Technical Renovation Programme on 68 Thousand Tons Bleached Wheat Straw Pulp Extended Delignification Cooking and Clean Bleaching of MCC Meili Paper Industry Co., Ltd

Environmental Management Plan

Consturction unit: MCC Meili Paper Industry Co., Ltd

Assessment unit: Environmental Protection Research Institute of Light Industry

September 2011

Contents

1 Overview

1.1 Background of Programme

MCC Meili Paper Industry Co., Ltd is one of the key pulp and paper enterprises in "Strategic research and plan for paper industry development of Ningxia Autonomous region". The old factory produces bleached wheat straw for internal use and all types of cultural paper and paper board.

In recent years, pollutant emission standards and industrial policies concerning pulp and paper industry were issued one after another. A series of problems on existing facilities in old factory of the enterprise were found, including low production efficiency of wheat straw cooking system, high energy consumption of cooking, low yield, poor finished pulp quality, low alkali recovery rate, backward production capacity of some paper-making workshops, which belonged to phase-out type in "Guidance Catalog for Adjustment of Industrial Structure (2011)". For above reasons, MCC Meili Paper took the chance of key technology of "oxygen delignification and ECF bleaching technology development in wheat straw pulp making" by NDRC (National Development and Reform Committee) to construct this Technical Renovation Programme on 68 Thousand Tons Bleached Wheat Straw Pulp Extended Delignification Cooking and Clean Bleaching by way of leading the old technology with the new technology.

This programme received environmental assessment approval and reply from Environmental Protection Bureau of Ningxia Hui Autonomous Region (Ning Huan Shen Fa [2009] No. 12) in February 2009, however, the programme was not started at the industrial park of MCC Meili Paper after its approval. In 2011, the enterprise restarted this programme and proposed to change the construction site to the old factory.

1.2 Programme Overview

1. Name of the Programme

Technical Renovation Programme on 68 Thousand Tons Bleached Wheat Straw Pulp Extended Delignification Cooking and Clean Bleaching

2. Constrction Unit

MCC Meili Paper Industry Co., Ltd

3. Nature of Construction

Reconstruction and extention

4. Construction Site and Land Area Occupied

It is proposed to construct this programme at the northeast of the factory with the land area of 45000m^2.

5. Legal Representative

WANG Kun

6. Product Plan and Construction Scale

The construction scale of this programme is 68 thousand tons bleached wheat straw pulp. Refer to table 1.2.1 for major product criteria.

Table 1.2.1 Major Criteria for Bleached Wheat Straw Pulp Product

Item		Unit	Criteria for white pulp
1, whiteness (blue light method)		%	80
2, beating degree		° SR	≤42
3, wet weight		g	≥2.0
4, residual chlorine		g/l	≤0.015
5, clarity degree of washed pulp		mgN/l	≤20
6, dust（piece/15g dry pulp）	（0.2-1.0）mm^2	piece	Less than 7
	（0.5-1.0）mm^2		Less than 2
	More than 1.0 mm^2		Not allowed to exist

7. Total Investment of the Programme

The total investment of the programme was 185.20 million RMB with construction investment of 149.88 million RMB and current fund of 16.00 million RMB.

1.3 Basis and Standards

1.3.1 Laws, regulations and documents concerning environmental protection

1. “Environmental Protection Law of the People's Republic of China”, (December 26th, 1989)

2. “Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution” (September 1st, 2000)

3. “Law of the People's Republic of China on Prevention and Control of Water Pollution” (June 1st, 2008)

4. “Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes” (April 1st, 2005)

5. “Law of the People's Republic of China on the Prevention and Control of Environmental Noise Pollution” (March 1st. 1997)

6. “Law of the People's Republic of China on Environmental Impact Assessment”, (Order of President of PRC (the People's Republic of China) No. 77 issued on October 28th 2002)

7. “Circular Economy Promotion Law of the People's Republic of China”, (Order of President of PRC(the People's Republic of China) No. 4 issued on August 29th 2008)

8. “Regulations of the People's Republic of China on Natural Reserves” (December 1st. 1994)

9. “National Development and Reform Commission”, (Order of President of P(the People's Republic of China No. 72 issued on June 29th 2002)

10. “Law of the People's Republic of China on Conserving Energy” (January 1st 1998)

11. “Law of Land Administration of the People's Republic of China”□August 29th 1998□

12. “Implementation Regulations on Law of Land Administration of the People's Republic of China” □June 29th 1991□

13. “Law of the People's Republic of China on Urban and Rural Planning” implemented □April 1st 1990□

14. “Regulations on the Administration of Construction Project Environmental Protection”, □order of State Council of PRC [1998] No. 253 issued in November 1998□

15. “Regulation on Environmental Impact Assessment of Planning” (Order of State Council No.559 on August 17th 2009)

16. “Regulations on the Management of Hazardous Chemicals” (Order of State Council No.344 on March 15th 2002)

17. Decision of the State Council on Several Issues Concerning Environmental Protection (Guo Fa [1996] No. 31)

18. Decision of the State Council on Several Issues Concerning Accelerating the Development of Circular Economy (Guo Fa [2005] No.22 issued on July 2nd 2005)

19. “Decision of the State Council on Implementing Scientific Viewpoint of Development and Strengthening Environmental Protection” (Guo Fa [2005] No. 39 issued on December 3rd 2005)

20. Notice of General Office of the State Council on Strengthening and Regulating the Management of Newly Constructed Programmes (Guo Ban Fa [2007] No. 64 issued on November 17th 2007)

21. “Notice of the State Council on Printing and Distributing the Comprehensive Work Scheme of Energy Conservation and Reducing the Discharge of Pollutants” (Guo Fa [2007] No. 15 issued on May 23rd 2007

22. Several Opinions of the State Council on Further Promoting Economic and Social Development in Ningxia (Guo Fa [2008] No. 29 issued on September 7th 2008)

23. Opinions of Ministry of Industry and Information Technology on Further Strengthening Industrial Water Conservation (Gong Xin Bu Jie [2010] No. 218 issued on May 4th 2010)

24. Notice on Printing and Distributing "the rules on development of Cogeneration of Heat and Power" jointly issued by SDPC(State Development Planning Commission), State Economic and Trade Commission, Ministry of Construction and SEPA (state environmental protection administration) (Ji Ji Chu [2000] No. 1268 issued on August 22nd 2000)

25. Notice of SEPA on Strengthening Environmental Impact Assessment Management and Preventing Environmental Risks (Huan Fa [2005] No. 152)

26. "Guidance Catalog for Adjustment of Industrial Structure (2011)" (order of NDRC [2011] No. 9 issued on March 27th 2011)

27. "Sulfur dioxide emissions from coal-fired pollution control technology policy" issued by SEPA (Huan Fa [2002] No. 26 issued on January 30th 2002)

28. "Protection Regulations of Ningxia Hui Autonomous Region (Revised version)" (revised on November 19th 2009)

29. "Measures for the Administration of Environmental Protection of Construction Project in Ningxia Hui Autonomous Region" implemented on October 1st 2002

30. Notice of Preliminary Hearing System Environmental Protection of Construction Project in Ningxia Hui Autonomous Region forwarded by General Office of People's Government of Ningxia Hui Autonomous Region (Ning Zheng Ban Fa [2001] No. 33 issued on March 5th 2001)

31. "Regulations on Water Conservation of Ningxia Hui Autonomous Region" (on May 1st 2007)

32. "Measures of Natural Reserve Administration of Ningxia Hui Autonomous Region" in October 2002

1.3.2 Environmental Policies and social policies of the World Bank

OP/BP4.01 (Environmental Assessment)

1.3.2 Relevant technical basis

1. HJ/T2.1-1993 Technical guidelines for environmental impact assessment-general programme"

2 HJ2.2-2008 "Technical guidelines for environmental impact assessment-atmospheric environment"

3 HJ/T2.3-1993"Technical guidelines for environmental impact assessment - surface water"

4 HJ/610-2011"Technical guidelines for environmental impact assessment - underground water"

5 HJ2.4-2009 "Technical guidelines for noise impact assessment"

6 HJ19-2011“Technical guidelines for ecological impact assessment- ecological environment”

7 HJ/T169-2004“Technical guidelines for environmental risk assessment on projects”

8 Huan Fa [2006] No. 28 “Interim Procedure On the Public Participation In Environmental Impact Assessment”

9 HJ/T91-2002“Technical specifications requirements for monitoring of surface water and waste water”

10 HJ/T92-2002“Technical requirements for monitoring of total amount of pollutants in waste water”

11 HJ/T164-2004“Technical specifications for environmental monitoring of ground water ”

12 HJ/T55-2000“Technical guidelines for fugitive emission monitoring of air pollutants”

13 GB18218-2009“Identification of major hazard installation for dangerous chemicals”

1.4 Important Environmentally Sensitive Targets

The major environmental protection factors of the proposed programme are air environment, surface water environment and sound environment. Refer to table 1.4.1 for the major environmental protection targets in assessment scope.

Table 1.4.1 List of Major Environmentally Sensitive Points

Environmental Factors	Environmental Protection Target	Direction	Distance from the Factory Boundary□m□	Scale	Environmental Function
Air	Rouyuan Village	WNW	520		Residential area
	Government of Rouyuan Town	WNW	1010		Office area
	Shaqu Village	NW	1370		Residential area
	Fanmiao Primary School	NE	1970		School
	Shimiao Primary School	ENE	490		Shool
	Jiaqu Village	SW	290		Residential area
	Zhaojia Shaofang (Shimiao Village)	W	45		Residential area
	Shimiao Village	N	25		Residential area

Environmental Factors	Environmental Protection Target	Direction	Distance from the Factory Boundary□m□	Scale	Environmental Function
	Xiangjiazhuang (Jiaqu Village)	SE	0		Residential area
Surface water	Yellow RIver	S	1500	--	Class III water body
Sound	Zhaojia Shaofang (Shimiao Village)	W	45		Residential area
	Shimiao Village	N	25		Residential area
	Xiangjiazhuang (Jiaqu Village)	SE	0		Residential area

2 Measures to Mitigate Environmental Impact

2.1 Measures to Mitigate Environmental Impact in Design Stage

Table 2.1 Measures to Mitigate Environmental Impact in Design Stage

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
Pulp making bleaching	Water pollution	Apply ECF bleaching technology	MCC Meili Paper	/	/
Waste water emitted from waste water treatment station	Water pollution	Treated with preliminary sedimentation pool+ regulation pool +selection pool+ aeration pool+ secondary sedimentation pool+ coagulative precipitation pool	MCC Meili Paper	Environmental Protection Bureau	Monitoring Station
Final emission of waste water	Water pollution	Waste water emitted from waste water treatment station after meeting the requirements in GB 3544-2001 “Discharge standard of water pollutants for paper making industry” shall enter oxidation pond for further treatment and after mixing with water from Yellow River, the water quality can meet the requirements for dry farming in GB 5084-1992 “Standards for irrigation water quality”	MCC Meili Paper	Environmental Protection Bureau	Monitoring Station
Emission of smoke from alkali furnace	Air pollution	Current alkali recovery system is equipped with three alkali liquor furnace, the dust in the smoke from 1 # and 2# alkali recovery furnace is removed through 3-electric field, and the dust in the smoke from 3# alkali recovery furnace is removed through spraying, washing and water film method.	MCC Meili Paper	Environmental Protection Bureau	Monitoring Station
Emission of dust of wheat straw	Air pollution	The dust is removed through railroad precipitator, wheat straw and dust enter duct collection room for temporary storage and are sent to	MCC Meili Paper	Environmental Protection Bureau	/

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		The forest base of MCC Meili Forest Development Co., Ltd for comprehensive utility.			
Emission of waste gas from chlorine dioxide preparation workshop	Air pollution	This technical renovation programme used R8 to produce chlorine dioxide, the process is simple; the equipments are mature, easy to operation and regulate. The tail gas after washing in chlorine dioxide absorption tower is little. And nearly no pollutants will be generated during preparation process.	MCC Meili Paper	Environmental Protection Bureau	/
Fugitive emission of waste gas	Air pollution	The coal in the factory is stored outdoor, and the measure of spraying is conducted to prevent dust in coal yard.	MCC Meili Paper	Environmental Protection Bureau	/
Wheat straw scraps generated in Material preparation workshop, pulp residues generated in pulp making section, white mud, green mud and a small amount of lime residue generated in alkali recovery section, sludge generated in waste water treatment station	SW (Solid waste) pollution	Wheat straw scraps and dust is used as fertilizer; pulp residues is used in paper making workshop; white mud is temporarily stored in SW storage yard and planned to be used as desulfurizer; green mud and lime residue is land-filled, household waste is transported by environmental health department; sludge generated in waste water treatment station is used as fertilizer in forest base.	MCC Meili Paper	Environmental Protection Bureau	/
The operation of equipments generating noise such as chaff-cutter, grass chopper, pump and millstone in material preparation section	Noise Pollution	1. equipments with low noise level shall be used to reduce noise from the source; assign equipments with noise reasonably, separate low noise area from high noise area; place equipment with high noise level away from office area and residential area to reduce the impact of noise. 2. Strengthen the maintenance of mechanical equipment, and	MCC Meili Paper	Environmental Protection Bureau	Monitoring Station

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		take sound insulation and sound-proofing measures on mechanical equipments as major noise sources. Install silencer on air hoses according to the spectral characteristics of noise. For key noise sources like air blower room, se noise elimination measure such as noise insulation room or green belt noise insulation screen can be taken under the condition without influencing operation. For pumps or electrical machines, shock absorption measures shall be taken. 3. The noise control in workshop shall refer to the allowable noise level standard of special workshops to select equipments or change working time. Sound insulation operation room can be set up when conditions permit. Workers working in high noise level environment shall wear necessary protection tools and reduce working hours according to stipulation of labor protection standards. 4. Submersible sewage pump shall be used for waste water pump and sludge pump. 5. Transportation of sludge shall comply with specified transportation lines and time to reduce the impact of transportation noise on area near transportation lines. 6. Green belts shall be set in factory or at factory boundary. Plant broad-leave tree species at factory boundary and increase the height of factory wall thus to reduce noise.			

2.2 Measures to Mitigate Environmental Impact in Construction Period

Table 2.2 Measures to Mitigate Environmental Impact in Construction Period

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
Dust from dismantling and transportation of waste or old equipments and facilities, site smoothing and clearing, piling, excavation and backfill of earth and stone, road pouring, movement of construction equipments, loading and unloading, transportation and storage of contraction materials, tail gas from all types of mechanical equipments and transportation vehicles; volatile gas from the painting and coating used in construction period	Dust, tail gas, and volatile gas	1. During dismantling and transportation of waste or old equipments and facilities, land excavation and drilling, water shall be sprayed at dry land of dismantling, excavation and drilling area to maintain certain humidity; during earth and stone backfill, water shall be sprayed at dry surface earth to prevent dust during backfill operation. 2. Transport waste such as soil in time, solid road surface and spray regularly. 3. The vehicles transporting construction materials and dismantled waste such as lime, cement, earth and stone, construction garbage and dismantled waste shall be in good conditions, be covered tightly with canvas, be loaded too fully thus to ensure no dropping during transportation. Closed tank truck shall be used to transport dry cement to cement storage warehouse through closed system. 4. Transportation vehicles is prohibited to overload shall move at low speed or under limited speed to reduce dust. Transportation roads in construction area shall be cleaned and washed in time. 5. Regularly wash the wheel and under-pan of vehicles to reduce the soil left on land. The soil left on land during transportation shall be cleared in time to prevent much dust in road and thus reduce the dust during vehicles transportation.	MCC Meili Paper	Environmental Protection Bureau	Monitoring Station

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		6. Use semi-finished products, finished products such as commercial concert, commercial (wet) cement and pre-cast cement parts as much as possible, reduce use of dry cement, reduce the use and storage of coarse materials (sand, cement, etc) easy to generate dust. 7. Avoid outdoor storage of materials easy to generate dust. Concrete mixing plant shall be set indoor. Cement and other fine particle materials shall be stored in warehouse or covered tightly. 8. It is suggested that closed construction method is used and set screen at the construction boundary which not only prevent the entry of irrelevant people, but play the role of noise insulation, dust prevention and reducing visual pollution. 9. In case of weather with 4^{th} scale wind or above, dismantling and excavation work shall be stopped. 10. Strengthen the maintenance of mechanical equipments and vehicles, do not use poor fuel, ensure no black smoke of incomplete combusted is emitted and tail gas is emitted after meeting requirements. 11. Construction unit and unit undertaking the project shall assign necessary full-time or part-time environmental protection supervisor, responsible for supervising the implementation of air pollution prevention and treatment measures, and properly solveing problems in time.			
Dismantling,earth and stone work, foundation, structure and fitment, etc	Noise	1. set the fixed noise sources with noise level above 80dB(A) such as air compressor, electronic saw in room and the room's	MCC Meili	Environmental Protection	Monitoring Station

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		sound insulation effect shall be better than 15dB(A). For those must set outdoor, temporary sound insulation room or sound insulation screen shall be set. 2. Work such as transportation of construction materials and construction waste, excavation, piling, land clearing, pneumatic pick shall be done at day, a screen of 6-8 m shall be set at the construction boundary to reduce noise., and hard material shall be used at the outside of the screen. 3. Only work of low noise level such as lifting shall be done at night. The use of pile driver, soil shifter, excavator. If continuous operation is needed for special reasons, approval from government department shall be gained in advance. 4. Avoid many motive power machines working at the same construction site thus to avoid high sound level in certain part. 5. When conditions permit, equipment of high noise level shall be set far away from sensitive areas (especially Xiangjiazhuang in Jiaqu Village closely near at the southeast of the programm). 6. Use the exist buildings in the factory as sound screen to reduce noise. 7. Equipment of low noise level shall be selected as much as possible, for example, use hydraulic machines to replace fuel machines, use high-frequency vibrator. 8. Fix mechanical equipments and earth excavating and transporting machines such as excavator and soil shifter. Noise can be reduced by silencer at exhaust pipe and insulating the vibrating parts of motor.	Paper	Bureau	

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		9. The noise level of equipment may be increased for the vibration of loose parts or damage of silencer, thus motive power machines shall be regularly maintained and repaired. 10. Unused equipment shall be turned off in time to reduce the working time of noise sources. 11. Transportation vehicles shall move at low speed and decrease times of whistle after entering construction site. 12. Mechanical equipment as noise sources shall be operated according to operation procedures to reduce noise generated by faulty operation. 13. Replace the whistle, clock, and flute with modern communication equipment to command work. 14. sound insulation screen shall be set at northwest of Xiangjiazhuang in Jiaqu Village, east of Zhaojia Shaofang in Shimiao Village, north of programme boundary, and south of Shimiao Village to minimize the adverse impact of construction noise on nearby sensitive points. 15. Optimize construction plan, reasonably arrange construction time, thus to minimize the adverse impact of construction noise. At the stage of programme tendering and bidding, the measures to reduce noise pollution shall be set as the design content and clarified in contract. 16. Construction unit and unit undertaking the project shall assign necessary full-time or part-time environmental protection supervisor, responsible for supervising the implementation of noise pollution prevention and treatment measures, properly			

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		solving problems in time and cooperating local environmental protection departments in their law enforcement work.			
Household waste water of construction workers, waste water containing sludge generated from washing of transportation vehicles, waste water containing sludge generated from washing of stored construction materials by rain, waste water containing oil generated from leakage of construction mechanical equipment, waste water containing oil generated from washing of outdoor mechanical equipment by rain.	Waste water	1. Waste discharge pipeline shall be prepared before construction; household waste water of construction workers after treated in Digestion tank and waste water generated from construction work after treated in sedimentation pool shall enter waste water treatment station through prepared waste discharge pipeline for treatment. Waste water shall not run without control and is prohibited to emitted to water bodies such as Yellow River. 2. Mechanical equipment and transportation vehicles shall not be washed in construction area and shall be covered with canvas in case of rain. 3. Maintain mechanical equipment regularly to minimize the possibility of leakage. 4. Construction unit and unit undertaking the project shall assign necessary full-time or part-time environmental protection supervisor, responsible for supervising the implementation of waste water pollution prevention and treatment measures.	MCC Meili Paper	Environmental Protection Bureau	Monitoring Station
SW from dismantling and waste earth and stone in building project, metal waste from installation, waste cement, brick, lime and sand during construction, household waste of construction workers such as kitchen waste, waste water bottle and daily waste in office area.	Construction garbage and household garbage	1. The land get and fill are equal, the waste earth and stone can be filled or poured in road. 2. Construction and household waste shall be cleared in time, freely discard and storage is not allowed. 3. Temporary closed garbage station shall be set in construction area and be cleared in time. 4. Metal waste from dismantling and installation, waste cement, brick, lime and sand during construction, equipment package shall be sent to relevant department for recycling. 5. Household waste during construction period shall be treated	MCC Meili Paper	Environmental Protection Bureau	/

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		separated by environmental protection department and shall not be mixed with construction garbage. 6. Waste in digestion tank shall be cleared regularly to avoid polluting environment. 7. Minimize the pollution of leaked oil to soil. 8. Construction unit and unit undertaking the project shall assign necessary full-time or part-time environmental protection supervisor, responsible for supervising the implementation of SW pollution prevention and treatment measures.			
Change of natural feature caused by excavation of earth and stone project, damage of natural and artificial vegetation on surface, water and soil loss, degradation of soil fertility, damage of natural landscape	Ecology	1. Strictly comply with "three the same time" system in "Law of Water and Soil Conservation" , i.e. water and soil conservation facilities shall be to designed, constructed and finished at the same time with main project. 2. Strengthen the protection of water and soil conservation facilities such as land surface and vegetation. Do not discard waste residue and soil freely. 3. Close and beautify construction area, enclose the buildings in structure period to decrease visual pollution. 4. Avoid earth and stone excavation work in rainy season to reduce water and soil loss. 5. plant trees after construction to recover landscape.	MCC Meili Paper	Environmental Protection Bureau	/
Trucks are needed to transport dismantled waste equipments and SW during construction from construction site and transport cement, stone, lime, earth and brick	traffic	1. Reasonably arrange transportation time, avoid heavy transportation work at traffic peak. 2. Special entrance and exit for transportation vehicles shall be set and special traffic supervisor shall be assigned to command traffic.	MCC Meili Paper	□□□□ Transportation department	/

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
needed for construction to construction site					
The drop, movement, turning and break of dismantled waste equipments and facilities as well as constructing equipments and facilities, crash and falling of people when transporting dismantled waste equipments and facilities and operating equipments and facilities	Safety risk	1. Install platform receiving dropped articles on passageways and under conveyer. 2. The walking surface shall be water-proofing and retains no water. 3. Install handrail on the channel near the constructing equipments and facilities or at high level. The lines for vehicles and people shall be clearly marked. 4. For moving equipment, overturn prevention measures shall be taken. 5. Stipulate the work procedures on crane not lift heavy articles above human head. 6. For moving equipment parts (such as the involving points of chain and chain sprocket of conveyer; rotary drum, conveying belt, pulley and roller of conveyer; rotary drum of paper making machine, and feed belt of grinder), safety protection device or interlock device which can prevent workers form contact these moving parts shall be installed. 7. Conduct training to operators on safe use of construction equipments. 8. Reasonably arrange the dismantling procedures to reduce the possibility of damage of broken fragments on human beings. 9. Regularly check and maintain construction equipments to prevent the failure of equipments.	MCC Meili Paper	□□□□□□ Relevant safety department	/

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
		10.. The temporary storage yard for dismantled equipments and facilities shall be clearly defined and the vehicles entry and leaving shall be closed controlled. 11. The temporary storage yard for dismantled equipments and facilities shall be equipped with shelter, chain and other device preventing dismantled equipments and facilities from falling.			

2.3 Measures to Mitigate Environmental Impact in Operation Period

Table 2.3 Measures to Mitigate Environmental Impact in Operation Period

Activity	Impact	Measures	Construction party	Supervision Party	Monitoring Party
Emission of waste water	Water pollution	Waste water of proposed programme shall be treated in waste water treatment station with preliminary sedimentation pool+ regulation pool +selection pool+ aeration pool+ secondary sedimentation pool method. Waste water emitted from waste water treatment station after meeting the requirements in GB 3544-2001 “Discharge standard of water pollutants for paper making industry” shall enter oxidation pond for further treatment and after mixing with water from Yellow River, the water quality can meet the requirements for day farming in GB 5084-1992 “Standards for irrigation water quality”	MCC Meili Paper	Environmental Protection Bureau	Monitoring Station
Emission of smoke from alkali furnace	Air	Current alkali recovery system is equipped with three alkali	MCC	Environment	Monitori

	pollution	liquor furnace, the dust in the smoke from 1 # and 2# alkali recovery furnace is removed through 3-electric field, and the dust in the smoke from 3# alkali recovery furnace is removed through spraying, washing and water film method. Both dust and emitted SO2 from the outlet of furnaces meet the requirements for level II in "Emission standard of air pollutants for industrial kiln and furnace" (GB9078-1996)	Meili Paper	al Protection Bureau	ng Station
Emission of dust from wheat straw scraps	Air pollution	The dust is removed through railroad precipitator, wheat straw and dust enter duct collection room for temporary storage and are sent to the forest base of MCC Meili Forest Development Co., Ltd for comprehensive utility.	MCC Meili Paper	Environmental Protection Bureau	/
Emission of waste gas from chlorine dioxide preparation workshop	Air pollution	This technical renovation programme used R8 to produce chlorine dioxide, the process is simple; the equipments are mature, easy to operation and regulate. The tail gas after washing in chlorine dioxide absorption tower is little. And nearly no pollutants will be generated during preparation process.	MCC Meili Paper	Environmental Protection Bureau	/
Fugitive emission of waste gas	Air pollution	The coal in the factory is stored outdoor, and the measure of spraying is conducted to prevent dust in coal yard.	MCC Meili Paper	Environmental Protection Bureau	/
Wheat straw scraps generated in material preparation workshop, pulp residues generated in pulp making section, white mud, green mud and a small amount of lime residue generated in alkali recovery section, sludge generated in waste water treatment station	SW pollution	Wheat straw scraps and dust is used as fertilizer; pulp residues is used in paper making workshop; white mud is temporarily stored in SW storage yard and planned to be used as desulfurizer; green mud and lime residue is land-filled, household waste is transported by environmental health department; sludge generated in waste water treatment station is used as fertilizer in forest base.	MCC Meili Paper	Environmental Protection Bureau	/
The operation of equipments	Noise	1. Equipments with low noise level shall be used to reduce noise	MCC	Environment	Monitori

generating noise such as chaff-cutter, grass chopper, pump and millstone in material preparation section	pollution	from the source; assign equipments with noise reasonably, separate low noise area from high noise area; place equipment with high noise level away from office area and residential area to reduce the impact of noise. 2. Strengthen the maintenance of mechanical equipment, and take sound insulation and sound-proofing measures on mechanical equipments as major noise sources. Install silencer on air hoses according to the spectral characteristics of noise. For key noise sources like air blower room, se noise elimination measure such as noise insulation room or green belt noise insulation screen can be taken under the condition without influencing operation. For pumps or electrical machines, shock absorption measures shall be taken. 3. The noise control in workshop shall refer to the allowable noise level standard of special workshops to select equipments or change working time. Sound insulation operation room can be set up when conditions permit. Workers working in high noise level environment shall wear necessary protection tools and reduce working hours according to stipulation of labor protection standards. 4. Submersible sewage pump shall be used for waste water pump and sludge pump. 5. Transportation of sludge shall comply with specified transportation lines and time to reduce the impact of transportation noise on area near transportation lines. 6. Green belts shall be set in factory or at factory boundary. Plant broad-leave tree species at factory boundary and increase the height of factory wall thus to reduce noise.	Meili Paper	al Protection Bureau	ng Station

3 Risk Control and Emergency Response Management

3.1 Major Risk Factors

The major risk factors of this programme are leakage of hazardous chemicals, accidental emission of pollutants, fire and explosion accident caused by flammable and explosive substances and devices. Refer to table 3.1.1 for detailed analysis of risk factors.

Table 3.1.1 Analysis of Risk Factors of Proposed Programme

Risk source	Specific Risk Link	Possible Cause
Leakage of hazardous chemicals	Leakage of hazardous chemicals such as chlorine dioxide, methanol, sulfuric acid, sodium hydroxide, hydrogen peroxide	Break of storage tanks or storage grooves, leakage of pipelines, and possible transportation incident
Accidental emission of pollutants	Waste water treatment system	Failure of waste water treatment system, leading to decrease of treatment efficiency
	Smoke treatment system	Failure of smoke treatment system, leading to decrease of treatment efficiency
	Alkali recovery system	Black liquor overflows from storage tank, break of pipelines and valves.
Fire and explosion	Raw Material yard	Fire may be caused by improper management
	Chemical storage warehouse	Explosion may be caused by explosive substances such as chlorine dioxide, sodium chlorate and methanol.
	chlorine dioxide preparation workshop	Explosion may be caused by explosive substances such as chlorine dioxide, sodium chlorate and methanol
	Alkali recover furnace	Explosion may be caused by machine failure and improper maintenance and repair of equipments
	(heavy oil storage warehouse)*	Fire may be caused by leakage of heavy oil because of break of storage tank
	(finished products storage yard)*	Fire may be caused by improper management

Note:*refers to the risks existing in current project but not existing in proposed project.

3.2 Measure to Mitigate Environmental Risks

3.2.1 Measures to prevent and treat risks caused by hazardous chemicals

The risks of chemicals of this programme mainly exist in the storage, transportation and use of hazardous chemicals. For the purpose of reducing and avoiding environmental pollution and human injury or death caused by accidents, construction unit shall design chemical storage warehouse in accordance with the requirements in GBJ 16-87“Code of design on Building Fire Protection and Prevention (2001)” and

GB50187-1993 “General graphic design of industrial enterprises”, and for the parts where leakage is easy to happen such as pumps and valves, automatic change system shall be set. Acid, alkali and chemicals storage warehouse shall be corrosion-proofing and comply with “Code for anticorrosion design of industrial constructions”. The storage, transportation and use of chemicals shall comply with “Regulations on the Management of Hazardous Chemicals” (Order of State Council No.344 in 2002). Refer to table 3.2.1 for the requirements of storage and transportation of chemicals and safe treatment plan.

Table 3.2.1 List of Requirements of Storage and Transportation of Chemicals and Safe Treatment Plan.

Name	Storage Requirements	Transportation Requirement	Safe Treatment
Chlorine dioxide	Anti-corrosive materials shall be used in storage area; no wood, combustible and plastic materials shall be used as floor; good ventilation is required for storage and operation area, warning signs shall be posted at suitable places; limit the access to storage area; fire-fighting equipments and sand shall be prepared in or near the storage area; downflow weir shall be equipped for chlorine dioxide solution storage facility; check regularly the defect of storage facility such as damage or overflow or leakage, etc	Water-proof and rain-proof shall be done for transportation vehicles; handle with care during transportation; it is prohibited to transport chlorine dioxide together with acid, organic matter, flammable and explosive articles.	Evacuate people in leakage polluted area to upwind area, and insulate polluted area until gas is sent over. Emergency response people are suggested to ware positive pressure contained respirator and protecting suit. Cut off fire source. Avoid contact of leaked substance with inflammable substances (wood, paper, oil etc). Cut off gas source. Spray vaporic water to dilute and dissolve it. Extract (from indoor) or strong ventilation (to outdoor). Leaked container can not be used again, and the left gas shall be eliminated with technical treatment.
Sodium chlorate	It is required to store sodium chlorate in cool and ventilated place far away from fire and heat source; sodium chlorate shall be closely packed and separate from combustible (flammable) substance, reductant, alcohol, mixed storage of	Handle with care during transportation to prevent package and container from being damaged; shock, hit and friction are prohibited. Fire-fighting equipments and emergency	Insulate polluted area to limit entry and exit. Emergency response people are suggested to ware positive pressure respirator and general working clothes. Do not directly contact leaked substance, prevent the leaked substance from contacting organic matters, reductant and inflammables.

Name	Storage Requirements	Transportation Requirement	Safe Treatment
	sodium chlorate with above matters is prohibited; there shall be proper material to contain leaked sodium chlorate.	response equipments shall be prepared with right types and amount.	
Methanol	It is required to store methanol in cool environment and fully closed container to prevent methanol from contacting fire source and human being; grounding and ventilation device as well as vapor sending control device shall be equipped in storage facility. Storage facility shall be enclosed; avoid the mixed storage with incompatible substance.	Storage facility shall be kept closely during transportation, avoid the line with sunshine and fire source; avoid the mixed transportation with incompatible substance.	Leakage: quickly evacuate people in leakage polluted area to safe area, and insulate polluted area to limit entry and exit. Cut off fire source. Emergency response people are suggested to ware positive pressure respirator and gas protection clothes. Do not directly contact leaked substance. Cut off leakage source to prevent it from entering the limited space such as kennel and drainage channel. Small leakage: absorb with sand or other non-flammable material. Or wash with large amount of water. Large leakage: construct closure or pit, covered with foam to reduce the harm of its steam. Transfer to tank car or special container with explosion-prevention pump. Collect for recycling or send to waste treatment area.
Sulfuric Acid	Sulfuric acid shall be separate from inflammable, reductive and strong alkali substances.	Sulfuric acid shall be separate from inflammable, reductive and strong alkali substances.	Pay attention to the control of sulfuric acid mist and improve ventilation. Washing equipment shall be prepared in workshop.
Sodium Hydroxide	Pay attention to prevent moister and rain. Store sodium hydroxide separately from inflammable, combustible and acid substances.	Handle with care during transportation to prevent package and container from being damaged; transportation is not allowed in rainy day.	Collect with clean shovel into dry, clean and covered container, or wash with a large amount of water and emit to waste water system.

Name	Storage Requirements	Transportation Requirement	Safe Treatment
Hydrogen Peroxide	The storage area shall be protected from direct sunshine; enough water, fire-fighting hoses and spraying device shall be prepared; no fuel, oxidizer or organic matter are allowed to exist in storage area; maintain clean and be in order.	hydrogen peroxide with the concentration between 20%-60% shall be transported in polyethylene drum or pure aluminum drum with air vents on the cover of drum; storage of hydrogen peroxide with the concentration above 60% shall use contained made from pure aluminum (above 99.6%) poly tetra fluoroethylen and polychlorotrifluoroethylene; the mixing of foreigner such as iron, rust and dust is prohibited.	Evacuate people in leakage polluted area to safe area, and insulate polluted area to limit entry and exit. Cut off fire source. emergency response people is suggested to ware positive pressure respirator and gas protection clothes. Do not directly contact leaked substance. Cut off leakage source to prevent it from entering the limited space such as kennel and drainage channel.
Heavy oil	Fire separation distance of storage tanks shall be designed according to the C-class articles.	The mixing of water and other foreigners is prohibited.	Cut off leakage source to prevent it from entering the limited space such as kennel and drainage channel. Small leakage: absorb with sand□vermiculite, or other inert material. Large leakage: transfer to tank car or special container with pump. Collect for recycling or send to waste treatment area.

Based on the characteristics, following measure shall be taken.

Storage area shall meet the requirements for fire-fighting. The selected site of buildings including chemical production unit, chemical storage warehouse, storage groove (tank), storage yard, etc, structure, electric equipment, anti-explosion and pressure relief device and fire-fighting device all need to meet the requirements for fire-fighting. Chemical Storage area shall be far away from wheat straw storage yard and current heavy oil storage warehouse where fire is easy to happen. The storage groove (tank) shall meet the requirements for safety and stored in dry and clean warehouse. Pay attention to prevent moister and rain, and shall be stored separately from inflammable, combustible and acid substances. Pay attention to personal

protection during subdividing and transportation.

All hazardous must be managed with special people and keep good use record to assign individual responsibility. Staffs working in warehouse shall receive special training and take poison with certificate. Warehouse keeper shall check the warehouse three times a day, i.e. check after starting work, during work and before leaving: check whether the stacking is firm, whether the package has leakage, whether the power is safe. Problem shall be treated as soon as possible to eliminate risks.

Establish industrial health, environmental monitoring and management system. Manage the normal running of the factory. In case of accident, emergency poison-prevention monitoring, poison-prevention command and rescue the poisoning.

3.2.2 Measures to prevent risks in chlorine dioxide preparation workshop and storage warehouse

Based on the characteristics of chlorine dioxide preparation workshop and storage warehouse, the floor, wall and equipment base in working area of strong corrosive medium such as chlorine dioxide, sulfuric acid and sodium hydroxide shall be treated with anti-corrosion method and the floor shall be treated with seepage-proofing method. Dioxide preparation workshop shall be equipped with accident treatment device-alkali liquor spray device to treat possible chlorine dioxide leakage. Dioxide preparation workshop shall be equipped with emergency power to ensure the power supply in case of accident. Poisoning working area such as chlorine dioxide and methanol shall be equipped with special cabinet for anti-poison equipments. Sufficient emergency rescue equipment shall be prepared and managed by specific people and in use condition under any circumstance.

Improve the maintenance of storage facilities of chlorine dioxide, sulfuric acid and sodium hydroxide to eliminate the possibility of leakage. In addition to complying with relevant design standards, reasonable fire-fighting and anti-explosion measures shall be arranged for above inflammable and explosive chemicals.

Comprehensive repair of pipelines, valves and equipments shall be conducted once a year to ensure the safe operation of equipments, repair the equipments in case of problems found in production and correct the safety risks in time. The equipments shall be maintained regularly to ensure and material and process quality of flange, gasket, connecting bolt, valves and pipelines. Abnormal situation shall be immediate reported for repair to ensure the normal operation of relevant equipment.

Dioxide preparation workshop shall be placed at the downwind area of predominant wind direction at the programme area (the predominant wind direction of proposed programme area is E and dioxide preparation workshop is planed to be placed on the west of the proposed programme). dioxide preparation workshop shall be more than 50m away from the boundary of intensively populated area (dioxide preparation workshop of the proposed programme is more than 400 away from the nearest office area.)

3.2.3 Measures to prevent risks in alkali recovery workshop

In order to effectively prevent explosion accident in alkali recovery workshop, we must start from the purchase, installation, use, repair and maintenance of alkali furnace and strictly comply with relevant national laws, regulations and standards.

1. Strict requirements for purchase of alkali furnace

Construction unit shall apply strict requirements for selection of all equipment in alkali recovery workshop. The selected alkali furnace shall be weak in the hearth of the furnace, thus in case of accidental explosion happened in hearth of the furnace, the huge impact force will be released quickly through weak structure, thus to minimize the loss.

2. Installation of alkali furnace must comply with requirements

The quality of alkali furnace installation is directly related to the safe operation of alkali furnace. The installation unit must hold the certificate above class III (including class III) of professional contractor in power plant equipment installation. Before the installation of alkali furnace, any part of the furnace shall be checked one by one. In case of disqualified parts, the installation shall be rejected. All butt weld shall use advanced welding technique with the base of argon arc welding, and shall be checked with 100% X ray to ensure the welding quality.

3. Strengthen the safety management and repair in use

In order to prevent accident of alkali furnace, the safety management of furnace must be strengthened. The unit using alkali furnace shall do well in the management, maintenance and regular check of furnace according to “Safety technical supervision code for steam boiler”. Specific people shall be responsible for the technical management of equipment and rules and systems with system of post responsibility as main content shall be established. Detailed rules on anti-explosion, fire-prevention and anti-poison shall be stipulated. System of patrol monitoring and inspection and regular check and repair of automatic instrument shall be established. Worker managing furnace shall hold “Certificate for special equipment operator” the when taking the position. Operator in charge of alkali furnace operation shall continuously check the waste liquor supply and combustion situation, and report abnormal or dangerous signs immediately thus to take measure to prevent explosion.

4. Establish and complete fire-fighting and fire alarming system

Complete safety and fire-fighting measures shall be taken and complete fire-fighting system shall be prepared. Fixed foam fire-fighting system and cooling water spraying system shall be set. Automatic system control and complete alarming interlock system shall be set on key equipments and strict operation system shall be stipulated.

3.2.4 Measures to prevent fire and explosion risk

In order to prevent or reduce fire, fire hydrate shall be set around wheat straw storage yard and current finished warehouse at regular intervals; fire-fighting water shall be stored in high-level pool of production or fire- fighting, and technical facility shall be

set to make fire- fighting water will not be used for purpose other that fire- fighting to ensure the safety of fire- fighting use water. Waste fire- fighting water shall not be emitted directly and shall be emitted after treatment and meet relevant requirements.

For workshop with high requirements such as current finished warehouse, automatic water spraying fire-fighting system as well as fire alarming, smoke detector and water flow indicator shall be set. In addition, fire-fighting hydrate with alarming valves for indoor fire-fighting hydrate and fire extinguisher shall be set in all workshops in accordance with GBJ 16-87“Code of design on Building Fire Protection and Prevention (2001)” and GBJ 140-90 “Code for design of extinguisher distribution in buildings”.

Refer to the section of “Measures to prevent risks in alkali recovery workshop” for the risk prevention measures in alkali recover furnace

Facilities such as storage groove and storage tank storing hazardous chemicals (such as chlorine dioxide, methanol, sodium chlorate etc) shall be distributed in low area to with a certain fire separation distance from nearby factory room and other storage facilities. Current heavy oil tank shall be stored separately with buffer zone around storage and area and specific people managing. More over, closure shall be set around current heavy oil tank to prevent fire caused by oil leakage and diffusion. Foam fire-fighting and automatic spraying devices shall be equipped in groove (tank) area and grounding device shall be installed to prevent fire caused by static electricity.

Fire-prevention and anti-explosion measures needed for the storage of hazardous chemicals such as chlorine dioxide, methanol, sodium chlorate etc include: strictly manage according to stipulations concerning pressure vessel management; regularly check wall thickness, welding line and pipe connecting; lighting protection and anti-static facilities, Static electricity guiding device and safety sign shall be set at the inlet and outlet of the equipment and pipeline systems chlorine dioxide, methanol, and sodium chlorate; strictly comply with safety operation procedures and process procedures; stipulate emergency response plan for explosion accidents and exercise it regularly.

3.2.5 Measures to prevent risks of accidental emission

1. Accidental emission from waste water treatment station

    (a) collection and treatment of accidental waste water

The waste water of proposed programme will be treated in waste water treatment station. In case of accident happens in waste water treatment station, it will fail to treat waste water. Waste water directly entering oxidation pond without treatment will impose huge impact on oil and underground water of forest base as well the underground water of the whole region. For the purpose of minimizing impact of emitted waste water, production shall be stopped in case of failure of waste water treatment station. It is suggested to equip emergency collection pool for waste water treatment station to minimize the environmental risks caused by accidental waste water.

It is suggested that the emergency collection pool and the closure of each storage tank shall not contain waste water or other water, the retained rain water shall be emitted in time, thus the leakage, fire-fighting water, washed waste water can be collected into emergency collection pool quickly and safely in case of water pollution accident. The collected waste water then will be sent to waste water treatment device fore necessary treatment to prevent accidental emission and environmental pollution.

(b) spare equipment

The failure of pump, valves, electrical equipment and instrument of waste water treatment station will lead to accident of waste water treatment. The measures to prevent this kind of accident is to prepare several suits of spare parts, check frequently by operator during the operation waste water treatment station, and maintain and repair above devices thus to reduce the failure rate.

(c) strengthen monitoring

Operator on duty must operate in accordance with the rules and systems for waste water treatment station, check regularly, maintain and contact for repair and change. Operator on duty shall be able to discover the all types of sign which may cause abnormal running of waste water treatment station, and eliminate accident risks with the cooperation of relevant staffs. The following measure shall be taken in case of potential accident situation.

(i) Blocking of garbage rack: In case of overflow caused by blocking for high content of waste residue in waste water, operator on duty shall immediately report to leader of emergency response group and shall organize people to clear garbage. The members of emergency response group shall come to site upon receiving report, make decisions to clear site according to the potential impact scope of overflowed waste water, and report to higher level leaders about treatment situation. Emergency response group shall also contact the production department to improve water quality.

(ii) Inflow of pump room of equalization tank: In case of failure of all pumps, operator on duty shall immediately report to leader of emergency response group and highest director of the department, contact relevant repair units to organize repair. The highest director shall make the order to stop production.

(iii) Overflow of preliminary and secondary sedimentation scum well: operator on duty shall immediately report to leader of emergency response group and turn on scum pump. Leader of emergency response group shall organize people to clear the scum overflowed to the land.

(iv) Overflow of preliminary and secondary sedimentation scum well: operator on duty shall immediately report to leader of emergency response group and turn on most dehydrators to accelerate treatment capacity and reduce the sludge in sludge well from preliminary and secondary sedimentation tank. Leader of emergency response group shall organize people to clear the scum overflowed to the land.

(v) Leakage of waste water pump and sludge pump: operator on duty shall immediately report to leader of emergency response group, and leader of

emergency response group shall organize people to change or repair equipment and clear the scum overflowed to the land

(d) ensure the running effect of waste water treatment station

On line monitoring instruments must be equipped on the key technique units of waste water treatment station to monitor quantity of flow and water quality. Meanwhile regular manual sampling determination shall be taken as complementary measures. The signals from analysis instruments related to waste water treatment outside the factory shall be analyzed synchronously with the data from waste water treatment station for operator to refer to and change operation in time.

2. Accidental emission of black liquor

Alkali recovery treatment is the most effective method to solve the problem of black liquor. SS. COD, BOD5 in black liquor can be completely removed after four sections: black liquor extraction, evaporation, combustion and causticization. Meanwhile alkali can be recovered and secondary steam can be generated as energy. It is needed to set black liquor tank with overflow alarm control system to prevent large amount of overflow of black liquor from impacting waste water treatment station. Treatment shall not continue until the recovery of system. In case of large amount of leakage, production shall be stopped immediately until the recovery of system. Leaked black liquor is sent to waste water treatment station for treatment.

3. Measure to prevent risks of underground water pollution

SW storage yard shall be treated with seepage-proofing before its use. The treatment method is rolling, tamping, laying HDPE seepage-proofing film, lining with closure at the dam body and accidental ash yard, thus to prevent impact on underground water. A seepage-proofing layer s hall be set under the storage yard and storage dam with the seepage-proofing capacity reaching the seepage-proofing coefficient of 1.0×10^{-7}cm/s or equivalent to the seepage-proofing capacity of 1.5m thick clay layer. Meanwhile, project measures shall be taken to treat the gutter, groove and grotto near the storage yard, which shall meet the requirements in “Standard for pollution control on the storage and disposal site for general industrial solid wastes” (GB 18599-2001), thus the proposed programme imposes little impact on underground water of nearby region. More move, flood drainage channel shall be set around the storage yard to stop rain. Underground water monitoring points shall be set to conduct regularly monitoring. If situation out of limits is found, operation in residue yard shall be stopped immediately. Relevant technical unit shall be entrusted to check the seepage-proofing measure of storage yard to find reasons and repair. The storage yard can only be used again after the problems are solved.

Measures shall be taken to prevent leaked materials during processing process and loading and unloading process in major production area from polluting underground water. The ground of related area shall be hardened. In case of leakage of waste water and chemicals, emergency treatment measures such as land washing and dilution shall be taken immediately to lead pollutant to waste water treatment station. emergency collection pool shall be treated with seepage-proof measures with the seepage-proofing capacity reaching the seepage-proofing coefficient of 1.0×10-7cm/s in “Standard for pollution control on the storage and disposal site for general industrial solid wastes” (GB 18599-2001), thus to prevent waste water from polluting underground water. The quality of waste water pipelines shall be controlled strictly to

use pipelines with good anti-corrosion performance. Measure shall be taken to monitor the water emission of pipelines. In case that abnormal situation is found in water from waste water treatment station or leakage of waste water pipelines is found, the pipeline shall be immediately checked and repaired in shortest time. In the leakage source is large, take into consideration of stopping production and waste water emission before the recovery of pipelines.

The quality of underground water shall be monitored regularly. In case of situation out of limits is found, problems shall be checked and corrected immediately. Refer to table 3.2.2 for monitoring plan.

Table 3.2.2 Underground Water Monitoring Plan

Distribution of Monitoring Moints	Monitoring Frequency	Monitoring Indicators
Monitoring well shall be set at Shimiao Village at the upstream of the factory and Jiaqu Village at the downstream of the factory, SW storage yard, oxidation pond, raw material forest base	Once half a year. Emergency monitoring shall be started in case of pipeline leakage, damage of production facility and leakage of waste water	pH, sulphate, total hardness, TDS, ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, volatile phenol, permanganate Index, fluoride, As, Hg, Cd, Cr VI, Pb, etc

4. Accidental emission of smoke

Daily maintenance of electrostatic precipitator shall be conducted, and the damaged parts and parts will problems shall be repaired in time. Spare circuit shall be prepared to ensure the normal running of precipitator in case of circuit failure. On-line monitoring device shall be set for waste gas from boiler to monitoring the emission of pollutants at any time. Measure shall be taken in case of problems found.

3.2.6 Measures to prevent risks of professional health

Current occupational disease prevention and treatment department shall continue to be responsible for the management and leadership of occupational disease prevention and treatment to ensure the orderly conduction of occupational disease prevention and treatment work, protect the legal rights and interests of staffs' health, advance the sustainable development of enterprise economy, and implement the social responsibility undertaken by the enterprise. This occupational disease prevention and treatment department shall establish a leading group of occupational disease prevention and treatment, with the members including leaders of each functional department, managers, secretaries, workshop directors and leaders in change of infirmary of each sub-factory. There shall be a general office under the leading group, located at labor unit office and responsible for the daily work of occupational disease prevention and treatment.

In addition, the waste and old equipments and facilities needed to be dismantled or transferred include current 1# and 3# pulp making equipments and facilities, 2# pulp making equipments and facilities, porous pressured filter, drum vacuum pulp washer, self-washing vibrating flat screen, drum vacuum pulp washer, mould thickener, centrifugal screen, alkalization tower, chlorination tower, centrifugal screen, and

paper making system, mould the first paper making, one piece 1575/60 paper machine and related equipments and facilities, the second, third, forth and seventh paper making related equipments and facilities, a suit of alkali recovery system, five-body and five-effect evaporimeter of two-board and three pipes. The dismantled equipments and facilities are all waste and old equipments and facilities; therefore no environmental risks shall be involved.

3.3 Emergency Response Plan

Emergency response plan shall be prepared for the potential risks and accidents based on the characteristics. Refer to table 3.3.1 for the framework of emergency response plan.

Table 3.3.1 The Framework of Emergency Response Plan.

No.	Item	Contents and Requirements
1	General provisions	This plan is emergency response plan for the environmental risks in Technical Renovation Programme on 68 Thousand Tons Bleached Wheat Straw Pulp Extended Delignification Cooking and Clean Bleaching of MCC Meili Paper Industry Co., Ltd. The contents and requirements in this plan shall be implemented and specified in later design and construction stages. This plan stipulates the contents for environmental risks inspection and acceptance of "three the same time".
2	General information on hazards	Descript the types, amount and distribution of hazards
3	District covered in emergency response plan	Factory and nearby areas
4	Emergency response organization	Factory: Emergency response command in the factory: responsible for comprehensive command of Emergency response site Professional rescue team: responsible for accident control, rescue and treatment Local area: Emergency response command: responsible for command, support, administration and evacuation of nearby areas Professional rescue team: responsible for providing support to the Professional rescue team in the factory
5	Classification of emergency response status and emergency response procedures	Conduct classified management procedures to different accidents according to the class of accidents
6	Emergency response facility, equipment and material	Emergency response facility, equipment and material for fire and explosion are mainly fire-fighting equipments. Major equipments preventing leakage of hazardous and harmful substance are spraying devices, equipment and material. To prevent the emission of accidental pollutants is the normal use of related storage equipment.
7	Emergency response communication,	Stipulates the measures of communication ways, inform ways and traffic control communication ways: telephone, interphone and internet

No.	Item	Contents and Requirements
	inform and transportation	Inform ways: telephone, interphone and internet Transportation vehicles: car Traffic control: road in the near the factory
8	Emergency response monitoring and pose-accident assessment	There are professional team to conduct Emergency response monitoring on the impact of the accident in order to assess the nature, parameters and consequences of the accident, thus to provide support the decision making of command.
9	Emergency response measures, measures and equipments to clear leakage	Accident site: control and accident, prevent accident from extending and chain reaction, clear site leakage to reduce damage and prepare corresponding facility and equipment Nearby area: control the fire district, prevent chain reaction, control and clear pollutants prepare corresponding facility and equipment
10	Emergency response dose control, evacuation plan, medical rescue and public health	Accident site: accident treatment personals shall stipulate the emergency response dose of poisons, evacuation plan and rescue plan Nearby area: stipulate the emergency response dose of poisons for people in influence area, evacuation plan and rescue plan
11	Termination of emergency response state and recovery measure	Remove accident alarming, treatment of site after accident and recovery measure
12	Training and exercise	When the emergency response plan is prepared, the factory shall organize training and exercise
13	Public education and information	Conduct public education, training and publish relevant information in nearby areas
14	Record and report	Special record shall be set for emergency response accident and set special report system
15	Annex	All types of materials related to emergency response accident

3.3.1 General provisions

3.3.1.1 Purpose

According to the requirements of relevant laws and regulation, and in consideration of actual situation of the programme This emergency response plan is stipulated for the purpose of effectively responding to environmental accidents, improving the capacity of enterprise to respond to environmental accidents, minimizing the adverse impact of environmental accidents on human being, property and environment, protecting the life and property of the public as well as and environmental safety. The plan needs to be specified and detailed in later implementation of the programme.

3.3.1.2 Preparation basis

1. "Technical guidelines for environmental risk assessment on projects" (HJ/T169-2004, issued by SEPA in 2004)

2. "Urgent notice of further strengthening environmental supervision and management to prevent environmental accidents" (Huan Fa [2005] No. 130 issued by SEPA in 2005)

3. "Notice of further strengthening environmental impact assessment

management and prevent environmental risks" (Huan Fa [2005] No. 152 issued by SEPA in 2005)

3.3.1.3 Application scope

This emergency response plan is applied to the emergency environmental pollution accidents caused by predictable accidents and other accidents in Technical Renovation Programme on 68 Thousand Tons Bleached Wheat Straw Pulp Extended Delignification Cooking and Clean Bleaching of MCC Meili Paper Industry Co., Ltd. The potential risks and accident of the programme include: leakage of hazardous chemicals such as chlorine dioxide, methanol, sodium chlorate, fire, explosion and accident emission of pollutant including waste water.

3.3.2 Organizations and their responsibilities

The Emergency response plan must clarify the Emergency response organizations, commanding department and their responsibilities. Only complete organization and clear work distribution can enable effective Emergency response work. The plan shall established corresponding Emergency response plan leading group. Refer to figure 3.3.1 for the organizations of this Emergency response plan. The leading group shall incorporate all technical departments whose responsibilities areas following.

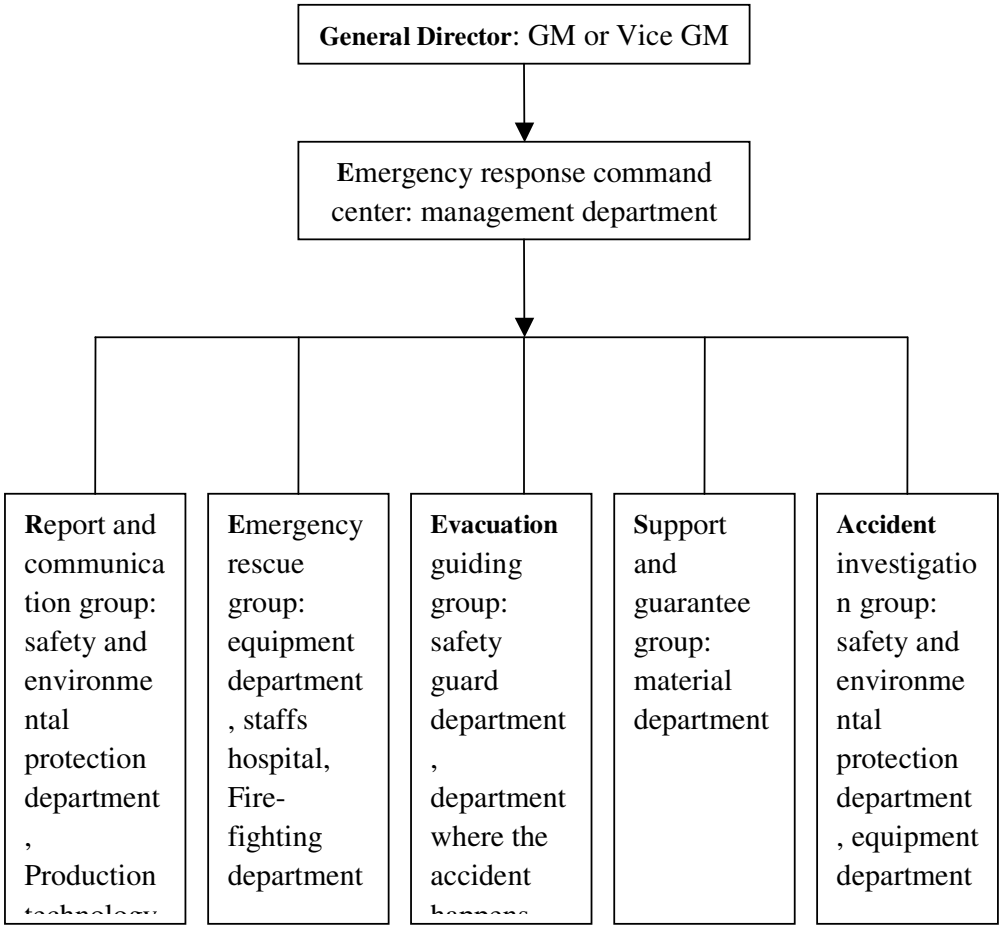

Figure 3.3.1: Organization Chart of Emergency Response Plan

General Director: responsible for issuing and relieve emergency response plan, authorizing emergency response center to conduct emergency rescue activity.

Production technology department: responsible for accident alarming, report and treatment.

Equipment department: responsible for assisting General Director to treat accident, organizing emergency rescue ream and commanding to accident site.

Safety and environmental protection department: responsible for treating accidents, arranging safety and environmental protection measures, reporting accident situation to relevant government department and emergency monitoring at accident site.

Safety guard department: responsible for security, alarming, evacuation of people and safety protection at accident site.

Staffs hospital: responsible for commanding all medical care personnel to rescue the injured and the poisoned.

1. Fire-fighting department: responsible for check the nature of poisonous gas and put forward protection measure, rescuing the poisoned, commanding evacuation and fire-fighting.

2. Material department: responsible for supply of emergency response materials and products needed for production.

3.3.3 Information report and notification

In case of accident, it must be reported to Emergency response command, higher level competent department local people's government at the first time according to "National emergency environmental accident response plan", "Method to report information on emergency environmental accident to competent environmental protection departments (in trial)" and other relevant national stipulations. It shall be determined the communication and contact information with related department 24 hours so as to take corresponding rescue measures.

3.3.4 Emergency response and rescue measure

3.3.4.1 Emergency response

1. initial emergency response

At the beginning of the accident, the directors on duty shall hold the position of director of emergency response and monitoring room shall play the role of emergency rescue command center to react at the accident site according the type and position of emergency response. Meanwhile, communication director shall make initial report to external organization and government department. Upon receiving the report, GM shall decide the emergence as on-site emergency response or overall emergency response. Refer to figure 3.3.2 for the specific operation procedures.

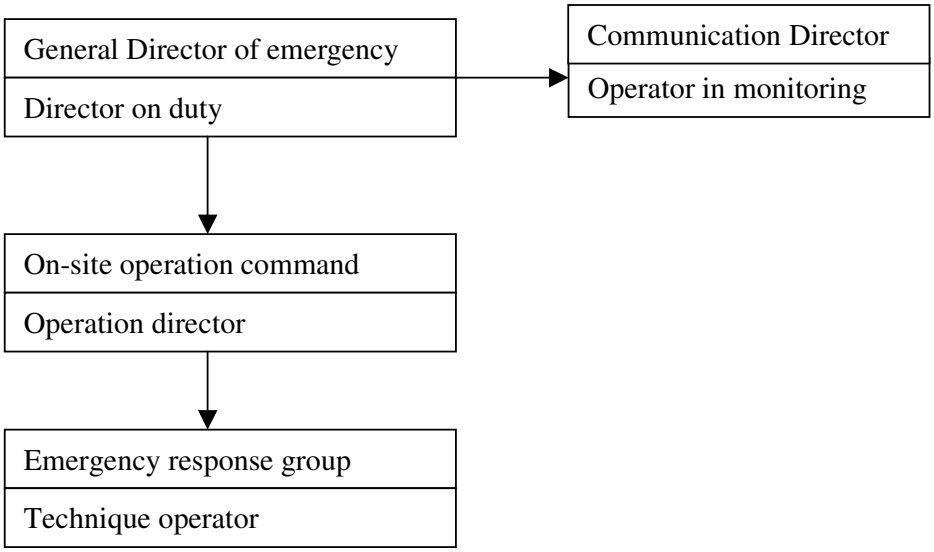

Figure 3.3.2 Initial Emergency Response and Rescue Organizations

2. Overall emergency response

Once the accident is classified or upgraded, General Director of emergency rescue shall report to government department. Emergency response command center shall start to organize emergency response team. Communication liaison man shall be designed to keep in touch with initial Emergency response team at accident site, until external originations come to replace on-site command. On-site safety guard shall be responsible for check personnel. In case that the accident is under control, General Director of emergency rescue can downgrade the accident class, and direct access and recovery activity. Refer to figure 3.3.2 for the specific operation procedures.

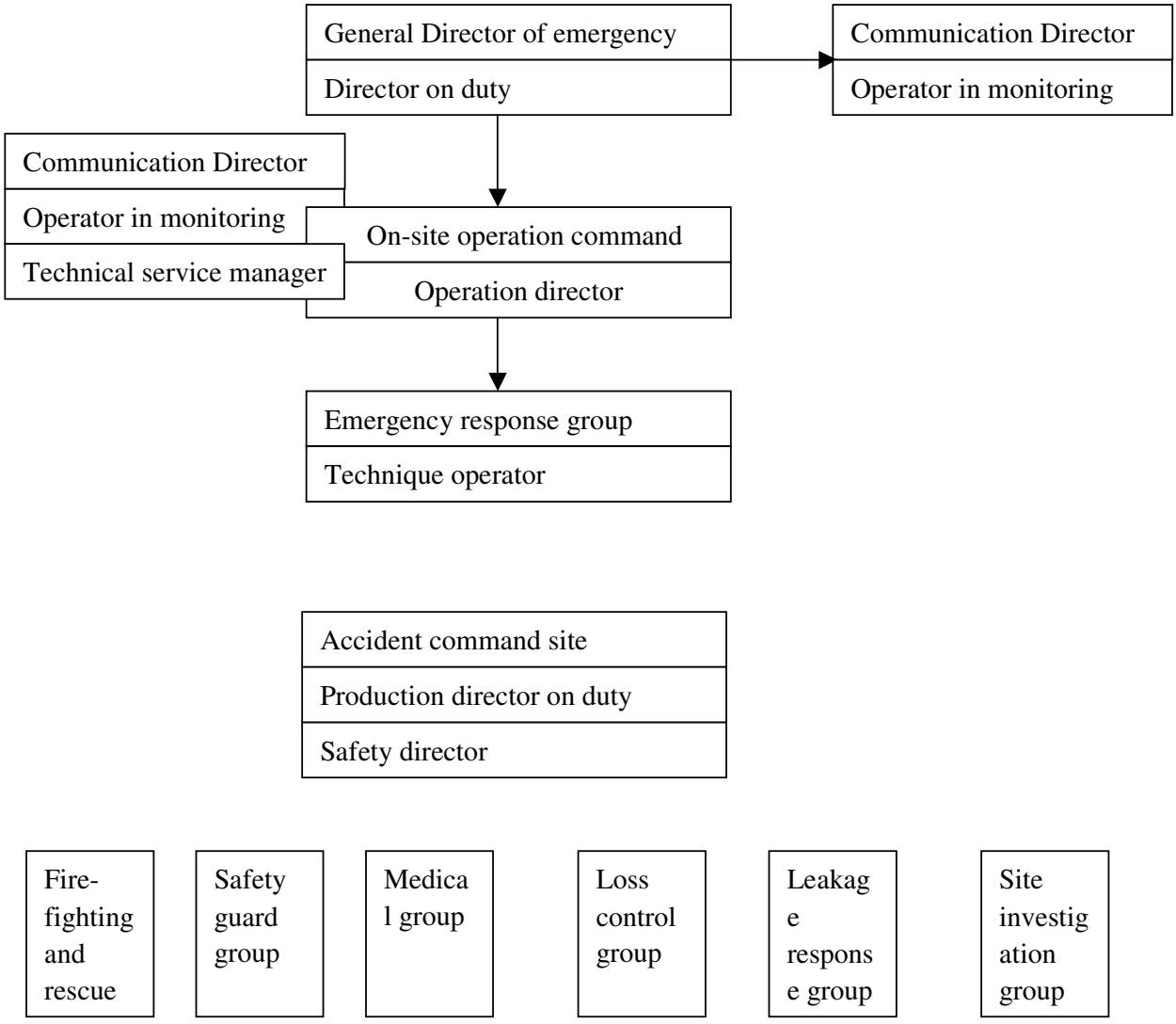

Figure 3.3.2 Initial Emergency Response and Rescue Organizations

3.3.4.2 Technical plan in emergency response plan

1. emergency response to hazardous chemicals leakage

(a) in case of chemical leakges that can not be treated by self, operator on duty shall immediately report to his direct leader and director. Relevant deparment shall be contacted to treat leakage accident.

◆ Corrosive and poisonous chemicals such as acid and sodium

In case of leakage at storage tank and pipelines, relevant operators shall ware protection clothes and turn off valves to stop leakage, evacuate people to prevent corrosive liquid and irritating gas from damaging people; organized people to move

articles which may be corroded and mobile equipment to safe area; move chemicals which may react with leaked chemical to safe area, set alarming plat on leakage area. In case of leakage pipeline connect with storage tank, relevant operators shall first turn off valves of storage tank to cut off pollution source, and properly treat chemical left in the pipeline. In case of leakage at the pump conveying chemicals such as acid and sodium, relevant operators shall turn off pump, and the nearest inlet and outlet valves to cut off pollution source. In case of leakage at the tank truck transporting chemicals before arriving at unloading place, entrance guard, worker in the factory, checking people or raw material worker shall require driver to stop the vehicle at safe place (far away from rain gutter and material storage yard), take effective measures to prevent leakage; if the leakage can not be treated, relevant operators shall contact raw material department. Raw material department shall organized emergency response team to go to leakage site. In case of leakage at pipeline connecting storage tank, body of storage tank or conveying pump, above measures shall be taken. In case of a large amount of leakage unable to control, effective measure shall be taken to plunged up water gutter, warehouse to control leaked chemical in certain area and prevent chemicals from flowing into rain gutter or warehouse, and polluting water source and product. All labs shall prepared fine sand to treat small leakage of chemicals like acid and sodium. The leaked acid and sodium shall be considered being recycled and reused. And then the harmless treatment shall be considered. Small leakage shall be diluted with water; the chemicals near the closure or on the ground shall be washed into waste water gutter and then sent to waste water treatment station for treatment. Large leakage shall be neutralized. Leakage of chemicals which can not be washed with water s hall be covered with sand and then treated.

◆ Heavy oil leakage of current project

Cut off leakage source to prevent it from entering the limited space such as kennel and drainage channel. Small leakage: absorb with sand， vermiculite, or other inert material. Large leakage: transfer to tank car or special container with pump. Collect for recycling or send to waste treatment area.

Leaked corrosive liquid chemicals shall be diluted with clean water. Leaked corrosive gas chemicals shall be eliminated with natural ventilation or forced ventilation. The waste water shall be sent to waste water treatment station. In case of large amount of chemical leakage, nearby rain water gutter shall be bunged up to prevent diffusion of chemical, and then leaked chemical shall be treated.

If someone contacts hazardous chemicals, corresponding treatment measures shall be taken immediately. Washing the contacting place with large amount of clean water from nearby water source and with washing devices. If acid solution enters eyes, eyes shall be washing with clean water or 3% sodium bicarbonate solution or normal saline. If sodium solution enters eyes, eyes shall be washing with clean water and the patient shall be sent to hospital.

In case of hazardous chemical leakage, relevant people shall to the accident site as quickly as possible. And the decision on evacuation or production stoppage shall be

made according to the leakage amount, toxicity of chemicals and scope of impact.

Each responsible department shall organize people to wash the place polluted by leaked chemicals until the required sanitary requirements are met to ensure the normal running of the factory. The final waste water shall be sent to waste water treatment station for treatment.

After site treatment, the cause of hazardous chemical leakage shall be investigate and corresponding measure shall be taken until the restart of production, thus to prevent the happening of similar accident, relevant departments shall be responsible treating leaking tank or groove, repairing closure near leaking tank or groove. After the recovery of production, the operator on duty when the accident is happening shall summarize the record the correction work, and record for later checking.

2. Chlorine dioxide preparation workshop

◆water solution of chlorine dioxide

Workers at site shall release accident notice immediately and evacuate irrelevant people. Workers shall wear labor protection clothes to turn off valves and check leaking point. Reactor shall be turned off if necessary. Workers shall use fire-fighting spray to decompose gas to ensure human safety. If leakage is happened at pipeline or valves, relevant device shall be changed. If leakage is happened at the main body of storage tank, the tank shall be transferred immediately and the leaked chlorine dioxide solution shall be further treated.

◆ Water solution of methanol

Quickly evacuate people in leakage polluted area to safe area, and insulate polluted area to limit entry and exit. Cut off fire source. Emergency response people are suggested to ware positive pressure respirator and gas protection clothes. Do not directly contact leaked substance. Cut off leakage source to prevent it from entering the limited space such as kennel and drainage channel. Small leakage: absorb with sand or other non-flammable material. Or wash with large amount of water. Large leakage: construct closure or pit, covered with foam to reduce the harm of its steam. Transfer to tank car or special container with explosion-prevention pump. Collect for recycling or send to waste treatment area.

3. Emergency rescue of fire and explosion

◆ Accident site

In case that fire or explosion is caused by chlorine dioxide, sodium chlorate, methanol, or at facilities like alkali furnace, related switch must be turned off immediately and the case must be reported to related department in time. Related department shall set professional rescue team and rescue people, protection article, vehicles, equipments and communication devices, and prepare rescue plan for all types of accidents. In case of accidents, repair shall be immediately organized.

Once the fire is found by operator, operator shall take measure according to the seriousness of fire. If the fire is small, operator shall use nearby fire-fighting

equipment to put out fires. If the fire is out of control, operator shall immediately report to fire-fighting team and dispatch division of the enterprise. In addition, operator shall take necessary measures to buy time for professional fire-fighting team.

Fire at storage tank, pipelines and road shall be put out from short distance or with remote control hydraulic giant. Container of fire shall be cooled with a large amount of water until the extinguishment of fire.

◆Emergency rescue department

Dispatch division shall inform the leader in charge of accident department to investigate accident situation, make order to start emergency rescue plan, inform member of command, fire-fighting team and medical care team to go to the accident site.

Fire-fighting team shall immediately put out fire and rescue poisoned and injured people at site. The poisoned and injured shall be taken out of site, the serious people shall be sent to hospital for treatment. The waste water from fire-fighting shall not be directly emitted, shall be stored in accidemnt pool and emitted after treatment and meeting relevant requiremen

4. Emergency response plan for accidental emission of waste water

(a) Blocking of garbage rack: In case of overflow caused by blocking for high content of waste residue in waste water, operator on duty shall immediately report to leader on duty and shall organize people to clear garbage. The members of emergency response group shall come to site upon receiving report, make decisions to clear site according to the potential impact scope of overflowed waste water, and report to higher level leaders about treatment situation. Emergency response group shall also contact the production department to improve water quality.

(b) Inflow of pump room of equalization tank: In case of failure of all pumps, operator on duty shall immediately report to leader on duty and highest director of the department, contact relevant repair units to organize repair. The highest director shall make the order to stop production.

(c) Overflow of preliminary and secondary sedimentation scum well: operator on duty shall immediately report to leader on duty and turn on scum pump. Leader of emergency response group shall organize people to clear the scum overflowed to the land.

(d) Overflow of preliminary and secondary sedimentation scum well: operator on duty shall immediately report to leader on duty and turn on most dehydrators to accelerate treatment capacity and reduce the sludge in sludge well from preliminary and secondary sedimentation tank. Leader of emergency response group shall organize people to clear the scum overflowed to the land.

(e) Leakage of waste water pump and sludge pump: operator on duty shall immediately report to leader on duty, and leader on duty shall organize people to change or repair equipment and clear the scum overflowed to the land.

(f) In case of failure of waste water treatment station, such as abnormal situation of waste water treatment line, operator on duty shall immediately report to leader on

duty. Leader on duty shall immediately organized repair and report to higher level leaders about this situation. Waste water treatment system shall not return work until the elimination of failure. If waste water treatment system can not be repaired in short time, production shall be stopped. Production can only be restarted after the repair of waste water treatment facilities and the treatment of waste water in accident pool. The situation shall be reported to higher level leader and the highest director shall make the order to stop production of pulp which shall be restarted after the repair of waste water treatment system.

(g) Overflow from pulp grove, pulp pump, waste water pump and lost pulp groove: when pulp overflow from pulp groove and lost pulp groove is caused by failure of alarming system or human neglect, the operator finding this overflow shall immediately report to leader on duty, and find the causes to stop overflow. The pulp overflowed to the ground shall be washed to waste water gutter and sent to waste water treatment station for treatment with other waste water. Meanwhile, waste water treatment station shall be informed with the case. If the case is serious, responsible person shall immediately report to highest department who can make the decision to stop production, contact with other departments and make record.

(h) Exceeded flow or pump failure of chlorine dioxide preparation workshop may cause leakage of waste water or cause waste water to flow to rain water system, then the flow shall be reduced or equipment shall be changed or repaired. The waste water overflowed to the ground shall be washed to waste water gutter and sent to waste water treatment station for treatment with other waste water. Responsible person shall immediately report to highest department who can make record of the case.

5. emergency rescue of other accidental emission

◆ Accidental emission of waste gas

The failure of electronic precipitator of t he furnace will cause the emission of TSP out of limit. If that were the case, the loading of furnace shall be reduced immediately. If the situation is not changed, combustor shall be started to reduce coal consumption amount. If all electronic precipitators stop working, combustor shall be started immediately. If electronic precipitators can be repaired in short time, fuel oil and paraffin can be maintained, and factory shall organized people to repair electronic precipitators. If electronic precipitators can not be repaired in short time, measures of stopping furnace can be considered.

◆Accidental emission of black liquor

It is suggested to install an overflow alarming control system on black liquor storage tank to prevent large amount of overflow of black liquor from impacting waste water treatment station. Treatment shall not continue until the recovery of system. In case of large amount of leakage, production shall be stopped immediately until the recovery of system. Leaked black liquor is sent to waste water treatment station for treatment.

3.3.4.3 Medical care and public health

After the happening of accident, factory shall judge the accident degree and coordinate with medical care department to evacuate nearby people, treat poisoned

people or injured people, thus to ensure the human life and safety.

3.3.4.4 Emergency environmental monitoring

After the happening of accident, factory must coordinate with local environmental monitoring department to monitor pollutants with its current monitoring equipments, analyze impact of accidents on nearby environment and put forward feasible control measures. As of air pollution caused by poisonous substance leakage, concentration of pollutants shall be monitored to analyze the polluted scope and degree and put forward feasible control measures. Liquid harmful to water body and waste water shall be controlled in accident pool to ensure that they can only be emitted after effective treatment and meeting relevant requirements.

3.3.4.5 Emergency response termination and recovery measures

The conditions for the complete termination of emergency rescue work are: all fires are extinguished; all leaked pollutants are controlled and can no longer impose impact on nearby environment. Only above conditions are met, enterprise can inform relevant department and nearby communication and people that the accidental danger has been removed and emergency response procedures are terminated.

After termination of emergency response, recovery work shall be implemented, including equipment repair, installation and commissioning. Accident report shall be prepared to show t he accident causes, losses, and summarize lessons to prevent similar accidents. As of losses caused by the accident, the victims shall be treated properly and compensate for their losses. Experts shall be invited to conduct assessment of medium and long term impact of pollution accident on environment, and put forward suggestions on compensation and recovery of polluted ecological environment.

3.3.4.6 Personnel training and exercise

Emergency response command shall conduct emergency education for all workers of the factory. Workers of dangerous positions shall take safety and accident treatment training and shall take examinations before taking offices. Emergency response plan shall be exercised in time. It is required that theory training shall be conducted once a month and exercise shall be conducted once half a year. In addition, the leaders of each professional emergency response team shall take professional training organized by fire-fighting department, safe production supervision and management department and other related departments.

3.3.4.7 Emergency Rescue guarantee

In case of emergency accident, it must be ensured that relevant emergency rescue plan can be started immediately thus to control pollution at the first time and minimize the impact. Therefore, relevant emergency rescue guarantee must be well prepared.

1. Emergency communication guarantee

The communication method and approaches with emergency response units or personnel shall be clear and backup plan shall be prepared. Information communication system and maintenance plan shall be established to ensure free communication during emergency cases.

2. Emergency team guarantee

All types of emergency response personnel shall be clarified including the organization and guarantee plan for professional and part-tine emergency response teams.

3. Emergency response mateiral and equipment guarantee

Pollution accident response fund shall be appropriated for purchasing, managing and maintaining regular emergency response materials and equipments. These emergency response materials and equipments include fire-fighting equipments, spraying devices preventing diffusion of pollution. The conditions of emergency response materials and equipments shall be checked and maintained by specific personnel.

4. Fund guarantee

The enterprise shall appropriate certain amount of fund for risk prevention, make sure specific fund is used for specific purpose and the emergency response fund shall be in place in case of emergency situation.

5. Others

Other relevant guarantee measures needed for this programme according to its emergency response work, such as technical guarantee, transportation guarantee, security guarantee, health care guarantee and logistic guarantee.

4 Community Relations Improvement

Two rounds of online disclosures were performed for this project but received no feedback from any working units or individuals. A questionnaire survey of 100 individuals was performed and obtained general feedback from the respondents on the proposed project. This section is developed based on the results of the survey.

4.1 Problems the Community is Concerned

Based on the survey results, most respondents (over 70%) believed that local environmental conditions are “average” not good but also not bad. According to 71% of the respondents, the most concerning environmental problem is air pollution, which may be related to local dust issues as the city is close to the desert area. The survey results also showed that most of the respondents believed that the proposed project at the company will generate “acceptable” environmental impacts to local air and water environment. Such statements show that the respondents do care about their living environment but may not understand totally that the project overall will bring about positive environment benefits to the local community.

4.2 Community relations improvement plan

Based on the survey results, the company will need to improve public awareness of its proposed project, including but not limited to its physical investment activities, potential environmental impacts and benefits, proposed mititgation measures and environmental management plans. This will help the community understand fully the environmental and social economic benefits of the proposed project.

5 Responsibilities of Environmental Management

5.1 Management Organizations and Distribution of Responsibilities

The programme must set environmental management organizations to implement leader responsibility system. Professional environmental management personnel shall be designated to in charge of environmental supervision and management. And environmental management people shall receive environmental protection training.

GM of MCC Meili Paper Industry Co., Ltd shall take the position of the first person in charge of environmental protection and clean production, responsible for the environmental management in the whole factory. Meanwhile, environmental protection sub-factory affiliated to environmental protection management department shall continue to be responsible for the coordination and contact with higher level environmental protection department, overall environmental quality protection work, normal running of environmental protection projects, environmental protection management and environmental monitoring work happened in technical renovation and project expansion process. Environmental protection sub-factory designates specific management staffs for material preparation section, cooking section and extraction and screening section, bleaching section of pulp making system; closed screening technology renovation section of 2# pulp making system, evaporation section of alkali recover furnace, chlorine dioxide preparation section, raw material storage yard, chemical storage warehouse, finished products warehouse, heat and power station, waste water treatment station, responsible for the supervision and checking of pollutant source control and environmental protection facilities, which has been incorporated in environmental management system of the enterprise. Refer to figure 5.1.1 and 5.1.2 for organizations of environmental protection management and environmental protection sub-factory.

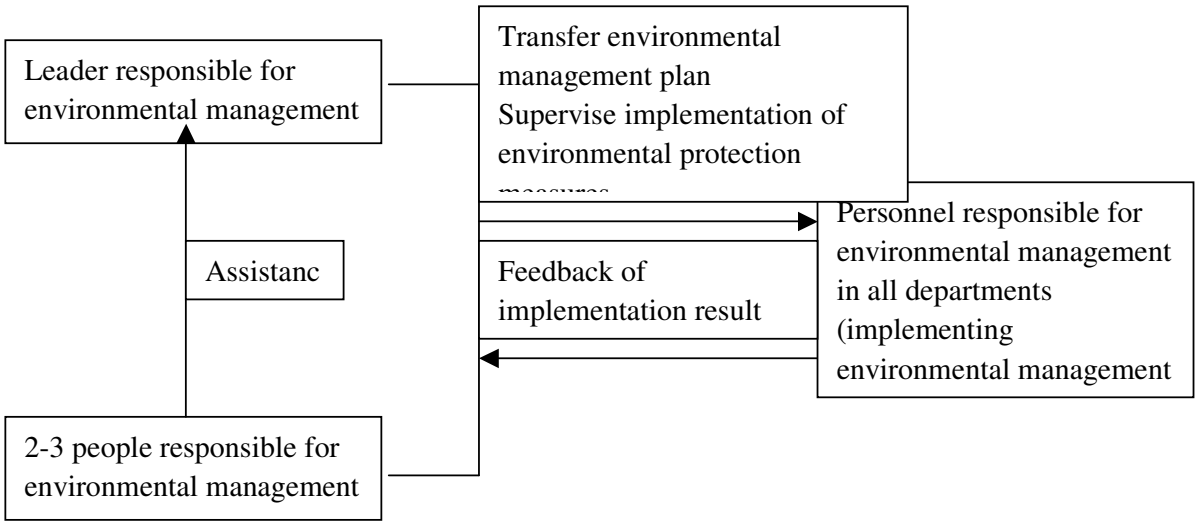

Figure: 5.1.1 Organizations of Environmental Protection Management

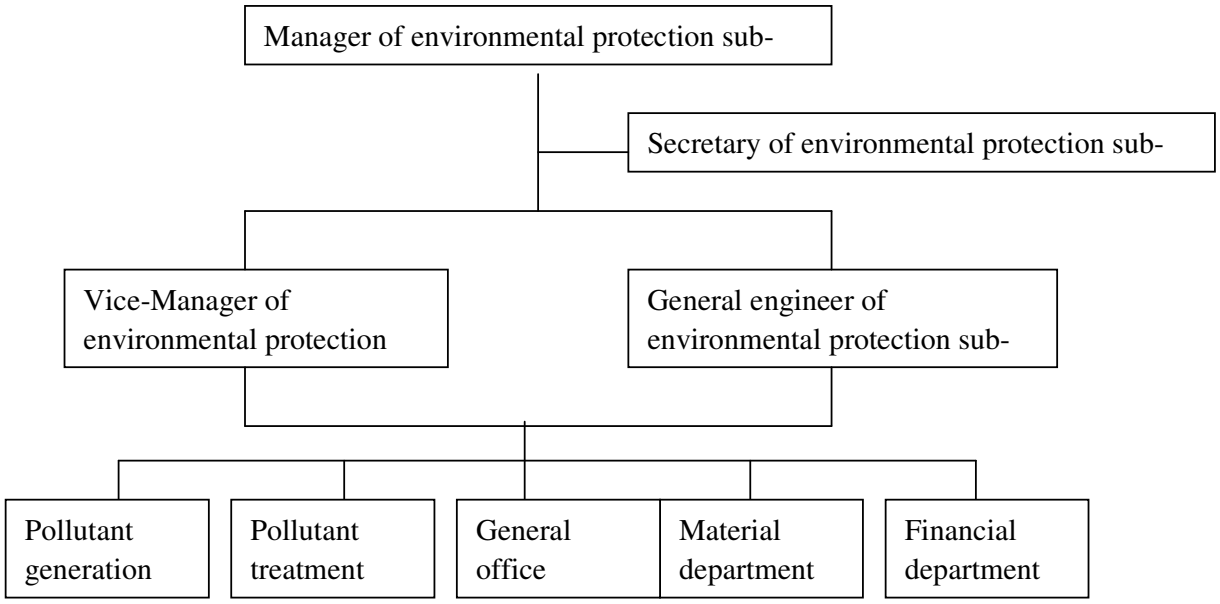

Figure 5.1.2 Organizations of Environmental Protection Sub-factory.

5.2 Environmental Supervision

Environmental protection sub-factory is responsible for supervising and managing the implementation of environmental protection measures of the whole programme, undertaking the comprehensive responsibility for the regional environmental quality. Environmental protection sub-factory needs to accept the supervision, inspection and guidance of higher level environmental protection department. The specific functions of environmental protection sub-factory of environmental management include the following:

1. Responsible for all types of environmental protection work;
2. Implement laws, policies and standards concerning environmental protection;
3. Stipulate and organize implementation of environmental protection plan;
4. Based on relevant national and local construction management requirements and construction operation standards and in considering the characteristics of the programme, stipulate environmental management rules for construction, supervise the implementation of relevant rules, receive and solve the opinions of nearby residents on environmental protection during construction period, and to coordination with construction unit

5. Regularly supervise and check the running of environmental protection facilities, lead the maintenance work of environmental protection facilities, such as waste water treatment station, etc.

6. Organize the stipulation of rules and systems concerning environmental protection and management, operation procedures of key pollution positions, and supervise the implementation.

7. Organize professional and technical training on environmental protection, and conduct regular education and propaganda on environmental protection knowledge to improve the environmental protection awareness of staffs and the consciousness of staffs to actively protect environment.

8. Participate in the programme inspection and acceptance on environmental protection and investigation of environmental pollution accident.

9. Publicize the application of advanced technology and experience on environmental protection.

10. Undertake the environment monitoring task entrusted by higher level department and relevant department; cooperate with other departments to solve the environmental pollution accident of the programme.

11. Responsible for the environmental pollution analysis and decision in accident state. If necessary, design unit and relevant expert shall be invited to participate in the analysis and decision.

12. In addition to the environmental protection work of this programme, it shall also accept the inspection and supervision of environmental protection deparment and report the implementation situation of each environmental management work.

5.3 Management of Contract Party

1. The guidelines of “three at the same time” must be implemented during programme construction. Construction unit must ensure that the facilities preventing pollution and other public hazard shall be designed, constructed and put into operation at the same time with the main project. Upon the completion of the programme, completion, inspection and acceptance report of specific inspection and acceptance report with the content of environmental protection shall be submitted to environmental protection department. The programme can only be used after the inspection of environmental protection department.

2. Declare and register pollutant emission to local environmental protection department according to national and local provisions on environmental protection. And pollutant shall be emitted based on distributed quotation after approval of environmental protection department.

3. Strengthen statistics of environmental monitoring data; establish complete documents on pollution source and materials loss; strictly control the emission amount of pollutants, ensure the pollutant emission indicator meet the design requirements.

4. Strengthen supervision and management of environmental protection facilities; establish complete technical documents on running, maintenance and repair of environmental protection facilities; strengthen technical training to operators of environmental protection facilities; ensure normal running of environmental protection facilities and continuous emission of pollutant after meeting requirements.

5. Strengthen monitoring of abnormal working situation such as operation start and stop, and nearby environmental, stipulate effective measures to control pollution expansion and prevent pollution accidents.

6. Take requirements for environmental protection into consideration during the stipulation of products standard, process documents and operation procedures.

7. Conduct environmental education to improve the environmental awareness of cadre and staff to enable active effort for environmental protection.

8. Incorporate environmental protection into position responsibility system and uniform scoring, into production dispatch, to enable all departments to complete environmental protection tasks through advance, check, praise, reward and punish with administrative methods.

9. Incorporate environmental management into overall plan of enterprise management to achieve the goal of pollution reduction, energy conservation and consumption reduction, and environmental protection through running and continuous improvement of environmental management system, thus to improve the environmental and economic benefit of the enterprise.

6 Environmental Protection Monitoring Plan

Environmental monitoring is to collect, test sample of major pollutants, process data prepare report during construction period and operation period, and respond the all types of environmental problems. The preparation and implementation of environmental monitoring plan is the basis of environmental management, which can provide scientific basis for environmental statistics and environmental quantities assessment. This plan can ensure the implementation and carrying out of all pollution prevention and treatment measure, enable the timely discovery, correction, and improvement of problems in environmental protection measures.

6.1 Environmental Monitoring Plan

6.1.1 Environmental monitoring during construction period

Local Monitoring Station is entrusted to conduct environmental monitoring during construction period, refer to table 6.1.1 for detailed environmental monitoring plan during construction period.

Table 6.1.1 Environmental Monitoring Plan during Construction Period

Monitoring Type	Monitoring Content	Monitoring Position	Monitoring Item	Monitoring Frequency
Pollution source monitoring	Air pollution source	Raw material storage yard, construction site	TSP, dust	Once half a year
	Water pollution source	Outlet of waste water from construction	pH, SS, COD, BOD5, petroleum, ammonia nitrogen etc	Once half a year
	Noise pollution source	Near the equipment in construction site	equivalent continuous sound level A	Once half a year
Environmental quality monitoring	Air quality	Major air sensitive areas note 1	TS, duct	Once half a year
	Sound quality	Within 1m from factory boundary, Zhaojiashaofang, Shimiao Village, Xiangjia Village note 2	equivalent continuous sound level A	Once half a year

Note: 1. the distance between Rouyuan Village, Shimiao Primary School, Jiaqu Village, Zhaojiashaofang, Shimiao Village, Xiangjia Village and the factory boundary are all within 1 m. 2. Monitoring points out 1m from the factory boundary is the same with that of current sound situation. Zhaojiashaofang, Shimiao Village, Xiangjia Village are all sensitive points within 200m from the factory boundary. The following texts refer to the same.

6.1.2 Environmental monitoring during operation period

Refer to table 6.1.2 for environmental monitoring plan during operation period.

Table 6.1.2 Environmental Monitoring Plan during Operation Period

Monitoring Type	Monitoring Content	Monitoring Position	Monitoring Item	Monitoring frequency
Pollution source monitoring	Air pollution source	Chimney note1	SO_2, NO_2, dust	Once a season
		Chimney	SO_2	Continuous automatic on-lie monitoring
	Water pollution source	General outlet of waste water	6 items including pH note2	Once a season
		Outlet of workshop or production facility	AOX, dioxin	
		Inlet and outlet of waste water treatment station	Waste water amount and COD	Continuous automatic on-lie monitoring
	Clearing of SW	Material preparation section	Wheat straw scraps	Once a month
		Material preparation section	Dust	
		Pulp production line	Pulp residue	
		Causticization section of alkali recovery	White mud	
		Living of staffs	Household garbage	
		waste water treatment station	Sludge in waste water treatment station	
		Green mud, lime residue	Alkali recovery workshop	
Environmental quality monitoring	Air quality	factory boundary	Concentration of NH_3, H_2S, odorous gas	Once half a year

Monitoring Type	Monitoring Content	Monitoring Position	Monitoring Item	Monitoring frequency
		Air sensitive areas at downwind of predominant wind and nearby air sensitive areas note 3	SO_2, NO_2, TSP, PM_{10}	Once a year
	Underground water quality	Shimiao Village at the upstream of the factory and Jiaqu Village at the downstream of the factory, SW storage yard, oxidation pond, raw material forest base note 4 underground water well	15 items including pH note5	Once half a year
	Sound quality	Within 1m from factory boundary, Zhaojiashaofang, Shimiao Village, Xiangjia Village	equivalent continuous sound level A	Once half a year

Note: 1. a chimney of circulating fluidized bed boiler and a chimney of alkali recover furnace, the following texts refer to the same; 2. six items including pH, COD, BOD_5, SS, NH_3-N, TP; 3. Rouyuan Village, Jiaqu Village, Zhaojiashaofang, Shimiao Village, Xiangjia Village; 4. 3-5 underground water wells shall be set in raw material forest base; 5. fifteen items including pH, sulphate, total hardness, TDS, ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, volatile phenol, permanganate Index, fluoride, As, Hg, Cd, Cr VI, Fe, Mn, etc.

The emission amount of waste water during operation period, COD and waste gas of SO_2 from boiler room is monitored on line by continuous automatic on-line monitoring system. The clearing of SW is checked regularly by local environmental protection department. Other types of environmental monitoring all entrust local Monitoring Station to conduct. Refer to the chapters of current situation monitoring for the instruments used for non-supervised monitoring links.

6.1.3 Emergency monitoring and tracking monitoring

Emergency response plan shall include emergency monitoring procedures. Emergency monitoring shall be started immediately in case of accident happened in operation, and the migration of pollutants shall be tracked until the impact of accident is eliminated completely. The monitoring instruments, equipments and vehicles for major pollutants shall be prepared and be maintained in working conditions. The

emergency monitoring plan shall be stipulated and implemented jointly with monitoring unit.

6.1.4 Monitoring facilities

Local Monitoring Station is entrusted to conduct regular monitoring.

Upon the competition of this programme, local Environmental Protection Bureau shall supervise the implementation of environmental management and monitoring plan.

6.2 Completion and Inspection and Acceptance Monitoring for "Three at the same time" on Environmental Protection of Construction Programme

The aim of inspection and acceptance for environmental protection is to supervise the simultaneous putting into operation and use of environmental protection facilities with the main projects, and implement other supporting environmental protection measures. The inspection and acceptance scope is: environmental protection facilities related to construction programme, including project, equipment, device and monitoring measure constructed for pollution prevention and treatment, supporting project, equipment, device and monitoring measure, all ecological protection measures, environmental impact report and other environmental protection measures taken according to relevant programme design documents.

Before the commissioning of this programme, the commissioning can be conducted after the approval of Ministry of Environmental Protection. This programme need to apply for completion inspection and acceptance to Ministry of Environmental Protection within three months after the starting data of commissioning according to the stipulations in "Administration Measures of Inspection and Acceptance of the Environmental Protection of the Finished Construction Projects" issued by Ministry of Environmental Protection.

Refer to table 6.2.1 for the inspection and acceptance contents of inspection and acceptance for "three at the same time" on environmental protection of construction programme.

Table 6.2.1 List of Inspection and Acceptance for "Three at the same time" on Environmental Protection of Construction Programme

No.	Environmental Protection Equipment and Facility	Monitoring Items for Inspection and Acceptance	Position of Monitoring Points for Inspection and Acceptance	Standard of monitoring for Inspection and Acceptance	Contents for Checking
1	waste water treatment station	Waste water treatment amount	General outlet of waste water treatment station（waste eater outlet of workshop or production facilities for AOX and dioxin）	/	Whether they are constructed in accordance with the requirements of "three at the same time"
		pH, COD, BOD_5, SS, NH_3-N, TP, AOX, dioxin, etc		Requirements for pulp and paper enterprise in "Discharge standard of water pollutants for pulp and paper making industry" (GB3544-2008)	
		NH_3, H_2S	waste water treatment station Downwind of factory boundary	Requirement for new, renovated and expanded enterprise level II in table 1 of "Emission standards for odor pollutants" (GB 14554-1993)	
		(sludge room, sludge pump room, test room, sludge pool, regulation pool, preliminary sedimentation pool, aeration pool, secondary sedimentation pool, flocculation pool, waste water collection net, odorous gas collection and treatment system)			
2	oxidation pond	Waste water amount	Waste water outlet of oxidation pond	/	
		pH, COD, BOD_5, SS, NH_3-N, TP etc		Requirement for dry farming in GB 5084-1992 "Standards for irrigation water quality"	
3	Precipitator and desulfuration	Concentration of SO_2, NO_X, PM_{10} in smoke	Outlet of chimney for boiler	the requirement for the third period in "Emission standard of air pollutants for thermal power plants" (GB13223-2003):	Whether they are constructed

No.	Environmental Protection Equipment and Facility	Monitoring Items for Inspection and Acceptance	Position of Monitoring Points for Inspection and Acceptance	Standard of monitoring for Inspection and Acceptance	Contents for Checking
	desulfuration facilities of circulating fluidized bed boiler	Desulfuration efficiency and precipitation efficiency meet the designed requirements			are constructed in accordance with the requirements of "three at the same time"
4	Precipitator and desulfuration facilities of alkali recover furnace	Concentration of SO_2, PM_{10} in smoke	Outlet of chimney alkali recover furnace	Relevant requirement in table 2 and table 4 of "Emission standard of air pollutants for industrial kiln and furnace" (GB9078-1996)	
		Desulfuration efficiency and precipitation efficiency meet the designed requirements			
5	Sound elimination and shock reduction measure for high noise level equipment	Equipment noise, noise reduction effect and monitoring of noise at factory boundary	factory boundary	level II in "Emission standard for industrial enterprises noise at boundary"(GB12348-2008)	Whether they are constructed in accordance with the requirements of "three at the same time"
		(silencer, and sound insulation room)			
6	Fugitive source	Concentration of NH_3, H_2S, odorous gas	Downwind of factory boundary	Requirement for new, renovated and expanded enterprise level II in table 1 of "Emission standards for odor pollutants" (GB 14554-1993)	Whether the requirements are met
7	Risk prevention facilities	(hardening of factory, fire hydrate, automatic spraying fire-fighting system, etc)			Whether they are constructed in accordance with the requirements of "three at the

No.	Environmental Protection Equipment and Facility	Monitoring Items for Inspection and Acceptance	Position of Monitoring Points for Inspection and Acceptance	Standard of monitoring for Inspection and Acceptance	Contents for Checking
					same time"
8	Underground water seepage-proofing facility	pH, sulphate, total hardness, ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, volatile phenol, permanganate Index, fluoride, As, Hg, Cd, Cr VI, Fe, Mn, etc	Shimiao Village at the upstream of the factory and Jiaqu Village at the downstream of the factory, SW storage yard, oxidation pond, underground water well (3-5 points) in raw material forest base	Level III in "Quality standard for ground water" (GB/T 14848-93)	Whether they are constructed in accordance with the requirements of "three at the same time" and engineering provisions

No.	Environmental Protection Equipment and Facility	Monitoring Items for Inspection and Acceptance	Position of Monitoring Points for Inspection and Acceptance	Standard of monitoring for Inspection and Acceptance	Contents for Checking
		1. Wheat straw scrap warehouse: the ground of closed warehouse storing wheat straw scrap and dust shall be overall poured with C30 Impermeable concrete, thus the closed area will not generate percolate for rain. And the garbage will be transferred by nearby farmers as fertilizer. 2 white mud (including small amount of green mud) warehouse: white mud (including small amount of green mud)of the factory shall be temporarily stored in half-closed warehouse whose ground is overall poured with C30 Impermeable concrete with the bottom laying soil impermeable membrane. The order for the clay is: concrete cushion (200mm), insolated layer, screed-coat (20mm), cushion layer (150mm), gravel bed (500mm), plain fill, to ensure the coefficient of permeability less than 1.0×10-7cm/s and a closure shall be set at outside (500mm high). 3. White mud storage yard: the SW landfill yard of MCC Meili Paper is located at Mopan Mountain which is 12 km away from north of Zhenluo Town. There is a flood-proofing gutter of 2 m wide, 2 m deep at the south and north of causticized white mud airing yard. A vertical Impermeable Layer shall be set at the white mud yard: after finishing of the bottom, a clay layer of 300 mm thick shall be laid with a geotextile of 300g/m2 thick above, and another clay layer of 300 mm thick shall be set above the geotextile. Thus the coefficient of permeability can be less than 1.0×10-7cm/s, meeting the requirements in Standard for pollution control on the storage and disposal site for general industrial solid wastes"(GB 18599-2001). 4. Each factory building: each factory building is equipped with rain collection gutter inside and outside the building. The collected waste water will be emitted after treated in waste water treatment station and meeting relevant requirements.			
9	COD on-line monitor	/	General outlet of waste water treatment station	/	Whether the instrument passes metrology accreditation?
10	SO_2on-line	/	Outlet of chimney	/	Whether the

No.	Environmental Protection Equipment and Facility	Monitoring Items for Inspection and Acceptance	Position of Monitoring Points for Inspection and Acceptance	Standard of monitoring for Inspection and Acceptance	Contents for Checking
	monitor		of boiler and alkali recover furnace		instrument passes metrology accreditation?
11	Afforest of factory	/	/	/	Whether they are constructed in accordance with the requirements of “three at the same time”
12	Standard signs at waste outlet	The sign plate shall be set at visible place near pollutant outlet (sample collection point) with the top of the sign plate 2 m above the ground.			Whether they are constructed in accordance with the requirements of “three at the same time”

6.3 Standard Setting of Outlet

6.3.1 Waste water outlet

After the completion of the programme, the general outlet of waste water shall be equipped with flow gauge with the function of sampling and monitoring. A environmental protection sign plate shall be set at visible place near the general outlet. The general outlet of waste water treatment station of current project is equipped with JHC-IIIA online waste water monitor to conduct online monitoring of COD.

6.3.2 Waste gas outlet

The sampling from chimney of boiler in heat and power station and alkali recover furnace shall be easy. Environmental protection sign plate shall be set at visible place on the ground near the chimney for the sampling port, sampling and monitoring platform. The sampling and monitoring platform for chimney of boiler of current project is equipped with ZE-CEM2000 online smoke monitor to conduct online monitoring of smoke flowing speed and SO_2.

6.3.3 Fixed noise source

Noise monitoring points as well as sign plate shall be set at the place outside factory where fixed noise source imposed the largest impact.

6.3.4 SW storage yard

As of SW, there shall be temporary storage place with loss prevention and seepage-proofing measures and sign plate at the entrance.

6.3.5 Establishment of waste outlet record

The content in outlet record shall include number and position of waste outlet; measuring method used by this outlet; source, type, concentration and measuring record of emitted pollutant; emission destination; maintenance and update record, etc.

6.3.6 Requirements for the setting of sign plate

Environmental protection sign plate shall be made at specific place designated by Ministry of Environmental Protection and purchased by local environmental protection supervision department according to the programme pollutant emission situation. The distribution figure of waste outlet shall be drawn by local environmental protection supervision department.

The sign plate shall be set at visible place near pollutant outlet (sample collection point) with the top of the sign plate 2 m above the ground. Plane sign plate is required if there are buildings within 1 m from the waste outlet, and vertical sign plate required if there are no buildings within 1 m from the waste outlet.

Standard settings (such as sign plate and measuring device) of outlet are part of Environmental protection facilities, which need regular maintenance and repair by pollutant emission unit. No unit or individual is entitled to dismantle. If change is really needed, the approval from local environmental protection supervision department and change document shall be gained.

7 Environmental Protection Training Plan

7.1 Goal and Content of Training

In order to ensure the successful and effective implementation of environmental protection and management plan, relevant worker shall have good environmental protection knowledge and technique. Therefore, staffs participating in programme management and construction shall receive relevant environmental protection training thus to ensure good implementation of all environmental protection measures. Training methods include domestic training and overseas training according to the management requirements and position. The training contents shall including the following aspects.

1. Laws and regulations on environmental protection: relevant directors of environmental protection sub-factory shall understand China's legal system and composition concerning environmental protection, environmental policies of the World Bank, legal responsibilities stipulated by laws and regulations concerning environmental protection, Regulations on the Administration of Construction Project Environmental Protection, local regulations and rules concerning environmental protection, local economic and social development plan. The directors shall know laws and act according to laws.

2. Environmental monitoring: relevant directors of environmental protection sub-factory shall understand environmental monitoring method; sampling standard and method for water quality, air, and biology, analysis method and standard of environmental parameters; requirements for data collection and analysis technology.

3. Waste water treatment technology: relevant directors of environmental protection sub-factory shall understand waste water treatment technique, theory and method; technology and method to maintain the normal running of waste water treatment station; internal and domestic waste water treatment technology and method.

4. Sludge treatment and disposal: relevant directors of environmental protection sub-factory shall understand the sludge landfill treatment technology and management method, method to treat percolate and biogas, matters needing attention for maintain landfill yard safety and environmental protection.

5. Environmental accident treatment and response ability: relevant directors of environmental protection sub-factory shall understand the happening theory, preventing measures and method of environmental accident, as well as emergency response measure in case of accident.

6. Public participation and public contact: relevant directors of environmental protection sub-factory shall understand the type and method for Public participation; the importance of Public participation as well as the procedure of Public participation.

7. Pollution control and management during construction period: construction contractor shall understand construction procedures and pollutant generating links,

measure to control pollution during construction period as well as management and supervision measure.

8. The programme plans to organize relevant directors of environmental protection sub-factory and construction contractor to take part in relevant training. And relevant directors shall conduct regular internal training to all staffs participating in programme management and construction.

7.2 Budget of Training Expense

It is planned that the training is conducted once a month. Calculated with 20 thousand RMB for one training, the total training expense for a year is 240 thousand RMB.

8 Environmental Management Related Plan

8.1 Plan of Regular Environmental Impact Report

During programme construction period and according construction progress stage, environmental management organization shall regularly (such as once a month) entrust local environmental Monitoring Station to conduct environmental monitoring, and submit report to programme management department and local environmental protection department. This stage report shall include project progress, major construction contents and method, description on environmental impact and implementation of environmental impact mitigation measures.

During programme operation period and according to the requirements of environmental impact assessment, environmental management organization shall entrust local environmental Monitoring Station to monitor the operation situation of the programm, and submit monitoring report to local environmental protection department. This monitoring report shall include the following information.

1. Monitoring time, monitoring frequency, monitoring points, monitoring item, monitoring method and quality control plan;
2. Monitoring data and statistic analysis;
3. The summary of facility operation situation during monitoring period;
4. Description of abnormal operation.

In summary, programme construction unit shall conduct monitoring according to monitoring plan for construction period and operation period, and submit a semi-monitoring report to Ministry of Environmental Protection and the World Bank every half year.

8.2 Environmental Protection Information Exchange Plan

Different departments and different positions in environmental management organization shall exchange necessary environmental protection information. Meanwhile, the organization shall also report related necessary environmental protection information to outside (related parties and the public). Internal information exchange can be conducted as meetings and internal news, etc. But there must be one official meeting and all exchanged information must he recorded and saved.

External information exchange can be conducted once half a year or a year. The information exchange with cooperation agency shall form summary and be saved.

8.3 Environmental Protection Record Plan

For the purpose of effective operation of environmental management system, enterprise must set up a complete record system and maintain the record of the following aspects:

1. Requirements of laws, regulations and relevant standards;
2. License documents;

3. Environmental factors and relevant environmental impact and environmental relief measures;

4. Training

5. Project construction progress;

6. Monitoring data;

7. Information about related parties;

8 Examination and approval;

9. Review.

In addition, above record must be controlled necessarily, including label, collection, catalogue, saving, storage, management, maintenance, search, saving period and disposal of record

8.4 Environmental Protection Monitoring Plan

Refer to table 8.2.1 for environmental protection monitoring plan of this programme.

Table 8.2.1 Environmental Protection Monitoring Plan of this Programme

Stage	Monitoring agency	Monitoring contents	Monitoring goal
Design stage	The World bank, Zhongwei Municpal Government, and Zhongwei Environmental Protection Bureau	1. examining and approving environmental impact report 2. examining and approving EMP.	1. ensure complete assessment content, theme setting properly, and notable focus 2. ensure all major potential problems were reflected 3. ensure there are specific and reliable implementation plan for mitigating environmental impact
Construction stage	Zhongwei Municpal Government, and Zhongwei Environmental Protection Bureau	1. Examining and approving the preliminary design of environmental protection and EMP 2. Examining the recovery of temporarily occupied area, vegetation recovery and environmental recovery 3. Examining measures to control dust and noise pollution and determining construction time 4. Examining emission of air pollutants 5. Examining treatment and	1. strictly comply with "three at the same time" 2. ensure the temporarily occupied area meet the requirements of environmental protection 3. reduce the impact of construction on nearby environment and implement laws

		emission of household waste water and waste water containing oil 6. Treatment of waste earth 7. Exchanging information with the public and inviting public opinions	and standards concerning environmental protection 4. ensure the river water is not polluted 5. ensure that the landscape and land resource are not seriously damaged and prevent water and soil loss.
Operation stage	Zhongwei Environmental Protection Bureau and Public Security and Fire-fighting Department of Zhongwei Municipality	1. Examining the implementation of EPA during operation period 2. Examining the implementation of environmental monitoring plan 3. Determining the sensitive points needs further environmental protection measures 4. Examining whether the environmental quality in sensitive area meet the requirement of relevant standards 5. strengthen supervision to prevent accidents, prepare emergency response plan to ensure that the danger can be eliminated in case of accident.	1. Implement EMA 2. Implement environmental monitoring plan 3. Actually protect environment 4. Strengthen environmental management, ensure human health 5. Ensure the reasonable emission of waste water

9 Occupational Health and Safety

Occupational health and safety shall be considered as a part of comprehensive hazard or risk assessment, including HAZID, HAZOP and other risk assessment and research. The research results shall be used in formulation and implementation of health and safety management plan, design of safety work system, and preparation and exchange of safety operation. The issues related to occupational health and safety in pulp and paper industry include: chemical hazard, physical hazard, wood dust, biological agent, heat, space limitation, noise, and radiation.

9.1 Chemical Hazard

Pulp and paper industry may use and generate many chemical substances, which may impose adverse impact on workers' health and safety. These chemical substances include:

1. Gas—such as reduced sulfur compounds (sulphate pulp making), sulfur oxide compound which are mainly referred to sulfur dioxide (sulphate pulp making), chlorine, chlorine dioxide, terpene, and other volatile organic compound and oxide.

2. Liquid—include sodium hydroxide and other corrosive substance, acid such as sulfuric acid, cooking by-product such as turpentine, sodium hypochlorite, water solution of chlorine dioxide, hydrogen peroxide, biocide, additive of paper making, dissolvent, dye and cement.

3. Solid—include sodium chlorate, sodium sulfate, lime, calcium carbonate, dust and stone wool (used for insulation).

The following measures are recommended to taken in order to prevent, control or minimize the potential impact of chemical substance on workers' health and safety.

1. Use mechanical pulp and paper making work as much as possible, thus operators can finish operation in control room without potential chemical hazard and other health and safety hazards; effective process control can also minimize the use of bleached and other chemicals.

2. Provide engineering control. For example, automatic valve of cooking boiler cover; immediate gas exhaustion of batch digester and blow boiler which can exhaust gas in the boiler; impose of negative pressure on recovery furnace and acidification tower for sulphurous acid and sulfur dioxide to prevent gas leakage; ventilation of fully closed or partly closed cover of cooking room; sealing or ventilation of lime conveyer, lifter and storage framework; preparation of special exhaust machine for closed cover of canopy of each bleaching tower and washer; closed cover for paper sample dryer.

3. Continuous gas detectors with alarming apparatus shall be installed in the place with potential leaked or generated hazardous gas, such as chemical recovery furnace, chlorine storage area, chlorine dioxide generator and bleaching area, etc. provide respirators for emergency evacuation to all workers, contractors and visitors in above areas.

4. Update data base of all chemicals used and generated in the factory, including data concerning hazards, poisonous substances and biological substances.

5. Identify and prevent chemical reaction which may lead to generation of hazardous gas and other substance (for example, the mixture of waste liquid of sulphite and sulfuric acid may generate hydrogen sulfide). All chemical substances used or generated shall be checked to find whether it may react with other chemical substances in the facilities.

6. All chemicals shall be labeled, packaged and stored in accordance with national and international certified requirements and standards.

7. During the production halt period, staffs of contractor party, including maintenance staff shall stay in factory. The staffs staying in factory shall receive relevant training and comply with safety procedures, including protection equipment and chemicals treatment.

8. The workers contacting or treating chlorine dioxide and sodium chlorate shall receive relevant training. Wet out the spilled sodium chlorate and keep polluted clothes in certain humidity before washing.

9. Avoid bleaching with element chlorine.

10. Use water-base ink or dye (other than solvent ink and dye).

11. Keep sulfur storage box clean and with accumulation of sulfur.

12. Prepare check and maintenance plan to check the problem such as leakage and equipment failure.

9.2 Physical Hazard

Serious physical hazard are generally cause by the poor implementation of system of LOTO. It is suggested to take the following measures to prevent, reduce and control common physical damage (such as damage happened in transportation, drop and material disposal).

1. Install platform receiving dropped articles on passageways and under conveyer.

2. Immediately clear the overflowed articles.

3. The walking surface shall be water-proofing and retains no water.

4. Install handrail on the channel near the constructing equipments and facilities or at high level. The lines for vehicles and people shall be clearly marked.

5. For moving equipment, overturn prevention measures shall be taken.

6. Stipulate the work procedures on crane not lift heavy articles above human head.

9.3 Mechanical Safety

For pulp making factory use wood processing machines such as wood peeling machine and chipping machine which may cause serious injury, it is suggested to take the following measures to prevent, reduce and control the potential damage caused by wood processing machines such as wood peeling machine and chipping machine.

1. For moving equipment parts (such as the involving points of chain and chain sprocket of conveyer; rotary drum, conveying belt, pulley and roller of conveyer; rotary drum of paper making machine, and feed belt of grinder), safety protection device or interlock device which can prevent workers form contact these moving parts shall be installed.

2. During equipment maintenance, cleaning or repairing, equipment must be turned off and locked out.

3. Conduct training to operators on safe use of equipments such as wood peeling machine and chipping machine.

4. Reasonably arrange working platform to reduce the possibility of damage of broken fragments on human beings.

5. Regularly check and maintain construction equipments to prevent the failure of equipments.

6. All operators of cutting and chipping equipment shall ware eye protection tools and other personal protection tools if necessary.

9.4 Treatment of Log

For pulp making factory, logs are unloaded from train or heavy truck and stacked by machine, and then sent to log conveyer and log platform waiting for being processed. In log yard, vehicles may cause serious injury of human being. In addition, rolling down of log and drop of log from equipments and stacks may also cause people injury. Thus it is suggested to take the following measures to prevent, reduce and control damage in log yard.

1. Stipulate and comply safe operation rules for unloading log, converted timber and wood chip.

2. The complete mechanization of operation in the log yard can reduce the contact of people with log during the log unloading and stacking process.

3. The transportation lines in log yard shall be clearly defined, and vehicle movement shall be closely controlled.

4. The height of log stack shall not exceed the safety height stipulated in risk assessment which takes into consideration of the specific situation of log yard, including log stack method.

5. Access to the log yard is not allowed without permission.

6. Log mill dell shall be equipped with shelter chain and other device to prevent log from rolling or dropping from mill dell.

7. Workers shall receive training concerning log stacking and safe operation in mill dell area, including how to prevent log from dropping, and planned evacuation lines.

8. Provide workers with iron protection boots, protection helmet and conspicuous jacket.

9. All moving equipment shall be equipped with overturn sound alarm.

9.5 Wood Dust

In wood processing (such as half automatic wood chipping machine) area of pulp making factory, contact with sawmilling dust in operation is an inevitable problem. And in paper making factory, the contact with wood fiber dust is also a problem. And wood fiber dust is a fire hazard. Thus it is suggested to take the following measures to prevent, reduce and control damage cause by wood dust.

1. Insolate wood saw, grinder, dust collector, chip conveyer and install ventilation equipment

2. Consider the sealing of chip storage area.

3. Avoid the use of compressed air to clear wood dust and waste paper

4. Insolate areas unloading, weighing and mixing dry and dusty addictive or using liquid addictive and install ventilation equipment.

5. Regularly check and clear dusty area to reduce the possibility to contract wood dust.

9.6 Biological Agent

Biological articles include microorganisms such as bacteria, fungus and virus and part of them are pathogenic microorganisms. Microorganisms may grow in closed loop system of paper making equipment, biological treatment workshop and water cooling tower of waste water. Thus it is suggested to take the following measures to prevent, reduce and control damage cause by microorganisms.

1. The design of biological treatment workshop shall be helpful to the reduction of pathogenic microorganism growth.

2. Bacteriacide shall be used during the process of water cooling, pulp making and paper making to minimize the growth of pathogenic microorganism.

9.7 Heat

There are many high-temperature or high-pressure processes in pulp making factory (including pulp cooking, recycling of pulp making chemicals, lime production and paper drying process). The measures to prevent, reduce and control the contact with heat in pulp making and paper making factory are:

1. Provide control room with air conditioning equipment in working areas such as wood preparation, pulp making, bleaching and paper making.

2. Plan the schedule of work in heat area to ensure the worker can adapt to the temperature and have rest time.

3. Automatically remove the smell in chemical recycling furnace and provide good protection clothes for workers who may contact hot melting or high-temperature material.

4. Implement safety procedures; reduce risks of explosion of hot melting articles and water. Hot melting articles shall be transferred at certain speed. Recycling boiler shall be repaired to prevent water leakage from boiler wall. In case of signs of water leakage are found, chemical recycling boiler shall be turned off immediately.

5. Consider the use of mobile equipments and keep operation area closed and air-conditioned.

9.8 Noise

Wood peeling machine in pulp making factory and paper making machine in paper making factory are two major noise sources. But the other production processes also generate noise. As we have mentioned above, the use of control room is an effective noise control measure.

9.9 Radiation

Some measuring instruments (especially in paper making factory) contains radioactive substance. Though the instruments containing radioactive substance are sealed, but people may be exposed to radioactive substance if the instruments are damaged or repaired. The design and utility of these instruments shall comply with relevant national requirement, international certified occupational and/or ionizing radiation natural exposure standards such as “International Basic Safety Standards for Protection against Ionizing Radiation and the Safety of Radiation Sources” and the other three correlated safety guidelines.

10 Legal Effect of Environmental Management Plan

From the environmental standard, clean production, total amount control, programme-related document and contract, environmental management plan shall bear corresponding legal effect.

1. Environmental standard is stipulated on work concerning environmental protection according to laws on environmental protection and relevant policies with the purpose of protecting human health, preventing environmental pollution, advancing virtuous ecological circle, reasonable utilizing resource, and promoting economic development. It is inevitable for enterprise to emit pollutants during production process. In order to prevent enterprise from transferring internal cost to external environment and balance the pollutant emission right between enterprises, government representing the public benefit must control the action of pollutant emission and stipulate standards on pollutant emission. Environmental standard stands for the external indicators of the impact of pollution source on environment, requires pollution source to take continuous pollutant emission reduction measure and implements technical measures with legal binding on pollutant emission action.

2. Clean production refers to continuous use of environmental protection measures including pollution prevention measures in production process and product, aiming to reduce the impact of pollutant on human being and environment. The nature of clean production is to implement comprehensive prevention environmental measure in production process and product, in order to reduce or eliminate the potential damage of pollutant on human being and environment. In addition, the demand of human shall be met. Thus clean production is a production mode with the maximum social and economic benefit. “Cleaner Production Promotion Law of the People's Republic of China” was passed on the 28th session of Standing Commission of the 9th People’s Congress and implemented from January 1st 2003.

3. Control of total amount of Pollutant emitted (hereinafter referred to as total amount control) is to treat a control region (such as administrative region, basin and environmental function region) as a whole system, take measures to control the total amount of pollutants emitted to the region under a certain limit, thus to meet the requirements of the region for environmental quality. Total amount control includes three parts: total amount of pollutants, region receiving pollutants and period of pollutant emission. Total amount control system requires national environmental manage department to decide the total amount of pollutant in certain region according to measured regional environmental capacity, and distribute pollutant quotation to individual enterprise in the region.

4. Environmental management plan is a part of bid document and construction contract between the World bank and construction unit, thus it bears legal effect.

5. This programme is a programme of the World Bank, and the complying of environmental management plan is an article of programme agreement and donation

agreement between the World Bank and Chinese Government, thus environmental management plan bears legal effect.

Therefore, construction unit shall implement environmental pollution prevention and treatment measures, environmental risk mitigation measures, emergency response environmental monitoring plan, environmental monitoring plan, plan of regular environmental impact report, environmental protection information exchange plan, environmental protection record plan, environmental protection monitoring plan in order to protect the legal effect of environmental management plan.

11 Assessment of Investment in Environmental Protection

This programme is mainly based on current environmental protection equipments and facilities, which can meet the demand of proposed production. After the completion of reconstructed and expanded project, construction unit need to implement environmental protection measures, ensure the normal running of environmental protection equipments and facilities and the pollutant emission after meeting relevant requirement.

Refer to table 11.1 for the situation of investment in environmental protection of current projects.

Table 11.1 Comparison and Analysis of the Percentage of Investment in Environmental Protection in Total Investment unit: 10 thousand RMB

Department	Asset	Investment in Environmental Protection	Total Investment	Percentage
Power station	Three electrical precipitator	2212.0	330133.9	0.67%
Alkali recovery workshop	Alkali recovery system	9218.5	330133.9	2.79%
Waste water treatment system	Medium water treatment system	7313.8	330133.9	2.22%
White water recovery and treatment system	White water recovery	534.8	330133.9	0.16%
/	comprehensive waste water treatment of forest base, oxidation pond	11882.5	330133.9	3.60%
Power station	Desulfurition	1400.0	330133.9	0.42%
Subtotal		32561.7	330133.9	9.86%

Refer to table 11.2 and 11.3 for investment in environmental protection of proposed project during construction period and operation period.

Table 11.2 Estimation of in Investment in Environmental Protection of Proposed Project during Construction Period

NO.	ITEM	AMOUNT（10 THOUSAND RMB）
1	Dust treatment system	10
2	Waste water treatment system	20
3	Noise reduction facility	10
4	Underground waste water gutter	10
5	Facility to prevent risks during waste and old facility dismantling	20
6	Facility to collect and transfer SW	20
7	Afforest in construction area	10
Total		100

Table 11.3 Estimation of in Investment in Environmental Protection of Proposed Project during Operation Period

NO.	ITEM		AMOUNT（10 THOUSAND RMB）
1	Waste gas treatment	Roll precipitator, hydraulic grass grinder	50
		Rain spraying waste gas recycling device	100
		Treatment of smoke from alkali furnace	150
		Tail gas washing system and risk prevention facilities in chemical preparation workshop	30
2	Waste water treatment	Add a evaporator of 7000m^2	1398
		Grass washing water treatment facility	200
		Emergency pool for black liquor	10
		Renovation of Waste water treatment system	1800
3	SW treatment	Closed temporary storage yard for green mud, etc	10
4	Noise treatment	Shock reduction and sound insulation	20
5	Afforest in factory		20
6	Environmental protection lab and environmental monitoring instrument and equipment		100
Total			3888