EMP

CHAPTER - 7

ENVIRONMENTAL MANAGEMENT PLAN

7.0 ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL PERFORMANCE

Any developing project exerts certain adverse and beneficial impacts on immediate surroundings. PCIL has commenced the cement plant in the year 2005. PCIL strongly believes in the eco-friendly industrialization in the area. Since the inception of the cement plant, the management of PCIL had implemented Environmental Management Plan to minimize the adverse impacts on the surrounding areas.

All the process units are provided with pollution control equipment like bag filters and Electro Static Precipitators (ESPs). These dust abatement measures were installed at all the dust prone points and are working efficiently by proper maintenance and upkeep.

Due to the cement plant already in existence, most of the infrastructure of the existing plant will be shared by the new Line.

The site clearance will involve movement of substantial quantities of soil. The digging operation will involve stock piling of waste material which will be reused for leveling within the plant site. During dry weather conditions the dust generated by excavation, leveling and transportation activities will be controlled by sprinkling of water.

The present Environmental Management Plan of the cement plant details the environmental quality control measures to be taken in the post expansion phase. EMP also details the post project monitoring undertaken by the plant authorities in order to maintain environmental quality within the stipulated standard limits specified by APPCB and CPCB

7.1 ENVIRONMENTAL MANAGEMENT PLAN DURING CONSTRUCTION PHASE

PCIL will extend the existing infrastructure facilities available at the cement plant for the construction labour during the installation of the new

line. The following factors would be given consideration to maintain good environmental quality during construction phase.

7.1.1 Air Environment

The installation of the cement plant would result in the increase of SPM concentrations due to fugitive dust. Frequent water sprinkling in the vicinity of the construction sites would be undertaken and will be continued after the completion of plant construction, as there is continuous movement of trucks. It will be ensured that both gasoline and diesel powered vehicles are properly maintained to comply with exhaust emission requirements.

7.1.2 Noise Environment

Noise levels generated during construction activity sometimes may be high. Onsite workers working in noise prone areas would be provided with ear muffs & plugs.

7.1.3 Water Environment

During implementation phase, provision for infrastructural services including water supply, sewage, drainage facilities and electrification will be made from the already available existing facilities. The construction labour would be provided with toilet facilities near the existing cement plant area to allow proper standards of hygiene.

7.1.4 Land Environment

The site for the proposed project is free from vegetation and is within the plant premises. All the units will be located adjacent to the existing power plant.

7.1.5 Socio-economic Environment

Any construction activity will benefit the local population in a number of ways. Management of PCIL will give preference to local people through

both direct and indirect employment in the implementation of the cement plant.

7.1.6 Safety And Health During Construction Phase

The construction, fabrication, erection etc work of Civil / Mechanical / Electrical will be awarded to contractors who will mobilize the manpower. PCIL will provide accommodation to contractors in their colony. Adequate space will be provided for construction of temporary sheds for construction workers mobilized by the contractors. PCIL will supply potable water for the construction workers. The safety department will supervise the safe working of the contractor and their employees. Work spots will be maintained clean, provided with optimum lighting and enough ventilation to eliminate dust/fumes.

7.2 ENVIRONMENTAL MANAGEMENT PLAN DURING OPERATIONAL PHASE

Environmental management plan which is being implemented in the existing plant and which is proposed for implementation in the expansion phase to comply with APPCB and CPCB standards are detailed below :

7.2.1 AIR ENVIRONMENT

7.2.1.1 POLLUTION CONTROL SYSTEMS OF EXISTING PLANT

PCIL has integrated the Environmental management with the manufacturing process.

PCIL has invested about Rs 3.5 Crores for the installation of various pollution control systems in the existing cement plant. Electro Static Precipitators has been installed in the plant for kiln stack to control the emissions and also to meet the emission norms. The emissions from all the chimneys are maintained well within the prescribed norms of APPCB.

Details of the pollution control systems provided in the existing cement plant are given in following table

List of pollution control systems in the plant

S. No.	Location / Unit	Type of Equipment
1	Limestone Crusher	Bag Filter
2	Raw Mill / Kiln	Bag House
3	Coal Mill	Bag Filter
4	Cement Mill	ESP
5	Cooler	ESP
6	Limestone Hoppers	Bag Filter
7	Additives Extraction	Bag Filter
8	Raw Meal Silo	Bag Filter
9	Raw Meal Silo Discharge	Bag Filter
10	Raw Coal Hopper	Bag Filter
11	Cool Crusher	Bag Filter
12	Clinker Stockpile	Bag Filter
13	Clinker Transport to cement Mill	Bag Filter
14	Clinker Transport at Discharge End	Bag Filter
15	Clinker Hopper at Cement Mill Section	Bag Filter
16	Cement Silo	Bag Filter
17	Packing Plant	Bag Filter

All the material handling systems are covered with aprons. Ventilation systems are provided with bag filters in the plant. About 15 bag filters have been provided at various points in the cement plant. All the pollution control equipment were designed to meet outlet particulate emission of less than 115 mg/Nm^3 emission for particulate matter.

PCIL is continuously monitoring the status of various pollution control systems and upgrading them from time to time.

7.2.1.2 POLLUTION CONTROL SYSTEMS - NEW LINE

PCIL under the expansion scheme of the cement plant, to control particulate emission, will install the following pollution control equipment for main process units as given below for Proposed line - II :

POLLUTION CONTROL SYSTEMS - NEW LINE- II

S.NO.		POLLUTION CONTROL EQUIPMENT
1.	Raw mill / Kiln	Bag House
2	Clinker cooler	ESP
3	Coal Mill	Bag filter
4	Cement mills	ESP

18 bagfilters will be provided at various locations in the process line apart from Installation of above Baghouse, Bag filters and ESP, to control the dust emissions from dropping/transfer points of the belt and bucket conveyors. Details of proposed bag filters at various locations is given below :

PROPOSED POLLUTION CONTROL EQUIPMENT

S. No	Location	Pollution Control Eqpt.	Dust Emission mg/Nm3
1.	Belt conveyor transfer point	Bag filter	50
2.	Raw material Hoppers	Bag filter	
3.	Belt conveyor+Weight feeders	Bag filter	
4.	Gravel gate+B.E+Belt conv.+Fluidor	Bag filter	
5.	Kiln/Raw Mill Circuit	**Bag house**	
6.	Central mixing Bin-Insertible	Bag filter	
7.	Bucket elevator, Fluidors, Blending silo	Bag filter	
8.	Weigh bin, Surge bin	Bag filter	
9.	Kiln feed B.E. & Fluidors	Bag filter	
10.	Grate cooler	**ESP**	
11.	DBC and Clinker Stock pile	Bag filter	
12.	Reject belt conveyor and reject silo	Bag filter	
13.	Stock pile extraction	Bag filter	
14.	Stock pile extraction	Bag filter	
15.	Stock pile extraction	Bag filter	
16.	Clinker conveyor TT to mill feed hopper	Bag filter	
17.	Clinker, Gypsum hopper, Weighfeeder, Belt	Bag filter	
18.	Cement mill	**Bag filter**	
19.	Cement mill Separator	ESP	
20.	Cement mill bucket elevator, fluidors	Bag filter	
21.	Cement silo feed bucket elevator and silo	Bag filter	
22.	Packer machine	Bag filter	
23.	Packer machine	Bag filter	

C FUGITIVE DUST CONTROL

Fugitive dust is generated during raw material handling (unloading, conveying, transporting, stacking etc), vehicular movement, bagging and

packing. Asphalting or concreting of the work area will be done by PCIL to control fugitive dust emissions. Unloading of material will be carried out with great care by avoiding dropping of material from height, wetting the material by sprinkling water while unloading.

For control of fugitive dust, water spray arrangement is provided to spray water all round the coal stock piles to suppress the dust and to wet the coal while compacting to minimize the dust nuisance. Adequate ventilation and dust suppression systems will be implemented in the coal conveyer system.

7.3 NOISE POLLUTION CONTROL MEASURES

The noise generating sources are enclosed in the existing cement plant, wherever feasible. Plant machinery like cement mill, raw mill, ID fan, compressors are the major sources of noise pollution. The following measures have been implemented for control of noise pollution:

- Encasement of noise generating equipment wherever feasible.
- A thick greenbelt all around the cement plant site to act as noise attenuator in an area of 8 Ha.
- In addition, personnel working near high noise level generating sources are provided with ear muffs.
- Effective preventive maintenance and vibration measurement of all rotating equipment are helping in the improvement of plant life and also noise reduction.
- Implementation of source control measures and occupational safety measures

The above measures will be implemented for the proposed Line – II

7.4 WATER ENVIRONMENT

The water consumption of the existing cement plant including colony is about 130 m^3/day. Due to implementation of the new line, an additional of 80 m^3/day will be required.

The total water consumption of the plant after expansion will be 210 m^3/day.

Due to adoption of dry process technology, water consumption in the cement plant will be less.

In the expansion i.e in the new line, due to installation of bag house for the kiln, no gas conditioning tower is envisaged and thereby saving of about 200 m^3/day of water will be achieved.

Also PCIL proposes to construct a full fledged sewage treatment plant where the treated wastewater usage for gardening will further result in reduction of raw water consumption.

In the entire process water is used only at very few stages in the process at Cement mill and for cooling. Cooling includes the circulating cooling water for bearings and gear boxes. The other areas of water consumption other than process is for domestic purposes in the plant and colony.

7.4.1 WASTEWATER GENERATION AND DISPOSAL

Of the total water consumption of about 210 m^3/day in the plant including colony, wastewater generation is estimated to be about 88 m^3/day which is mainly from domestic use.

Domestic Wastewater from Plant and Colony

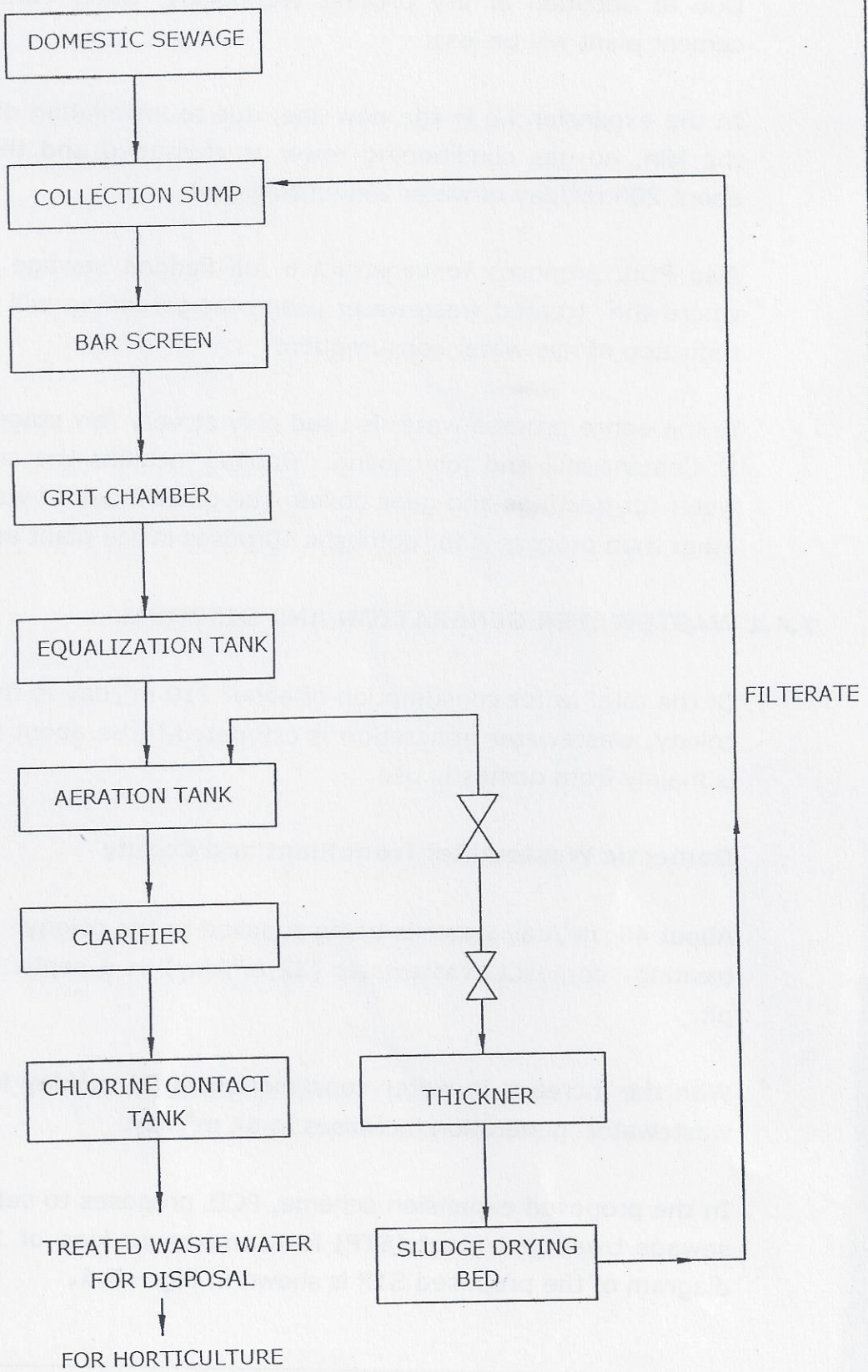
About 40 m^3/day water is being supplied to the colony. PCIL is presently treating domestic wastewater (32 m^3/day) in a septic followed by soak pit.

With the increase in water consumption to 80 m^3/day in the colony, the wastewater generation increases to 64 m^3/day.

In the proposed expansion scheme, PCIL proposes to setup a full-fledged sewage treatment plant (STP) for a maximum load of 100 m^3/day. Flow diagram of the proposed STP is shown in **Fig – 7.1.**

Fig – 7.1.

FLOW DIAGRAM OF SEWAGE TREATMENT PLANT



7.4.2 RAIN WATER HARVESTING & STORM WATER MANAGEMENT

PCIL will design the storm network to collect the rainwater from the plant area. The collected rainwater will be diverted to the proposed rainwater harvesting pits for recharging the ground water.

PCIL has estimated the quantity of rain water which can be harvested. The following are the details of estimate :

Total plot area	: 42.0 ha
Unpaved area	: 22.75 ha
Existing paved area (including roof tops)	: 11.25 ha
Proposed paved area (including roof tops)	: 8.0 ha
Total paved area considered for runoff calculations	: 19.25
Annual rainfall of the area	: 600 mm (0.6 m)
Runoff coefficient for unpaved area	: 0.80
Runoff coefficient for paved area	: 0.90
Runoff from Unpaved area	: 109200 m^3/year
Runoff from paved area	: 103950 m^3/year
Total runoff	: 213150 m^3/year

PCIL has already provided the rainwater harvesting pits measures in the plant. The rain water collected from the above areas collected through a network of drains are routed to a common storm water drain which has an outlet into a rainwater harvesting pit located at the lower level of the plot floor in the eastern direction of the plant.

7.5 LAND ENVIRONMENT

The cement plant along with colony is located in an area of 32 Ha. The proposed new line will be located within the existing cement plant premises.

PCIL will utilize 10 ha of its own land for expansion of the cement plant. The area proposed for acquisition does not cover any habitation or green

cover. There are no settlements in the site and hence displacement of the people is not envisaged.

SOLID WASTE GENERATION AND HANDLING

PCIL has implemented the following measures for solid waste management in cement plant and the same measures will be implemented after expansion of the cement plant.

The dust collected in the air pollution control equipment in the cement plant is recycled back to the process. Hence no solid waste which requires disposal is generated from the plant.

Refractory bricks is one of the solid waste generated from the kiln section. Due to wear and tear, PCIL is replacing the refractory bricks once in a year. These bricks due to high recycling value are disposed to outside agencies.

Solid waste generated from colony and sewage treatment plant will be disposed after segregating the waste into bio-degradable and nondegradable. Bio degradable waste is subjected to composting and non degradable waste is land filled at identified areas.

HAZARDOUS WASTE MANAGEMENT RULES

PCIL is storing the hazardous waste in a designated area. This area is isolated from the other utility areas.

Spent Oil from the gear boxes and automobile batteries are disposed to the authorized vendors as per the Hazardous Wastes (Management and Handling) Amendment Rules, 2003.

7.6 GREEN BELT DEVELOPMENT & PLANTATION PROGRAM

PCIL has already developed greenbelt in a scientific manner around the plant boundary, roadside, office buildings and stretches of open land in an area of 6 ha. PCIL will develop another 8 ha under greenbelt in future. **Fig – 7.2** shows the greenbelt plan of PCIL.

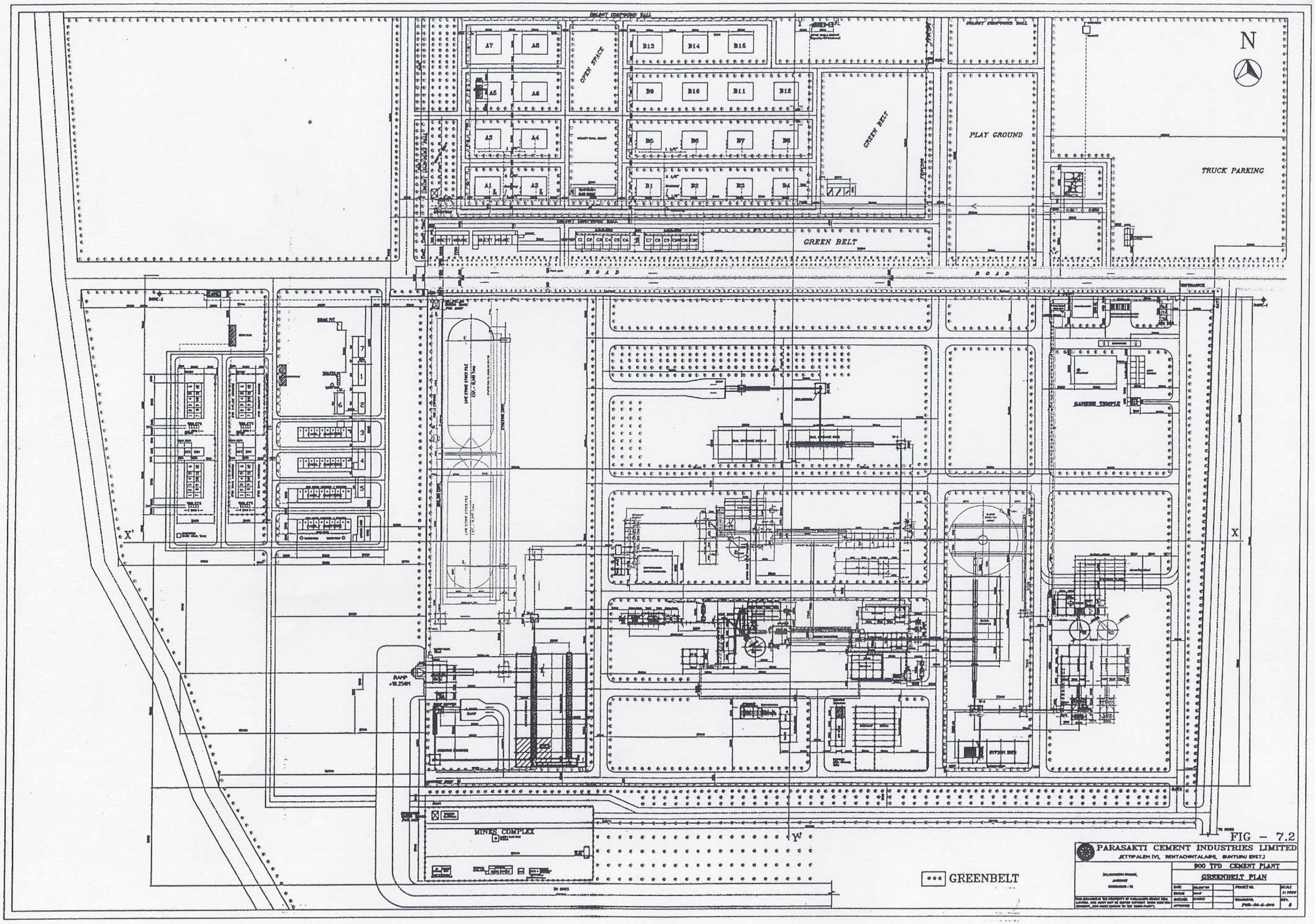

N
TRUCK PARKING
PLAY GROUND
GREEN BELT
OPEN SPACE
A1
A2
A3
A4
A5
A6
A7
A8
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
B13
B14
B15
GREEN BELT
ROAD
ROAD
X
X'
Y'
RAMP
MINES COMPLEX
GREENBELT
PARASAKTI CEMENT INDUSTRIES LIMITED
900 TPD CEMENT PLANT
GREENBELT PLAN

FIG – 7.2

7.7 SOCIO ECONOMIC ACTIVITIES

PCIL has undertaken the following social welfare programme for upliftment of the area.

The salient features of rural development programme are to provide :

- Health and hygiene through mobile medical clinic
- Agricultural extension
- Drinking water Project
- Educational Programme
- Woman and youth development activities
- Income generating schemes
- Sports and cultural activities

Some of the brief highlights of the activities undertaken by PCIL are given in **Annexure – 7A.**

7.8 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

PCIL has provided a dispensary with a full time doctor and supporting staff

Periodical health checkup are done for all the employees. Individual health cards of all the employees and their family members are maintained.

PCIL is participating in the State and central government immunization programs. Free medical camps in health center are conducted regularly.

First-aid materials are maintained in all the areas in the factory. One first-aid center in the mines 'e' stretcher, splints and torn quite is provided in the cement plant.

PCIL has also established a training department to give the need based training to the staff and workers on safety. Training programmes are conducted regularly as per training calendar based on training needs assessed by the concerned departments.

PCIL has prepared the trainer faculty list for imparting the training as and when required. Regular sponsorship of the employees for the external trainings/seminars/meetings is part of PCILs activity. The safety Policy has been made under Factory Act. The safety slogans/cartoons are displayed at strategic places in the factory premises.

7.9 ENVIRONMENTAL MONITORING

M/s. PCIL is implementing various productivity management programs in the plant to improve the work environment, effective house keeping and environmental quality. All the necessary steps were taken in the plant to meet standards prescribed the State Pollution Control Board and Central Pollution Control Board.

7.9.1 ENVIRONMENTAL MANAGEMENT CELL

In order to implement an effective environmental management plan in the plant, M/s. PCIL has constituted a full-fledged environmental cell headed by General Manager. Qualified environmental engineers are looking after the day-to-day environmental activities.

The environmental cell with well-established laboratory will regularly monitor all the pollution sources in the existing plant. Pollution control systems have shown satisfactory performance with respect to the prescribed emission norms. The organization setup of the Environmental cell is depicted in **Fig -7.3**

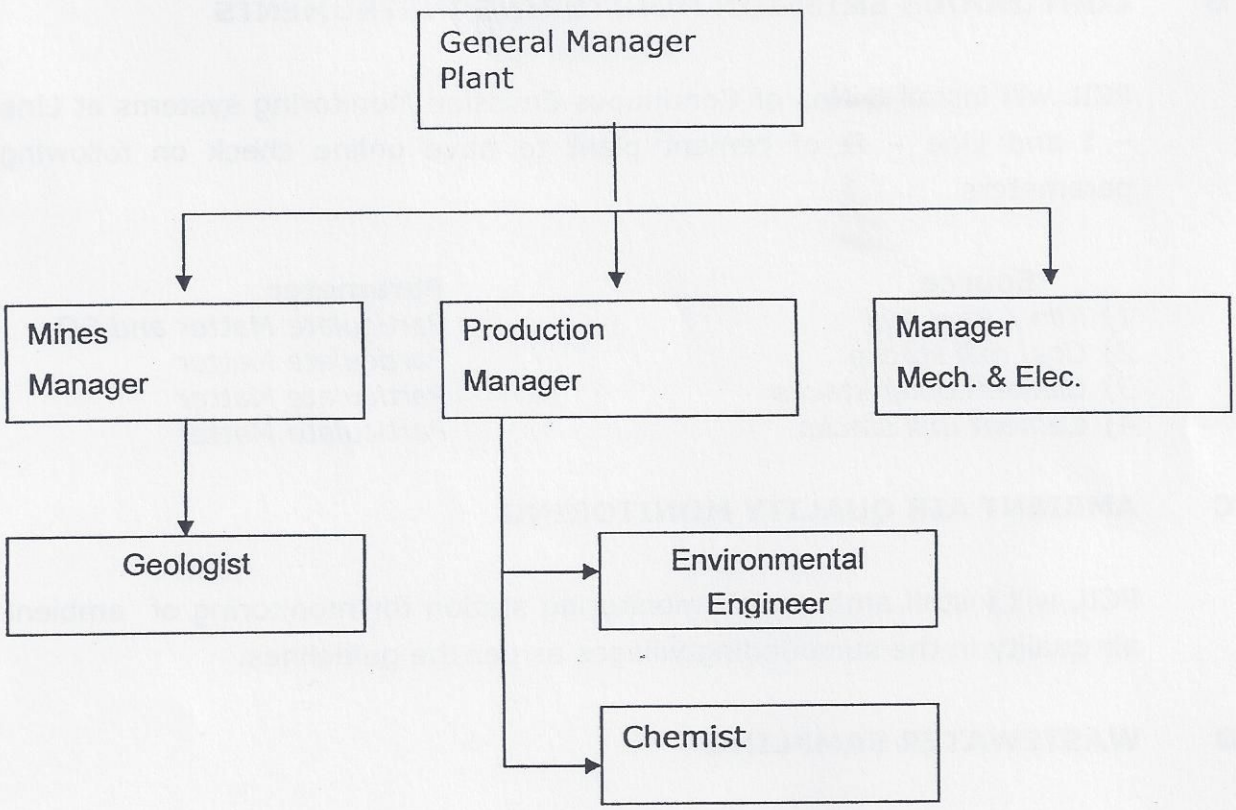
7.9.2 ENVIRONMENTAL MONITORING

Monitoring of various environmental parameters is carried out on a regular basis to ascertain the following:

- state of pollution within the plant and in its vicinity;
- generate data for predictive or corrective purpose in respect of pollution;
- examine the efficiency of Pollution Control Systems installed in the complex
- to assess and monitor environmental impacts

Fig 7.3

ORGNISATION CHART



The following monitoring programme has been proposed to monitor various environmental components.

A METEOROLOGY

An automatic weather monitoring station would be installed within the plant premises for a proper measurement and record of meteorological parameters.

B CONTINUOUS EMISSION MONITORING INSTRUMENTS

PCIL will install 8 Nos of Continuous Emission Monitoring systems at Line – I and Line – II of cement plant to have online check on following parameters

Source	Parameter
1) *Kiln / Raw mill*	*Particulate Matter and SO_2*
2) *Coal mill stacks*	*Particulate Matter*
3) *Clinker cooler stacks*	*Particulate Matter*
4) *Cement mill stacks*	*Particulate Matter*

C AMBIENT AIR QUALITY MONITORING

PCIL will install ambient air monitoring station for monitoring of ambient air quality in the surrounding villages as per the guidelines.

D WASTEWATER SAMPLING

The wastewater samples will be collected regularly both at inlet and outlet of sewage treatment plant to assess the performance and compliance as per the norms.

7.9.3 ENVIRONMENTAL LABORATORY

A full-fledged environmental laboratory will be established in the plant with required equipment.

7.10 BUDGET FOR ENVIRONMENTAL MANAGEMENT PLAN

The following is the estimated budget for implementing various environmental measures like installation of pollution control equipment, monitoring of environmental parameters etc.

BUDGET FOR ENVIRONMENT MANAGEMENT PLAN
(amount in Rs crores)

	CEMENT PLANT
Pollution Control Equipment	9.0
Online Monitoring Equipment	1.0
Greenbelt development	0.20
TOTAL	**10.2**

CONCLUSION

PCIL has successfully implemented a well-designed Environmental Management Plan to meet all the consent norms and Environmental Guidelines issued by MoEF.

With the same commitment and dedication, PCIL will commission the new line of the cement plant with modern equipment.

PCIL will implement all the environmental measures proposed under the new line and commits to comply with the standards stipulated by statutory bodies.