	14000.00	1.68	800.00	12.00	9600.00	70.00	6.72	14000.00	1.68	
3	Rapesseed/Oil Seeds		20.00	1.00	20.00	2425.00	0.49	18080.00	0.18	21.00	1.00	21.00	2425.00	0.51	18080.00	0.18	
4	Vegetables		60.00	0.50	30.00	1000.00	0.30	15000.00	0.08	70.00	0.50	35.00	1000.00	0.35	15000.00	0.08	
5	Sugar Cane		0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	
6	Pulses		11.00	1.00	11.00	2800.00	0.31	19192.00	0.19	12.00	1.00	12.00	2800.00	0.34	19192.00	0.19	
7	By product of wheat		49.00	84.00	4116.00	250.00	10.29	0.00	0.00	54.00	84.00	4536.00	250.00	11.34	0.00	0.00	
	Total		882.00	184.00	16825.00	7830.00	73.31	92095.00	23.82	1014.00	184.00	18992.00	7830.00	80.78	92095.00	23.82	
	G.Total				31956.00		139.67		50.57			36017.00		154.29		50.57	

139.67-5057 = 89.10 Lacs

154.29-50.57 = 103.72 Lacs.

Incremental Agricultural production/100 Ha

Net Benefit /100 Ha  
103.72-89.10 =  
14.62/Ha

36017-31956 = 4061/Qtl

47

Table T-14

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.

DESCRIPTIVE STATEMENT OF NEW PROPOSED S.T.P DISTY.

Name of Channel	Off taking channel	Off taking RD	Discharge of Channel at Head in CS.	Tail RD	Length in KM	Committed Area Ha		Benefited Area Ha 90% of CCA			Additional Irrigation Potential created in Ha
						GA	CCA	Kharif	Rabi	Avg.	
1	2	3	4	5	6	7	8	9	10	11	12
New proposed STP Disty	Budha Nalla 150000	150000	220 CS	1756 00	53.54	15575	13544	12190	12190	12190	12190

418

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.

## Annexure A1

**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.**

**DETAIL ABSTRACT OF COST**

S.NO.	DESCRIPTION		AMOUNT (IN Lac)
	<b>DIRECT CHARGES</b>		
	<b>I-WORK</b>		
<b>1</b>	<b>A-PRELIMINARY</b>		
	Detailed Surveying, Levelling & observing Cross Section (L.S)	=	5.50
	Preparation & Printing of Project Reports (LS)	=	1.50
	Establishing & Fixing Bench Marks (LS)	=	2.50
	Cosultancy Charges (LS)	=	11.00
	Field Tests & Soil Classification (L.S)	=	2.50
	54 Km Havey Jungle Clearance	=	20.00
	<b>Total</b>	=	<b>43.00</b>
<b>2</b>	<b>B-LAND</b>		
i)	For straightening the alignment (7000x120/43560) =19.28 Acres		
ii)	For Drain 50000 x 20/ 43560 = 22.95 Acre For disputed Land (L.S.) 40 Acre Total Land = 82.23 Acre Cost of 82.23 Acre land @ 25.00 Lac per Acre	=	2055.75
	Add 30% of compulsory Acquisition charges	=	616.72
	Add 5% of Crop Compensation Charges	=	102.78
	Add 5% for compensation of Buildigns	=	102.78
	<b>Total</b>	=	<b>2878.03</b>
<b>3</b>	<b>C-WORKS.</b>		
	57 No. Constructing outlets/Tail Clusters@ 35000/each.	=	19.95



<b>4</b>	<b>D-REGULATOR</b>		
i)	Providing Head Regulator and Cross regulator of proposed disty. And cross regulator of proposed disty. And Budha Nala at RD 0 cost of civil works including protection works	=	600.00
	Cost of Gatges and Gearing		
	Gate Sizes ( 18 x 5.00) = 90 Sqft. @ 6000/per Sqft.		5.40
	Gate Sizes ( 65 x 5.00) = 325 Sqft. @ 6000/per Sqft.		19.50
ii	Intake Structure at RD 2500 of 6-R Disty and RD 175600 of propsed disty		
	Cost of Civil Works	=	5.50
	Cost of Gates & Gearing	=	3.00
	<b>Total</b>		<b>633.40</b>
<b>5</b>	<b>E-FALLS at RD</b>		
	Discharge upto 100 cs. @ 19.25		
	1 Nos Constructing falls at RD 132200		19.25
<b>6</b>	<b>F-CROSS DRAINAGE WORKS</b>		
	Syphon crossing at RD		
	11 No.21000, 30000, 40000, 58000, 67500, 70000, 75500, 93300, 102000,112000, 118000		242.00
	@ Rs. 22.00 Lacs each		
	1 No.Syphone Acqueduct at RD 45285 crossing Purain Drain 350/-		350.00
	1 N. Symphon Aqueduct crossing Jaisowal Drain at RD 110000		
	@ 800/- Lac		800.00
	1 N. Symphon Aqueduct cum Bridge at RD 156305 crossing Kishanpura distributory		
	@ Rs.200.00		200.00
	Syphon Aqueduct at RD 159750 crossing Kishanpura Drain		
	@ Rs. 175.00		175.00
	<b>Total</b>		<b>1767.00</b>
<b>7</b>	<b>G.Bridges.</b>		
	Discharge above 100 cs.		
	7 No. construction of Single V,R.Bridges at RD 4492,6692,112545, 114530,117650,122244,123989,@ 13.15		

		92.05
	27 Nos Construction of Double V.R.Bridges at RD 14380,17285,19978	
	22948,34390,35285,37723,41205,45485,47330,52030,531 23,54800,	
	58766,60510,63989,66452,69477,73251,80389,85110,866 00,89291,	710.10
	93000,97850,98731,104838,	
	Rs. 26.30.Lac each	
ii)	Discharge upto 100 cs.	
	9 Nos. Construction of Single V.R.Bridge at RD 128105,130665,	74.25
	132000,134800,135234,138400,164265,166645,173375,	
	Rs. 8.25	
	4 Nos. construction of Combind disty /drain V.R.Bridges at RD 145430,	
	148875,151840,152980,	
	Rs. 16.50 lac each	66.00
	<b>Total</b>	<b>942.40</b>
<b>8</b>	<b>H-Escapes</b>	
	1 No. Escape Regulator At RD 110000 of proposed distributory	
	Cost of Civil Works.	400.00
	Cost of gates & gearing Gate size 16 x 3 = 48 ft. @ 6000 per Sft.	2.88
	<b>Total</b>	<b>402.88</b>
<b>9</b>	<b>I-NAVIGATION WORKS</b>	<b>Nil</b>
<b>10</b>	<b>K-BUILDINGS</b>	
	6 Nos. (2700Sqft.) Construction of Residential Quarters Required for the employees of Sidhwan Canal Division, Ludhiana.	
	Rs.1923 per Sq.ft of the covered Area.	51.92
<b>11</b>	<b>L-I EARTH WORK</b>	
	As per detasisis attached.	6650
	<b>L-II LINING</b>	

	<b>GRAND TOTAL OF E/W &amp; LINING</b>	
12	<b>M-PLANTATION</b>	Nil
13	<b>N-TANKS AND RESERVOIRS</b>	Nil
14	<b>O-MISCELLANEOUS</b>	
	28800 Km ( 24 x 1200) running of Vehicles for inspection purpose during implementation of the project @ 13.70/K.M.	3.95
ii)	351 Nos. ( 175600/500) Fixing of Distance Marks & Boundary Pillars.Rs. 2680/-each (For cost refer Page No.	9.41
iii)	70 Nos. ( 175600/2500) Sign Boards/identification Boards @ Rs.3000/each (M.R.)	2.10
iv)	Visit of Dignitaries (L.S.)	1.10
v)	Technical Records/Photographic Records (LS)	1.10
vi)	Inaugural Ceremonies (L.S.)	1.10
	<b>Total</b>	<b>18.76</b>
15	<b>P-MAINTENANCE</b>	
	1% of the cost of I-works except the cost of A-Preliminary B-Land Q Special T& P	105.06
	1% of (19.95 +633.40+19.25+1767+942.40+402.88+51.92+6650+18.76) 10505.56	
16	<b>Q-SPECIAL T &amp; P</b>	
i)	1 No. purchase of computer with printer Rs. 37700/each (M.R.)	0.38
ii)	1 No. purchase of Fax. Machine Rs. 10000/- each (M.R.)	0.10
iii)	1 No. purchase of Photostate Machine rs. 55000/-	1.10
	<b>Total</b>	<b>1.58</b>
17	<b>R-Communication</b>	
18	<b>S-POWER PLANT &amp; ELECT. SYSTEM.</b>	
19	<b>T-WATER SUPPLY WORKS</b>	
20	<b>U-DISTY, MINORS &amp; SUB MINORS.</b>	
21	<b>V-WATER COURSES &amp; FIELD CHARGES.</b>	

22	W-DRAINAGE		
23	X-ENVIRONMENT AND ECOLOGY		
24	Y-LOSSES ON STOCK AND UNFORESSEEN ITEMS		
	0.25 % of the cost of 1-works except the cost of A-preliminary, B-land		
	Q-Special		
	0.25% of 10505.56	=	26.26
25	ESTABLISHMENT CHARGES		
	TOTAL DIRECT CHARGES	=	13559.49
	INDIRECT CHARGES		
	Capitalization of abutment of Land revenue & 5% of 2055.75 lacs.	=	102.78
	Audit & Account Charges @ 1% on 10Works 10505.56	=	105.05
	TOTAL INDIRECT CHARGES	=	207.83
	TOTAL INDIRECT AND DIRECT CHARGES.	=	13767.32
	Total Cost in Crores	=	137.67

Sub Divisional officer  
Sidhwan Canal Sub  
Division  
Ludhiana.

Sub Divisional officer  
Moga Canal Sub Division  
Moga.

Sub Divisional officer  
Zira Canal Sub Division  
Zira

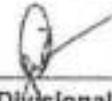
Executive Engineer  
Sidhwan Canal Division  
Ludhiana.

**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.**

**ABSTRACT OF COST FOR L-I EARTH WORK**

Qty.	Unit	Description	AMOUNT IN LACS
266850	cum	Earth work undressed combind lead 45 Meter including breaking of clods @ ( 39.77 +4 x 1.66 ) +12% = 51.98	138.71
1716521	cum	Earth work undressed for combind with avg. lead 5 KM including 1st Km and Last 2 Km Katcha including loading and unloading Complete in all respects. @ (142.50 + 20% 75 +20% 32.25)+15% 4.33 +4.15 +36.50 +12% +15.22 +15% = 256.11	4396.18
827187	cum	Earth work undressed with Avg. lead 5 KM including 1st KM and Last 2 KM Katcha including Loading and unloading Complete in all respects @ 142.50+20% of 75 +20% 32.25+15% 15.22 +15% = 205.74	1701.85
743250	sqm	Dressing of Earth work. @ 0.50 +12% = 0.56/Sqm	4.16
		Add 5% for water charges and contingency	6240.9
		Add cost as per detail attached	312.04
		<b>G.Total</b>	<b>6552.84</b>

  
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 LUDHIANA  
CITY AFTER TREATMENT AT STP THROUGH BUDHA NALLAH AND BY  
CONSTRUCTING NET WORK OF DISTRIBUTORY/WATER COURSE.**

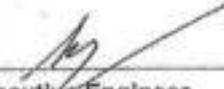
**ABSTRACT OF COST FOR L-I EARTH WORK**

Qty.	Unit	Description	AMOUNT IN LACS
28853	cum	Earth work undressed combind lead 45 Meter including breaking of clods @ ( 39.77 +4 x 1.66 ) +12% = 51.98	15.00
37468	cum	Earth work undressed for combind with avg. lead 5 KM including 1st Km and Last 2 Km Katcha including loading and unloading Complete in all respects. @ (142.50 + 20% 75 +20% 32.25)+15% 4.33 +4.15 +36.50 +12% +15.22 +10% = 256.11	77.09
63172	Sqm	Dressing of Earth work @ 0.50 +12% = 0.56/ Sqm	0.35
			92.44
		Add 5% for water charges and contingency	4.62
		<b>G.Total</b>	<b>97.06</b>

  
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 LUDHIANA CITY AFTER TREATMENT AT STP THROUGH BUDHA  
NALLAH AND BY CONSTRUCTING NET WORK OF DISTRIBUTORY/WATER COURSE.

EARTH WORK STATEMENT RD 0-60000

S.No	X-Section RD	Length	Earth work Excavation			Earth work Puddling			Earth work Dressed		
			Area	Mean Area	Contents	Area	Mean Area	Contents	Area	Mean Area	Contents
1	2	3	4	5	6	7	8	9	10	11	12
1	150	150	0	0	0	123.22	61.61	9242	45.43	0	0
2	10000	9850	88.25	43.12	424732	295.13	209.18	2060423	42.74	44.08	434186
3	20000	10000	58.96	72.6	726000	158.32	226.72	2267200	41.02	41.88	418800
4	30000	10000	33.04	46	460000	319.76	240.04	2400400	40.37	40.69	406900
5	40000	10000	50.7	41.87	418700	0	341.47	3414700	43.47	41.92	419200
6	50000	10000	135.04	92.87	928700	370.95	365.86	3658600	42.24	42.86	428600
7	60000	10000	116.77	125.9	1259000	327.14	348.85	3488500	44.42	43.33	433300
8	70000	10000	87.03	101.9	1019000	399.63	363.38	3633800	41.75	43.08	430800
9	80000	10000	88	84.51	845100	393.59	396.61	3966100	43.16	42.45	424500

10	90000	10000	148.69	118.34	1183400	86.65	240.12	2401200	33.83	38.5	385000
11	100000	10000	25.59	87.14	871400	378.78	232.71	2327100	45.52	39.67	396700
12	110000/109850	10000	0	12.79	127900	657.99	518.38	5183800	53.63	49.57	495700
13	120000	10000	0	0	0	321.1	489.55	4895500	48.8	51.21	512100
14	130000	10000	0	0	0	446.82	383.96	3839600	52.43	50.6	506000
15	140500	10500	28	7.85	82425	450.76	448.79	4712295	52.43	52.43	550515
16	150000	9500	0	32.15	305425	401.85	426.355	4050372.5	51.39	51.91	493145
17	159750	9750	56	48.155	450011	306.25	354.1	3452475	48.95	50.17	489157.5
18	175800	15850	0	28	443800	301.82	304.05	4819192.5	48.47	48.71	772053.5
				Or	9545593.25			60580499.5			7998659.4
					268856			1716521			723250

= 268856 cum  
 = 1716521 cum  
 = 743250 cum

1. Earth work undressed combined lead 45 Metre
2. Earth work undressed for combined lead 5 KM
3. Earth work Dressed with Avg. Lead 5 KM

Sub Divisional officer  
 Moga Canal Sub Division  
 Moga.

Sub Divisional officer  
 Zira Canal Sub Division  
 Zira

Sub Divisional officer  
 Sidhwan Canal Sub Division  
 Ludhiana.

Executive Engineer  
 Sidhwan Canal Division  
 Ludhiana.

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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.

EARTH WORK STATEMENT RD 140000-150000

S.No	X-Section RD	Length	Earth work Excavation			Earth work Puddling			Earth work Dressed		
			Area	Mean Area	Contents	Area	Mean Area	Contents	Area	Mean Area	Contents
1	2	3	4	5	6	7	8	9	10	11	12
1	140000-150000	10000	101.88	0	1018800	234.18	0	2341800	0	0	0
				or	1018800 cft			2341800 cft			

1. Earth work Long lead 5 KM
2. Earth work Local available
3. Earth work Dressed (2x25+2x5x1.80) x 10000 = 680000 Sft

= 37468  
 = 28853  
 = 63172 Sqm

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.

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.

ANALYSIS OF RATE

Carriage of materials

1.	C/o of Cement with avg. lead 15 km pucca including loading & unloading complete in all respect.(CSR Item 5.2 ii) @ $(72+5 \times 8.25+5 \times 6.75) \times 15\% (1.68+1.68)+13\%$ $= 169.05/\text{Tone} +20+3.80=12.25 \text{ Bag}$	12.25 / Bag
2.	C/o of Bricks with avg. lead 10 km pucca.(CSR Item 5.2 ii) @ $(288.75 \times 5 \times 27.75)+15\%+(39.20+39.20)+13\%$ $= 580.22/\%$	580.22 /%
3.	C/o of sand with avg. lead 60 km @ $(142.50+5 \times 11.25+10 \times 7.50+20 \times 4.50)+15\%+(20 \times 3.35)+10\%$ $(15.80+9.80)=26.60+13\% = 522.07/\text{cum}$	522.07/cum
4.	C/o of coarse sand with avg. lead 225 Km including loading & unloading @ $(142.50+5 \times 11.25+10 \times 7.50+20 \times 4.50)+15\%+(20 \times 3.35)+10\%$ $+(9.0 \times 1.70)+8\%+(75 \times 1.10)+5\%(16.80+9.80)+13\%$ $= 773.94/\text{cum}$	773.94/cum
5.	C/o shingle with avg.lead 225 Km including loading & unloading @ $773.94-11.07=762.87 / \text{cum}$	762.87/cum
6.	C/o of Brick bats with avg.lead 25 Km including loading & unloading @ $(142.50+5 \times 11.25)+15\%+26.60+13\% = 258.62/\text{cum}$	258.62/cum
7.	C/o of steel with avg.lead 50 Km including loading & unloading @ $(101.25+6 \times 5 \times 5.62 \times 5)+15\%+(56.0+44.80)+13\%$ $= 297.16/\text{Ton or } 29.72/ \text{ Qtl}$	29.72 / Qtl

**ANALYSIS OF RATES**

1.	E/work excavation undressed with avg. lead 15 mtr a combined lead up to 15 mtr including breaking of clouds complete in all respect.(CSR Item 6.2 b) @ 39.77+12%=44.54/ cum	44.54/ cum
a)	Extra E/work excavation undressed for every 7.5 additional lead behind 15 mtr but only 300 mtr l/c breaking of clouds complete in all respect.(CSR Item 6.2 b(i)) @ 1.66+12% = 1.86 cum	1.86/ cum
2.	E/work excavation undressed with an av. lead 1.00 km. Katcha including loading & unloading complete in all respect.(CSR Item 5.2 (i)) @ (75+20%of 75) +15%+16.80 + 13%= 122.48/cum	122.48/ cum
3.	E/work excavation undressed with an av. lead 2.00 km. Katcha including loading & unloading complete in all respect.(CSR Item 5.2 (i)) @(93+20%of 93)+15%+16.80+13%=147.32/cum	147.32/cum
4.	E/work excavation undressed with an av. lead 3.00 km. Katcha including loading & unloading complete in all respect.(CSR Item 5.2 (i)) @(110.25+20%of 110.25)+15%+16.80 +13%=171.13/cum	171.13/cum
5.	E/work excavation undressed with an av. lead 4.00 km. Katcha including loading & unloading complete in all respect.(CSR Item 5.2 (i)) @(126.75+20%of 126.75)+15%+16.80 + 13%=193.90/cum	193.90/cum
6.	E/work excavation undressed with an av. lead 5.00 km. Katcha including loading & unloading complete in all respect.(CSR Item 5.2 (i)) @(142.50+20%of 142.50)+15%+16.80 + 13%=215.63/cum	215.63/cum
7.	E/work excavation undressed with an av. lead 6.00 km.	

	Katcha including loading & unloading complete in all respect.(CSR Item 5.2 (i)) @ $(142.50+11.25+1.50 \times 1+20\% \text{ of } 153.75)+15\%+16.80+13\%$ =231.16/cum	231.16/cum
8.	Extra for laying E/w in 20 cm layers, watering & rolling to specifications complete in all respect.(CSR Item 6.2(i to iii)) $(4.33+4.15+36.50)+12\%=50.38/ \text{ cum}$	50.38/ cum
9.	Dressing of E/work complete in all respect(CSR Item 6.3(i)) @ Rs. 0.50+12%=0.56/ sqm	0.56/sqm
10.	Extra Dressing of E/work complete in all respect. @ Rs. 1.89+12%=1.89/cum (CSR Item 6.12)	1.89/cum
11.	Compaction for earth taken from private land @ 25+12%%=28/cum (CSR Item 6.4)	28.00/cum
12.	E/w Excavation in foundation and trenches etc in all kinds of soil where pick-jumper work is not involved and not exceeding 2mtr depth i.e dressing of bottom and sides of trenches, stacking of excavated soil clear from the edge of excavation and subsequence filling around masonry in 15 cm layers with compaction in doing disposal of all surplus soil as directed with lead of 30 mtrs. (CSR item 6.6) @ 66.28+12% = 74.23/cum	74.23/cum
13.	Laying cement sand mortar 1:5 including supply & carriage of all material and loading & unloading complete in all respect.	
	5.75 bags S/o & C/o. Cement including loading & unloading @ $(295+12.25)=307.25/\text{bag}$	1766.69
	1.15 cum S/o & C/o sand including loading & unloading @ $(52.75+522.07)=574.82$	661.04
	1.00 cum Labour charges @ $425.19+12\% = 476.21/\text{cum}$	476.21
	<b>Total =</b>	<b>Rs.2903.94</b>



14.	E/work for Lip cutting for lining of Irrigation channels inclusive of all allowances leads and dressing Upto 1.50 mtr. height. (CSR 19.23(a)) @ Rs. 68.78+12% = 77.03/cum	77.03/cum
15.	Extra E/work for Lip cutting for lining of Irrigation channels inclusive of all allowances leads and dressing Exceeding 1.50 mtr. but upto 3.00 mtr.height @ Rs.72.10+12% = 80.75/cum (CSR 19.23(b))	80.75/cum
16.	Laying brick lining 7.5 cm thick laid in 1:3 C.S.M. over first layer of 12.5 mm thick cement plaster on subgrade and second layer of 10mm thick cement plaster 1:3 including supply, carriage and loading & unloading of cement, sand & bricks complete in all respect. (For side lining)	
	364 Nos. S/o brick @ Rs. 4418.18/% Nos.	1608.22
	364 Nos. C/o bricks from nearest kiln with an av. lead 25 km including loading & unloading @ Rs. 580.22/% Nos.	211.20
	0.47 cum S/o Sand @ Rs. 52.75 /cum	24.79
	0.47 cum C/o Sand from to site of work with an av. lead 60 km pucca including loading & unloading @ Rs.522.07/cum	245.37
	3.89 bags S/o Cement @ Rs. 295/bag	245.37
	3.89 bags C/o Cement with lead 15 km. including loading & unloading @ Rs.12.25/bag	47.65
	10 sqm Labour charges @ Rs. 82.06+12%=91.91/sqm	919.10
	<b>Total</b>	<b>4203.88</b> Or <b>420.39/sqm</b>
17.	Laying brick lining 7.5 cm thick laid in 1:3 C.S.M. over first layer of 12.5 mm thick cement plaster on subgrade and second layer of 10mm thick cement plaster 1:3 including supply, carriage and loading & unloading of cement, sand & bricks complete in all respect.(For Bed)	

	364 Nos. S/o brick @ Rs. 4418.18%o Nos.	1608.22
	364 Nos. C/o bricks from nearest kiln with an av. lead 10 km including loading & unloading @ Rs. 580.22/%o Nos.	211.20
	0.47 cum S/o Sand @ Rs. 52.75 /cum	24.79
	0.47 cum C/o Sand from to site of work with an av. lead 60 km pucca including loading & unloading @ Rs.522.07/cum.	245.37
	3.89 bags S/o Cement @ Rs. 295/bag	1147.55
	3.89 bags C/o Cement with lead 15 km. including loading & unloading @ Rs. 12.25/bag	47.65
	10 sqm Labour charges @ Rs.(82.06-10%)+12%=82.71/sqm	827.10
	<b>Total =</b>	<b>4111.88</b> Or <b>411.19/sqm</b>
18.	Dressing Bed and preparation of sub grade for lining @ 4.05 + 12% = 4.54/sqm (CSR item 19.1)	4.54/sqm
19.	Dressing of side slopes & preparation of sub grade for lining @ 6.60 + 12% = 7.39/sqm(CSR item 19.2)	7.39/sqm
20.	Extra allowances for producing templates in curved position. (CSR itm19.14) @ 6.89 + 12% = 7.72 sqm	7.72/sqm
21.	Extra allowances for scaffolding in tiles & concrete lining. (CSR itm19.16) @ 10.62 + 12% = 11.89 sqm	11.89/sqm
22.	Curing lining for 28 days in bed (CSR item 19.13 a) @ 3.05 + 12% = 3.42 Sqm	3.42/sqm
23.	Curing lining for 28 days in side slopes @ Rs. 11.05 + 12% = 12.38 Sqm	12.38/sqm
	<b>Total</b>	
24.	<b>Cement Brick masonry 1:3 Foundation and plinth</b>	

	480 Nos	S/o & C/o loading and unloading of Bricks @ Rs. 4418+580.22=4998.40/ % 0 Nos.	2399.23
	2.40 Bags	Supply, Carriage, loading and unloading of Cement @ Rs.295+12.25=307.25 per Bag	737.40
	0.25 cum	Supply, Carriage, loading and unloading of Sand @ Rs.52.75+522.07=576.82 per cum	143.71
	1.00 cum	Labour charges @ Rs.(355.18+12% = 397.80 (CSR Item No.11.9)	397.80
		<b>Total</b>	<b>3678.14</b>
<b>25.</b>	<b>Cement Brick masonry 1:3 Super Structure</b>		
	480 Nos	S/o & C/o loading and unloading of Bricks @ Rs. 4418+580.22=4998.40/ % 0 Nos.	2399.23
	2.40 Bags	Supply, Carriage, loading and unloading of Cement @ Rs.295+12.25=307.25 per Bag	737.40
	0.25 cum	Supply, Carriage, loading and unloading of Sand @ Rs.52.75+522.07=576.82 per cum	576.82
	1.00 cum	Labour charges @ Rs.537.78+12% = 602.31/cum	602.31
		<b>Total</b>	<b>4315.76</b>
<b>26.</b>	<b>Cement Brick masonry 1:3 Foundation and plinth</b>		
	480 Nos	S/o & C/o loading and unloading of Bricks @ Rs. 4418+580.22=4998.40/ % 0 Nos.	2399.23
	1.75 Bags	Supply, Carriage, loading and unloading of Cement @ Rs.295+12.25=307.25 per Bag	537.69
	0.25 cum	Supply, Carriage, loading and unloading of Sand @ Rs.52.75+522.07=576.82 per cum	144.21
	1.00 cum	Labour charges @ Rs.355+18+12% = 397.80/cum	397.80
		<b>Total</b>	<b>3478.93</b>

27.	Laying 1 <sup>st</sup> class brick masonry in cement sand mortar 1:4 in super structure including supply & carriage loading and unloading of cement sand and brick complete in all respects	
	Same as per Item No. 26 above except Labor Charges = 3478.93 - 397.80 = 3081.13	3081.13
	Labour Charges (587.78 + 12% = 602.31)	602.31
	<b>Total</b>	<b>3683.44</b>
28.	350mm wide brick on edge coping laid with cement sand mortar 1:3 and filling triangular portion with over 10 mm thick CP 1:4 over 12.50 mm thick CP i.e. preparation of sub-grades. (unit 10 Mtrs)	
2.00 sqm	Preparation of sub-grades @ 4.05 + 12% = 4.54 Sqmtr	9.08
1.00 sqm	10mm thick cement plaster 1:3 @ 3.14 + 12% = 40.48 sqm	40.48
1.00 sqm	12.5 mm thick cement plaster 1:5 @ 45.18 + 12% = 50.60 sqm	50.60
2.00 sqm	cement plaster 12.50 mm thick 1:3 @ 45.18 + 12% = 50.60 sqm	101.20
195 nos	S/o brick @ Rs. 4418 / %o Nos.	861.55
195 nos	C/o bricks including loading & unloading @ 580.22 / %o Nos.	113.14
1.71 Bag	S/o & C/o of cement @ 295 + 12.25 = 307.25 / Bag	525.40
0.20 cum	S/O sand @ 52.75 / Cum	10.55
0.20 cum	C/o, Loading & Unloading charges @ 522.07 / Cum	104.41
0.41 cum	Labour charges for brick masonry 1:3 Cement sand mortar @ 397.80 / cum	163.10
0.036	Labour charges for cement sand mortar 1:3	17.14

	@476.21	
		Total = 1996.65 or 199.67/mtr
29.	Brick on edge coping 9" wide 4 <sup>1/2</sup> thick cement sand mortar 1:3, 10 mm thick CP 1:4 over 12.50 mm thick CP 1:5 and preparation of sub-grades.(unit 10 Mtrs)	
	0.91 sqm Prepration of sub-grades @ 4.05+12% = 4.54 Sqmtr	4.13
	0.76 sqm 10mm thck cement plaster 1:3 @ 36.14+12% = 40.48 sqm	30.76
	0.76 sqm 12.5 mm thick cement plaster 1:5 @45.18+12% = 50.60 sqm	38.46
	0.91 sqm cement plaster 12.50 mm thick 1:3 @45.18+12% = 50.60 sqm	46.05
	130 nos S/o brick @ Rs. 4418/% Nos.	574.36
	130 nos C/o bricks including loading & unloading @ 580.22/% Nos.	754.29
	1.15 Bag S/o & C/o of cement @ 295+12.25 =307.25 / Bag	353.34
	0.13 cum S/O, Loading & Unloading sand @ 52.75+522.07=574.82 / Cum	74.73
	0.25 cum Labour charges for brick masnry 1:3 Cement sand mortar @ 397.80/cum	99.45
	0.036 cum Cement sand mortar 1:3 @ 476.21/cum	17.14
		Total = 1992.7 or 199.27/mtr
30.	Deep Variety In Cement Sand Mortor 1:3 (unit 1 Sq/mtr)	
	0.015 bag S/o & C/o of cement bags @ 307.25	4.61
	0.0014 cum S/o & C/o of sand i.c loading & Unloding @574.82/cum	0.80

	1.00 Sqm . Labour Charges (CSR item 15.60) @ 46.15+12%=51.69/sqmtr	51.69
	<b>Total</b>	<b>57.10</b>
31.	<b>Deep Variety in Cement Sand Mortor 1:2 (unit 1 Sq/mtr)</b>	
	0.044 bag S/o & C/o of cement bags @ 307.25	13.52
	0.003 cum S/o & C/o of sand l.c loading & Unloding @574.82/cum	1.72
	1.00 Sqm Labour Charges (CSR item 15.59) @ 46.15+12%=51.69/sqmtr	51.69
	<b>Total</b>	<b>66.93</b>
32.	<b>Laying cement concrete 1:4:8 with 40mm brick ballast hand mixed for foundation (unit 1 cum)</b>	
	1.04 cum. S/o brick bats @ Rs. 41+15%=307.50	319.80
	1.04 cum Breaking of Brick Bats into brick Ballast 40 mm @ 82.50	85.80
	0.96 cum. C/o brick bats from nearest kiln with an av. lead 10 km including loading & unloading @ Rs. 358.62/cum.	248.28
	0.48 cum S/o & C/o of Sand @ 574.82 /cum	275.91
	3.50 bags S/o & C/o Cement bags @ Rs. 307.25/bag	1075.38
	1.00 cum Labour charges @ Rs. 330.21+12% = 369.84cum	369.84
	<b>Total =</b>	<b>Rs. 2375.01</b>
33.	<b>Reinforced cement cons. M-20 with shingle machine mixed including materials at site, curing using of vibrator &amp; shuttering etc. complete in all respects. (For Main Slab)</b>	<b>(Unit per cum)</b>
	7.5 Bags Supply of cement @ 295/bag	2212.50
	7.5 Bags Carriage, loading and unloading of Cement with avg lead 15 km puoca @ 12.25 per Bag	91.88
	0.43 cum Supply of course Sand @ 182.56 per cum	78.50

	0.43 cum	Carriage, loading and unloading of coarse Sand with avg lead 225 km pucca @ 773.94 per cum	332.79
	0.85 cum	Supply of Shingle @ Rs.281.66/- per cum	239.41
	0.85 cum	Carriage, loading, unloading & washing of Shingle with avg. lead of 225 Km pucca @ Rs.762.87/- per cum	648.44
	8.25 sqm	Centering & shuttering @ 162.80+12% =182.34 sqmtr	1504.30
	1 cum	Labour charges RCC(M-20) @ Rs.(1271.86+12%=1424.48 per cum	1424.48
		<b>TOTAL</b>	<b>6532.30</b>
34.		<b>Reinforced cement cons. M-20(1:1<sup>1/2</sup>:3) with shingle machine mixed including materials at site,curing using of vibrator &amp; shuttering etc. complete in all respects. (For Approach Slab)</b>	(unit per cum)
	7.5 Bags	Supply of cement @ 295/bag	2212.50
	7.5 Bags	Carriage, loading and unloading of Cement with avg lead 15 km pucca @ 12.25 per Bag	91.88
	0.343 cum	Supply of coarse Sand @ 182.56 per cum	78.50
	0.343 cum	Carriage, loading and unloading of coarse Sand with avg lead 225 km pucca @ 773.94 per cum	332.79
	0.665 cum	Supply of Shingle @ Rs.281.66/- per cum	239.41
	0.665	Carriage, loading, unloading & washing of Shingle with avg. lead of 225 Km pucca @ Rs.762.87/- per cum	648.44
	1 cum	Labour charges RCC(M-20) @ Rs.(921.39+12%=1031.96 per cum	1031.96
		<b>TOTAL</b>	<b>6139.78</b>
35.		<b>Cement concrete M-15(1:2:4) with shingle machine mixed including materials at site,curing using of vibrator centering &amp; shuttering etc. complete in all respects.</b>	(unit per cum)

6.50 Bags	Supply, Carriage, loading and unloading of Cement with avg lead 10 km pucca @ 307.25 per Bag	1997.12
0.45 cum	Supply, Carriage, loading and unloading of coarse Sand with avg lead 150 km pucca @ 773.94+182.56= 956.50 per cum	430.43
0.90 cum	Supply of Shingle @ Rs. 281.66 per cum	253.49
0.90 cum	Carriage, loading, unloading & washing of Shingle with avg. lead of 150 Km pucca @ Rs.762.87 per cum	686.58
1 cum	Labour charges RCC(M-20)(CSR Item 22.90) @ 686.92+12% = 769.35 per cum	769.35
	<b>TOTAL</b>	<b>4136.97</b>
35	<b>Reinforced Cement concrete M-15(1:2:4) with shingle machine mixed including materials at site, curing using of vibrator centering &amp; shuttering etc. excluding S/o &amp; C/o of steel.</b>	
	Same as per item no. 35 except labour charges @ (4136.97-769.35)	3367.62
	Labour charges for RCC, M-15 @ 869.29+12% = 973.60 (CSR 21.32)	973.60
	<b>Total</b>	<b>4341.22</b>
37.	<b>S/o &amp; C/o and fixing for steel up to 20mm dia</b>	
1 Qtl	S/o Steel @ Rs. 4300 per Qtl.	4300.00
1Qtl	C/o Steel from with Avg. lead 50 Km. pucca i.c loading & unloading @ 29.72 qtl	29.72
	Labour Charges (C.S.R. Item 18.18) @ 358.23 + 12% = 401.22	401.22
	<b>Total</b>	<b>4730.94</b>
38.	<b>S/o &amp; C/o structural steel and fixing</b>	

		Same as per item no.37 except labor charges (4730.94-401.22)+200= 4529.72	4529.72
		Labour Charges (C.S.R. Item 18.30) @ 1970.81 + 12% = 2207.31/-qtl	2207.31
		<b>Total</b>	<b>6737.03</b>
39.	<b>Cement concrete M-15(1:3:6) with shingle machine mixed including materials at site, including using of vibrator centering &amp; shuttering etc. complete in all respect</b>		
	4.50 Bags	Supply of cement @295/bag	1327.50
	4.50 Bags	Carriage, loading and unloading of Cement with avg lead 15 km pucca @ 12.25per Bag	55.13
	0.47 cum	Supply of coarse Sand @ 182.56 per cum	85.80
	0.47 cum	Carriage, loading and unloading of coarse Sand with avg lead 150 km pucca @ 773.94 per cum	363.75
	0.94 cum	Supply of Shingle @ 281.66/- per cum	264.76
	0.94 cum	Supply of Shingle @ 762.87/- per cum	717.10
	1 cum	Labour charges cement concrete(CSR 21.40) @ Rs.519.19+12% = 581.49 per cum	581.49
		<b>TOTAL</b>	<b>3395.53</b>
40.	<b>Filling Sand Behind wing walls &amp; abutments (compacted)</b>		Unit cum
	1 cum	S/o sand @ 52.75/cum	52.75
	1 cum	C/o sand @ 522.07 /cum	522.07
	1 cum	Sand filling @ 155.63+12% = 174.31	174.31
		<b>TOTAL</b>	<b>749.13</b>
41.	<b>Dry brick on edge paving over 25mm thick mud mortar grouted with sand</b>		Unit 10 sqmt
	575 no.	S/o Bricks @ 4418 / %	2540.00
	575 no.	C/o including loading & unloading Bricks @ 580.22 / %	333.63

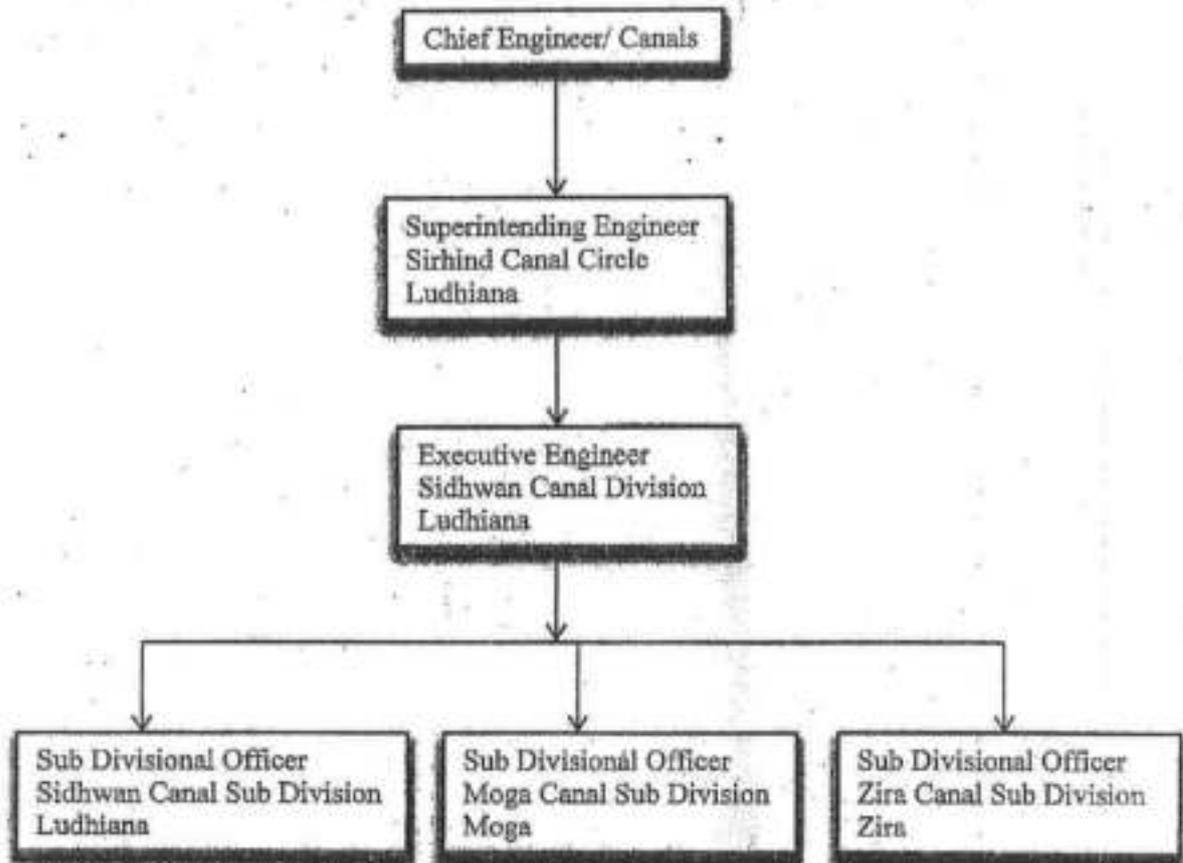
	0.15 cum	S/o sand @ 52.75	7.91
	0.15 cum	C/o including loading & unloading sand @ 522.07	78.31
	10 sqmtr	Labour Charges 30.07 + 12% = 33.68/- sqmt	336.80
		<b>TOTAL</b>	<b>3296.65</b>
<b>42.</b>	<b>Laying 200mm (0.65') thick brick masonry cement mortar 1:4 over 150mm (0.50') thick M-10 in-foundation and plinth.</b>		
	96 Nos.	S/o Brick @ Rs. 4418/- % Nos.	424.15
	96 Nos.	C/o & Loading & Unloading of bricks @ Rs. 580.22 % Nos.	55.70
	1.046 Bags	S/o Cement @ Rs. 295/- per Bag.	308.57
	1.046 Bags	C/o and Loading & Unloading of Cement @ Rs. 12.25 per Bag	12.81
	0.104 Cum	S/o Sand @ Rs. 52.75 per Cum	5.49
	0.104 Cum	C/o and Loading & Unloading of Sand @ Rs. 522.07 per Cum	54.30
	0.128 Cum	S/o Shingle Size 12mm @ Rs. 281.66 per Cum	36.05
	0.128 cum	C/o and Loading & Unloading of Shingle @ Rs. 782.87 per Cum	97.65
	0.150 Cum	For Labour Charges of conc. @ 769.35 (CSR 22.90)	115.43
	0.200 Cum	Labour Charges for brick masonry 1:4 @ 355.18+12%	79.56
		<b>Total</b>	<b>1189.71</b>
<b>43.</b>	<b>Laying stone in wire creates including supply and carriage. Loading &amp; Unloading of stone complete in all respects as per drawing, design and specifications.</b>		
	1.0 Cum	S/o Stone @ Rs. 344.31/- per Cum	344.31

	1.0 Cum	C/o ,Loading & Unloading @ Rs. 762.87/ Cum	762.87
	1.0 Cum	Labour Charges @ 104.26 + 12% = 116.77	116.77
		<b>Total</b>	<b>1223.96</b>
44.	<b>Weaving wire of requisite mesh including cost of supply and carriage.</b>		
	2.20 kg	Anniled wire @ 41340 Mt.	90.95
	1 Sq. Mtr.	Weaving Charges@ 2373+12% = 26.56/sqmtr	26.56
		<b>Total</b>	<b>121.63</b>
45.	<b>Extra for smooth surface with steel shuttering exposed surface (CSR 9.16)</b> @ 102.12+12%=114.24		<b>114.24</b>
46.	<b>Providing &amp; fixing 18mm vide pre-moulded bituminous filling for expansion joint including cost of ceiling compound and primer coat 20mm vide</b> @ 1+12% =1.12 (C.S.R. Item 24.40)		11.20 Mtr/ Depth
47.	<b>Rubbing top surface for abutments and piers rubbed with coir bore natum stone.</b>		25 Sq. Mtr. / Market Rate
48.	<b>10 mm thick cement plaster 1:3 including supply, carriage, loading and unloading of all materials at site, complete in all respect.</b>		(Unit per Sq.m.)
	0.12 bags	Supply,carriage,loading & unloading of cement @ Rs. (295+12.25)= 307.25 per bag	36.87
	0.012 cum	Supply, carriage, loading and unloading of sand @ Rs. 574.82per cum	6.90
	1.00 sqm	Labour charges @ 36.14+12% = 40.48 per sqm	40.48
		<b>TOTAL</b>	<b>84.25</b>
49.	<b>Laying Dry Brick bats including breaking, stacking, supply, carriage, loading and unloading of brick bats etc. at site, complete in all respect.</b>		(Unit per cum)
	1.00 cum	Supply, Carriage, loading and unloading of brick	566.12

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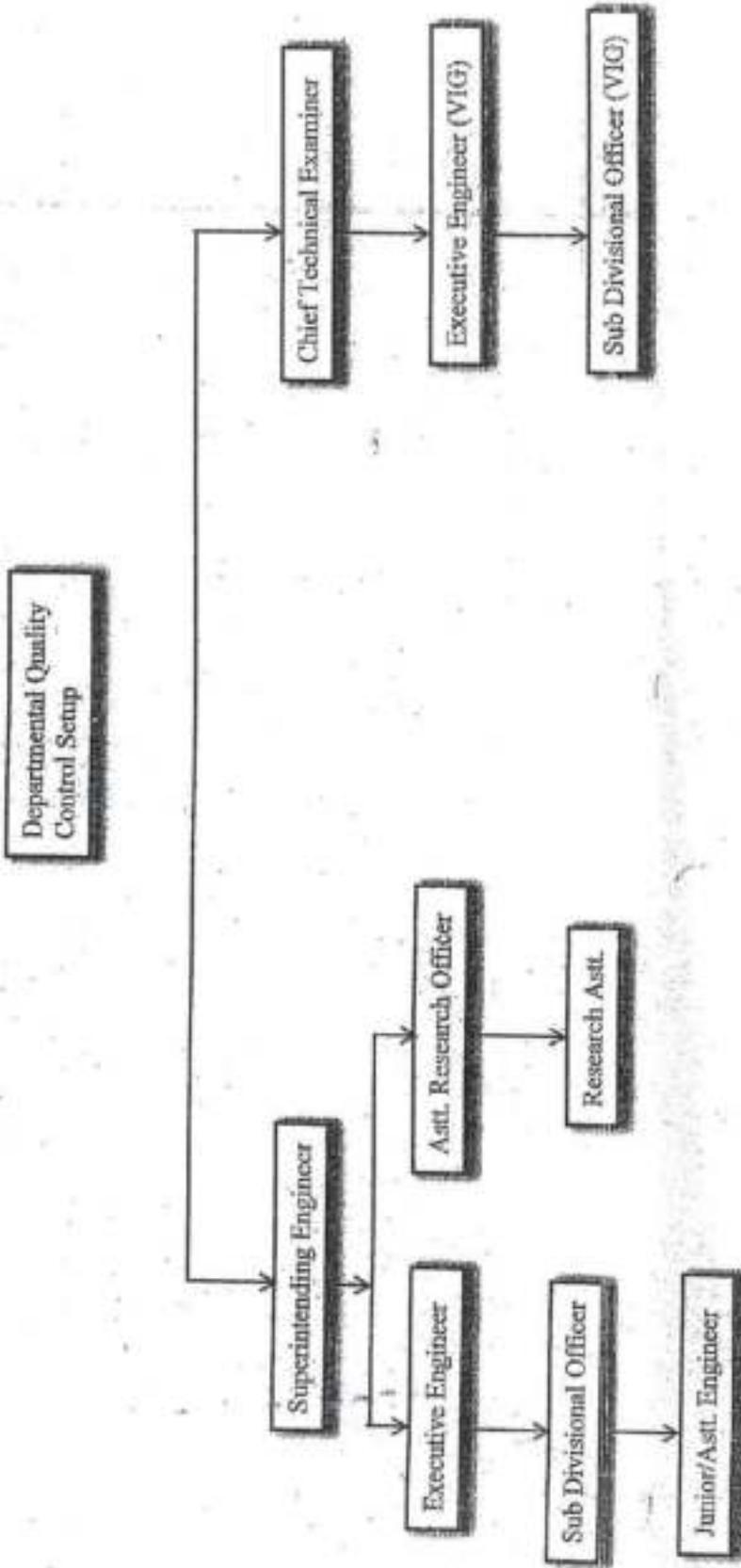
		bats @ Rs.307.50+258.62=566.12 per cum	
	1.00 cum	Labour charges @ Rs.(155.63+12%)= 174.31 per cum	174.31
		<b>TOTAL</b>	<b>744.43</b>
50.		Preparation, watering and raming of surface for laying concrete (C.S.R. Item 10.34) @ 5.17+12% = 5.79	5.79
51.		Dismantling brick work and cement hydraulic work complete in all respects. @ (241.54+50%)+12% = 405.79	405.79 Cum
52.		Dismantling brick work in cement non hydraulic work complete in all respects. @ (241.54+12%)	270.52 Cum
53.		Dismantling cement concrete 1:3:6 hydraulic work complete in all respects. @ (340.54+50%) + 12% = 580.51	580.51 cum
54.		<b>Making Sikri Sarkanda temporary godown 3m x3m with 2 m height 1.1/2 brick thick burnt laid dry excluding cost of bricks but including the cost of other material</b> @ 2400+15%= 2760 each	2760.00
55.		Dismantling RCC 1:1 1/2 :3 =779.99+15%	896.99 Cum
56.		Dismantling RCC 1:3 :6 = 345.54 + 15%	397.37
57.	(a)	Ordinary jungle clearance of both banks of running disty./ Minor & drains with discharge upto 1.5 cums $\frac{(1248+1920.01)+15\%}{2}$	1821.60 KM
	(b)	1.5 cums but upto 4.5 cums $\frac{(1920+2496.01)+15\%}{2}$	2539.20 Km
	(c)	Discharge exceeding 4.5 cums $\frac{(2496+3168.01)+15\%}{2}$	3256.81 KM

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.



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QUALITY CONTROL MANAGEMENT SETUP



Annexure - C

Annexure A



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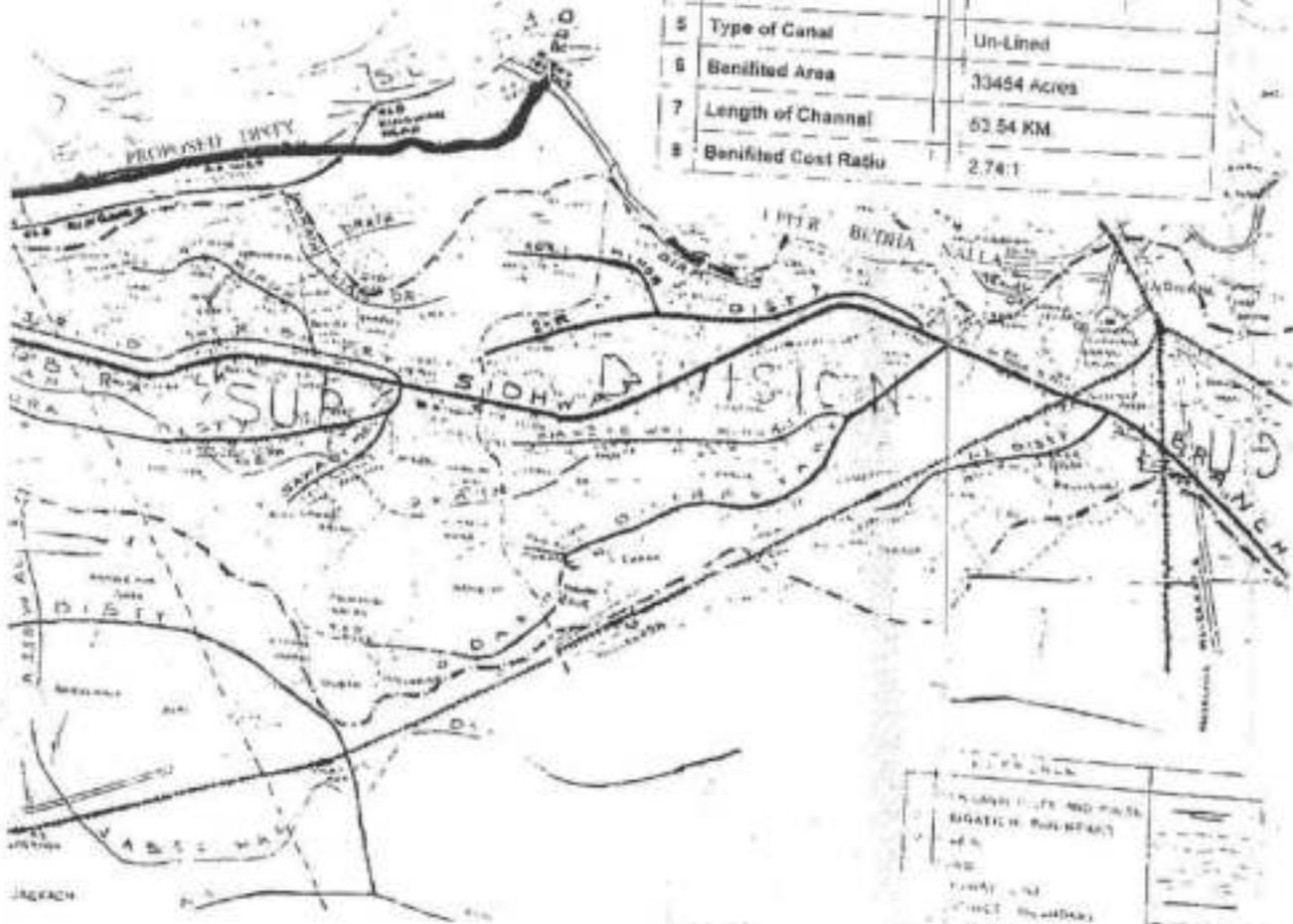
**DIVISION  
LUHIANA**

**PLAN**

DOMESTIC SEWERAGE OF LUHIANA  
STP THROUGH BUDHA NALLAHA 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 & Ferozepur
3	Benefited Villages in Nos.	35 Nos.
4	Total DA/CCA under Project	36472/33454 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



CIVIL WORKS AND PIPES	---
BAGGATE R. BOUNDARY	---
DWTY LINE	---
DIST. BOUNDARY	---
N. S. BOUNDARY	---