

SERIAL NO.	CONTENTS	PAGE NO.
CHAPTER 1 EMP – AN OVERVIEW		
1.1	Introduction	01-1
1.2	Parameters Pertaining To Environmental Management	01-3
CHAPTER 2 METHODOLOGY		
2.1	Approach	02-1
2.1.1	Pilot Survey	02-1
2.1.2	Detail Survey	02-1
2.2	Suggestion of Environmental Management plan	02-2
2.2.1	Catchment Area treatment	02-2
2.2.2	Biodiversity Conservation and Management Plan	02-2
2.2.3	Fish Management	02-3
2.2.4	Green Belt Development	02-3
2.2.5	Geo Environmental Management Plan	02-3
2.2.6	Muck Disposal Plan	02-3
2.2.7	Restoration Plan for Quarry Areas	02-3
2.2.8	Landscaping and Restoration of Construction Area	02-3
2.2.9	Public Health Delivery System	02-4
2.2.10	Solid Waste Management and Sanitation Facilities	02-4
2.2.11	Energy Conservation Management Plan	02-4
2.2.12	Resettlement and Rehabilitation Plan	02-4
2.2.13	Disaster Management Plan	02-4
2.2.14	Maintenance of Air, Water and Noise Quality	02-5
2.2.15	Environmental Monitoring Programme	02-5
2.2.16	Estimation of Financial Outlay with Year Wise Physical & Financial Targets for the Suggested Action Plan	02-5
CHAPTER 3 CATCHMENT AREA TREATMENT		
3.1	Introduction	03-1
3.2	Catchment Area Treatment	03-2
3.3	Estimation of Soil Erosion	03-3
3.3.1	Drainage	03-3
3.3.2	Delineation of Watersheds and Sub-watersheds	03-3
3.3.3	Slope	03-4
3.3.4	Land Use/ Land Cover Mapping	03-6
3.3.5	Soils	03-10
3.3.6	Sediment Yield Index Model	03-11
3.3.7	Sediment Yield Weightage Value	03-12
3.3.8	Delivery Ratio	03-13
3.3.9	Sediment Yield Index	03-13
3.3.10	Prioritization of Subwatersheds	03-14
3.4	Methodology for Prioritization	03-14
3.5	Assignment of Erosivity Weightage Value	03-14
3.6	Assignment of Delivery Ratios (DRs)	03-15
3.7	Computation of Silt Yield Index	03-16

3.8	Prioritization of Subwatersheds	03-21
3.9	Area Identified for CAT	03-22
3.10	Period and Schedule of Implementation	03-23
3.11	Details of Treatment Measures with Unit Cost Estimate	03-27
3.11.1	Silt Retention Dams	03-28
3.11.2	Contour bunding	03-28
3.11.3	Brush Wood Check Dams	03-30
3.11.4	Loose Bolder Check Dam	03-31
3.11.5	Gabion Structures	03-33
3.11.6	Biological Measures	03-33
3.12	Administrative Charges	03-34
3.13	Administrative Setup	03-34
3.14	Contingency Charges	03-34
3.15	Monitoring, Evaluation and Maintenance	03-35
3.16	Cost Estimate	03-35
3.17	Total Cost of CAT	03-38
CHAPTER 4		
BIODIVERSITY CONSERVATION AND MANAGEMENT PLAN		
4.1	Conservation Plan For Endangered Species	04-1
4.2	Wildlife Conservation	04-5
CHAPTER 5		
FISH MANAGEMENT		
5.1	Introduction	05-1
5.2	Fish In Dibang River	05-1
5.3	Conservation And Management Considerations Of Dibang River	05-2
5.3.1	Mitigation of the Negative Impact	05-4
5.3.2	Stop Use of Destructive Fishing Methods	05-4
5.3.3	Ban of Harmful Fishing Implements	05-4
5.3.4	Other Measures	05-5
5.4	Recommendations	05-5
5.4.1	Fish Hatchery	05-6
5.4.1.1	Seed Collection	05-6
5.4.1.2	Analysis of Water Quality	05-7
5.4.1.3	Seed Stocking	05-7
5.4.1.4	Organization of Fishermen	05-7
5.4.1.5	Other Requirements	05-7
5.4.1.6	Conservation of Downstream River Bed	05-8
5.4.2	Management of Reservoir Fisheries	05-8
5.4.2.1	Institutional Mechanism	05-8
5.4.2.2	Staffing Pattern	05-8
5.4.2.3	Planning and Monitoring	05-9
5.5	Cost Estimates	05-9
CHAPTER 6		
GREENBELT DEVELOPMENT		
6	Greenbelt Development	06-1

CHAPTER 7		
GEO - ENVIRONMENTAL MANAGEMENT PLAN		
7.1	Landslide Control	07-1
7.1.1	Landslide Control Measures	07-1
7.1.2	Treatment of slope conformation	07-2
7.2	The Drainage Of Landslide	07-3
7.3	Land Slide Potentiality	07-6
7.3.1	Mitigation Measures	07-6
7.4	Estimation Of Concrete Slab For 30-Meter Long Drain	07-16
7.5	Abstract Of Cost	07-17
7.6	Financial Outlay	07-18
CHAPTER 8		
MUCK DISPOSAL PLAN		
8.1	General	08-1
8.2	Muck Disposal Areas	08-1
8.3	Restoration Of Muck Disposal Sites	08-3
8.3.1	Engineering Measures	08-3
8.3.2	Phyto-remediation of Muck Disposal Areas	08-3
8.3.2.1	Re-vegetation of Spoil Tips	08-25
8.3.2.2	Soil Work and Plantation Technique	08-25
8.3.2.3	Species for Plantation	08-27
8.3.2.4	Irrigation Facility	08-27
8.3.2.5	Fencing	08-27
8.3.2.6	Watch and Ward	08-27
8.4	Recommendations	08-27
8.5	Financial Outlay	08-28
CHAPTER 9		
RESTORATION PLAN FOR QUARRY AREAS		
9.1	Quarry Sites	09-1
9.2	Stabilization Of Quarry Sites	09-6
9.3	Phytoremediation Of Quarry Sites	09-9
9.4	Cost Estimates	09-9
CHAPTER 10		
LANDSCAPING AND RESTORATION OF CONSTRUCTION AREA		
10.1	Landscaping	10-1
10.2	Restoration Of Road Sites	10-1
10.2.1	Design	10-2
10.2.2	Construction	10-2
10.2.3	Drainage	10-3
10.2.4	Grassing and Planting	10-3
10.2.5	Control of Landslides along the Roads	10-3
10.3	Restoration Of Construction Sites	10-4
CHAPTER-11		
PUBLIC HEALTH DELIVERY SYSTEM		
11.1	General	11-1
11.2	Medical And Health Care Facilities	11-1
11.3	Traditional Medicinal Practices	11-2

11.4	Reservoir	11-2
11.5	Residential Colonies For The Workers	11-2
11.6	Other Measures	11-3
11.7	Development of Medical Facilities	11-3
11.7.1	Manpower	11-3
11.7.2	Proposed Health Facilities at Construction Sites and Labour Camp	11-4
11.8	Surveillance	11-4
11.8.1	Malaria Control Activities	11-5
11.8.2	Vaccination and Health Check-Up Camps	11-5
11.8.3	Health Extension Activities	11-6
11.9	Cost Estimates	11-7
11.9.1	Fixed Cost (Non-Recurring)	11-7
11.9.2	Variable Cost (Recurring)	11-7
11.9.3	Overall Expenditure	11-8
CHAPTER 12		
SOLID WASTE MANAGEMENT AND SANITATION FACILITIES		
12.1	Solid Waste Management	12-1
12.1.1	Population Generating Solid Waste	12-1
12.1.2	Total Solid Waste To Be Generated	12-2
12.1.3	Approach For Scientific Solid Waste Management System	12-2
12.1.3.1	Recommended Solid Waste Management System	12-3
12.1.3.2	Administrative Set Up	12-3
12.1.4	Solid Waste Management Plan	12-3
12.1.4.1	Segregation at source	12-4
12.1.4.2	Collection of Solid Wastes	12-8
12.1.4.3	Transportation of Solid Wastes	12-9
12.1.5	Treatment & Disposal of Waste	12-9
12.1.5.1	Composting	12-10
12.1.5.2	Sanitary Land filling	12-11
12.1.6	Estimation of Total Land Requirements for Disposal of Solid Wastes	12-11
12.1.7	Site Selection for Landfill Facility	12-14
12.1.8	Construction of The Landfill Facility	12-15
12.1.8.1	Foundation of the Landfill Site	12-15
12.1.8.2	Filling of the Waste	12-16
12.1.8.3	Lining Landfill Site	12-16
12.1.8.4	Landfill Liners	12-16
12.1.8.5	Drainage System	12-17
12.1.8.6	Leachate Management System	12-17
12.1.8.7	Leachate Collection	12-18
12.1.8.8	Leachate treatment	12-18
12.1.8.9	Post Closure Plans	12-19
12.1.9	Cost of Construction of Landfill (Phase-I)	12-19
12.1.10	Leachate Solid Waste Management	12-19
12.1.11	Measures for Improving Solid Waste Management System	12-20
12.1.11.1	Discourage the use of Polythene / Plastic Bags	12-20
12.1.11.2	Reduce, Reuse and Recycle	12-20

12.2	Sanitation Facilities	12-21
12.3	General Sanitary Measure	12-22
CHAPTER 13		
ENERGY CONSERVATION MANAGEMENT PLAN		
13.1	General	13-1
13.2	Energy Savers	13-1
13.2.1	Distribution of Kerosene Oil Stoves	13-1
13.2.2	Distribution of Pressure Cookers	13-1
13.2.3	Solar Cookers	13-2
13.2.4	Installation of Improved Chullhas	13-3
13.2.5	Construction of LPG Depots	13-3
13.3	Cost Implications	13-3
CHAPTER 14		
RESETTLEMENT AND REHABILITATION PLAN		
14.1	Existing Guidelines for Resettlement Programme in Arunachal Pradesh	14-1
14.2	Objectives of R&R Plan	14-2
14.3	Definitions	14-3
14.4	Resettlement and Rehabilitation Grants	14-6
14.4.1	Compensation for Land along with Rights and Privileges	14-6
14.4.2	Housing Benefit and Compensation	14-8
14.4.3	Land Allotment and Compensation	14-8
14.4.4	Ex Gratia for the Landless	14-8
14.4.5	Ex Gratia for those Affected Families who are left with less than 1 ha of land	14-8
14.4.6	Land Development Assistance	14-8
14.4.7	Livelihood Grant for Landless	14-8
14.4.8	Livelihood Grant for those who have been left with less than 1 ha of land	14-9
14.4.9	Financial Assistance for Self Employed	14-9
14.4.10	Transportation Grant	14-9
14.4.11	Assistance for Construction of Cattle shed	14-9
14.4.12	Subsistence Allowance	14-9
14.4.13	Pension for Life for Vulnerable Affected Persons	14-9
14.4.14	Schedule Tribe Family Grant	14-10
14.4.15	Free Electricity	14-10
14.5	Financial Outlay for R&R Benefits	14-10
14.6	Application for Grant and Grant Distribution	14-11
14.7	Infrastructure Facility at Resettlement Site / Colony	14-12
14.7.1	Financial Outlay for Infrastructure Facilities	14-13
14.8	Lump sum Cash Assistance	14-14
14.9	Community and Social Development Plan (CSDP)	14-14
14.9.1	Aim of CSDP	14-14
14.9.2	Objectives of CSDP	14-15
14.10	Plan for Protection of Cultural Identity	14-15
14.10.1	Objectives	14-15
14.10.2	Strategies / Guidelines	14-16
14.10.3	Protection of Cultural Identity of Local Tribal	14-16

14.10.4	Protection of the Natural Habitat of Local Tribal	14-17
14.10.5	Regulation of Traffic on Roads	14-17
14.10.6	Institutional Arrangements	14-18
14.10.7	Action Plan	14-18
14.11	Evaluation and Monitoring	14-19
14.12	Budgetary Provision	14-20
CHAPTER 15 DISASTER MANAGEMENT PLAN		
15.1	Dam Break Analysis	15-1
15.1.1	Governing Equations	15-3
15.2	Salient Features	15-9
15.3	Requirement of Field Data	15-10
15.3.1	Field Survey	15-10
15.3.2	Topographic Characteristics	15-10
15.3.3	Channel Roughness	15-11
15.3.4	Numerical Applications	15-12
15.3.5	Need of Considering Extended Width	15-16
15.4	Emergency Action Plan	15-24
15.5	Disaster Management Plan	15-24
15.5.1	Dimension of Disaster and Area/Population likely to be Affected	15-25
15.6	Financial Outlay for Disaster Preparedness and Mitigation	15-27
15.6.1	Financial Outlay for Installation of VSAT Communication System	15-27
15.6.2	Evacuation Plans	15-28
15.6.3	Notification	15-29
15.7	Cost Estimate	15-30
15.8	Conclusions	15-31
CHAPTER 16 MAINTENANCE OF AIR, WATER AND NOISE QUALITY		
16.1	General	16-1
16.2	Water Quality Monitoring	16-2
16.3	Ambient Air and Noise Quality in the Project Area	16-2
16.3.1	Control of Air Pollution	16-2
16.3.2	Control of Noise Pollution	16-3
16.3.3	Miscellaneous Expenditure	16-4
16.4	Financial Outlay	16-4
CHAPTER 17 ENVIRONMENTAL MONITORING PROGRAMME		
17.1	The Need	17-1
17.2	Environmental Monitoring Cell	17-1
17.2.1	Monitoring Mechanism	17-1
17.3	Areas of Concern	17-2
17.3.1	Catchment Area Treatment	17-2
17.3.2	Water Quality	17-3
17.3.3	Air & Noise Quality	17-3
17.3.4	Ecology	17-4
17.3.5	Public Health Delivery System	17-4

17.3.6	Fisheries	17-4
17.3.7	Rehabilitation & Resettlement	17-4
17.3.8	Dumping Site	17-5
17.3.9	Environmental Studies	17-5
17.4	Cost Implications	17-6
CHAPTER 18		
SUMMARY OF COST ESTIMATE		
18	Summary of Cost Estimate	18-1