

Case Study

On

**250 KLD STP based on SBT system @Village Phulo khari,
Taluka- Talwandi Saboo, Bathinda
Under, HMEL CSR**



Energising a Brighter Tomorrow



सुगम पर्यावरण विकल्प

Punjab state vision clearly depicts their sincere approach for Grey water management (GWM) across state.

VISION:

“The policy envisages maximizing the collection of sewage and its treatment and reusing the treated unused water increasingly for non-potable applications thereby reducing the dependency on the limited ground and surface water resources: and to eventually promote treated unused water as an economic resource to meet with part capital as well as operation and maintenance cost of sewage treatment for 5 enhanced performance.”

More than 70 per cent of freshwater across rural households in India gets converted to greywater.

With the Union water ministry's Jal Jeevan Mission providing tap water connection to every rural household at the rate of 55 liters per capita per day, the problem is set to intensify.

Greywater refers to wastewater from non-toilet systems, that is, wastewater from kitchen sinks, dishwashers, baths, showers, etc.

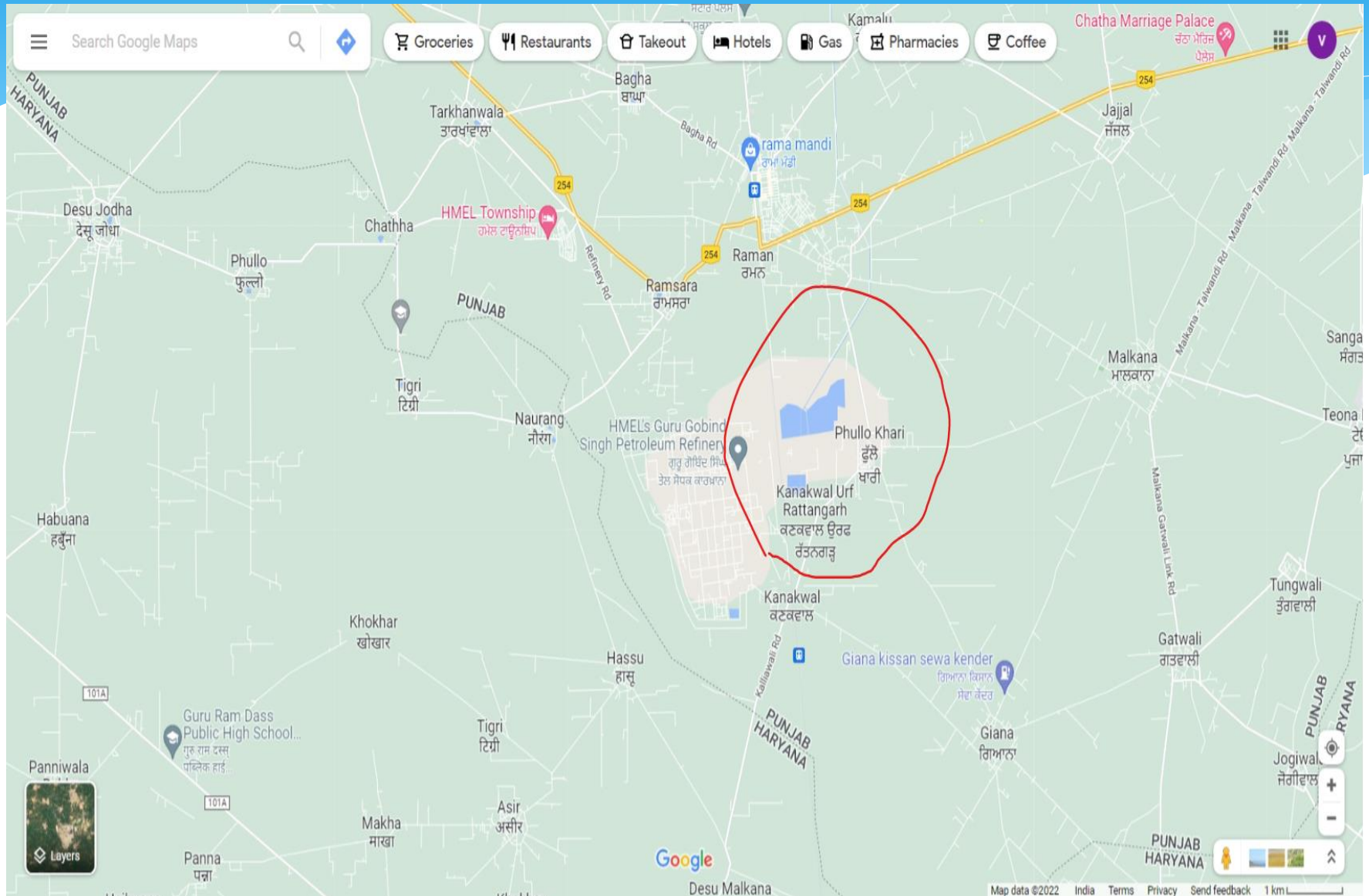
In rural areas, grey water is often let into storm water drains, which is discharged into the surroundings. This poses environmental and public health risks.

Phulo Khari - Village Overview

Gram Panchayat :	Phulo Khari
Block / Tehsil :	Talwandi Sabo
District :	Bathinda
State :	Punjab
Pincode :	151302
Area :	1192.65 hectares
Population :	2,120
Households :	420
Nearest Town :	Raman

Particulars	Total	Male	Female
Total Population	2,120	1,196	924
Literate Population	1,203	745	458
Illiterate Population	917	451	466

Geographical Location: Phulo Khari



Overview of Water Scenario in Phulo Khari

Parameter	Status
<i>Drinking-Water Availability</i>	Huge discrepancies lie in drinking water facilities. The villagers either rely on water tanks, borewells, RO Plants or other sources for drinking purposes.
<i>Water Availability for Domestic Use</i>	Overhead water tanks are insufficient or just enough to meet the water requirements of the villages.
<i>Borewell availability and use</i>	All the villages have borewells though the water is salty and hard. The water is not fit for drinking purposes but can be used for domestic usages like cleaning and washing.
<i>Groundwater Status</i>	The extraction of groundwater is non-economical as the water table is very low. However, some households in villages have excess groundwater pumping.
<i>Open Defecation</i>	Village is comparatively free from open defecation
<i>Sanitation Facilities</i>	Although, most of the households have access to toilets but low to medium open defecation is noticed in all villages, possibly due to the floating population.
<i>Grey Water Management</i>	village have open gutters, some having conditions resulting in sanitation-related health risks.
<i>Rain Water Harvesting</i>	There is good scope of RWH, as the geology comprises mostly of clay, shale and sandstone. Scanty and low rainfall is the only issue.

Call for Action....



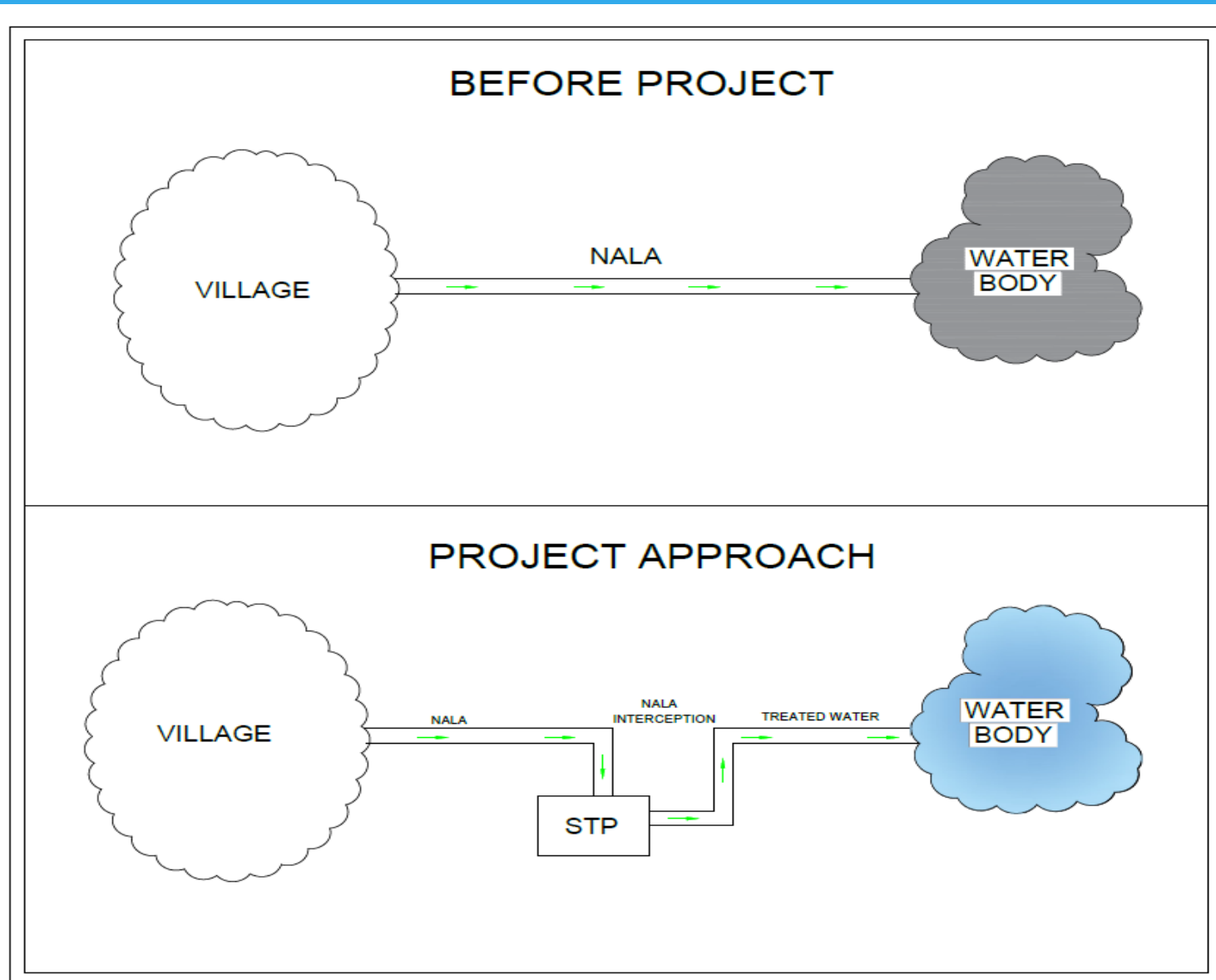
Need to preserve Natural water body of the village Phulo Khari



Approach for solving the Issue

- ✓ Initial Survey of the village was done by HMEL
- ✓ Suitable land parcel near the Pond was identified combinely
Commitment from Gram Panchayat for Land site in Gram Sabha & transfer on 7/12
- ✓ MOU between all stake holders - Gram Panchayat, HMEL, SUGAM, Lifelink
Distribution of Responsibilities (DOR) between all stake holders: Gram Panchayat,
HMEL, SUGAM, Lifelink, Local Vendor
- ✓ Interception of the Nallah was done and flow diverted to wet well
- ✓ STP was installed
- ✓ Treated water from STP was fed into the Village water body----Pond
- ✓ Initial training to run the plnt was given to Pram Panchayat person
Initial O&M assistance for 3 months was given to Gram Panchayat to run the plant
- ✓ O&M manual was given in English and local language to Gram Panchayat
- ✓ Periodic monitoring, Visits, and Technical assistance to Gram panchayat

Engineering Intervention to Problem



Key points of the project

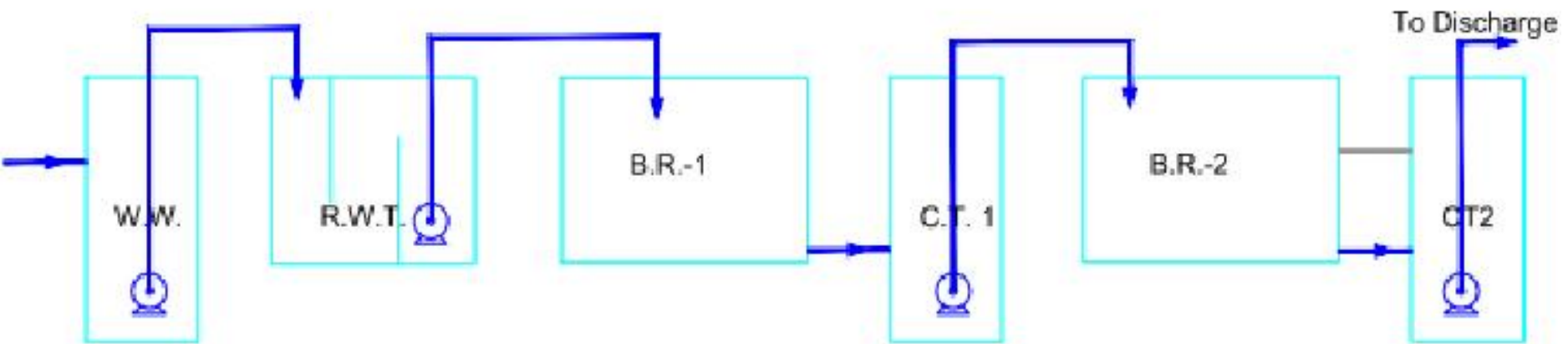
Capacity of STP	: 250 KLD
Area requirement	: 450 sqm for STP, additional area for pond beautification
Ownership of facility	: Phulo Kori Gram Panchayat
Ownership of the project	: HMEL under CSR
Statutory Requirement	: MOU between HMEL & Gram Panchayat
Agencies	: Local contractor
	: SUGAM Paryavaran Vikalp, Mumbai
	: LifeLink Eco Technologies Pvt Ltd, Mumbai
CAPEX in Lacs	: Approx. 105-110 Lacs (to be confirmed from HMEL)
Duration of Project	: 8 months
Year of completion	: 2017-18
	First 3 months training by SUGAM and HMEL to Gram
O&M	: Panchayat
	: Till today run by Gram Panchayat successfully

Distribution of Responsibilities (DOR)

Stake Holders		Activity
✓	Initial Survey	:HMEL
✓	Project Report	:HMEL + SUGAM
✓	Finance	:HMEL
✓	Project Ownership	:HMEL
✓	Facility Ownership	:Gram Panchayat
✓	Land Transfer	:Gram Panchayat
✓	Project work agencies	:HMEL (Overall Supervision) :SUGAM (Design, Drawing, Biomedica) :Local Vendor (CIVIL & Electro-Mechanical work) :Life Link (technology support)
✓	O&M, Training to local staff	:HMEL + SUGAM
✓	Current O&M	:Gram Panchayat since Mid 2018

Process Description

The process is a batch processes in which wastewater is pumped and applied onto the top surface of the Bioreactor as shown in the figure.

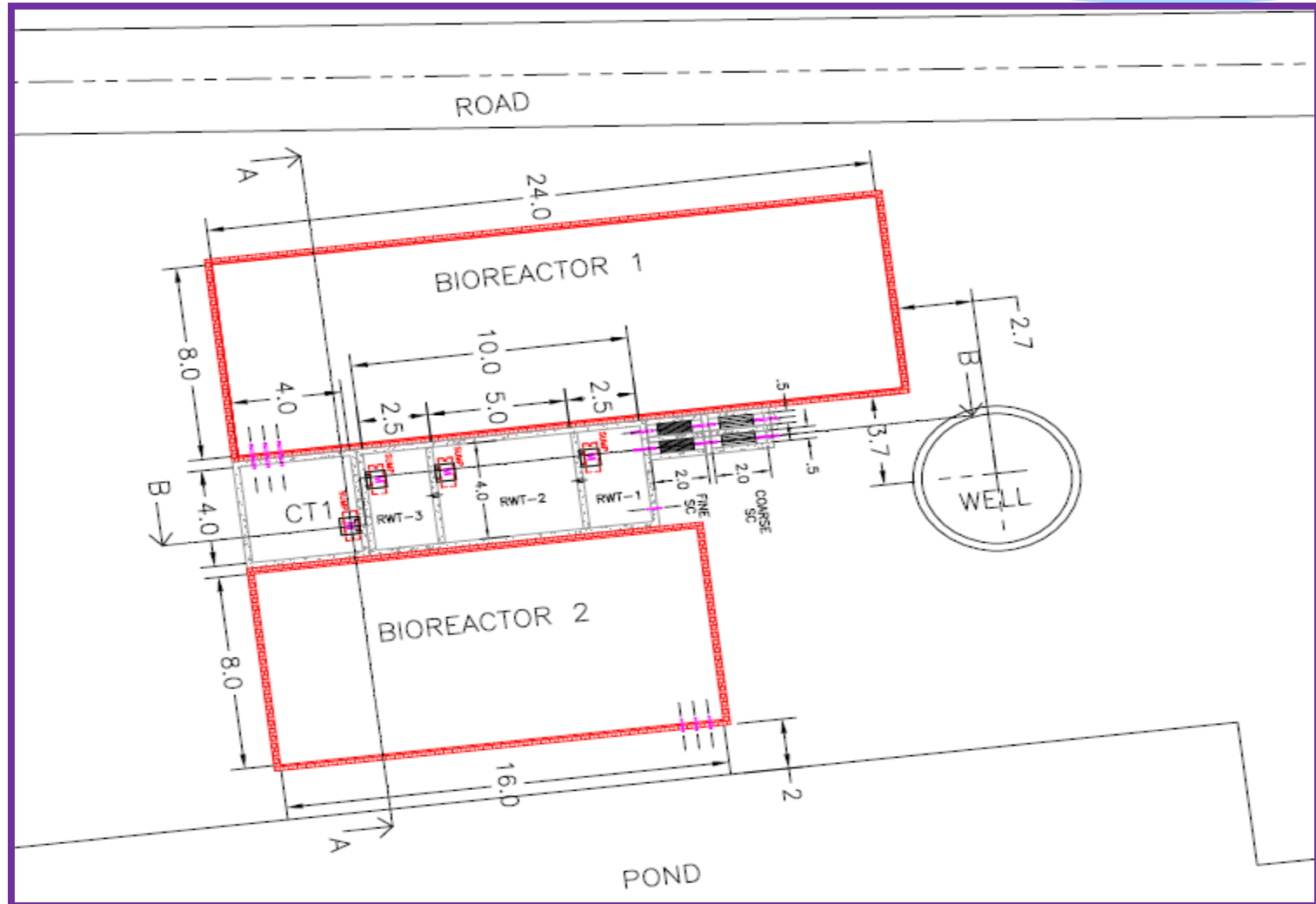


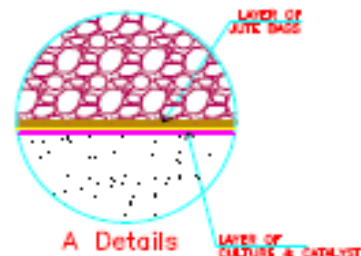
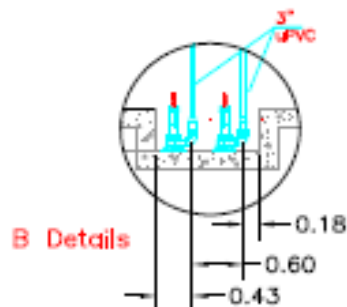
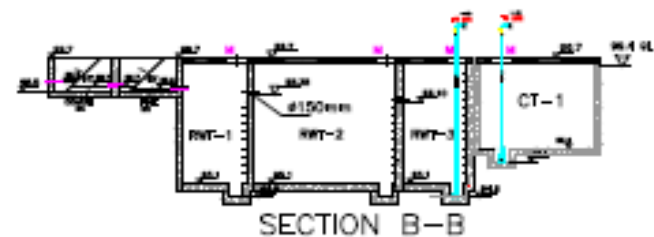
Raw sewage is collected in Raw Water Tank (RWT) after initial screening and settling. The raw sewage is pumped on the top of a SBT Bio Reactor where it percolates through a geological media. The treated water from BR-1 is collected and again treated to attain reuse quality and then collected at the bottom of the Bio-Reactor (BR-2) and stored in a Treated Water Tank (TWT).

Process Description

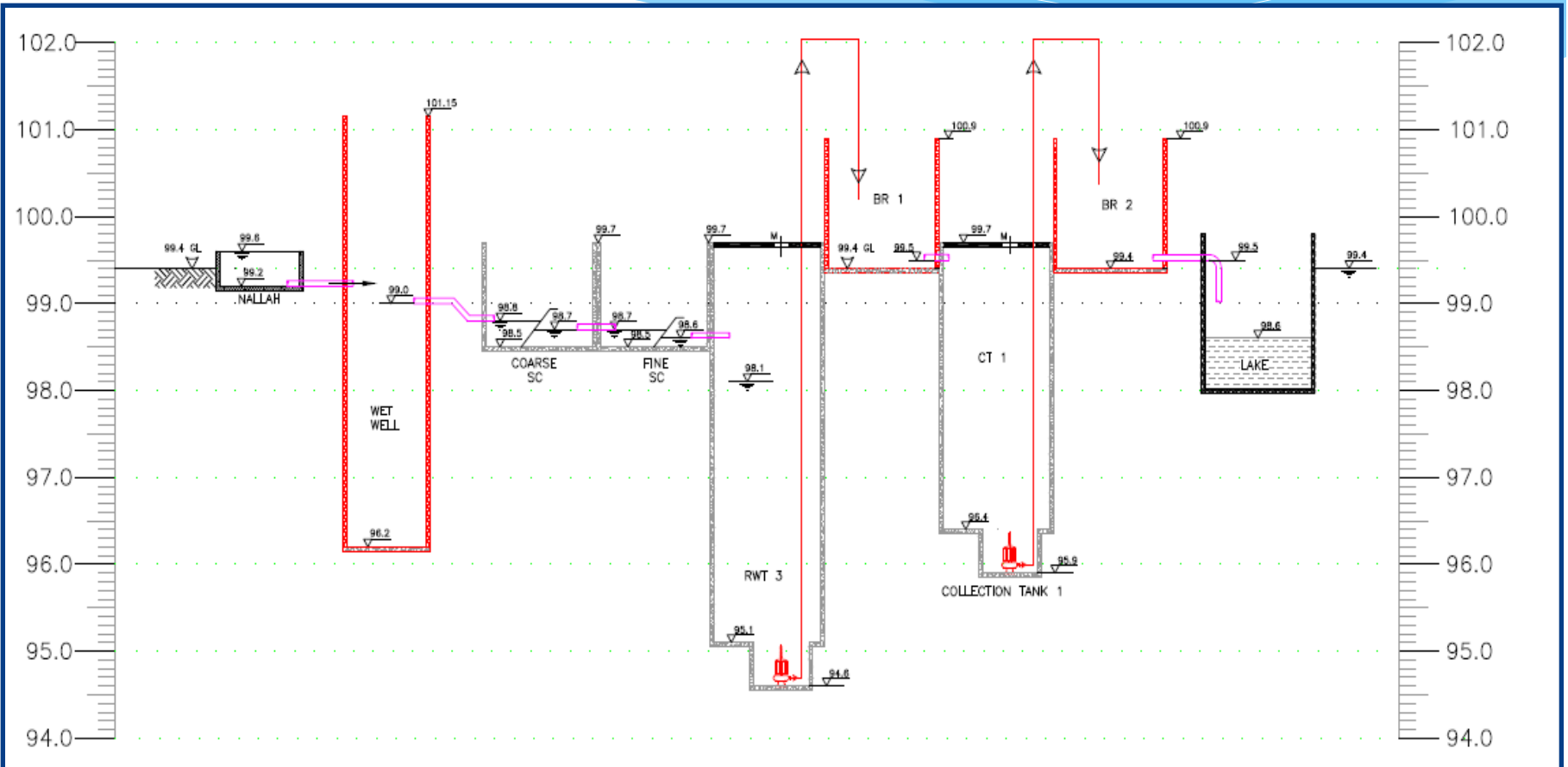
The design has suitable provision for manual removal of suspended solids from the bio filter surface. Distribution of wastewater over the media is achieved via pumping, piping and distribution arrangements. Separate distribution lines are provided for raw wastewater as well as recycle water. The suspended solids are filtered out which includes additives that combine with organic of waste to produce manure. Solids are typically retained in the settling tank and then can be removed mechanically. Water first percolates through the bioreactor media which in houses cultured media in 40-60 min and gets collected into the collection tank. It can then be pumped on to the media again (recycling) in order to achieve maximum solid liquid contact. The recirculation mode is provided for further polishing of the effluent. Dissolved organic and inorganic are oxidized and the water is purified further.

Lay out of the plant

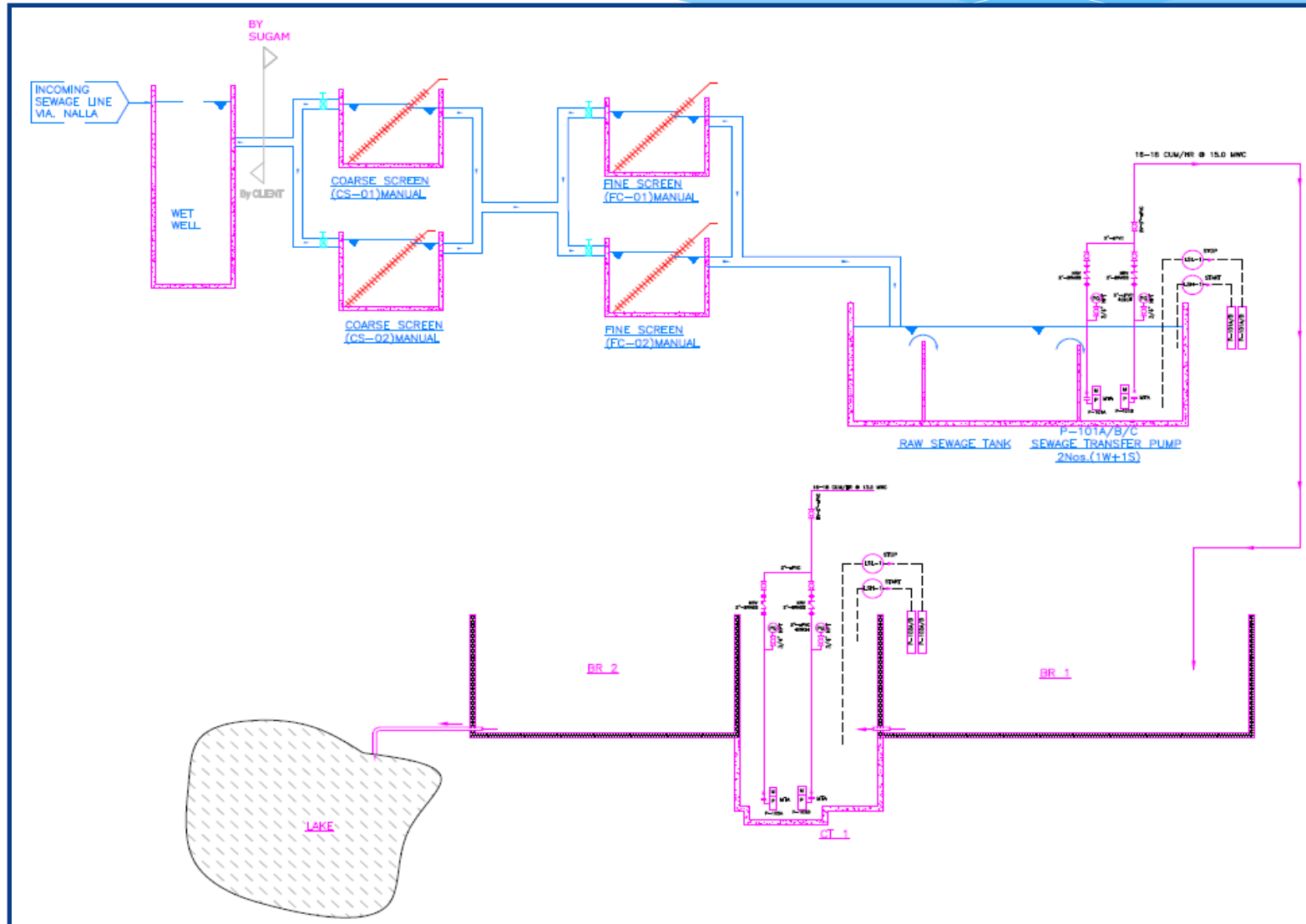


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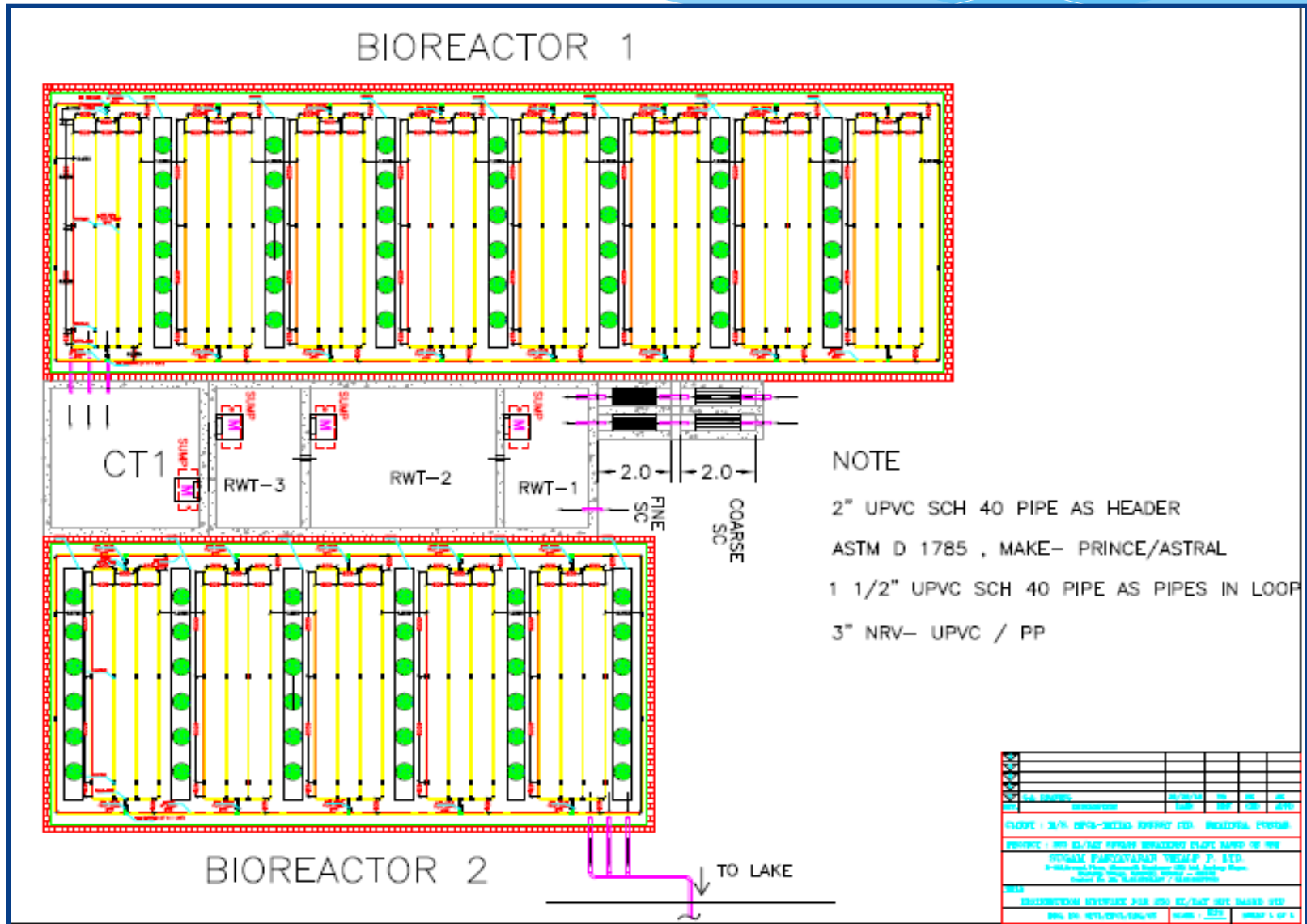
PFD of the Plant



P&ID of the plant



Distribution Layout



Performance of the plant

SN	Parameters	Unit	Input	Output
1	pH		6.0-7.1	7.1-7.4
2	Dissolved Oxygen	Mg/L	ND-2.8	4.0-5.5
3	Suspended Solids	Mg/L	300-400	<20
4	COD	Mg/L	500-1000	<50
5	BOD	Mg/L	300-600	<10
6	Turbidity	NTU	50-150	<5.0
7	Fecal coliform*	CFU/100 mL	10^6 - 10^7	$<10^3$

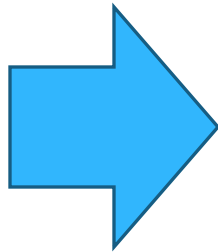
Plant Photos







Transformation.....



Achievements.....

- ✓ **Rural Sanitation**
- ✓ **Sewage Treatment**
- ✓ **Nallah Cleaning**
- ✓ **Containment of Pond pollution**
- ✓ **Pond cleaning & Beautification**
- ✓ **Rejuvenation of local water body**
- ✓ **Water security for the village**
- ✓ **Participation & Ownership of Gram Panchayat in Project**
- ✓ **Regular Maintenance by Gram Panchayat**

Contact Us

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