



The Lawrence School

Sanawar-173202, District Solan
Himachal Pradesh, India
Tele : 01792-261208/261209
Fax : +91-1792-261210

THE LAWRENCE SCHOOL, SANAWAR CASE STUDY PAPER ON WATER RE-CYCLING

The Lawrence School, Sanawar is one of the most prestigious schools of India and being founded in the year 1847, is also one of the oldest. It was earlier called the Royal Military School where children of the British soldiers were sent to study. The School has always had excellent infrastructure backed by dedicated Management and staff to provide all round education to students for many years. Sir Rudyard Kipling stated in his book 'Kim' quote "send him to Sanawar and make a man of him" unquote.

The school is situated on top of a hill near Sanawara village in Himachal Pradesh and is close to Kasauli and Solan. Being formerly an army school, the school received most of its water from MES reservoir near the Kasauli Club by means of a gravity main line of GI of 3" diameter. On an average, the school received 1,28,000 liters per day (128 KLD) if supplies are normal. This supply was however erratic especially during the summer months.

1. **Water Requirement of the School:** The immediate water requirement of the School on an average basis was as under:

SL #	USE OF WATER	CALCULATION (Average Basis)	REQUIREMENT (Liters)
1	Bathing	30 liters x 1,600 units	48,000
2	Washing/Cloths, Utensils etc	35 liters x 1600 units	56,000
3	Cooking	10 liters x 1600 units	16,000
4	Flushing	10 liters x 1600 units	16,000
5	Drinking	5 liters x 1600 units	8,000
6	Gardening		35,000
7	Swimming Pool	Daily topping	3,000
	TOTAL		1,82,000

A Member of the Indian Public School Conference and the Headmaster's Conference (UK)

E-mail : snaoffice@yahoo.com, Website : www.sanawar.edu.in

This is an ideal situation in consumption of water as per Central Public Health and Environmental Engineering Norms, where by each child is given a bath daily. Break up of 1600units staying on the school campus during term time is students -711 staff including supports staff 200 nos X4 (dependents)units = 800units, total say 1600 units.

1. **Future requirement:** The school has many playing fields, which it always wanted to green, but could not do so owing to lack of water.
2. **Water supply situation:** The School received water from various sources. These were as follows:

SL #	SOURCE	AVERAGE QUANTITY (Liters)	BRIEF DESCRIPTION
01	MES (Kasauli)	60,000	Being formerly an army school, the school received most of its water from MES reservoir near the Kasauli Club by means of a gravity main line of GI of 3” diameter. The supply is very erratic.
02	Spring Source	6,000	Erratic supply as spring dries up during summer months.
03	Bore Wells	50,000*	There are 3 bore wells dug. They give a supply ranging from a high of 20,000 liters per day to a low of 2,000 liters per day. One bore well has already stopped working.
04	Tankers	5,000	Water is carried from Pinjore to the School in water tankers at great cost.
05	Recycling of STP	8,000	Partial recycling was being done of sewage water.
06	Rain water harvesting	3,000	Erratic supply and only partial roofs covered.
	TOTAL	1,32,000	

* Bore wells: There are three Bore-wells drilled in the School Campus. These three Bore-wells have been drilled to a depth of about 450 feet to 500 feet each. Initially the discharge from these Bore-wells, like the one below SSC was about 10,000 liters per hour but during the dry spell from March to June, it went down to 2000 to 3000 liters per hour.

3. **Total requirement of the School:** The School urgently needed at least 50,000 liters per day in order to meet its requirements. The School approached many batches for help and many meetings took place, however nothing substantial materialized.
4. **Batch of 1983:** The batch of 1983 created a milestone of sorts by collecting > Rs 20 lakhs from various students. The batch made Mr. Sanjay Aggarwal (their own batch mate) to head the project and create water for the School. This was because Mr. Aggarwal owns and heads, Clover Organic Pvt. Ltd, a Company offering ecological and innovative solutions in the area of wastewater treatment amongst other segments and could provide sustainable solution for the School. Many ideas were discussed by him and rejected. These included the following:

SL #	SOURCES	REMARKS
01	Digging more tube wells	No contractor was willing to offer assured supplies and hence this ideas was dropped.
02	Rain water harvesting	This meant tapping all the major roofs the buildings of the School and creating a contour mapping to collect water in different locations. Estimated cost of the same was given to be > Rs 2 crores and hence this was dropped.
03	More tankers	This was not a sustainable solution. Water had to be carried large distances and with the constant increase in fuel rates, it did not offer a lasting solution and hence it was dropped.

Exploring each idea above and then subsequently rejecting the same took a lot of time. He decided to look at recycling of wastewater as an option and found it to be a plausible solution to the School's problems. After a lot of survey, data was collected and consolidated on the School wastewater situation. (Kindly see Annexure 1).

5. **Implementing the project:** Funding for the project was received from the Batch of 1983. They nominated Clover Organic Pvt. Ltd., to head the project.

6. Details of project implemented:

- a. **Creation of s new STP near Butchery:** A new STP was created of 10 KL capacity. This was to take care of sewage being generated in the Girl's Department (GD) of about 6.5 KLD.
- b. **Refurbishing existing plants:** The existing plants located in PD (Prep Department) & BD (Boy's Department) were repaired and made more efficient.
- c. **Connectivity:** Pipe connectivity was carried out for bringing sewage to the new plant and then taking the same for recycling after treatment.
- d. **Bio-augmentation:** In order to make the water fit for recycling, Clover Organic used NatureVel – WW for the same. It is a microbial product used for making the plants more efficient. This was used in all the plants by the School.

7. **Outcome of the project:** The following benefits accrued to the School as a result of this intervention:

- a. The School has started receiving > 38 KLD of recycled water, which is being used for gardening and flushing. This has freed fresh water of equal quantity and now the School is surplus in water requirements.
- b. Due to the use of NatureVel – WW, there is negligible Coliform in the treated wastewater and the treated waste water more than meets the norms as laid down by CPCB. There is also no foul odour and very little sludge is being created.

8. Some pictures of the project with explanations:



The existing plant at PD (Prep Department) was refurbished under the directions of Clover Organic Pvt. Ltd. The plant now offers water quality within CPCB norms including the Coliform count.



The new plant near the Butchery that was made with the help of the Batch of 1983.



A pipe line was laid to connect the wastewater generated at GD (Girl's department) to the new plant installed near Butchery.

ANNEXURE A:

CLUSTER	AREA	APPX SEWAGE GENERATED		PIPING		METHOD OF TREATMENT FOLLOWED AND PROPOSED						
		CALCULATION	QTY (Ltrs)	INSTALLED	NOT INSTALLED	CLUSTER 1			CLUSTER 2		CLUSTER 3	TOTAL
						Butchery STP	BD ETP	HHBD ETP	PD STP	PD ETP	NEW PLANT PROPOSED	
Cluster 1	Boy's Department (BD)	293 boys @ 35 ltrs per person (flushing only)	21,850	Connected to Butchery STP (Capacity 30 KLD)		10,255						10,255
	Boy's Department (Holding house)	77 boys @ 35 ltrs per person (flushing only)				2,695						2,695
	Staff support (Toilets, bath and kitchen)	89 people @ 100 ltrs per person		Connected to Butchery STP for 21 people.	Piping for 68 people yet to be done	8,900						8,900
	Boy's Department (BD)	293 boys @ 32.50 ltrs per person bathwater only)	9,523	Connected to BD ETP. Capacity 10 KLD			9,523					9,523
	Boy's Department (Holding house)	77 boys @ 32.50 ltrs per person (bathwater only)	2,503		Connected to BD ETP. Capacity 5 KLD			2,503				2,503
	Prep Department (PD)	151 boys & girls @ 35 ltrs per person (flushing only)		Connected to PD STP					9,185			9,185

ANNEXURE A:

Cluster 2	Staff support (Toilets, bath and kitchen)	39 people @ 100 ltrs per person	9,185	Connected to PD STP for 39 people for flushing only	Piping for 39 people for bath and Kitchen yet to be done							
	Prep Department (PD)	151 boys & girls @ 32.50 ltrs per person bathwater only)	4,908						4,908			4,908
Cluster 3	Girl's Department (GD	201 girls @ 35 ltrs per person (flushing only)	10,435	Only septic tank treatment followed so far	Piping would need to be both for inputs and outputs if we set up a new STP for this.	10,435						10,435
	Staff support (Toilets, bath and kitchen)	34 people @ 100 ltrs per person										
	Girl's Department (GD	201 girls @ 32.50 ltrs per person (bathwater only)	6,533									
TOTAL			64,935			32,285	9,523	2,503	9,185	4,908	6,533	64,935
Plant Capacities (Installed)						30,000	10,000	5,000	20,000	10,000	10,000	85,000
Excess/ Shortage (+/-)						(2,285)	478	2,498	10,815	5,093	3,468	16,598
Total water being recycled at present						-	9,523	2,503		4,908	-	16,933
Additional Water made available for recycling						32,285	-	-	9,185	-	6,533	48,003