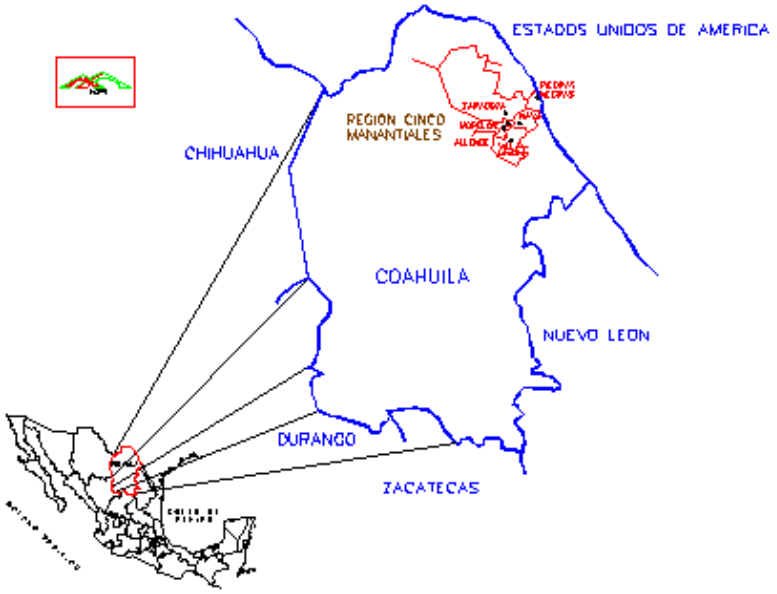
Border Environment Cooperation Commission

Wastewater Treatment Facility and Recycling Paper Facility in Región Cinco Manantiales, Coahuila

I. General Criteria

1. **Type of Project.** A Recycling Paper Facility (RPF) and Wastewater Treatment Plant (WWTP). The integrated project encompasses the construction and operation of a paper and cardboard recycling facility for the fabrication of paper liners for cardboard boxes; and the construction and operation of a WWTP. Grupo Solar presents this project, a private Mexican corporation engaged in the business of recycling paper. Additionally, the project contemplates an in-kind contribution toward the construction of a sanitary landfill or other related public facilities. This project fits within the BECC's definition of category 1 of the Private Sector Projects as a Public/Private Partnerships, where the project benefits the community-at-large.

2. **Project Location.** The project components identified above will be located in Region Cinco Manantiales, in Morelos and Allende, Coahuila, and the respective site is within the 100 km border region.



3. Project Description and Work Tasks. The project is described in the following sections. It is important to mention that the Master Plans funded by the BECC (water and wastewater, and solid waste) were instrumental in developing a regional solution for this particular project.

The municipalities of Allende, Morelos, Nava, Villa Union, and Zaragoza, in Coahuila, Mexico comprise region Cinco Manantiales. It is located in the northeast quadrant of the state. Region Cinco Manantiales has an estimated population of about 71,500 people, which is expected to increase to over 117,000 people by the year 2020. However, the plan is to serve Morelos and Allende first, then connect the rest of the communities at a later date, the current population for Allende and

Morelos is approximately 22,949 and 8,196 respectively. Presently, the needs of the residents in terms of sanitary sewer, wastewater treatment, and collection and disposal of municipal solid waste (MSW) are not being met. Thus, the integrated project as presented, will contribute to the strengthening of the environmental infrastructure and the economy of the region. The components of the project are described below.

- The RPF will consist of an operation with the capacity to process 140 metric tons per day and to generate 43,200 metric tons/yr of liner paper during the first phase. The second phase will increase the capacity to 225 metric tons/day and is expected to generate 66,000 metric tons/yr of liner paper. The raw material will come from both the US and Mexico, in approximately equal shares of 50% each. The paper recycling process requires a water supply of up to 0.571 mgd (25 lps). This water will be extracted from wells or irrigation canals, treated (if necessary), used in the process, treated again, and subsequently discharged back into irrigation canals or into a proposed green belt. The raw material coming from the U.S. will be hauled by railroad. This project component will help extend the area's landfill capacity, reduce consumption of live trees, recycle wastewater and non-potable water. Additionally, the project will create 140 direct jobs and 260 indirect jobs, which are needed in the region.

- The wastewater treatment plant will have a mixed technology with the use of a clarifier and aerated and facultative lagoons, and will have a capacity to treat up to 2.283 mgd (100 lps). The WWTP is being proposed to be constructed in Morelos, adjacent to Allende's city limits. Currently, the region has no wastewater treatment facilities other than unlined lagoons and cesspools. Approximately 53.64 mgd (235 lps) of wastewater could be generated in the region, Morelos and Allende currently can generate about 0.571 mgd (25 lps), and it would go up to about 1.712 mgd (75 lps) once both cities have all residents hooked-up to the system. By constructing this facility, coverage of sewage treatment would increase by 35% for the entire region, and 100 % for Morelos and Allende.

- Grupo Solar is considering an in-kind contribution for the construction of a regional sanitary landfill or other related public facilities. The recycling plant is mandated by federal law to dispose of its solid waste at a permitted sanitary landfill. The process will generate about 20 metric tons per day of solid waste. Although this portion of the project is a very important component, is not being considered part of the project for certification.

4. Compliance with International Treaties and Agreements. The project will have positive international impacts, because it will help reduce the wastepaper and cardboard delivered to region landfills. Additionally, the air emissions generated by paper and cardboard trucks will be reduced since the bulk of the raw material will be transported by railroad. In addition, it will reduce the threat of contamination of the regional aquifer by treating the wastewater for the communities of Morelos and Allende, which are currently being discharged into

open lagoons, this project eventually could be a pilot project for the rest of the communities in the region.

II. Human Health and Environment

1. Human Health/Environmental Need. The project will address human health and environmental concerns by reclaiming paper, cardboard, non-potable water, and wastewater. The recycling project presented herewith provides built-in benefits to the region. Some of these benefits are described below:

- Treatment of up to 2.283 mgd (100 lps) of raw sewage from the region. About 1.94 mgd (85 lps) will be used to irrigate a proposed 500 acres (200-hectare) green belt, as part of a reforestation/buffer zone program within the RPF property, the other portion could be recycled through the plant.

- The reuse of waste paper and cardboard will extend the landfill capacity, and will help reduce the consumption of live trees.

- Private participation (through funding) in the construction of the regional landfill, or other related public facilities.

- Reduce air emissions from trucks transporting cardboard back and forth across the US - Mexico border. By using the railroad system, the distances covered by truck traffic within the border region will be reduced, thus generating less pollution from trucks.

Furthermore, by designating a contribution toward the construction of a landfill, the communities will benefit by improving the collection and management of municipal solid waste (MSW). The inefficient handling of MSW triggers several impacts to the environment. For instance, continuous fires in the open dumps pose a threat to human health, or not having restricted access to landfill facilities promoting disposing of hazardous substances or bio-medical waste at the dumps and open fields. In some instances, leachate represents a threat to the regional aquifer. With a sanitary landfill these problems tend to decrease gradually, due to the reason that it would be a regulated facility.

The construction of the WWTP, will reduce dramatically the potential to pollute the regional aquifer, by reducing the number of cesspools and latrines. Additionally it will eliminate the use of open pits to discharge wastewater, and will reduce the risk of contamination to the regional aquifer.

2. Environmental Assessment.

The environmental studies for the recycling plant and the treatment plant have been finished and being reviewed by BECC, the National Institute of Ecology (INE) and by the State of Coahuila. The study did not reveal negative transboundary impacts from the selected site.

The preliminary environmental assessment studies contained in the Master Plan for the Improvements of the Water, Sanitary Sewer, and Wastewater Treatment Services for Cinco Manantiales, sponsored by the BECC, indicated that the WWTP location proposed by Grupo Solar, fits within the Master Plan will not have negative impacts on the site's flora, fauna, environment, or the ecosystem.

3. Compliance with Environmental and Cultural Resource Laws and Regulations.

No impacts to cultural resources are expected, as the proposed paper recycling plant and the wastewater treatment plant will be located in a previously developed tract of land, which is near a railroad spur and associated appurtenances. Nonetheless, this issue will be further discussed during the development of the appropriate cultural and environmental assessment by the consultant, and at the time the final designs are completed for both plants (RPF and WWTP). The sponsor will be required to provide all the required permits before starting operations.

III. Technical Feasibility

1. Appropriate Technology. Recycling Plant. The paper recycling facility will produce 43,200 metric tons per year, and up to 66,000 metric tons/year during the second phase. The technology to be implemented in this process is currently utilized in two other sites in Mexico. NADB has indicated that they will coordinate an independent evaluation of the production process. This evaluation will also include a technical review of the experience and expertise of Grupo Solar. This facility has an estimated cost of about USD $16.2 million.

Wastewater Treatment Plant. Grupo Solar considered two different alternatives for treating the sanitary sewer for Morelos and Allende.

The first alternative consists of constructing a WWTP using the wetlands technology. This technology is currently used in an industrial facility with similar wastewater characteristics. The process will include one digestor, two plantation

trains, and one storage pond. The estimated cost of this WWTP is USD $1.0 million. Although this alternative is the most economical, does not provide the adequate treatment and quantity for the water to be reused in the RPF.

The second alternative considers the construction of a WWTP using the stabilization lagoons technology. This scheme includes a pretreatment lagoon (clarifier), an anaerobic lagoon, a facultative lagoon, and a stabilization lagoon. The estimated cost for this alternative is USD $1.3 millions. This is the preferred alternative.

Mexican legislation requires the paper industry to treat their industrial wastewater when is being reused, and to dispose of their solid waste at a sanitary landfill. Thus, it is imperative that Grupo Solar finds the means to accomplish this. Grupo Solar has the option to build their own landfill or send their solid waste to an approved sanitary landfill.

2. Operation and Maintenance Plan. Grupo Solar will provide the operation and maintenance manuals for both the paper recycling plant (PRF) and the WWTP as part of the final design.

3. Compliance with Applicable Design Standards and Regulations. Grupo Solar has designed the paper recycling facility with modern leading technology and pursuant to the industry standards. If a landfill is constructed, it will be designed in general accordance with NOM-ECOL96-083. The WWTP has been conceptually designed following proven leading technology, and in accordance with State and Federal regulations.

IV. Financial Feasibility and Project Management

1. Financial Feasibility.

The construction of the project (RPF and WWTP) will have an approximate total cost of $17.5 million, as described in the table below.

Grupo Solar is seeking a NADB loan for up to USD $6.5 millions. This amount includes USD $1.3 million for the construction of a WWTP, USD $5.0 million for the construction of the recycling plant and a $200,000 in-kind contribution that Grupo

Solar is considering toward the construction of a regional landfill or other related public facilities. Grupo Solar is seeking a 25-year loan from NADB.

ESTIMATED TOTAL PROJECT COSTS

ITEM	AMOUNT IN USD
Land	$ 200,000
Construction Activities	$ 2,000,000
Machinery and Equipment *	$14,000,000
Office and computing equipment	$ 30,000
Transportation equipment	$ 220,000
Engineering (both RPF & WWTP)	$ 250,000
Working Capital	$ 800,000
Total investment	$ 17,500,000
TOTAL COST	**$ 17,500,000**

* Includes WWTP and in-kind contribution toward landfill or public improvements.

The following table indicates the funding sources for the paper recycling plant.

Available Funding	Amount ($, millions)	% of Total
Grupo Solar	$10.0	57
NADB	$ 6.5	37
Voith (machinery supplier)	$ 1.0	6
Total	$17.5	100

The following table indicates the funding sources for the WWTP.

Available Funding	Amount ($, millions)	% of Total
Grupo Solar (NADB loan)	$1.3	100
Other sources		
Total	$1.3	100

V. Community Participation

1-Comprehensive Public Participation Plan. The objectives of the comprehensive public participation plan (the "Plan") are to ensure that the

community understands and supports the environmental, health, social and financial benefits and costs of the project. Grupo Solar submitted a public participation plan for BECC's evaluation and approval. The Plan comprises the following activities: gather information documenting public support for the project, develop a steering committee, identify and meet with local groups and organizations, and hold a minimum of two public meetings.

2. Steering Committee: Steering Committees were formed by Grupo Solar emphasizing a regional approach (Allende and Morelos). The Steering Committees were responsible for distributing public information and for scheduling a minimum of two public meetings. The members of the Steering Committee also met as necessary to develop the process for distributing information to the public and will help educate the public about the project by providing informational fact sheets.

3. Local Organizations: One or more members of the Steering Committee met with representatives of local organizations to make presentations to ensure the public understands the project.

4. Public Information: Information about the project was be provided to the public by members of the Steering Committees, local organizations and by making the draft Step II document available at City Halls and schools. Additionally, the Steering Committee met with the public to inform them about the project.

5. Public Meetings: Two public meetings were coordinated between BECC, the Steering Committees and Grupo Solar. The first public meeting took place in October 6, 1999, and the second public meeting was scheduled for May 5, 2000. During the second meeting, the financial aspects of the project were presented to the public. The project will have no negative impacts on solid waste or wastewater user fees, due to the reason that the sponsor is purchasing the wastewater from the communities.

VI. Sustainable Development

1. Definition and Principles

The project contemplates the integration of a commercial process that will use waste paper and cardboard as raw material, avoiding using virgin wood, to generate liner paper. Additionally, the project includes the implementation of wastewater treatment infrastructure, with the purpose of replacing the non-potable water and well water consumed during the process. Furthermore, the project will also include an in-kind contribution for the construction of a regional landfill or related public facilities, to dispose of the byproduct waste in an acceptable manner.

The project promotes improving the quality of life of the residents of Region Cinco Manantiales, as it will generate employment opportunities, will ameliorate the impacts on water resources and potential disease vectors.

2. Institutional and Capacity Building

The project includes the construction and operation of a WWTP (total capacity of 2.283 mgd)(100 lps) without any cost to the communities. The municipalities will receive a payment of USD $0.04/m3 of wastewater sent and treated by Grupo Solar. The project will also include paying up to $70/ton for cardboard collected from the area landfill and delivered to the RPF. These revenues will benefit the municipalities and can be used to strengthen the communities' public utility budget.

The project may also encourage municipal authorities to institute either new or expanded paper and cardboard recycling programs in the community. This new or expanded institutional capacity will provide additional ancillary employment as well as increased institutional capacity.

3. Conformance with Applicable Local and Regional Conservation and Development Plans

The project incorporates results and information obtained in the following studies:

* Master Plan for the Improvements of Water, Sewer, and Wastewater Treatment Services in Region Cinco Manantiales.

* Master Plan and Final Design for Municipal Solid Waste of Region Cinco Manantiales.

These Master Plans were developed prior to the conception of Grupo Solar's project.

4. Natural Resource Conservation

The project promotes the protection of the environment through the following actions:

* The recycling plant will use 100% used raw material.

* Up to one metric ton will be reclaimed from the area's landfill per day.

* 140 metric tons/day will be collected from sources in both the US and Mexico.

* The wastewater used in the recycling plant will be treated and reused (irrigation of 500 acres (200 hectares) for a green belt/buffer zone area for reforestation only).

* The wastewater treated from the communities will promote good health by reducing the use of cesspools and latrines, and possible contamination of the regional aquifer.

5. Community development.

The project will promote the creation of employment (direct and indirect). The availability of environmental infrastructure will provide wastewater treatment, and will reduce the amount of solid waste (paper, cardboard) sent to landfills. The project will also improve the economic and health conditions of the residents of Region Cinco Manantiales.

Available Documents

1. Step II Document

2. Information regarding the Financial Analysis

3. Agreement between the communities of Allende and Morelos and Grupo Solar about the sale of the wastewater