

EXECUTIVE SUMMARY

This summary presents a brief sum of the rapid environmental Impact Assessment (REIA) of the proposed greenfield cement plant at village Musiang Lamare, dist- Jaintia Hills in the state of Meghalaya to be set up by **M/S Goldstone Cements Ltd** with 1.65 MTPA clinker for the productions of 2.54 MTPA cement grinding capacity, in different phases. It also proposes to install 2 X 20 MW FBC CPP to meet the internal power requirement of the proposed cement project.

PROJECT HIGH LIGHTS

Product for sale	2.54 Million TPA Cement
Raw materials	LimeStone, Shale/Clay, Sandstone, Millscale, Coal, Gypsum, Fly ash etc.
Process route	Raw materials handling-RawmillGrinder-Pyroprocessing Kiln-CementGrinding-Packing-Storage/Sale.
Fuel	Reductant coal.
Water	2600 m ³ /day Water will be sourced from perennial stream near plant site.
Power	2 X 20 MW Coal Based CPP
Employment potential	500 (Cement plant+CPP)
Estimated project Cost	565.00 Crores

Environmental Aspects

Cement & thermal power plants are prone to air pollution with respect to particulate matter, Sulphur dioxide and carbon monoxide.

M/S Goldstone Cements Ltd envisages comprehensive environment management plan (EMP) to manage the pollution problem of this integrated cement plant so as to improve productivity through waste minimization and waste re-utilization techniques, as well to comply to the statutory requirements.

Rapid Environmental Impact Assessment & EMP report contains following chapters.

CHAPTER I

INTRODUCTION

NEED FOR THE STUDY

Rapid growth in the industrial sectors as a result of unplanned industrialization in developing countries like India has caused significant damage to the environment. The failure in recognizing the impact of the development on the environment often renders the concept of development meaningless.



All manufacturing projects are required to obtain Environmental Clearances from MoEF, Govt. of India.,Forest clearance under Forest Act (Conservation), is also specifically required if the project involves utilization of forestland for non-forestry activities.

OBJECTIVES OF REIA & EMP STUDIES

- Collection and analysis of the baseline data of the study area with respect to land use, geology, hydro-geology, meteorology, flora & fauna, air, water, soil & noise quality and socio-economic condition of the region.
- Identification, Prediction and assessment of the environmental impacts.
- Preparation and implementation of Environmental Management Plan (EMP) that includes green-belt development plan, post-project environmental monitoring and on site emergency plan.
- To suggest preventive and mitigating measures to minimize adverse impacts and to maximize beneficial impacts.

The company's selection of technology is based on the following facts

- 1 The cost effective Cement technology to produce upto 100% PPC grade cement.
- 2 The technology adopted is with the State of Art technology using 5 stage preheater with precalciner, third generation cooler, low nox burner, high efficiency fans with high efficient bag filters, a reverse bag house (RABH) will be used in place of gas conditioning tower to conserve water and avoid trippings due to CO.
- 3 Company has chosen the site of village Musiang Lamare (old) as per MoEF guidelines and its close proximity to major raw materials, utility resources and infrastructure facilities.
- 4 The company proposes to undertake comprehensive EMP, which will not only meet the compliance requirement but also increase the productivity.
- 5 With a view for obtaining environmental clearance from MoEF, **M/s. Goldstone Cements Ltd** has entrusted the assignment to **M/s. Global Experts**, Bhubaneswar for preparation of Rapid EIA & EMP report. M/s.Global Experts has generated base line data from Nov. 2007 to Feb 2008 and accordingly prepared the REIA & EMP report.

CHAPTER –2

Location

The company has selected the site at village MusiangLamare, district Jaintia Hills in the state of Meghalaya.



The proposed site is located very nearer from lime stone deposit & coal sources. The geographical location of this site is demarcated by 25° 12' 13" N and 92° 20' 58.7" E.

M/s. Goldstone Cements Ltd proposes to implement its project in three phases to produce 2.54 Million TPA cement.

The integrated cement plant proposed by M/s. Gold Stone Cements Limited will have the following units.

PROJECT OUTLINE

Phase – I

- 1 0.412 MTPA (1250) TPD Clinker with 0.635 MTPA cement grinding facility
- 2 1 X 20 MW FBC CPP

Phase - II

1. 0.413 MTPA (1250) TPD Clinker with 0.635 MTPA cement grinding facility

Phase - III

1. 0.825 MTPA (2500) TPD Clinker with 1.27 MTPA cement grinding facility
2. 1 X 20 MW FBC CPP

After full expansion the company shall have 1.65 MTPA (5,000 TPD) clinker production capacity with 2.54 MTPA cement grinding capacity and 40 MW FBC CPP.

Annual Gross Raw Material Requirement after expansion in TPA.

Raw Material	Net Quantity	Gross Quantity	Source	Transport
Limestone	2210,000	2431000	Nearby mine	Road
Shale/clay	182,000	200,000	Local	Road
Sandstone	162,000	178,000	Local	Road
Mill scale	21,000	23,000	Guwahati	Road
Gypsum	1,27,000	140,000	Bhutan	Road
Fly ash	762,000	8,38,000	West Bengal	Rail/Road
Coal for clinkerisation	127,000	140,000	Nearby mine	Road
Coal for CPP	125,000	138,000	Nearby mine	Road

CHAPTER 3:

Present Environmental Scenario

For the purpose of preparation rapid EIA, the base line data about the air, water, soil, noise environment of the study area were collected during the three months period starting from the month of Nov 2007 to Feb 2009, also the detailed study about the socio-economic aspects of the study area were carried during the said period.



TEMPERATURE

The climate of the study area is very mild, with neither too hot summer nor too cold winter, except in the foothills of southern slopes where it is somewhat hotter in summer months.

RAINFALL

Rainfall however, is the most pronounced climatic factor and is fairly distributed throughout all the months. An entirely dry month is rare, except in northern slopes, where February-March is usually dry. The summer monsoon or the southwest monsoon sets in during June-July and is usually accompanied by squally winds, and dense mists. Clouds brought in during this period get intercepted by the high central ridge, resulting in heavy precipitation on the southern face of the region. The monsoon, which lasts till September, contributes nearly 75% of annual rainfall in the area. July-August is typical monsoon months experiencing the heaviest downpour, when a rainfall of as much as 150cm is not unusual.

Temperature and Relative Humidity Profile of the study area

Sl.No.	Season	Temperature (°C)		Relative Humidity (%)	
		Min	Max	Min	Max
1	Summer	12	32	61	78
2	Winter	5	27	57	87
3	Monsoon	13	31	62	89

Summarized Meteorological Data at site.

Period	Temperature (°C)			Relative Humidity (%)			Wind Speed (km/h)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Nov -2007	27.00	11.00	19.81	87.00	70.00	77.04	13.1	0.2	5.8
Dec-2007	20.00	9.00	13.91	80.00	57.00	66.69	13.8	0.2	4.5
Jan-2008	20.00	5.00	11.85	85.00	61.00	71.01	12.0	0.2	4.3
Feb-2008	19.00	10.00	13.46	75.00	61.00	66.53	13.8	0.2	5.0
Season	27.00	5.00	14.75	87.00	57.00	70.36	13.8	0.2	4.9

DETAILS OF AMBIENT AIR QUALITY MONITORING LOCATIONS

Station Code	Location	Environmental setting
A1	Project site (center)	--
A2	Project site (east)	
A3	Old musiang lamare	-
A4	New musiang lamare	1.9 Km, NE
A5	Umlaper	3.3,N
A6	Umrasian	2.8,NW
A7	Umlong	2.9,SW
A8	Lumshnong	4.4,SEE



A9	Nongsning	4.9,NE
A10	Umlatodh	5.8,W

DETAILS OF AMBIENT AIR QUALITY

Summarized Ambient air quality data for RPM and SPM

Code	Sampling station	SPM ($\mu\text{gm}/\text{Cu.m.}$)			RPM ($\mu\text{gm}/\text{Cu.m.}$)		
		Max	Min	98 th perc	Max	Min	98 th perc
A1	Project site (center)	97.7	56.1	95.5	58.6	36.8	54.4
A2	Project site (east)	95.2	55.0	93.5	57.1	35.4	55.0
A3	Old musiang lamare	96.5	54.9	93.7	57.9	35.2	56.6
A4	New musiang lamare	117.0	68.1	115.2	70.2	39.4	68.5
A5	Umlaper	115.6	62.3	114.6	69.3	40.1	66.2
A6	Umrasian	112.1	59.4	110.3	67.2	38.6	64.7
A7	Umlong	96.8	53.1	93.4	58.0	34.2	56.4
A8	Lumshnong	115.3	60.5	112.0	69.1	35.0	68.1
A9	Nongsning	116.4	61.7	114.8	69.8	35.3	66.4
A10	Umlatodh	100.9	50.6	99.1	60.5	34.6	57.3

Summarized Ambient air quality data for SO₂ and NO_x

Code	Sampling station	SO ₂ ($\mu\text{gm}/\text{Cu.m.}$)			NO _x ($\mu\text{gm}/\text{Cu.m.}$)		
		Max.	Min.	98 th perc	Max.	Min.	98 th perc
A1	Project site (center)	8.7	4.3	7.7	6.8	3.9	5.9
A2	Project site (east)	7.3	3.9	5.6	6.0	3.0	4.9
A3	Old musiang lamare	10.9	5.8	8.5	7.7	4.3	6.8
A4	New musiang lamare	11.1	6.2	9.8	8.9	5.1	7.7
A5	Umlaper	12.3	7.0	10.3	9.0	5.6	8.1
A6	Umrasian	11.0	5.1	9.0	7.9	4.7	6.8
A7	Umlong	9.4	4.8	7.9	7.2	4.0	6.3
A8	Lumshnong	11.8	6.5	9.9	8.0	4.8	7.2
A9	Nongsning	12.5	7.4	10.8	8.8	5.5	7.9
A10	Umlatodh	10.1	4.0	7.9	7.2	4.0	6.1



WATER ENVIRONMENT

The both surface water and ground water quality parameters are well within the statutory norms.

Surface Sampling Locations

Station Code	Location	Environmental setting
SW1	Spring near project site	--
SW2	Spring near Old musiang lamare	-
SW3	Spring near New musiang lamare	1.9 Km, NE
SW4	Spring near Umlaper	3.3,N
SW5	Spring near Umrasian	2.8,NW
SW6	Spring near Umlong	2.9,SW
SW7	Spring near Lumshnong	4.4,SEE
SW8	Spring near Nongsning	4.9,NE

Surface Water Quality in study area

SI. No.	PARAMETER	SAMPLING LOCATIONS							
		Project site	Old musiang lamare	New musiang lamare	Umlaper	Umrasian	Umlong	Lumshnong	Nongsning village
1	Color (Haz.unit)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Odour	UO	UO	UO	UO	UO	UO	UO	UO
4	pH	6.8	7.1	6.9	6.9	7.0	6.7	7.1	6.8
5	Temperature (°C)	21.0	19.0	21.0	21.0	19.0	20.0	19.0	20.0
7	Total Dissolved Solid (mg/l)	87.0	101.0	87.0	85.0	101.0	78.0	101.0	72.0
8	Total Suspended Solids (mg/l)	45.0	52.0	45.0	51.0	52.0	47.0	52.0	41.0
9	Turbidity (NTU)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
10	Residual Chlorine (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND
11	Total Hardness (mg/l) as CaCO ₃	58.0	176.0	58.0	82.0	154	78.0	169	84.0
12	Calcium (mg/l)	19.2	64	19.2	25.2	58	24.8	61	28
13	Magnesium (mg/l)	2.4	3.8	2.4	4.5	2.2	3.9	3.9	3.4
14	Chloride (mg/l)	12.0	14.0	12.0	9.8	14.0	9.0	14.0	10.0
15	Sulphate (mg/l)	9.4	12.4	9.4	7.9	12.4	8.1	12.4	8.2
16	Fluoride (mg/l)	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.3
17	Alkalinity (mg/l)	28.0	36.0	28.0	29.0	36.0	26.0	36.0	24.0
18	Nitrate (mg/l)	0.4	0.6	0.4	0.2	0.6	0.3	0.6	0.2
19	Phosphate (mg/l)	0.06	0.1	0.06	0.06	0.1	0.08	0.1	0.06
20	Iron (mg/l)	0.08	0.16	0.08	0.08	0.16	0.07	0.16	0.06
21	Copper (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Lead (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
23	Arsenic (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Chromium (mg/l)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
25	Mercury (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Biochemical Oxygen Demand (mg/l)	2.0	2.0	2.0	2.0	2.0	4.0	2.0	4.0



\$ indicates no limits have been specified.

UO indicates for unobjectionable.

ND Not Detectable

SOIL

The soil characteristically fall in category of red Laterite or alluvial. Due to clayey nature of the soil, the permeability is low and thus poor in fertility. Alluvial soil is very fertile and mainly found in the drainage area. The cultivable soils are spread over the maximum part of the study area.

Details of soil quality monitoring locations

Station Code	Location	Environmental setting
S1	P.Project Site	--
S2	Old Musiang Lamare	-
S3	New Musiang Lamare	1.9 Km, NE
S4	Umlaper	3.3,N
S5	Umrasian	2.8,NW
S6	Umlong	2.9,SW

Landuse Pattern of the Study Area

Based on the Census reports, the entire study area is encompassed under Musiang Lamare of Jaintia Hills district in Meghalaya state. The total numbers of villages covered are 12. The geographical area covered under 10 Km radius circle area works out to be around 314 square kms. The land use is classified into different types viz. settlement, crop land, dense forest, natural grass land, open forest, scrub forest & River.

Landuse pattern of the study area (10 Km radius)

Landuse categories	Area in Km ²	Percentage
Settlement	4.4	1.4
Crop land	10.7	3.41
Dense forest	143.9	45.8
Open forest	107.9	34.4
Scrub forest	4.8	1.53
Forest plantation	2.4	0.76
Natural grassland	31.5	10
River	8.4	2.68
Total	314	100

OTHER INFORMATIONS

- The wind speed varies from calm period to 39.9 km/hr (month of April) with a predominant wind direction from NE to SW direction.



- 2 From the ambient air monitoring data it is found that maximum ambient SPM 332.5 $\mu\text{g}/\text{Nm}^3$, SO_2 15.2 $\mu\text{g}/\text{Nm}^3$ and NO_x 16.2 $\mu\text{g}/\text{Nm}^3$ are found to be at the project site sample location, which is well within the statutory limits, Indicating sufficient carrying capacity for more industrialization.
- 3 The ambient noise levels were recorded to vary between lowest of 40.2 dB to 58.4 dB in the residential area. The noise levels recorded in residential, rural and sensitive area was found to be within the statutory limit.
- 4 The terrestrial vegetation cover mixed jungles, crop land and scanty shrubs & bushes. The fauna is predominated by species like Jackal, mongoose, rabbits & variety of snakes.
- 5 Bonai block has got its own scenic beauty with high hill ranges on either side, which has greenery look with beautiful landscape.
- 6 During the socio-economic survey the occupation pattern of the local people was found to be predominantly Worker/Marginal worker 40.38%, Non worker 59.62% the poor economic condition of the people.
- 7 The others notable feature of socio-economic study were population density 132 per sq. km. literacy rate 65.1%.

The said area has low to average facilities with respect to transportation, communication, education and health.

CHAPTER 4

IMPACT IDENTIFICATION

- 1 The proposed cement plant at the site will have impacts on the existing environment.
- 2 Both construction and operation phases will have some negative impact on air environment & land environment and water environment. It will also minimally affect both terrestrial and aquatic ecological set up.
- 3 The project will have beneficial impact on the socio-economic environments particularly in the area of employment, business opportunities, infrastructure facilities etc.

CHAPTER 5

IMPACT PREDICTION & EVALUATION

The objective of having an EIA for the proposed project under consideration is to identify the potential impacts on the site specific prevailing environmental setting and degree of impacts. This will enable to draw up an appropriate Environment Management Plan (EMP) to consider other alternatives so as to ensure that the proposed project activity does not impair the present environmental setting. The findings in an EIA are drafted in the form of Environment Impact Statement (EIS).



POLLUTION POTENTIAL

Sources of Type of Pollution from the Proposed Project

Process steps	Process activity	Release to the Environment	Type of pollution
1	Raw material unloading, stock piling and material transfer.	Limestone dust, coal dust, iron ore fines, other fugitive emission from transfer points	Air pollution
2.	Raw meal preparation	Meal dust	Air pollution and Noise pollution
3.	Rotary Kiln operation	Kiln waste gas, Heat, SPM, dust, SO ₂ , CO, and NO _x .	Air, land and thermal pollution.
4.	Clinker storage and handling	Dust	Air pollution.
5.	Cement grinding	Cement Dust	Land and air pollution
6.	Cement storage and handling	Cement Dust	Air Pollution
7.	Operation of FBC Boiler and Power plant	Heat, SPM, SO ₂ , NO _x , CO and water.	Air, water and thermal pollution.
8.	Fly ash handling and storage	Dust.	Air pollution, land pollution.
9.	Township	Sewage, solid waste	Water Pollution and land pollution

IMPACT ASSESSMENT AND PREDICTION

- 1 The proposed integrated cement plant at village Musiang Lamare(Old) will have some negative impact on existing air, water, land & noise environment.
- 2 There will be considerable generation of particulate matter owing to mineral based unit operation like Pyro-processing kiln, crusher, grinder, AFBC power plant. There will be appreciable fugitive dust emission due to transport, storage and handling of large quantity of raw material. These dust emission will increase SPM level in existing air environment.
- 3 Increase in SO₂, NO_x emission will be due to Coal Based operation like Pyro-processing kilns and Coal based AFBC power plant.
- 4 The prediction of air quality due to proposed activity through ISCST Model shows that the maximum incremental and predicted ground level concentration (GLC) of SPM, SO₂, NO_x as shown in table no. When the maximum incremental GLC IS added with the back ground existing GLC at the sampling location in the predominant down wind direction, the results are found to be well within the statutory norms

The predicted maximum values at core zone

AAQ Sampling Station at project site	Existing concentration in ($\mu\text{g}/\text{m}^3$)	Predicted incremental Concentration in ($\mu\text{g}/\text{m}^3$)	Maximum Predicted Concentration in ($\mu\text{g}/\text{m}^3$)
SPM	97.7	12.37	110.07
SO ₂	8.7	9.33	18.03
NO _x	6.8	1.5	8.3

- 5 There will be no perceptible negative impact on water sourcing as the company plans to construct an impoundment cum water harvesting reservoir in 5 Ha land across the nearby rivulet which will not only meet the project requirement, but also maintain the flow regime of the rivulet. There will be no negative impact on the surrounding water bodies because of the inherent processes and water & wastewater management practices to achieve zero discharge norms to be implemented by the plant authorities.
- 6 The impact on existing on noise environment will be localized which shall be considerably attenuated with proper management plan.
- 7 This integrated cement plant will consume considerable amount solid waste in the form of fly ash, BF Slag, Mill scale etc. It will non only consume the in-plant solid waste like ash from power plant & the waste from kiln and material processing units, it will also consume sold waste like fly ash and mill scale from other steel and power industries. Township solid waste and WTP sludge will be suitably mixed and composted for application in green belt area. Hence there will be no solid waste disposal problem.
- 8 The company is not to acquire any forestland for any of its operation and activities purpose. The pollution levels will be control with suitable environment management plan (EMP) as discussed in chapter 6. Adequate green belt will be developed in and around the plant site which not only will act as pollution sink but also improve the ecology and aesthetics of the region. Hence no adverse impact would occur to terrestrial as well as aquatic ecology.
- 9 There will be appreciable beneficial impact on human environment. There will be lot of employment opportunity both in organized and unorganized sector. The company will give preference to local people with respect to employment. The project activity will infuse lot of funds in the area, which will generate lot of economic and business activities that will help local people. Because of flow of people, transportation of raw materials & product there will be lot of development work in the field of road network, communication and other infrastructure development. There will be other beneficial impacts in social sectors like health and education.
- 10 With respect to Impact quantification, the total Impact score (TIS) of the project without environment management plan (EMP) is found to be -4890



indicating the need for comprehensive EMP. The TIS of the project action with EMP found to be 28 indicating the acceptance of the project with suitable EMP measure.

Total Impact Score (TIS) for Project activities with EMP

	PIV	Civil&Mech. work	Raw material handling & storage	Product Handling, Storage & Transportation	Plant Operation	Civic amenities	Total	Impact Score
Ambient air Quality	143		-2	-1	-2		-5	-715
Surface water Quality	57				-1	-1	-2	-114
Surface water Resources	29				-1	-1	-2	-58
Ground water Quality	28					-1	-1	-28
Noise Quality	57		-1	-1	-1		-3	-171
Soil Quality	57					-1	-1	-57
Land use Pattern	57		-1	-1			-2	-114
Flora & Fauna	86		-1	-1	-1		-3	-258
Aesthetics	86			-1	-1		-2	-172
Human Health & Safety	57	-1	-1	-1	-1	+2	-2	-114
Total Impact Score								(TIS)-1801

Chapter 6

ENVIRONMENTAL MANAGEMENT PLAN

1. The comprehensive EMP as a management tool will take up the action plan starting from raw materials crushing/grinding stage to marketing of the products through series of action steps like process optimization, preventive maintenance, good house keeping, waste minimization, energy conservation, environmental awareness & training and adequate pollution control measures etc.
2. EMP at design stage will incorporate latest cost effective technology to maximize production and minimize waste generation.
3. The suitable EMP measures will be taken up to alleviate the short term pollution problems during construction phase.
4. The Integrated Cement Plant will be prone to major air pollution problems. With regard for particulate matter, SO₂, NO_x & CO. The comprehensive EMP will take care of the problem with each individual unit.
5. The air pollution control equipment in cement and Power Plant will effectively reduce the particulate emission within the statutory norms.



The Bag Filters and dedusting units at raw material handling, product handling, and other units will control the dust emission for the particular unit. Water sprinkling, provision of separate haul road for raw material carrying vehicles etc, will control the fugitive dust emissions.

Details of Air Pollution Control (APC) System

Sl. No.	Department	Proposed in the project	Design stack emissions
1.	Limestone crushing/tipping/handling	Crushing plant shall be located at source of lime stone. So only tipping and stacking shall remain in plant area. Dust suppression system	-
2	Raw mill grinding	Pulse jet bag filter	<50 mg/Nm ³
3	Kiln	ESP	< 100 mg/Nm ³
4	Clinker Cooler	Cooler ESP inlet	< 100 mg/Nm ³
5	Clinker Silo & Transport	Silo top – Bag filter Transfer points – Bag filters	<50 mg/Nm ³
6	Cement Mill	Bag filters	< 50 mg/Nm ³
7	Cement silos/Packing Plant	No change for existing silos For New silo/packing plant – Bag filters	< 50 mg/Nm ³ < 50 mg/Nm ³
8	Rawmaterial handling	Truck Tippler – Dust suppression system Crusher – Dust suppression system Transfer points - Dust suppression system Dust suppression systems at unloading and transfer points	
9	Captive Power Plant	Electro Static Precipitator	< 100 mg/Nm ³
10	Coal crusher for CPP	Bag filter	< 50 mg/Nm ³

- 6 SO₂ emission will be controlled with the use of FBC Boiler with limestone dosing along with coal to reduce the sulfur problem by 90 % . Alternatively it explores the possibility of recovering Gypsum by the installation of Flue Gas Desulphurization unit.
NO_x emission will be managed at the design stage with the use of FBC Boiler
- 7 The CPP will consume water for boiler water circuit, equipment cooling and ash handling. However closed circuit boiler condenser system will require much less amount of makeup water, so also makeup water will be required for closed circuit cooling water system. The wastewater from ash handling system will be treated in settling ash pond. The overflowing water is recirculated to ash handling system. The boiler blow down and DM plant reuse water will be suitably treated in neutralization settling tanks and these will be used elsewhere. The treated water from sewage treatment plant will be used for Green Belt Development.

- 8 Thus with suitable conservation techniques and water management practices M/s.Goldstone cements Ltd envisages a zero discharge norm

Water & Wastewater Inventory & Management (in M³/Day)

Sl. No.	Cement Plant	Fresh make up	Recycled make up	Waste water	Waste water management
1.	Cement plant cooling	1600	-	240	-
2.	Power plant with air cooled condenser.	400	-	60	Reuse
3	Boiler feed water	240		10	
3	Ash moistening		200		
4	Plant potable	50		40	STP & Reuse
5	Colony potable	260		200	STP & Reuse
6.	WTP loss	50	-	-	-
7.	Greenbelt	-	50	-	-
8.	Dust suppression	-	300	-	-
	Total	2600	550	550	

- 9 This Integrated cement Plant will consumed minerals and consecutively will generate solid waste. However M/s. Goldstone cements Ltd will take up a comprehensive solid waste management plan in the form recycling, reuse and integrated land development plan.

Solid Waste Inventory And Management.

Unit	Solid waste	Quantity (In TPA)	Management Plan
Limestone crushing	Limestone Stone dust	2,21,000	Recycled
Shale	Dust	18,000	Recycled
Sandstone	Dust	16,000	Recycled
Mill scale	Dust	2,000	Recycled
Gypsum	Dust	13,000	Recycled
Coal fines	Dust	26,000	Use in FBC CPP
Fly ash	Dust	16,000	Use in cement plant (PPC)
Bottom ash	Dust	4,000	Use in Raw mill
Colony	MSW	182	Composting & use in green belt area.

- 10 The company will completely utilize in-plant ash generated from CPP in the PPC plant.
- 11 This will provide more direct and indirect employment to local population. The company will invest considerable amount of fund in infrastructure development, peripheral development, which will definite improve the socio-economic condition of the people.
- 12 Green belt will be developed on 33% of total area with suitable plant species. The green belt will be developed along the boundaries, vacant

spaces. The green belt will not only act as pollutant sink, attenuate noise level, reduce dust level but also improve ecology and aesthetics.

13. Eco-friendly cement plant using fly ash upto 100% production of PPC.
14. Reverse Air Bag House (RABH) will be used in place of gas conditioning tower to avoid tripping of ESPs due to CO formation. ESP is replaced with RABH in Pyro-system, which will conserve water.
15. There will be no generation of industrial effluent from manufacturing process and other ancillary industrial operation.
16. Cooling water will be completely recycled.
- 17 Entire sewage generated from the residential colony, Administrative building, Guesthouse, and other places will be collected and treated in a root zone technology system plant. This plant will have a capacity to treat 100 m³ Sewage per day, while expected sewage generation will be only 50 m³. The sewage treatment plant based on root zone technology system is one of the key components of the project; this plant helps in augmenting the supply of water for gardening, plantation and greenbelt development within the premises of the cement plant.

CHAPTER – 7

RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

- 1 The environmental risk assessment will identify the potential area of hazardous and environmental disaster, which will enable for safety planning and design to minimize the accidents and disastrous events.
- 2 A well planned, disaster management program and on site emergency plan will be taken up to manage emergency situation of any disaster event if occurs during the plant operation.

Hazard Identification of the Proposed Cement Plant

Sl. No.	Group	Item	Hazard Potential	Remarks
I	Raw materials and products	Lime stone	None	-
		Coal	Moderate	Fire
		Other minerals	None	-
		Acids/Alkalis	Major	Bio corrosive
		Lube oil	Moderate	Flammable
II	Processing			
	Kilns	Dust Kiln off gas	Moderate None	Environmental Pollution
	Raw material Grinding	Dust	Moderate	Environmental Pollution
	Cement Grinding	Dust	Moderate	Environmental Pollution
	Captive power plant	Fly ash Acid and alkali	Moderate Major	Environmental Pollution Highly corrosive & Personal injury
III	Utilities			
	Electric power Supply	Short circuit	Major	Fire



CHAPTER – 8

ENVIRONMENT MANAGEMENT SYSTEM & IMPLEMENTATION OF EMP

- 1 Finally the company will set up a department of Environment, Health & Safety (EHS) headed by a senior executive in the level of General Manager. The dept. will have a full-fledged laboratory and necessary technical staff for environmental monitoring. The department will be responsible for the implementation of EMP & safety and disaster management plan.
- 2 The cost of implementation of EMP will be about 4.4 % of the project cost i.e. Rs. 25 Crores in addition to the equipment costs at the design stage.

CONCLUSION

The Integrated Cement Plant proposed by M/s.Goldstone cements Limited will have environmental pollution problems as analysed by the total impact score. But with the proper implementation of comprehensive environment management plan environmental problem will be considerably reduced as analysed by total impact score after the implementation of EMP. But when the project benefits are superimposed then the TIS is found to be positive. Therefore the project may be implemented for the obvious socio-economic development of the region and economic development of the country as well.