



Environmental Management Manual

CENTRAL SALTILLO, S. A. DE C. V.

DAMES & MOORE de MEXICO, S. de R. L. de C. V.

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1.0 INTRODUCTION

The Environmental Management Manual is supplementary to the Environmental Action Plan submitted to the International Finance Corporation (IFC) on the part of Central Saltillo, S. A. de C. V. (CSO) and its purpose is to establish a mechanism to consolidate between the potential impacts generated by the project and the prevention, abatement or compensation procedure proposed in the Environmental Evaluation, to comply with the environmental guidelines set forth in the Mexican standards and by the World Bank applicable to the CMO project.

The Environmental Management Manual recaptures the corporate policy guidelines set forth by the General Direction of Central Saltillo with respect to environmental and safety issues, to reaffirm the company's commitment to the preservation of the environment and protection of the workers.

Thereinafter, the Manual sets forth the abatement procedure proposed for the environmental impact project identified in the different execution stages of the project, including descriptions of design, equipment and available operating procedures. Also included is the monitoring program to evaluate the operation of the abatement procedure, including the parameters to be evaluated, the measurement methods, the location of the sampling points, measurement frequency and detection limits, when applicable, as well as the definition of the thresholds effective from which corrective actions will be required.

Finally, this manual provides the implement program and cost estimates to perform the foregoing policy, mitigation and monitoring aspects.

According to the activities program proposed by CSO, the site and construction preparation stage will have a duration of 28 months effective from last quarter of 1999 and it is estimated that commercial operations will start-up by the second semester of the year 2001. The operation stage will have a minimum duration of 25 years, after which period the continuation of the operations or close and disassembly of the facilities will be defined.

The location site of the Power Station was proposed by the Comisión Federal de Electricidad based on the evaluation studies on the needs of the electrical sector and with the site selection procedures set forth by said agency (Environmental Impact Statement, COMIMSA, 1998), which seek the best alternative with respect fuel supply, water and transmission lines, as well as to minimize environmental impacts and potentially adverse socioeconomic.

The design criteria used for the Power Station, contained in the Preliminary Design Book on same, considers a combined cycle system with a gas combustion turbine, and the use of diesel for a maximum of ten days per year. The use of a turbine and a boiler with low NOx burners to be used with gas and water injections when diesel is used will allow the reduction of air emissions, while the use of air condensers for

cooling purposes will reduce the water consumption required. The evaporation lagoon will prevent industrial residual water to be exhausted to receiving bodies.

The previous design concepts are a sample of the fact that the Central Saltillo project was "born" including environmental protection criteria.

This manual is a supplement of the Environmental Action Plan to establish the necessary technical details and accuracy to follow-up the commitments established by CSO to protect the environment and comply with the guidelines set forth by the Mexican authorities and by the World Bank for new electrical generation projects .

The present manual considers the change of the water supply source on behalf of Central Saltillo, which has been applied because of the important variations of the parameters' composition originally considered for the design of the biological treatment system to be applied to the urban waste waters.

The new supply source will be underground water obtained through a main well with a flow capacity of 2.65 liters/s, which is the water flow required for the regular operation of the Power Station; and through an auxiliary well that will be located 1.5 km away from the site, and that will be used to satisfy the additional water requirements for the operation with diesel fuel (6 liters/s during a maximum of 360 hours per year) and during the stop of the use of the main well because of maintenance or dysfunction.

REFERENCES

1. Central Saltillo Project 247.5 MW; Report of Environmental Impact Evaluation, Vol. III, Environmental Action Plan. August 1999.
2. Saltillo Project 247.5 MW, Preliminary Design Book, Central Saltillo, S. A. de C.V./Comisión Federal de Electricidad. Electricité de France. Mexico. April 1999.
3. Environmental Impact Statement. General Modality "CCC Saltillo PEE". Corporación Mexicana de Investigación en Materiales, S.A. de C.V. (COMIMSA), December, 1998.

2.0 ENVIRONMENTAL POLICY

The environmental policy of Central Saltillo, S. A. de C. V. (CSO) is included in the Environmental Policy Statement of the Environment Director dated June 30, 1999 and sets forth as its main principle "to achieve and to maintain the levels, in environmental issues and pollution prevention, provided for by the Mexican Law in force, the Comisión Federal de Electricidad (CFE) of Mexico and the World Bank".

The purpose of the CSO's Environmental Policies is to achieve and maintain the highest levels of prevention and control of environmental pollution, complying with each and every requirement applicable to the activities of the Power Station, during the first stage, for the design, construction, testing and service start-up stages and, during a second stage, during operation and maintenance.

On June 1999 CSO prepared a Preliminary Environmental Management Manual for the Engineering, Design, Procurement, Construction, Mounting, Tests and Service Start-up stages, as well as the Specific Environmental Plans for the engineering and design phase, for the manufacturing and supply stage with which an attempt is made to define the environmental demands which are to be implemented during said phases of the project and to present and describe the provisions adopted by CSO with respect to its Environmental Management System.

For the first stage, the following goals and objectives have been set forth by the top management of CSO, in the Preliminary Environmental Management Manual prepared on June 1999:

- The Environmental Manual will be implemented by each of the parties involved during the different phases of the project.
- Take into account, from the beginning of the Project and throughout same, all the environmental aspects that could cause an impact in the project.
- To conceive the Power Station in such a way that the limit values established in the Mexican and World Bank standards are complied with, in environmental and protection of personnel issues.
- To perform the construction, assembly and service start-up activities without material negative impact to the environment.

The managing and direction departments of CSO, for the operation and maintenance phases at the Power Station, and at the required moment, for the abandonment phase, will apply the same policies, objectives and goals concerning the fulfillment of standards and environmental protection, considered for the construction phase.

The Environmental Management System that will be developed and set forth for Central Saltillo and of which the different manuals that have been prepared are a

part and those to be prepared in the future will be based on the international ISO 14001 references.

2.1 Environmental Policies Guidelines

The main Environmental Policy guideline set forth by CSO in the Preliminary Environmental Management Manual for the various phases of the design and construction of the Power Station is the "fulfillment in all cases of the Mexican standards (federal, state and municipal), as well as those provided by the World Bank".

The project "seeks to minimize the effects on the environment, even though in the cases where any damage to the environment would occur it would be bound to ease same". Thus, it is bound "to contribute to the conservation of the ecosystem and landscape of the site where the Power Station is located".

The use of fuels with low emission of pollutants, such as natural gas and light diesel, as well as the optimization of water usage are design criteria that contribute for the process to be cleaner.

The emissions to the atmosphere and the management of the residues generated will be accomplished within said limits and pursuant to the applicable provisions set forth.

2.2 Organization and Responsibilities

For the administration, operation and follow-up of the environmental policies of Central Saltillo during the study, design, construction and service start-up phases of the Power Station, the company has established an organization plan as set forth in the Figure 1.

Pursuant to this plan, the Environment Director of Central Saltillo, S.A. de C.V. will be the main coordinator of Environmental Management, around whom the functional, administrative, contractual and structural relationships are to be established with the rest of the companies and agencies involved in the project.

COMINSE is the engineering company in charge of supervising the construction activities of the Power Station and COMEGO is the service company that will be in charge of corporate management and supervision of operations and maintenance. Also involved in this project are EDF International (EDFI) as main investor and the support areas of said corporation, such as the Construction Direction and the Thermic Equipment National Center (EDF/CNET).

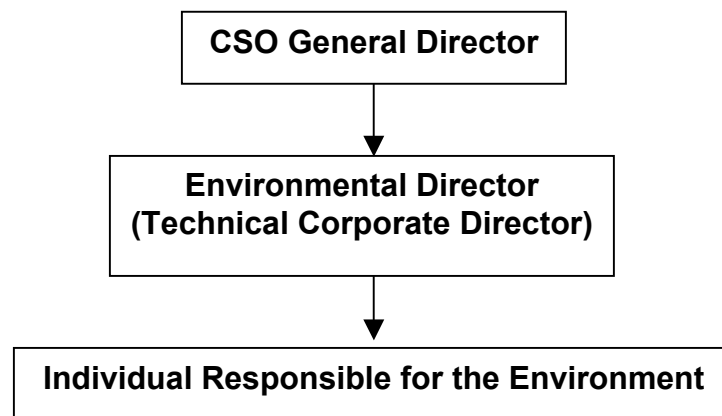
With respect to external organizations, we mainly identify CFE, which is the promoter of the project and who will acquire and distribute the energy generated by the Power Station; the subcontracted companies to be in charge of specific projects; the equipment and consumables suppliers and, finally, the Mexican

authorities and the IFC, whose instructions will be observed for the prevention of the pollution and environmental protection.

As shown in the diagram, the relationship between the different companies and agencies are of varying nature, though all commit those involved to the use of their best effort in the application of the environmental policies and in the compliance with the activities applicable to each as set forth in the manual herein.

The management responsibility of the commitment to ensure the application of the environmental policy, as well as to ensure the resources for the application of the system and of the manual herein will be under the Environmental Director (Technical Corporate Director), a position at an executive level, to be appointed by the General Director of CSO.

Below the Environmental is the person Responsible for the Environment, who during the design and construction phase will be a company member in charge of the construction, equipment and service start-up supervision of the Power Station (COMINSE), to be confirmed by the Environmental Director. The hierarchy of the organization is indicated below:



The duties and responsibilities of the personnel in charge of the Environmental Management System and of the Management Manual herein, in accordance with the Environmental Management Manual, are the following:

Position	Duties	Responsibilities
Environmental Director	Defines the Environmental Policy Ensures the adequacy of the resources (human, material and budget) necessary for the application of the Environmental Management System (SAA)	Responsible for management commitment in environmental management issues. Guarantor of the developed environmental policies. Provides the resources. Guarantor of the SAA.
Person Responsible for the Environment	Drafts the Environmental Management Manual. Implements the SAA. Ensures the internal training and sensitization meetings. Performs internal audits. Analyzes the operation of the SAA in search for improvements to implement. Defines the necessary means for the correct application of the SAA and proposes the Management System changes to the Environmental Director for approval. Continues the regulatory and records of maturity evolution of authorizations.	Ensure coherence of the SAA with the environmental policies and power production activities. Correct application of the SAA. Adequate communication on the Environmental Policy. Classification and filing of combined SAA documents.

For the Power Station's operation stage, the organization and responsibilities plan and hierarchy will be similar to the previous one. However, the individual Responsible for Environment will be a member of the COMEGO organization in charge of supervising the operation and maintenance of the Power Station and including activities and responsibilities for the Plant Director, who must also be ratified by the General Director.

The transmission guidelines of the Manual herein will be those set forth for the Environmental Action Plan and for the documents of the Environmental Management System of the Power Station. That is to say, it will be distributed for information purposes to the following participants:

- Power Station Management.
- Comisión Federal de Electricidad (CFE)
- International Finance Corporation/ World Bank

The Environmental Management Manual herein is a supplement of the Environmental Action Plan delivered to the IFC on August 1999 and forms an integral part of the Environmental Management System documents to be implemented for the Central Saltillo.

2.3 Applicable Standards

Below is a list of the laws, regulations and standards on environmental and safety, hygiene and health issues that will be considered by Central Saltillo during the various execution of project stages:

- General Ecological Balance and Environmental Protection Law.
- Regulations of the General Ecological Balance and Environmental Protection Law in prevention and air pollution control.
- Regulations of the General Ecological Balance and Environmental Protection Law with respect to hazardous residue issues.
- Regulations of the General Ecological Balance and Environmental Protection Law with respect to environmental impact issues.
- Regulations on Environmental Protection against pollution generated by noise emission.
- Regulations for Land Transportation of Materials and Hazardous Residues.
- National Water Law.
- Regulations of the National Water Law.
- Electrical Energy Public Service Law.
- Federal Rights Law.
- Federal Civil Protection Law.
- Federal Labor Law.
- Federal Regulation on Safety, Hygiene and Work Environment.
- Ecological Balance and Environmental Protection Law of the State of Coahuila.
- MEXICAN OFFICIAL STANDARD NOM-001-ECOL-1996 - Establishes the maximum pollutant limits authorized for discharge of residual water in national water and properties.
- MEXICAN OFFICIAL STANDARD NOM-034-ECOL-1993 – Sets forth the measurement methods to determine the carbon monoxide concentration in the air and the procedures to calibrate the measurement equipment.

- MEXICAN OFFICIAL STANDARD NOM-035-ECOL-1993 - Sets forth the measurement methods to determine the total concentration of suspended particles in the air and the procedure to calibrate the measurement equipment.
- MEXICAN OFFICIAL STANDARD NOM-036-ECOL-1993 - Sets forth the measurement methods to determine the ozone concentration in the air and the procedures to calibrate the measurement equipment.
- MEXICAN OFFICIAL STANDARD NOM-037-ECOL-1993 - Sets forth the measurement methods to determine the nitrogen dioxide concentration in the air and the procedures to calibrate the measurement equipment.
- MEXICAN OFFICIAL STANDARD NOM-038-ECOL-1993 - Sets forth the measurement methods to determine the concentration of sulfur dioxide in the air and the procedures to calibrate the measurement equipment.
- MEXICAN OFFICIAL STANDARD NOM-041-ECOL - 1996 - Sets forth the maximum limits authorized of pollutant gas emissions generated by the exhaust of automotive vehicles in circulation using gasoline as fuel.
- MEXICAN OFFICIAL STANDARD NOM-042-ECOL-1993 - Sets forth the maximum levels authorized of non-burned hydrocarbon, carbon monoxide and oxide monoxides emissions from nitrogen generated from new automotive vehicles exhausts in the plant, as well as evaporating hydrocarbons generated by fuel systems using gasoline, oil liquefied gas (gas l. p.), natural gas and other alternate fuels, with a vehicle gross weight of 400 to 3,857 kilograms.
- MEXICAN OFFICIAL STANDARD NOM-043-ECOL-1993 - Sets forth the maximum emission levels authorized of solid particles to air generated from fixed sources.
- MEXICAN OFFICIAL STANDARD NOM-047-ECOL-1993 - Sets forth the equipment characteristics and measurement procedures for monitoring the levels of pollutant emissions, generated by circulating automotive vehicles that use gasoline, oil liquefied gas, natural gas or other alternate fuels.
- MEXICAN OFFICIAL STANDARD NOM-050-ECOL-1993 - Sets forth the maximum authorized gas pollutant emissions generated from circulating automotive vehicle exhausts that use oil liquefied gas, natural gas or other alternate fuels.
- MEXICAN OFFICIAL STANDARD NOM-052-ECOL-1993 - Sets forth the characteristics of hazardous residues, a list of same and the limits that make a residue hazardous due to its on the environment.

- MEXICAN OFFICIAL STANDARD NOM-053-ECOL-1993 - Sets forth the procedure to perform the extraction test to determine the constituents that make a residue hazardous due to its toxicity on the environment.
- MEXICAN OFFICIAL STANDARD NOM-054-ECOL-1993 - Sets forth the procedure to determine the incompatibility between two or more residues considered hazardous in the Mexican Official Standard NOM -052-ECOL-1993.
- MEXICAN OFFICIAL STANDARD NOM-058-ECOL-1993 - Sets forth the requirements for the operation of a controlled confinement of hazardous residues.
- MEXICAN OFFICIAL STANDARD NOM-059-ECOL-1994 - Determines the species and subspecies of both land and water flora and fauna wildlife in danger of extinction, threatened, rare and those subject to special protection and sets forth the specifications for their protection.
- MEXICAN OFFICIAL STANDARD NOM-080-ECOL-1994 - Sets forth the maximum authorized emission limits of noise generated by circulating automotive vehicle, motorcycle and tricycle exhausts and their measurement method.
- MEXICAN OFFICIAL STANDARD NOM-081-ECOL/1994 - Sets forth the maximum authorized emission limits of noise from fixed sources and their measurement method.
- MEXICAN OFFICIAL STANDARD NOM-085-ECOL-1994 - For fixed sources that use solid, liquid or gaseous fossil fuels or any of their combinations; sets forth the maximum authorized emission levels of smoke to air, total suspended particles, sulfur dioxide and nitrogen oxides and the requirements and conditions for the operation of the indirect fuel heating equipment, as well as the maximum authorized emission levels of sulfur dioxide in the direct fuel heating equipment.
- MEXICAN OFFICIAL STANDARD NOM-086-ECOL-1994 - Sets forth the specifications on environmental protection to be fulfilled by gaseous and liquid fossil fuels used in mobile and fixed sources.
- MEXICAN OFFICIAL STANDARD NOM-122-STPS-1996 - Relative to the safety and hygiene conditions for the operation of the containers subject to pressure and steam generators or boilers that operate in the work centers.
- MEXICAN OFFICIAL STANDARD NOM-022-SSA1-1993 - Criteria to evaluate the quality of the air, sulfur dioxide (SO₂), authorized value for sulfur dioxide the concentrations in the air, as a protection means to the health of the population.

- MEXICAN OFFICIAL STANDARD NOM-023-SSA1-1993 - Criteria to evaluate the quality of the air, nitrogen dioxide (NO₂), authorized value of nitrogen dioxide concentrations in ambient air, as a protection means to the health of the population.
- MEXICAN OFFICIAL STANDARD NOM-024-SSA1-1993 - Criteria to evaluate the quality of the air, the total suspended particles (PTS) authorized value of total suspended particles concentrations in air, as a protection means to the health of the population.
- MEXICAN OFFICIAL STANDARD NOM-025-SSA1-1993 - Criteria to evaluate the quality of air, particles under 10 microns (PM₁₀), authorized value of particles concentrations under 10 microns in air, as a protection means to the health of the population.
- MEXICAN OFFICIAL STANDARD NOM-001-SEMP-1994 – regarding facilities to be devoted to the supply and use of electric energy

REFERENCES

1. P. Rossines. Policy, Goals and Environmental Objectives Statement. Central Saltillo, S. A. de C. V., June 30, 1999.
2. F. Lemardeley, M. Bouniol, Y. Imperatrice, P. Rossines, Specific Environmental Plan (Engineering and Design Phase), Central Saltillo, S. A. de C. V. Mexico, June 1999. 12 pp.
3. A. Lemerdeley, M. Bouniol, Y. Imperatrice, P. Rossines, Specific Environmental Plan (Manufacturing and Supply Phase), Central Saltillo, S. A. de C. V., Mexico, June 1999, 11 pp.
4. A. Lemerdeley, M. Bouniol, Y. Imperatrice, P. Rossines, Environmental Management Manual (Study, Design, Procurement, Construction, Mounting, Tests and Service Start-up Phases). Central Saltillo, S. A. de C. V., Mexico. June 1999, 33 pp.
5. Central Saltillo Project, 247.5 MW. Report on Environmental Impact Evaluation, Vol. III, Environmental Action Plan, August 1999.

3.0 PROCEDURE TO ALLEVIATE ENVIRONMENTAL IMPACTS

This chapter covers the prevention, abatement and compensation procedure of the possible environmental impacts to be generated during the various project stages of the Power Station, whenever possible indicating the technical details and the conditions under which they will be required.

The principal environmental impacts to be generated by the project were identified in the Environmental Impact Statement Study, General Modality that was prepared by Comisión Federal de Electricidad during December 1998. This study was performed by means of the application of a method that considered the following stages: simple activity lists and the crossed cause-effect matrix. The impacts identified were qualitatively and quantitatively evaluated by means of the Conesa Fdez-Vitora method, which considers the importance and magnitude of the impacts, based on the various attributes, in consideration to their nature (beneficial or adverse), persistency (temporary, extended or permanent), extension (on time, local or regional) and reversibility (reverse or non-reversible).

The results of said study, plus the evaluation of the consumables, products and processes to be used, the typical environmental impacts of Power Station Electrical Generation projects and the project's design and operation criteria set forth by CSO in the Preliminary Design Book, were used as the basis to identify impacts and to establish the abatement procedure proposed in the chapter herein.

Table 3.1 sets forth a summary of the main impacts estimated to appear during each of the various execution stages of the project, including indications of their persistence in the time, extension and intensity.

Table 3.1 Principal environmental impacts identified for the Central Saltillo Project

ENVIRONMENTAL FACTOR	SITE PREPARATION	CONSTRUCTION	OPERATION
AIR	Fuel dust & gas emissions from circulation combustion vehicles and land movements. Temporary, local, low intensity	Fuel dust & gas emissions from circulation combustion vehicles and land movements. Temporary, local, low intensity	Fuel gas emissions generated by the turbines and heaters. Extended, local, medium Intensity
NOISE	Generation of noise due to heavy vehicles traffic. Temporary, local, low intensity	Generation of noise due to heavy vehicles traffic and machinery use. Temporary, local, low Intensity	Generation of noise due to operation of the Power Station's Equipment. Extended, local, medium Intensity.
GEOMORPHOLOGY	Change of shape and grade of the land. Permanent, specific, low Intensity.	Placement of foundations and facilities that will change the shape and grading of the land. Permanent, specific, low Intensity	No other additional adverse impacts are estimated.

ENVIRONMENTAL FACTOR	SITE PREPARATION	CONSTRUCTION	OPERATION
SOIL	Land movements, landfills and compacting that will affect the top layer of the land. Permanent, specific, low intensity.	Handling of materials and residues which could cause soil pollution in the event of leaks or spills. Extended, specific, medium Intensity	Handling of materials and residues which could cause soil pollution in the event of leaks or spills. Extended, specific, medium intensity.
VEGETATION	Elimination of species. Movement of protected species. Permanent, specific, high intensity.	Handling of materials and residues which may be dragged to rain channels and affect specimens. Extended, local, medium intensity.	No other additional adverse impacts are estimated
FAUNA	Change or removal of habitat. Modification of habits. Permanent, local, medium intensity.	Loss of the habitat. Alteration of habits. Permanent, local, medium intensity.	No other additional adverse impacts are estimated.
SUPERFICIAL HYDROLOGY	Change of natural leakage patterns. Permanent, local, low intensity.	Water discharge with pollutants to intermittent channel riverbeds. Temporary, local, medium Intensity.	Water discharge with pollutants to intermittent channel riverbeds. Temporary, local, medium Intensity.
UNDERGROUND HYDROLOGY	No adverse impacts are estimated.	Pollution of water bearing bodies due to infiltration of pollutants. Extended, local. medium intensity.	Pollution of water bearing bodies due to infiltration of pollutants. Extended, local. medium intensity.
SOCIOECONOMIC	An increase in the trading of goods and services. Beneficial impact. Temporary, local. medium intensity.	An increase in the trading of goods and services. Beneficial impact. Temporary, local. medium intensity.	An increase in the trading of goods and services. Beneficial impact. Temporary, local. medium intensity.
SAFETY AND HYGIENE	Exposition to dusts. Temporary, specific, low intensity.	Exposition to dusts and noise and handling of hazardous materials. Temporary, specific, low intensity.	Exposition to noise and handling of hazardous materials. Extended, specific, low intensity.

It must be mentioned that the change of the water supply source does not represent adverse significant impacts on the evaluated environmental factors, as said in the Modifications to the Report of the Environmental Impact Assessment, done for that change of source on request of the IFC (Dames & Moore, 2000).

The main well is located in the Power Station's site; it is 435m deep and has a 10" diameter, with a water flow capacity of 2.65 l/s. The ancillary well will be located in the site of the measuring gas station near the connection point of the gas pipeline with the PEMEX trunk line; the required water flow will be for covering the exceeding volume of water needed during the operation with diesel fuel (6 l/s during a maximum of 360 hours per year) and during the stop of the use of the main well because of maintenance or dysfunction.

The zone where the wells will be located is officially recorded as a "free emergence" zone by the Water National Commission (CNA), which means that the underground aquifer is considered to be sub-exploited and potentially exploitable.

3.1 Impacts in the preparation of site and construction stage

Below is a listing of the main impacts that will be generated during the preparation of site and construction stage of the Power Station, which will last an estimated period of 28 months. Abatement procedure will be applied during all the construction stage period, otherwise the procedure applicable only in the events of contingency shall be indicated. In addition, the description will indicate when the procedure could generate further adverse impacts in other issues.

3.1.1 Air

Dust and gas emissions arising from land movements and from the use of machinery and vehicles during the tracing, leveling, cleaning of land, transportation of materials and excavation activities.

The access road to the Power Station from the Federal Highway is currently paved, which will reduced the dust emission generated by vehicle traffic. The road is a part of the industrial park, thus, the impact generated by its construction and operation are not part of the impacts generated by the Power Station's project.

Prevention and Abatement Steps

- The main traffic roads inside the Power Station's tract will be continuously watered. This will be performed more frequently during the hours of heavier traffic, based on visual observation of the dust conditions from the party responsible for the works. The irrigation will be performed using water trucks; non-potable water will be used, either from authorized suppliers or from sources authorized by the corresponding authorities.
- Vehicle access regulations will be drafted and distributed among the transporters, therein setting forth the access to the site procedures, entrance and exit authorizations and authorized speed limits.
- The trucks transporting earthy material will be covered with canvases to avoid the dispersion of particles. The canvas will completely cover the box of transportation trucks. This procedure will be included in the vehicle access regulations.
- Access to the site will be controlled to avoid the entrance of non-authorized personnel and vehicles that would increase the problem of dust emissions, as a result work areas will be kept fenced.
- All the automotive vehicles used during construction will have to comply with a regular maintenance program, pursuant to the manufacturer's recommendations and they will be checked annually in order to determine if

they comply with the Mexican Official Standards (NOM) applicable thereto, in accordance with the type of fuel used. In the event there are no authorized verification centers, the vehicles will be sent for evaluation to the neighboring cities of Saltillo or Monterrey.

NOM-041-ECOL-1993, maximum authorized level of gas pollutants from vehicle that use gasoline exhausts.

NOM-044-ECOL-1993, maximum authorized levels of hydrocarbons, carbon monoxide and nitrogen oxides, suspended particles, opaqueness of motor exhausts for vehicles using diesel.

NOM-045-ECOL-1993, establishes the maximum authorized levels of opaqueness exhaust generated by circulation automotive vehicles using diesel as fuel.

The verification of the vehicles used will be a requirement set forth by Central Saltillo to contractor companies and it will be used as a selection or cancellation criteria of the suppliers, provision that will be ensure fulfillment of the procedures set forth.

3.1.2 Noise

During the Power Station's construction stage noise will be generated due to the circulation of automotive vehicles and by the use of tools, machinery and equipment.

Prevention and Abatement Steps

- The vehicles will circulate with the exhaust closed and at low speed, both on the access roads as well as within the property of the Power Station. This provision will be set forth in the vehicle access regulations.
- It will be specified that vehicles must comply with the NOM-080-ECOL-1994 standard, that provides the maximum authorized limits of noise emission generated by circulating automotive vehicles, motorcycles and tricycles and the measurement method.
- In the work area, the workers will use hearing plugs when exposed to high noise levels and the exposure periods will be adjusted to the provisions set forth in NOM-011-STPS-1993 and NOM-080-STPS-1993.
- The machinery and equipment used during the construction operations inside the Power Station will have mufflers or devices to mitigate noise, pursuant to the operating provisions for each equipment. The use of noise mitigating devices in the machinery and equipment will be a requirement set forth by

Central Saltillo to contractor companies and it will be a selection or cancellation criteria of the suppliers. This will ensure the fulfillment of the procedures set forth.

- The Monitoring Plan will consider the evaluation during construction of the noise levels in the housing facilities located closer to the Power Station and in the town of Santa María to verify that the environmental noise values are not exceeded as set forth in the Pollution Prevention and Abatement Handbook, World Bank Group, Effective July 1998, Thermal Power: Guidelines for new plants.
- The Monitoring Plan will consider the evaluation of the noise levels in the work environment during the construction stage.

3.1.3 Geomorphology

The cleaning, landfills, opening of ditches and leveling activities of the land in the property of the Power Station and in the right of way of the gas pipeline, as well as the stone materials from material stratum, will generate changes in the shape and grading of the land.

The land of the Power Station is located in the Industrial Park Santa María, therefore, the surrounding areas and within the site have already been altered by industrial development. The property is located in a relatively flat area, thus, there are no elevations or depressions to be significantly changed.

Prevention and Abatement Steps

- The material resulting from the cleaning, leveling and excavation activities during construction will be reused for landfills and leveling within the property if same is adequate for such purpose, based on its consistency, resistance and compacting. All the remaining excavation material will be adequately disposed in a site authorized by the municipal authorities, to prevent its being dragged and dispersed by the action of the wind or rain. It is not estimated that this would generate additional negative impact, since the site must be foreseen and accepted by the authorities.
- NOM-003-RECNAT-1996 standard, in reference to the procedures, criteria and specifications to produce the improvements, transportation and storage of hill earth will be complied with.
- Stone material required for the construction will be acquired from material banks authorized by the competent authorities. The possible impact due to the exploitation of material banks will be the responsibility of the owners and authorized suppliers.

3.1.4 Soil

1. The cleaning of the land, excavations, leveling, compacting of ditches for ducts, foundation and drainage in the right of way of the gas pipeline and in the property of the Power Station will cause land movements that will affect the top layer of the soil.

Prevention and Abatement Steps

- The material resulting from the ditches dug to place the gas pipeline will be temporarily deposited on the right of way to prevent adjacent properties from being affected.
- The landfill, compacting and restoration works on the areas dug will be performed immediately after the tubing works are concluded to restore in the least possible time the topography, drainage patterns and natural conditions of the right of way and the same material resulting from the excavations will be used. The remaining material will be disposed on sites authorized by the corresponding authorities.
- The landfill and compacting material will be free of hazardous residues and not dangerous, for which purpose it will be checked visually by the party responsible for the work.
- During and after construction, the applicable erosion control procedures will be fulfilled to alleviate the soil impact, until the right of way areas have been restored.
- At least once a week periodic inspections will be performed in the right of way gas pipeline refilled areas, to check that there is no erosion and dragging of soil material and that no accumulated residues, that may alter the soil's conditions, have been left.

2. Improper handling of the residues generated during construction can generate soil pollution; this includes solid residues of domestic type, generated by the workers and those residues generated during construction.

Prevention and Abatement Procedures

- Containers strategically located will be installed in the property of the Power Station, to store garbage and other non-hazardous residues; these containers will be kept covered and will have signs to indicate their content. The residues will be removed periodically before the storage capacity is exceeded and they will be sent to authorized sites based on their characteristics.
- The earthy material resulting from excavations may be temporarily stored within the Power Station's lot; any other non-hazardous residue will be disposed off

outside the site in the manner agreed to with the municipal authorities for its collection. To use areas located outside the facilities, the requirements of Clause 3.4.5.1, "Use of areas outside the facilities" of the bidding basis will be fulfilled.

- All the residues that are considered hazardous pursuant to NOM-052-ECOL-93 will be stored in specific containers duly marked and placed in a temporary storage area, pursuant to the provisions of the Regulations on Hazardous Residues issues (mainly Articles 15 and 16), and the criteria of residue incompatibility set forth in NOM-054-ECOL-93. Mainly, the area will have waterproof material on the floor and devices to lead and control possible spills.
- The handling and transportation of hazardous residues will comply with the following procedures:

NOM-005-SCT2-1994. Emergency transportation information for shipping hazardous materials and residues.

NOM-006-SCT2-1994. Basic aspects for daily visually checking the unit to be devoted to transporting hazardous materials and residues.

NOM-007-SCT2-1994. Marking of containers and crates to be devoted to transporting hazardous substances and residues.

- The removal and final disposal of hazardous residues will be performed by a company authorized for said service, with the frequency required to avoid exceeding the storage capacity and pursuant to the provisions of the environmental standards in force.
- The storage of fuels and lubricants during construction will be made in an undercover specific area, with waterproof floor material and devices to guide and collect possible spills. The area will have restricted access and fire extinguishers for fire prevention and control.
- A procedure will be set forth to cover any case of hazardous material and residue spills during the construction stage. This procedure is to be circulated among the contractors in charge of handling said materials and supervised by the individual Responsible for the Environment. The procedure must consider the use of absorbing materials to recover and avoid the dispersion of the material spilled; the floor impregnated with material will be immediately removed and placed in a metal drum with a top to be sent for final disposal as a hazardous residue, together with the absorbing materials used and, finally, the site must be covered with a free of residue flooring. The personnel that performs this activity must wear personal protection equipment, based on the characteristics of the material spilled. This procedure will be applicable only in the event of a contingency.

- At the termination of the construction the property will remain free of all hazardous and non hazardous residues. All non-hazardous material that comes in contact with hazardous residues will be considered a hazardous residue.

3.1.5 Vegetation

1. The leveling and cleaning works will remove the vegetable topping in the property of the Power Station and in the right of way of the gas pipeline. Currently, in the lot where the Power Station will be located we have identified ten and twenty individuals of the species *Corypantha poselgeriana* and *Corypantha sulcata* var. *Nickelsiae*, as well as certain disperse individuals of *Lophophora williamsii* (peyote), the first two considered as threatened species and under special protection the latter, pursuant to NOM-059-ECOL-1994, have been detected.

Prevention and Abatement Procedures

- Central Saltillo will perform, prior to the activities of cleaning and leveling of the land where the Power Station is to be built, a program for the protection, recovery and handling of species, which will be submitted to the environmental authorities for its approval, for the rescue of vegetation species under a protection status pursuant to NOM-059-ECOR-1994, which were identified on the land where the Power Station is to be located. The rescue program will be performed by an acknowledged professional on the handling of forestry resources, based on the Recovery and Handling of Cactaceous Program which was approved on August 1998 by the Federal Delegation of the Ministry of the Environment, Natural Resources and Fishery in the State of Coahuila for the Industrial Park Santa María.
- It will be verified by an acknowledged professional to ensure that in the property and on the right of way of the gas pipeline, species with certain protection status, pursuant to NOM-059-ECOL-1994 do not exist. In the event additional individuals are found, they will be included in the protection program set forth in the foregoing item.
- A circulation procedure will be set forth to promote the use by the inhabitants of the area of the clearing and cleaning products generated by the gas pipeline project and in the Power Station's property. The organic residues generated from the clearing activities will be disposed at a place approved by the local authorities or they will be mashed to be reincorporated to the soil.
- The use of herbicides and/or chemical products will be strictly forbidden, as well as setting a fire for removal of vegetation, during the clearing and cleaning activities on the property and right of way. These activities will have to be performed manually.

- An internal regulation will be provided for the construction phase, therein explicitly setting forth that the workers, including the contracting companies, are forbidden to collect, market or damage cactaceous species inside the property and in the surrounding areas, same which shall be applicable during the period in which the work relationship lasts.

2. During the site and construction preparation hazardous residues will be generated mainly from the use of machinery and equipment, such as grease, oil, impregnated cotton waste and containers in which they are stored. If such residues are placed in direct contact with vegetation surfaces or else are dragged by rainwater runoffs, they can cause damages to the vegetation.

Prevention and Abatement Procedure

- The abatement procedures set forth to avoid soil pollution for handling hazardous residues are applicable .

3.1.6 Fauna

The construction activities will alter the habitat of the species within the Power Station's property and right of way of the gas pipeline and they may even damage individuals.

Prevention and Abatement Procedure

- The following will be strictly forbidden: to hunt, to capture, injure and market species of wildlife fauna, as well as to perform clearing activities forestry exploitation in the nesting, refuge and feeding areas of animal species. This prohibition will be explicitly included in the internal work regulations applicable during the construction stage and will be supervised by the person Responsible for the Works.
- Prior to the cleaning and clearing activities and to the use of heavy machinery, every work front will be checked to ensure that there is no fauna under protection status, pursuant to NOM-059-ECOL-1994; in the event a specimen listed in said standard, notice will be given to the SEMARNAP State Delegation, to determine its rescue or possible relocation as corresponds.

3.1.7 Superficial hydrology

The site and construction preparation works will modify the natural patterns of the runoffs in the property of the Power Station.

The discharge or residual water used in the hydrostatics tests on the ducts, tanks and equipment can generate pollution to the intermittent channels located around the Power Station.

Water discharge of a sanitary type generated during the construction can pollute the soil or the natural riverbeds, in the event it were discharged therein.

Prevention and Abatement Procedure

- In the right of way of the gas pipeline and in the property of the Power Station the necessary civil works, such as drains, sewers or bypassing dikes, will be built, in order to maintain, whenever possible, the connection with the natural riverbeds surrounding the Power Station.
- No accumulation of materials will be permitted that could hinder the natural run of the leaks. The supervision of this activity will be under the person Responsible for Environment, activity to be performed by periodic inspection runs of the facilities.
- The residual water generated during the hydrostatics tests performed in the facilities that so require it, will be gathered and submitted for treatment and final disposal with an authorized supplier or to the treatment facilities designed for the Power Station if already in service.
- Portable latrines will be used to provide sanitary service for the workers during the construction of the Power Station. Thus, the displacement, treatment and disposal of the residual water generated will be under the authorized service supplier company. The disposal of sanitary water in the property of the Power Station or in the surrounding areas will not be authorized.

3.1.8 Underground hydrology

The grease, oil and other liquid residues leaks could cause infiltration to the subsoil and migration to the water-bearing runoffs. Which in the area where the Power Station is located it is located 200 meters deep.

Prevention and Abatement Procedure

- The machinery and equipment used in the construction works must be in optimum mechanical conditions to avoid oil, lubricant and fuel leaks. This will be a requirement for the selection of contractors in charge of works within the Power Station and its fulfillment will be supervised by the person Responsible for the Environment .
- An area will be set up inside the project site to supply fuel and maintenance to the machinery and equipment, with a concrete slab and liquid residue collection systems to prevent their contact with natural soil.

- Waters with oil residues will be collected and sent for treatment and final disposal outside the property, by an authorized service supplier.

3.1.9 Socioeconomic

The site and construction preparation works of the Power Station will generate an increase in the marketing of goods and services at the In the Municipality of Ramos Arizpe.

Due to the fact that no camps will be installed in the site of the Power Station for the workers, these will be located in the urban centers of Ramos Arizpe and Saltillo. Thus, it is estimated that no extension of municipal services will be required for the workers during the construction stage and that the existing ones will be sufficient to cover their requirements.

Prevention and Abatement Procedure

- The impact due to the increase of goods and services are considered beneficial, because of the promotion of employment in the region which will allow a larger outlay of resources and an increase in the quality of life of the population, therefore, no abatement procedure is considered.
- Constant communication and information will be provided to the community by means of press releases, radio advertisement and information meetings to learn what is the community's opinion with respect to the project. This will be performed at least once a year or when there are important design and construction changes.

3.1.10 Safety and Hygiene

The workers will be potentially exposed to fugitive dust emissions and fuel gases during the preparation, construction and testing of the site.

The workers will be exposed to the noise generated by the machinery during the preparation, construction and testing of the site stages.

Prevention and Abatement Procedure

- The Abatement Procedures for dust and gas emissions and noise generation during the construction phase are applicable.
- Introduction and training programs will be provided in the use of personal protection equipment and general safety and hygiene procedures for the workers. Records and certificates of participation will be kept.

- The workers are required to have social security (IMSS) set forth in the applicable labor law and are to be provided with the personal protection equipment necessary, in accordance with the activities they perform. This will be a requirement for the contractor companies and a criteria for the selection of service suppliers.

3.1.11 Installation of the Gas Pipeline

The gas pipeline installation works imply accident risks as it is the main source of fuel feeding. This could cause serious injuries to the workers and damage to the natural environment or bordering towns where they could occur.

Prevention and Abatement Procedure

- The gas service will be provided by means of two, 16" and 24", connections to Pemex's trunk gas pipeline. The connections will be performed using "hot-tap", with a cut valve for each connection and an isolation joint between flanges in the common span. The hot-tap connection will be performed by Pemex's specialized personnel.
- All the tubing operating under a pressure of more than 100 psi will be subject to leak tests 1.5 times the design pressure during 24 hours. The test hydrostatics method with pressure correction based on the temperature will be used.
- The design, installation and use of pipelines, accessory and procedures for the construction of the gas pipeline will be performed in accordance with the following standards: ASME (American Society of Mechanical Engineers), ASTM (American Society for Testing and Materials), ANSI (American National Standard Institute) and API (American Petroleum Institute).
- The pipelines will have a passive protection system consisting of an epoxy coating set by fusion and with a cathodic protection system with a drainage position located at the entrance to the Power Station.
- During the placement of the pipes, caution will be taken to avoid damage to the outside coating. The welding will be executed with electrical arc by qualified welders and will be periodically controlled pursuant to the ACME code "Boiler and Pressure" and the API1104 code; the welds will be controlled by means of X-rays and protected with polyken type bands. The coating control will be performed by means of an electrical controller, "electrical brush" type and in the event of a defect same will be repaired.
- The outlay of the gas pipeline will be a line as straight as possible. Any change of direction will be executed by means of curves with a radius of more than 20 times the diameter.

3.1.12 Prevention and General Abatement Procedures during construction stage

- Training programs will be planned for workers and supervisors on prevention and control of the pollution issues, as well as on safety and hygiene issues, to include knowledge and communication of internal procedures and commitments before the authorities and international organizations. The program will have to include both CSO's personnel and contractors' personnel.
- The training records and certificates will be kept to evaluate the personnel's level of training and to define future needs.
- In the event remains of historical value are found, such as constructions, foundations, pots, arrows, etc., the clearing and leveling activities will be temporarily discontinued and notice will be given to the Regional Center of the National Anthropology and History Institute. The foregoing in accordance to the Federal Monuments and Archeological, Artistic and Historical Areas Law.
- An update on the risk study (of the Power Station and the gas pipeline) will be prepared, with detail engineering information once same is defined, based on the provisions of the environmental resolution.

3.2 Impact during the Operation and Maintenance Stage

This section describes the potential impacts that will be generated by the project during the operation and maintenance of the thermoelectric Power Station and the prevention, abatement and compensation procedures proposed to prevent the natural environment and the workers from being affected.

3.2.1 Air

The continuous operation of the Power Station will issue pollutant gases to the air, due to the combustion of natural gas, mainly constituted by nitrogen oxides and carbon oxides which could affect the air quality. Exceptionally (maximum 360 hours per year) diesel will be used as support fuel, which will, in addition, generate suspended particles and sulfur oxides.

Prevention and Abatement Procedure

- The use of natural gas as the basic fuel provides an adequate combustion, with high performance and yield, minimizing the emission of combustion gases damaging to the environment.
- High efficiency equipment with combustion chambers of low NO_x type, designed so as not to exceed the maximum authorized limits of emission will be

available, under any condition of electric energy generation, except during start-up periods, pursuant to the provisions set forth in NOM-085-ECOL-1994.

- The combustion equipment will have a water injection system when using diesel as a fuel, to minimize the formation of NOx.
- The construction of a chimney for the recovery boiler with a height of 40 meters and a diameter of 6 meters to ensure an optimum dispersion of combustion gases.
- Also available will be continuous emission measurement equipment at the chimney, that will analyze the following parameters: CO, O₂, NO_x, SO₂, PST and PM₁₀, to verify that the emission of pollutants complies with the provisions set forth in NOM-085-ECOL-1994 and the World Bank guidelines.
- A monitoring network for the quality of air will be installed to determine the levels of NO_x, CO, PST, PM₁₀ and SO₂. The network will also have three continuous monitoring stations and will provide information on the air quality in the region. Three fixed stations and a meteorological station located in one of the three stations will be installed. The location has been determined based on the results of the application of a mathematical model for emission dispersion to the air.

The quality of the air data will be registered and compiled through a data acquisition system, with the "software" to submit the reports according to the requirements of the environmental authorities. The measurement principles of the analyzers will comply with the provisions set forth in the Mexican standards.

- The meteorological station will register the following parameters: wind speed and direction, temperature, relative humidity and atmospheric pressure; these parameters will be transmitted directly to the Power Station. The parameters monitored will allow the chimney's emissions to be correlated with the values registered in the monitoring stations. These parameters will be registered in a data acquisition system compatible to those of the monitoring network.
- In the event the results of the monitors indicate that maximum emission values had been exceeded, the operating and calibration conditions of the combustion equipment will be checked to adjust the air flow parameters, fuel feeding and those necessary to make more efficient the combustion process and to reduce the pollutants emissions.

3.2.2 Noise

During the operation of the Power Station noise will be generated due to mechanical movement of the electrical generation equipment (turbine, boiler and generating).

Prevention and Abatement Procedure

- A silencer will be installed between the gas discharge chimney for combustion gasses to the air and at the steam boiler, as well as an absorption hood or screen to reduce the noise exiting the turbines, in order to reduce the generation of noise of said equipment.
- The equipment with high noise level generation will be installed outside the buildings and as far away as possible from the properties adjacent to the land.
- Hearing plugs will be provided for the personnel exposed to the noise and awareness and supervisions mechanisms will be provided for their adequate use.
- The Monitoring Plan will provide the programs and procedures for noise evaluation in the work environment, to verify that it complies with the provisions of NOM-011-STPS-1993 and NOM-080-STPS-1994.
- The Monitoring Plan will provide the programs and procedures for noise evaluation to verify that the Power Station comply with the maximum authorized levels for fixed sources as set forth in NOM-081-ECOL-1994, that provides the maximum authorized limits for noise emission from fixed sources and the measurement method. During operation this evaluation will be performed at least once a year.
- The Monitoring Plan will establish the programs and procedures of noise evaluation in the receivers located outside of the limits of the Power Station, mainly in the surrounding houses and in the town of Santa María, to verify that the Power Station complies with the maximum authorized levels set forth in the Pollution Prevention and Abatement Manual, World Bank Group, Effective July 1998, Thermal Power: Guidelines for new plants. During operation this evaluation will be performed at least once a year .

3.2.3 Geomorphology

No additional impacts are considered to the geomorphology of the area, during the operation and maintenance stage of the Power Station.

3.2.4 Soil

Improper handling of hazardous materials and residues, such as fuel, lubricants, impregnated materials and chemical products can cause soil pollution.

Prevention and Abatement Procedure

- Temporary storage areas for hazardous materials and residues were designed and built in accordance with the specifications of the standards applicable and taking into account the safety requirements set forth in the Materials Safety Worksheet (MSDS). The storage areas will be roofed, have waterproof material floors, devices to guide and collect possible spills and will have restricted access, among other things.
- There will be two diesel storage tanks each with a capacity of 5,800 m³, with a dam with a useful capacity of 6,100 m³ sized in accordance with the NFPA30 standard. The surface inside the dams will be designed to prevent soil pollution in the event of spills or leaks and will have valves for the rainwater displacement and evacuation to the water.
- Daily inspection procedures will be set forth in order to detect evidence or spills or leaks in the storage tanks, dam and fuel conduction pipeline. In the event a leak or a spill are detected notice will be given to the individual Responsible for Environment and the procedures to be set forth for handling leaks or spills will be applied.
- The diesel storage tanks will have measuring instruments and controls connected to the control panels, alarms and devices for fire prevention, pursuant to the codes and applicable procedures of the ASME, ANSI and NFPA.

3.2.5 Vegetation

No additional adverse impacts are foreseen on the vegetation during the operation and maintenance stage of the Power Station.

- Continuity to the Abatement Procedure with respect to the internal regulations for workers will be set forth, in order to avoid the collection and marketing of vegetation species in the areas surrounding the Power Station.
- Green areas will be established using species proper of the region in accordance with the rescue plan, to be supervised by an authorized professional.

3.2.6 Fauna

There are no estimated additional adverse impacts to the fauna during the operation stage of the Power Station.

- Continuity to the Abatement Procedure with respect to the internal regulations for workers will be set forth, in order to prohibit hunting and trading of fauna species in the areas surrounding the Power Station.

3.2.7 Superficial hydrology

During the operation and maintenance stage of the Power Station residual processing water will be generated, as well as rain and sanitary type water, which in the event they are improperly handled could generate pollution in the riverbeds of intermittent creeks or be dragged to water bodies.

Prevention and Abatement Procedure

- The design of the facilities considers "zero discharge" of industrial effluents during the operation and maintenance of the Power Station.
- A separate sewage network will be built for process residual water, for sanitary residual and rainwater. The residual process water will be led to an evaporation lagoon. The oily rainwater will be lead to a pit water–oil separator and thereafter will be connected to the rain sewage. Residual non-oily rainwater will be run and discharged on a receiving body to be authorized by the CNA. The sanitary residual water will be lead to septic tanks and from there left to infiltrate the subsoil. The residual water product of the boilers and turbines cleaning procedure will be submitted for treatment and disposal with an outside supplier.
- An evaporation lagoon will be built with a capacity of 14,000 m³, in a 2.8 hectares area within the property to dispose of the effluents generated by the boilers, turbines and demineralization process. The lagoon will be complete waterproof to prevent the water infiltration to the subsoil and to the water-bearing bodies.
- Monitoring pits will be installed around the evaporation lagoon, to verify that underground water are not affected by possible filtrations or leaks from the evaporation lagoon.

3.2.8 Underground hydrology

The project considers the change of the water source supply because of the differences in the quality of the residual water to be used, thus, we are considering the use of a deep well as the source of supply.

No additional adverse impacts are considered during the operation and maintenance stage of the Power Station.

- Review and maintenance procedure programs will be set forth for the various separate drainage systems, so that all the residual water generated by the Power Station is captured and lead to the different treatment facilities, thus avoiding any possible soil infiltration and their reaching the water bearing bodies of the area.
- Monitoring wells will be installed around the evaporation lagoon to check that the underground water is not affected by possible infiltration or leaks from the evaporation lagoon.

3.2.9 Socioeconomic

There are no estimated adverse impacts to the socioeconomic conditions of the area due to the operation and maintenance of the Power Station. The beneficial impacts are associated with the possibility of development of new industries in the Northeast zone of the country.

Increase in the trading of goods and services in the Ramos Arizpe municipality.

Prevention and Abatement Procedure

The procedures proposed correspond to support procedures and not to abatement procedure, since the impacts are considered beneficial.

- Continuity will be provided to the beneficial impacts resulting from the economic outlay and to the increase in the labor demand in the region. To economically benefit the community, preference will be given to the contracting of labor and services from local suppliers.
- Continuity will be provided to the Public Consultation procedures during the 25 years estimated assignment for the operation and maintenance stage.

3.2.10 Safety and Hygiene

There are no estimated additional adverse impacts to safety and hygiene issues on the workers during the operation and maintenance stage of the Power Station.

Prevention and Abatement Procedure

- A safety and hygiene program in the work place will be set forth to include:
 - Training for workers.
 - Installation of hygiene and safety notices.
 - Development of a prevention, reduction and control of accidents plan.

- The certificates of the training and records of the workers participation will be kept.
- Continuity of the social welfare provisions will be set forth (IMSS) for the workers of the Power Station, pursuant to the guidelines provided in the applicable labor law.
- The Monitoring Plan will set forth the procedures to comply with the Mexican Official Standard, NOM-015-STPS-1993, regarding occupational exposure to high or low thermal conditions in the work place.

3.2.11 Installation of the Gas Pipeline

During the operation stage of the Power Station, there will be the risk of leaks in the fuel pipelines, which could cause damages to the physical integrity of the workers and affect the environment or the towns surrounding the site where the leaks occur.

Prevention and Abatement Procedure

- A maintenance program will be set forth that includes periodical checking of the passive protection and cathodic protection systems to be installed in the gas pipeline.
- At least once a the week, inspection tours will be performed through the length of the right of way of the gas pipeline, from the entrance to the Power Station to the connection with the trunk pipes, to identify any situation that could indicate possible damages or leaks in the gas pipeline.
- At least once a the week, the explosion levels will be monitored in the facilities of the gas run system (measurement stations, connection areas, valve and instrument areas), to detect possible leaks.

3.2.12 Procedure for prevention and general abatement during the operation and maintenance stage

- With respect to hazardous residues issues the provisions set forth in the Regulations of the General Ecological Balance and Environmental Protection Law with respect to Hazardous Residue issues will be fulfilled, specifically at the temporary storage.
- The facilities will be designed in such a way that they are risk safe and are not a nuisance to the bordering housing areas and other close industries. They will not generate traffic problems.

- A periodic inspection and maintenance program will be provided, to be performed at least once a year, for the measurement instruments of the flow, pressure and temperature of risk fluids.
- Training programs for the workers and supervisors will be provided on prevention issues, pollution control and safety and hygiene. These programs will include the communication and knowledge of internal procedures and of the commitments before the international authorities and organizations. The program will also include both the CSO personnel, as well as the contractors personnel.
- Training records and certificate files will be kept to evidence the training level of the personnel and to define future needs.
- Information procedures for the surrounding population will be set forth, regarding how to act in the event of a possible contingency arising from the handling of fuels in the Power Station.
- Special training programs will be set forth for the personnel that operates and provides maintenance to the high risk systems of the Power Station, such as turbines, boilers, generators and equipment for high tension energy distribution.
- An Accident Prevention Program will be provided, based on the requirements set forth by the Mexican standards, that will contain the response procedures in the event of any emergency to be applied in the case of an accident in the Power Station's facilities and in the gas pipeline.
- A directionable fire detection system will be installed, that will include fire detectors, alarm pulsators and central signaling switchboards.
- Two fire water storage tanks will be available of 1,300 m³ and a safety tank with the same capacity, with level indicators and low level alarms. In addition, to the fire network system based on hydrants and equipped fire hydrants (BIE), the system will provide water to all the plant areas.
- An installation will be specifically devoted to the gas turbines, transformers and diesel storage area fire protection, the latter with the use of foam.
- In general, the equipment will be protected by safety and relief valves, fuses, rupture disks and other protection devices to prevent any potentially hazardous situation that could occur during the proper operation of same.
- The vents and drainage will be safely discharged and will not be discharged in or around the personnel's normal access areas.

- Pressure sensors, thermostats, advance contact ends, threshold relays, etc., that fulfil a safety operation will be independent from those that have a control operation. Unless it is impossible, the safety operation will be provided by means of sensors located as close as possible to the phenomenon to be monitored, in order to measure the direct effects.
- The electrical equipment will be designed in such a way that the operation or normal use will not represent any contact risk with a portion under tension, an electrical arch incident, splash of lubricant or melted metal. All the metal parts that are not under tension and those which may be accessed from the outside will be connected to a grounded connection system.
- Safety showers and eye rinsing equipment will be installed in the areas where corrosive products are used.
- The air isolated tanks will be protected by vacuum break valves, with a design that allows the required pressures to be sustained.

3.3 Impact during the site abandonment stage

The operating period assigned to Central Saltillo by the Comisión Federal de Electricidad is 25 years, which can be renewed; thus, at the end of the operating stage it is possible that the facilities will continue to be used for electrical generation purposes.

If this is not so and as the land is located in an Industrial Park where it is planned to develop other industries in the region, it is highly possible that the installations of the Power Station to be devoted to industrial activities.

However, regardless of the decision, Central Saltillo will upkeep its commitment to comply with the requirements of the environmental standards applicable at said time, including the possibility of returning the property to its original condition if, thus, were requested.

REFERENCES:

1. Saltillo Project, 247.5 MW, Preliminary Design Book, Central Saltillo, S.A. de C.V./Comisión Federal de Electricidad, Mexico. April 1999. Electricité de France.
2. Environmental Impact Statement, General Modality "CCC Saltillo PEE". Corporación Mexicana de Investigación en Materiales, S. A. de C. V., (COMIMSA), December 1998.

4.0 MONITORING PLAN

This section describes the Monitoring Plan that is to be implemented for the design and construction stages and operation and maintenance stages of Central Saltillo. The purpose of this Monitoring Plan is to detail the actions proposed in the Action Plan submitted before the IFC to check the efficiency of the abatement procedures proposed to reduce the emission of pollutants in the Power Station's site.

The main objective of the monitoring program is to verify the efficiency of the prevention and abatement procedure of all the environmental variables considered in the environmental impact evaluation (EIA), so that they comply with the applicable regulations and the good environmental practices considered by the IFC.

4.1 Air Emission Monitoring Program

This program is based on the measurement of pollutant concentration criteria of the Power Station's emissions, measured at the chimney, pursuant to the corresponding emission standards, measurement and guarantee values that allow to comply with the guidelines set forth by the World Bank and the Mexican standards to this respect, because Mexico has established emission standards, instructions to measure the emissions and the maximum concentrations of pollutants authorized in the environment.

CSO will install and operate a Continuous Emissions Monitoring System (SMEC) that will monitor pollutants issued by the chimneys of the Power Station. Initially, the system is considered to measure: SO₂, NO_x, CO, PM₁₀ and Total Suspended Particles (PST).

The SMEC was conceived to transmit all the gross and corrected measurements of gaseous emissions necessary for the preparation of daily, monthly and annual reports, as well as the logic fault and alarm information connected to the system.

The System's components considered in the design are the following:

- A probe to obtain hot samples, for taking gaseous samples.
- Opacity-meter to measure the concentration of particles.
- Non-hot sampling lines.
- An analysis cabin equipped with a multi-gas analyzer and all the materials necessary to control and condition the samples.
- Standard gas cylinders necessary to normalize the analyzer.

The measurement points will be located at a section of the chimneys where the speed and volume of flow of the combustion gases is relatively stable.

Operation (specific description, technical details)

To begin operating the SMEC, a Distributed Control System (SCD) sends a service start-up order. This information begins an automatic calibration of the combined sampling parameters, before beginning operation of the analysis cycles. In addition, it sends an alarm to gather the information on defects from the analysis cabin.

The measurements performed by the analyzers are transmitted to the automaton in a signal of 4-20 mA, which corrects the pollutant agents measurements and extrapolates them to a fixed value of oxygen equivalent to 5%.

The gross measurements are expressed in ppm, mg/Nm³ or corrected and extrapolated to a fixed value of O₂, and are then transmitted as 4-20 mA signals to a device in the analysis cabin to be finally sent to the SCD.

Main operating parameters of the SMEC:

- Sampling Probe

The sampling probe is heated to avoid gas condensations and depends on the sampling selected principle. The materials constituting the probe should be compatible with the gaseous fluid (characteristics of the emissions). The probe is fed through the electric input at the analysis cabin.

To implement in each chimney, the probe forms an angle comprised between 5 and 10° downward with respect to the horizontal.

- Opacity Meters

The main elements of the opacity meters are: Two optical blocks, an issuer, a receiver and a measurement compartment. The electric and pneumatic inputs are received and determined effective from the analysis cabin

- Sampling Line

The sampling lines will have a mean length of 40 m, the materials used should be compatible with the emission characteristics.

- Analysis Cabin

The analysis cabin includes:

- An analyzer to measure the gases:

O₂: Scale 0-20 % in O₂ volume
 Output signal at 4-20 mA
 Output impedance at 500 Ohm min.

The oxygen analysis is used to correct the measurement of pollutant agents, which are extrapolated to a fixed oxygen value equal to 5% and expressed as dry gas residues in mg/Nm³.

NO/NO_x: Scale 0-400 ppm in NO₂ or 0-800 mg/Nm³ in NO₂.
 Output signal at 4-20 mA
 Output impedance 500 Ohm min.

SO₂: Scale 0-1000 ppm in SO₂ or 0-3000 mg/Nm³ in SO₂
 Output sign 4-20 mA
 Output impedance 500 Ohm min.

CO: Scale 0-120 ppm or 0-150 mg/Nm³
 Output signal 4-20 mA
 Output impedance 500 Ohm min

- All the conditioning materials for the sampling tests, with all the instruments and necessary accessories for the good operation of the analyzers.
- The automation of control of the combined analysis. This ensures the autonomy of the combined analysis. Their main functions are:
 - Data examination.
 - Control of facilities.
 - Calibration of analyzers.
 - Supervision and signaling of faults.
 - Transmittal of results to the SCD (System of Distributed Control).
 - Receipt of analogical signals and logics issued by the dust opacity meters:
 - Scale 0-150 mg/Nm³
 - Output signal 4-20 mA
 - Output impedance 500 Ohm min.

In compliance with the standards, the operation of the combustion equipment will have an operating and maintenance log book of the combustion, measurement and analysis of emissions equipment, as well as of the quality certificates of the fuel used. This logbook must include as a minimum the following information:

- To control the operation: date, shift, report hour, steam pressure, gas temperatures, input water temperature, temperature and combustion pressure, color of the smoke, in depth purge, level purge, pop safety valve release, fuel

consumption; pressure, start and shut-off of input water pump and shut-off due to flame detection controls.

- For the control of pollutant emissions: efficiency, gas temperature, excess air, O₂, CO₂, opacity of smoke; data of the fuel used pursuant to certificate; emission analysis, smoke density, Total Suspended Particles (PST), sulfur dioxide, nitrogen oxides; analysis of input water.

The CSO's SMEC is designed to generate daily, monthly and annual monitoring reports of the pollutant parameters. This fully complies with the requirements on measurement frequency set forth in NOM-085-ECOL-1994 and the guidelines of the World Bank, both when using natural gas as well as when diesel is used.

Maximum Authorized Emission Values

The limits considered as maximum values are those set forth by the World Bank for new thermoelectric plants set forth in Table 4.1. In addition, said table sets forth the authorized maximums set forth in the Mexican standards.

Adjustment procedures will be established applicable in the event that, at any time, the maximum authorized values are exceeded.

Table 4.1. Maximum authorized emission values considered by CAC

	Pollutants	Mexican Standard(1)	World Bank (1) Standards
Basic fuel	NO _x	152 ppm	61 ppm
	SO ₂	N.A.	N.A
	PST	N.A.	50mg/Nm ³
Back up fuel (3)	NO _x	152 ppm	80 ppm
	SO ₂ (2)	891 ppm	(49.5 mt/d) 234 ppm
			2,000 mg/Nm ³
	PST	142 mg/Nm ³	50 mg/Nm ³

- (1) Based on the standard conditions of the World Bank guidelines (dry basis 15% O₂, 0°C° and 1 atm). The values of Mexican standard, NOM-085-ECOL-1994, under normal conditions (dry basis, 5% O₂, 25°C and 1 atm) were converted to standard conditions.
- (2) The total SO₂ emissions must be under 0.2 metric tons per day (mt/d) for the first 500 MW, plus 0.1 mt/d per each additional MW.
- (3) Sulphur content: 0.5% max. (weight %), ash content 0.1% max. (weight %).

Due to the fact that the SMEC will include maintenance and calibration procedures, it will also be in a position to comply with the recommendations and guidelines of the World Bank.

4.2 Environmental Air Quality Monitoring Program

4.2.1 Monitoring stations

According to CSO's environmental policies, an air quality monitoring program will be implemented that complies with the applicable Mexican regulations and with the World Bank's guidelines.

For this purpose a continuous monitoring network of the surveillance type will be installed with three stations designed for continuous monitoring of NO, NO₂, CO, PST, PM₁₀ and SO₂ (notwithstanding that the World Bank does not require the measurement of PM₁₀ and SO_x for gas plants) and meteorological parameters.

Because the area that surrounds the site of the Power Station is flat land, only one of the monitoring stations will have a surface meteorological system, consisting of a ten meter meteorological tower equipped with continuous sensors to determine in real time the following parameters:

- Wind speed and direction.
- Environmental temperature.
- Relative humidity.
- Atmospheric pressure.

By means of a study of pollutant dispersion in the project area, the location of the three stations or monitoring cabins for environmental air quality monitoring has been determined. The meteorological monitoring and air quality programs will be implemented according to the requirements and quality assurance standards set forth by the Mexican environmental law.

The study of atmospheric pollutant dispersion was achieved by the company Corporación Mexicana de Investigación en Materiales, S.A. de C.V. (COMIMSA) and the final report is included in the Environmental Impact Report (*Manifestación de Impacto Ambiental, MIA*) drafted by the CFE. This study and the report were analyzed by the Thermic Equipment National Center, that is the technical center specialized in thermoelectric plants of Electricité de France (EDF/CNET), in France. The location proposed by EDF/CNET for the monitoring stations is shown on Figure 2.

The location of the monitoring stations considers one at the North of the town of Santa María, near the connection point of the gas pipeline of the Power Station with the trunk pipeline of PEMEX, and another one South-West from the Fraccionamiento Santa María, with the purpose of measuring the concentration of pollutant parameters in and towards the surrounding inhabited areas on the direction of the dominant winds (North-South). A station next to the emission source is also considered, on the South-East side within the Power Station site, to detect eventual peaks of pollution.

For each monitoring station, the measurements performed by the analyzers, the sensors of the meteorological conditions, as well as the fault signals will be transmitted to the Distributed Control System (SCD). The transmission of the SCT information will be performed by means of a radio connection.

In addition, the three monitoring stations will also have:

- A system for taking calibration and normalization samples
- A safety battery
- Prefabricated premises with air conditioning.

Each station will be fed with 120 Vca - 60 Hz. The necessary electric power for each station will fluctuate around 2.5 kVA.

In the event of a failure in the outside electric output, the battery electric output allows for the storage of information and transmittal of the "failure of electric output" signal. The autonomy foreseen for each battery is of 10 min.

Air Quality Measurement Ranges

The air quality and meteorological parameter measurement ranges of the analyzers are the following:

- Concentration of PM₁₀: 0-100 ug/m³ (to confirm)
- Concentration of NO, NO_x and NO₂: 0-10 ppm (to confirm).
- Concentration of CO (to confirm).
- Wind Speed: 0-50 m/s (0-180 km/h).
- Wind direction: 0-360°.
- Outside temperature: -30° C, +70° C.
- Relative humidity percentage: 0-100%.
- Atmospheric pressure: 850 - 1100 hPa

Characteristics of the monitoring equipment

The main characteristics of the system's elements for the three fixed stations are:

- Air conditioned prefabricate premises

Total height: 2.6 m

Width: 2.0 m

Length: 2.0 m

Structure: in accordance with the seismic coefficient of Group A, based on chapter C.1.4 of the "Civil Works Design Manual" of the Comisión Federal de Electricidad (CFE).

- Airconditioning

Automatically reversible; in addition, it will also be equipped with an integrated heating system.

- Dust Analyzers (PST and PM₁₀)

Scale: 0-100 ug/m³ (to confirm)

Output signal: 4-20 mA

Output impedance: 500 Ohm min

- One gas analyzers NO/NO_x and NO₂

Scale: 0-10 ppm in NO₂ or 0-20 mg/Nm³ in NO₂

Output signal: 4-20 mA

Output impedance: 500 Ohm min

Each NO/NO_x and NO₂ analyzer has its own sampling system.

- One gas analyzer CO

Scale: 0-50 ppm or 0-60 mg/Nm³

Output signal: 4-20 mA

Output impedance: 500 Ohm min

Each CO analyzer has its own sampling system.

Meteorological parameter collectors:

- Wind speed: 0-60 m/s
Output signal; 4-20 mA
Output 12 or 24 Vcd
Output impedance: 500 Ohm min
- Wind direction: 0-360°
Output signal: 4-20 mA
Output 12 or 24 Vcd
Output impedance: 500 Ohm min.
- Outside temperature and humidity: - 30, +70° C
0-100 HR
Output signal 4-20 mA
Output 12 or 24 Vcd
Output impedance: 500 Ohm min
- Atmospheric Pressure: 850-1100 hPa
Output signal 4-20 mA
Output 12 or 24 Vcd

Output impedance: 500 Ohm min

The collectors will be mounted on a telescopic mast, approximately ten meters high.

- Data acquisition System (SAD).

Only one SAD is foreseen for the fixed station, wherein the meteorological parameter collectors are including, to provide the following functions:

Treatment of the collectors' analogous results/logical.

Mean calculation.

Mean radio transmittal to the SCD (Distributed Control System).

- Emergency Battery

Each fixed station will have an emergency battery with an approximate autonomy of 10 min.

Table 4.2 sets forth the maximum values to be considered for the air quality parameters showing the limits set forth by Mexican and the World Bank's standards.

Table 4.2 Maximum Authorized Limits of Environment Air Quality

Pollutant (Average for the period)	Mexican Standard	World Bank Limit
NATURAL GAS (Basic Fuel)		
NOx (1 hour)	395 µg/m3	----
NOx (24 hours)	----	150 µg/m3
Annual NOx (per hour)	----	100 µg/m3
LIGHT DIESEL (Alternate Fuel)		
NOx (1 hour)	395 µg/m3	----
NOx (24 hours)	----	150 µg/m3
Annual NOx (per hour)	----	100 µg/m3
SOx (24 hour)	341 µg/m3	150 µg/m3
Annual (per hour)	78 µg/m3	80 µg/m3
PM ₁₀ (24 hours)	150 µg/m3	150 µg/m3
PM ₁₀ Annual (per hour)	50 µg/m3	50 µg/m3

4.3 Program of residual waters monitoring

The Residue Water Monitoring Program considers the evaluation of rainwater that drains from the Power Station and the water of sanitary type, which will be the only ones that will be discharged to receiving bodies. The first will be discharged to the

natural leak areas surrounding the property, while the second will be sent to septic tank for their biological degradation and later will be filtered to the ground. Also to be considered are all intermittent or eventual discharge which could be at a later date to the receiving bodies.

Parameters of interest

Table 4.3 sets forth the interest parameters to be evaluated in the residual water discharges of Central Saltillo based on the NOM-001-ECOL-1996 and the applicable measurement methods pursuant to Mexican standards:

Table 4.3 Monitored Residual Water Discharge Parameters

Parameters of interest	Measurement Method
PH	NMX-AA-008 potentiometric method
Total Suspended Solids	NMX-AA-034 gravimetric method
Grease and Oils	NMX-AA-005 soxhlet extraction method
Total chlorine residues	- -
Chrome (total)	NMX-AA-051 atomic absorption spectrophotometric method
Copper	NMX-AA-066 neocuproina method
Iron	
Zinc	NMX-AA-078 ditizone I, ditizone II colorimetric methods & atomic absorption spectrophotometric
Temperature Increase to the edge of the mixture zone	NMX-AA-007 visual method with thermometer
Floating matter	NMX-AA-006 visual method with specific mesh
Arsenic	NMX-AA-046 spectrophotometric method
Cadmium	NMX-AA-060 ditizone method
Cyanide	NMX-AA-058 colorimetric and titulometric method
Mercury	NMX-AA-064 ditizone method
Nickel	NMX-AA-051 atomic absorption spectrophotometric method
Lead	NMX-AA-057 ditizone method

Construction Stage

During the construction stage, the only residual waters to be generated will be those for sanitary services used by the workers of contractor companies, as no other activities are being considered that could generate residual water during this stage.

For these discharges, the use portable latrines provided by an authorized supplier is being considered. The same supplier will be in charge of collecting and

disposing of the generated residual waters, thus, the performance of periodic monitoring is not required.

Operation and Maintenance Stage

During the operation and maintenance stage of the Power Station, residual water will be generated from the demineralization process rejection, as well as from boiler and turbine purges, which will be sent to an evaporation lagoon.

The residual water to be eventually generated during the cleaning of the boiler and turbine will be collected and treated outside the Power Station's facilities by an authorized supplier.

In accordance with the handling proposed by Central Saltillo of the foregoing residual water, no periodic monitoring is being considered. However, checking and supervision procedures will be set forth to ensure that the suppliers selected perform the treatment and final disposal of residual waters pursuant to the applicable provisions set forth.

The discharges of residual water sent to a receiving body will be monitored at the registry prior to their outlet from the Power Station in accordance Table 4.4.

Table 4.4 Sampling Parameters and Frequency pursuant to the World Bank

PARAMETERS	SAMPLING FREQUENCY
Ph	Continuous
Temperature	Continuous
Suspended Solids	Daily
Grease	Daily
Oils	Daily
Residual chlorine	Daily
Metals	Monthly
Other *	Monthly

* Considered herein are all the other parameters set forth in the Mexican standards and specified in the parameters table as required by the Mexican standards which provide monthly frequencies in the most strict cases.

The maximum authorized values that will be considered as threshold values are those included in the Mexican standards and in the World Bank guidelines and are specified on Table 4.5.

Table 4.5 Comparison of Maximum Authorized Limits of Residual Water Discharge

Effluent Parameter	Mexican Standards (1)	World Bank Standards (maximum value)
PH	N. E. (4)	6 - 9
Total Suspended Solids	N. A. (soil)	50 mg/l
Grease and Oils	15 mg/l (2) 25 mg/l (3)	10 mg/l
Total residual chlorine	N. E.	0.2 mg/l
Chrome (total)	1 mg/l (2) 1.5 mg/l (3)	0.5 mg/l
Copper	4 mg/l (2) 6 mg/l (3)	0.5 mg/l
Iron	N. E.	1.0 mg/l
Zinc	10 mg/l (2) 20 mg/l (3)	1.0 mg/l
Temperature increase to the edge of the mixing zone	N. E.	Maximum 3° C
Floating matter	Absent	N. E. (4)
Arsenic	0.2 mg/l (2) 0.4 mg/l (3)	N. E.
Cadmium	0.05 mg/l (2) 0.1 mg/l (3)	N. E.
Cyanide	2.0 mg/l (2) 3.0 mg/l (3)	N. E.
Mercury	0.005 mg/l (2) 0.01 mg/l (3)	N. E.
Nickel	2 mg/l (2) 4 mg/l (3)	N. E.
Lead	5 mg/l (2) 10 mg/l (3)	N. E.

- (1) The values correspond to discharges to receiving body (soil) used for agricultural activities.
- (2) Monthly average.
- (3) Daily average.
- (4) N. E. Not specified.

If from the initial evaluations are determined as parameters not considered in the residual water discharges and they are not generated by the Power Station according to the operating conditions of the facilities, their exemption will be requested based on the criteria of the Mexican standards.

In addition, the following will be carried out:

- Visual Examination: Each day a designate member of the environmental personnel will perform a routine run of the site and will examine the residual water and activities of the Power Station that could impact the quality of the water.
- Frequent observations will be made during the runoff periods of rainwater. The observer will seek certain conditions, such as the presence of floating materials on the water surface, suspended solids on the flows, stains caused by oil or grease, discoloration and smell. If any activity would be noted that they could adversely impact the water quality, the observer will record same and inform the Environmental Management of the Power Station, in order to take the corrective or abatement steps that are to be immediately developed and implemented.

4.4 Underground Water Monitoring Program

Three monitoring wells will be installed around the evaporation lagoon to evaluate the characteristics of the underground water quality and to verify any possible pollutant infiltration.

The parameters that will be analyzed for the underground water samples obtained from the monitoring wells, will be set forth based on the characteristics of the water to be submitted to the evaporation lagoon. However, they will be taken based on the same parameters and analysis methods that they will be analyzed for the residual water discharges, as set forth in Table 4.3 of the foregoing section.

The location proposed for the monitoring wells is set forth on Figure 3, one located South-West up-flow the direction of the phreatic current, another one North-East, taking into consideration that in said direction are located the main water deposits of the area and the other on the North considering the grounds grading.

The sampling and analysis of underground water will be performed at least once a year and will begin prior to the start-up of the lagoon's operations.

The threshold values that will be considered as reference values will be the initial values obtained from the analysis of underground water before the lagoon is in operation. Any increase over 10% will be taken into consideration to perform an evaluation of the lagoon's operating and maintenance conditions.

4.5 Noise Monitoring Program

4.5.1 Preparation of site and construction phases

For the site preparation and construction phases, noise level monitoring will be performed at least once a year measured on the site where possible receivers may be located, mainly in the houses bordering the Power Station and in the town of

Santa María, to verify that the noise does not exceed the level set forth in the World Bank guidelines and shown Table 4.6.

The items considered to monitor the sound generation levels are set forth in Figure 4.

Table 4.6 Maximum Noise Levels set forth in the World Bank Guidelines
Leq (dBA)

RECEIVER	WORLD BANK STANDARD	
	Day	Night
	07:00 A.M.- 10 P.M.	10:00 P.M.-07:00 A.M.
Residential	55 dB (A) or current level + 3 dB(A)	45 dB (A) or current level + 3 dB(A)
Industrial	70 dB (A) or current level + 3 dB(A)	70 dB (A) or current level + 3 dB(A)

4.5.2 Operation stage

During the operation of the Power Station monitoring of noise levels will continue to be performed once a year, measured on the site where the receivers are located, to verify that the levels do not exceeded the maximum values set forth by the World Bank, as shown on Table 4.6.

Additionally, the emission levels will be evaluated at least once a year at the boundaries of the Power Station's property in accordance with NOM-081-ECOL-1994, which sets forth the maximum authorized limits for noise emission from fixed sources and the measurement method.

Table 4.7 shows the maximum authorized values for noise generation set forth in NOM-081-ECOL-1994.

Table 4.7 Maximum Noise Levels set forth in the Mexican Standards (NOM-081-ECOL-1994), measured at the property boundaries

RECEIVER	MEXICAN STANDARD	
	Day	Night
	06:00 A.M.-22:00 P.M.	22:00 P.M.-06:00 A.M.
Property Boundaries	68 dB(A)	65 dB (A)

Figure 4 shows the location of the points considered for monitoring the noise generation levels.

4.6 Monitoring of occupational safety and hygiene

CSO will implement a personnel protection program providing all the essential procedures to ensure adequate safety for all the personnel and specifically those

that work close to high temperature, materials handling and hazardous residues places, as well as close to noise sources

The Safety and Hygiene Program in the workplace will include:

- Training for workers.
- Installation of hygiene and safety notices.
- Development of a prevention, reduction, control of accidents and handling of emergencies and contingencies program.
- Implementation of hearing plugs for all the personnel exposed to sound levels over 85 d(BA), in accordance with the general safety and hygiene guidelines set forth by the IFC. .

As a rule, information on safety and hygiene procedure in the workplace will be provided, thus, avoiding personnel insecurity and inefficiency, thus, avoiding work accidents.

The monitoring program considers the measurement once a year of the continuous noise level equivalent to which the workers are exposed in the workplace environment, in accordance with the procedures and maximum authorized values set forth in the NOM-011-STPS-1994 and NOM-080-STPS-1994 standards.

In addition, compliance with the Mexican Official Standard, NOM-015-STPS-1993, should be evaluated at least once a year, with respect to occupational exposure of the high or abated thermal conditions in the work centers.

The evaluation parameters will be the thermal stress to which the workers exposed and the temperature levels in the work centers.

To this respect, CSO will establish training programs for the workers in hygiene and safety issues, to avoid health impairment arising from high or abated thermal conditions and will perform the recognition, evaluation and control of such exposure.

REFERENCES:

1. Saltillo Project, 247.5 MW, Preliminary Design Book, Central Saltillo, S. A. de C.V./Comisión Federal de Electricidad, Mexico, April 1999. Electricité de France.
2. Environmental Impact Statement. General Modality "CCC PEE Saltillo" Corporación Mexicana de Investigación en Materiales, S. A. de C. V. (COMIMSA), December, 1998.
3. Central Saltillo Project, 247.5 MW; Report on Environmental Impact Evaluation, Vol. II, Supplementary Environmental Evaluation. August 1999.

5.0 INTEGRATION OF THE ENVIRONMENTAL MANAGEMENT MANUAL WITH THE PROJECT

One of the important issues in CSO'S Environmental Policies is to verify the environmental behavior, the fulfillment of standards and to make adaptations to the Environmental Management System, so that it is integrated as a fundamental part of the project's execution.

An instrument to comply with these purposes consists of implementing an Audit Program for the Power Station; thus, the monitoring of the environmental performance, that is the responsibility of the Environmental Director will be carried out by means of supervision, audits and periodic reports to verify the constant fulfillment of the environmental requirements on the part of CSO and of all the participants.

5.1 Reviews of the Environmental Management System (SAA)

An organization with an Environmental Management System (SAA) must set forth its current position with respect to the environment through a systematical and precise review. The objective will be to consider all the environmental aspects of the organization, as a basis for the establishment of improvements to the SAA.

The review will cover four key areas:

- a) The legal and regulatory requirements;
- b). An identification of meaningful environmental aspects;
- c) An examination of all the existing management practices and procedures;
- d). An evaluation of the feedback effective from of the investigation of previous incidents.

In all cases special attention should be provided to the normal and abnormal operations within the organization and the possible emergency situations.

An approach adapted for the review can include checklists, interviews, inspection and direct measurements, previous audit results or other reviews depending on the nature on the activities.

The scope of the review must be integral, though not all the elements of a SAA need to be checked at the same time, the review can be made during a specified period of time.

The reviews will include:

- a) Analysis of the Environmental Management System implemented.
- b) Evolution of the Environmental Management System,

- c) Scheduling of audits, regulatory periods and next reviews

The observations, conclusions and recommendations will be documented to follow-up the necessary actions.

5.2 Environmental Supervision

The objective of the environmental supervision is to provide a review of the procedures described and implemented in this Plan, so that they are performed either by CSO or by a third party. The main function of the Environmental Supervision will be to monitor the construction and operation activities, in such a way that the recommendations drawn up in the Plan are appropriately implemented. It should specifically serve the following purposes:

1. To develop a Work Plan for the implementation of the Environmental Supervision Program. The Work Plan should set forth the identification of the personnel, its responsibilities, the field logistics, the chronograms, the training, the monitoring requirements, the monitoring report formats and the communication and information required by the Project Promoters.
2. To ensure that the established technical environmental specifications are complied with, which cover the construction, installation and operation procedures of the camps, the behavior standard for the construction workers concerning the environment, the quality of the work performed by the contractors in environmental issues, the compensation procedures and other necessary factors considered by the Environmental Supervisor. The contractor will supervise all the activities during the project's construction phase with respect to the following aspects and must prepare the relevant reports:
 - a. Erosion control procedures;
 - b. Flora and fauna protection procedures;
 - c. Handling the discharge of solid and sanitary wastes;
 - d. Handling of hazardous materials and residues and storage practices;
 - e. Air quality protection and noise control;
 - f. Prevention, containment and control of spill procedures;
 - g. Standard and specialized construction of ditch practices;
 - h. Accidental discovery of cultural resources and human remains;
 - i. Field offices and abandonment or closing of the right of way.
3. To supervise the fulfillment of the technical requirements, as well as the specifications set forth in the environmental law.
4. If necessary, to make recommendations with respect to adjustments to the management system to ensure that the environmental protection process advances easily and efficiently during the construction phase of the project.

The individual Responsible for Environment will establish global priorities of the review, will maintain a data base on the project with respect to license or fulfillment aspects, will follow-up the sections to be fulfilled and will gather all the field data to prepare the reports for the environmental authorities.

A program will be prepared regarding community relationship, which will include the following components:

- To maintain contact with the public during construction.
- To develop an environmental education program.
- To develop an information to the public program regarding the project.
- To train the construction workforce with respect to maintaining an adequate relationship with hostess communities.

The individual Responsible for the Environment will supervise the implementation of these programs and will supply the interested parties with information regarding the project's environmental issues and the procedure regarding the abatement of environmental impacts. The individual Responsible for the Environment will also interact with the land owners and local residents to minimize their possible negative perceptions with respect to the project. In addition, he/she will receive and direct the citizens complaints with respect to non-fulfillment and other social conflicts that could arise during the construction.

5.3 Environmental Inspection Procedure

The Personnel of the Environmental Direction will be based on the field offices to supervise all the activities on site. All the activities related to the following elements should be observed and recorded:

1. To ensure that the requirements set forth in the Prevention Plan, Containment and Control of Spills are fulfilled.
2. To check daily the construction activities to verify that the contractors are complying with the requirements, the environmental provisions included in the construction designs and the environmental conditions of the license. All the observations will have to be recorded.
3. To document, with photographs, the condition of the sensitive areas and the work spaces before, during and after the construction.
4. To document, with photographs and videos, all the construction activities.
5. To identify potential problems and recommend appropriate actions before any problem occurs.

6. To communicate and provide training on the project's specific environmental subjects and issues.
7. To evaluate the earth transferred from other sites, to be used as landfill and/or material for additional topping in sensitive areas (for example, agricultural areas).
8. To survey the construction activities with respect to the social compensation programs, including the road improvements, restoration of dug areas, construction, location of sanitary landfills and other.
9. To record any infringement to the internal provisions of the Worker, as well as the penalty or punishment imposed for each infringement.
10. To evaluate the Monitoring Plan results, to verify its fulfillment with the environmental requirements and to propose the necessary corrective procedures.

It will be necessary for the environmental personnel to, at all times, use its best criteria in the field, to ensure that the documents on violations, audits and other events related to the environment are submitted to the project's relevant personnel.

5.4 Environmental Audit

The Environmental Auditor is an external appraiser authorized by Project Management to fulfil these tasks. The auditor will be responsible for the design and implementation of an effective audit plan. The Environmental Auditor will have authority to investigate issues at all operating levels of the organization, at any time and place. The specific responsibilities of the Environmental Auditor will be:

1. To develop and implement an environmental audit plan designed to determine the fulfillment level of the environmental action Plan with the conditions of the licenses and permits imposed on the project by the authorities.
2. To determine if the agreements on environmental issues, the abatement plans and conditioning of the project's Audit Statement on Environmental Impact from the Mexican environmental authorities are adequately implemented. In addition, the Auditor will determine the efficiency of the environmental supervision program.
3. To check and evaluate the fulfillment reports on environmental issues prepared by the Environmental Direction.
4. The auditor should, periodically and contingently, survey the construction areas of the gas pipeline run with respect to the fulfillment of the

Environmental Impact Statement and the monitoring and supervision programs.

5. To suggest actions and policies to minimize, control, avoid or ease potential impacts in the physical, biological and socioeconomic environment.

The audit program and procedures should cover:

- a) The activities and areas considered in the audits;
- b) The frequency of the audits;
- c) The responsibilities associated with the handling and preparation of the audits;
- d) The communication of the audit results;
- e) The competence of the auditor;
- f) How audits will be prepared.

5.5 Records

The procedures to identify, maintain and dispose of the records should focus on those necessary for the implementation and operation of the Environmental Management System (SAA) and to recording the degree of fulfillment of planned objectives and goals.

The environmental records may include:

- Information on environmental laws or other applicable requirements;
- Process information;
- Plan of the plant, showing the emission of pollutants sources and points, areas of hazardous material storage and destination of possible spills.
- Analysis of quality and fuel content;
- Inspection, maintenance and calibration records;
- Records of the generation, management, storage and final disposal of hazardous and non hazardous residues;
- Inventory of hazardous materials, including quantity and exact location in the plant.
- Results of laboratory analysis and monitoring equipment;
- Records of complaints;
- Training records;
- Relevant Information on the contractor and supplier;
- Incident Reports;
- Information on emergency programs and responses;
- Evacuation routes plans;
- Important environmental impact records;
- Audit results;
- Reviews on the part of management.

All CSO's records relative to the environment will be identified with a code of several specific digits in accordance with the type of document and the preparation date.

REFERENCES:

1. Pollution Prevention and Abatement Manual, 1998. Toward Cleaner Production. The World Bank Group.
2. Saltillo Project 147.5 MW, Preliminary Design Book, Central Saltillo, S.A. de C.V./Comisión Federal de Electricidad, Mexico, April 1999, Electricité de France.
3. F. Lemardeley, M. Bouniol, Y. Imperatrice, P. Rossines, Environmental Management Manual (Engineering, Design, Procurements, Construction, Mounting, Tests and Service Start-up Phases). Central Saltillo, S.A. de C.V., Mexico, June 1999.

6.0 IMPLEMENTATION AND ESTIMATED COSTS PROGRAM

This chapter includes the program and estimated costs to implement the Environmental Management System, to execute the environmental impact abatement procedure and to carry out the monitoring plan, both during the preparation of the site and construction stage, as well as during the operation and maintenance stage of Central Saltillo, S. A. de C. V.

6.1 Preparation of site and construction stage

Table 6.1 includes the estimated execution period and the cost estimate to implement the activities set forth in the Environmental Management Manual during the preparation of site and construction stage of Central Saltillo.

The implementation estimated costs set forth in the corresponding column considers a range, based on the variable conditions that may be faced at the time of performing the activities and corresponds to current estimated values, without taking into consideration inflationary or financial indexes at the time when they are to be performed.

Based on the estimates considered, during the 28 taken into account for the operation and maintenance stage, the investment costs relative to the implementation of the Environmental Management Manual and the performance of the abatement procedure in its various items will amount to approximately US\$440,000 and US\$ 685,000.

The previous estimate did not include the equipment Procurement or installation of equipment costs which are considered a part of the Power Station's proper design criteria, due to the fact that they are a part of the project's normal execution procedures or of the impacts abatement procedures set forth for the operation and maintenance stage, such as those related to the installation of the gas pipeline.

However, said procedures are set forth in the corresponding tables to make reference to the fact that they are considered an integral part of the Environmental Management actions set forth in the Manual.

**Table 6.1 Implementation and Estimated Cost Program
during the Preparation of the Site and Construction Stage**

CENTRAL ANAHUAC, S. A. DE C. V.

	MONTHS FROM 1 TO 28	ESTIMATED COST (US\$ THOUSANDS)
ENVIRONMENTAL MANAGEMENT SYSTEM (SAA)		
Preparation of the Environmental Management and Specific Environmental Plan Manuals	1-2	\$ 20 - \$ 25
Appointment of the individual Responsible for Environment and the Environment Director	1	(1)
Review of the SAA	13-14	(1)
Management and Supervision of the SAA	1-28	\$30 - \$50 (2)
Environmental supervision and inspection of the prevention and abatement procedure applied	1-28	\$ 40 - \$ 60
Outside environmental audits	13-15, 26-28	(1)
IMPACT ABATEMENT PROCEDURE		
		\$ 342 - \$ 538
AIR		
		\$ 81 - \$ 132
The main vehicle traffic roads within the property will be continuously watered during high traffic hours. The watering will be carried out with cistern trucks and fresh water will not be used, the water will be delivered either from authorized suppliers or from any other source authorized by the corresponding authorities.	1-17	\$ 30 - \$ 60
Drafting and distribution of access regulations to transporters, including access procedures to the site, authorizations for entry and exit and authorized speed limits.	1-3	\$ 1 - \$ 2
Placement of canvases to fully cover the trucks' box transporting earthy material. This procedure will be included in the vehicle access regulations.	1-19	(1)
Fencing to surround the work areas, to control access to unauthorized vehicles to the site that could increase the problem of dust emission.	1-6	\$ 50 - \$ 70
Periodic maintenance program and annual check of compliance with NOM standards, with respect to gas emissions by vehicles used during construction. This procedure will be included in the vehicle access regulation.	1-2, 13-14, 25-26	(1)
NOISE		
		\$ 3 - \$ 5
Vehicles will circulate with the exhaust closed and at low speeds, both in access roads as well as within property of the Power Station. This procedure will be set forth in the vehicle access regulation.	1-28	(1)
Periodic maintenance program and monitoring of NOM standards with respect to noise generation. This procedure will be included in the vehicle access regulation	1-2, 13-14, 25-26	(1)
Use of ear plugs by workers exposed to high noise levels.	1-28	\$ 3 - \$ 5
Mufflers or placement of noise attenuation devices in the machinery and equipment used during the construction operations, in accordance with the operation specifications for each equipment. This will be a requirement for the contractor companies and will be a selection or cancellation criteria for suppliers.	1-28	(3)
To include in the Monitoring Plan the evaluation of noise levels according to the specifications of the World Bank.	1-2	(1)
GEOMORPHOLOGY		
		\$ 12 - \$ 15
Reuse of the material resulting from the clearing, leveling and excavation activities, to landfill and level within the same property. To dispose in a site authorized by the municipality the remaining excavation material.	1-9	\$ 12 - \$ 15
NOM-003-RECNAT-1996 will be complied with respect to the procedures, criteria and specifications to do the exploitation, transportation and storage of hill earth.	1-9	(1)
Stony materials required for construction will be acquired from material banks authorized by the competent authorities.	1-13	(3)
SOIL		
		\$ 48 - \$ 78
The material resulting from the digging of ditches for the gas pipeline run, will be temporarily deposited in the right of way to avoid affecting adjacent properties.	1-22	(1)
To fill, compact and restore the dug areas, immediately after the project's pipeline works are concluded, using the same material resulting from the excavations. The remaining material will be disposed on a site authorized by the corresponding authorities.	1-22	(3)

	MONTHS FROM 1 TO 28	ESTIMATED COST (US\$ THOUSANDS)
To visually continuously check the landfill material and compacting, to verify that it is free of hazardous and non hazardous residues.	1-22	(1)
To apply the erosion control procedures required to ease the impacts on the soil during and after the construction, until the areas of the right of way process are restored.	1-22	\$ 15 - \$ 25
To perform periodic inspection, at least once a week, in the gas pipeline right of way landfilled areas, to verify that no erosion and drag of soil material is present and that no accumulated residues have been left which could alter the soil's conditions.	1-28	(1)
To install garbage and other non hazardous residue container; these containers will be held duly covered and with signals that indicate their content. Periodically remove said residues and send them to sites authorized based on their characteristics.	1-28	\$ 3 - \$ 5
The earthy material excavated may be temporarily stored in the property of the Power Station; any other non hazardous residue will be disposed outside the site, in the manner agreed to with the municipal authorities for recollection.	1-12	(3)
Hazardous residues are to be stored in specific containers, a temporary storage will be installed for them pursuant to the Regulations on Hazardous Residues issues.	1-6	\$ 6 - \$ 10
Removal and final disposal of hazardous residues by a company authorized for said service, with the frequency necessary to prevent the residues from exceeding the storage capacity, pursuant to the provisions of the environmental standards in force.	1-28	\$ 10 - \$ 15
Prepare a specific storage area for fuels and lubricants during construction.	1-6	\$ 6 - \$ 10
To set forth and communicate a procedure for cases of spills of hazardous materials or residues during the construction stage, to be informed to the contractors in charge of handling said material, supervised for the person Responsible for the Environment.	1-28	\$ 3 - \$ 5
At the termination of the construction the property will remain free of all hazardous and non hazardous residue. All non hazardous material which comes in touch with hazardous residues will be considered a hazardous residue.	26-28	\$ 5 - \$ 8
	VEGETATION	\$ 17 - \$ 28
Prepare a protection, recovery and handling program for vegetal species found in the Power Station's site, and identified under a protection status.	1-2	\$ 15 - \$ 25
Verify that in the property and in the gas pipeline right of way there are no species under any protection status that have not been identified in previous studies. In the event any are found, prepare a Species Protection and Rescue Program and submit it to the corresponding authorities for authorization.	1-2	(1)
To set forth a communication procedure to promote the use, by area's population, of the products resulting from the clearing and cleaning of the project's gas pipeline way and property of the Power Station.	1-2	\$ 2 - \$ 3
To provide a prohibition for the use of herbicides and/or chemical products, as well as for setting fire to remove vegetation during the clearing and cleaning activities in the site and right of way.	1-6	(1)
To establish an internal work regulation for the construction stage, which must include the prohibition to workers and contractors of recollecting, trading or damaging cactaceous species inside the property and in the surrounding areas.	1-28	(1)
	FAUNA	NA
It will be strictly forbidden to hunt, capture, injure and trade with wildlife species. This prohibition will be explicitly set forth in the internal work regulations.	1-28	(1)
Prior to the clearing and cleaning activities and to the use of heavy machinery, check each work area for the existence of fauna under any protection status and give the corresponding notice to the authorities in the event any is found.	1-7	(1)
	SUPERFICIAL HYDROLOGY	\$ 65 - \$ 100
In the gas pipeline's right of way and in the Power Station's site, build the necessary civil works, such as drainage, sewage or derived dikes, to maintain, as much as possible, the connection with the natural riverbeds in the areas surrounding the Power Station.	1-11	\$ 30 - \$ 50
Supervise by means of periodic inspection runs around the facilities, that there are no accumulated materials that could hinder the natural riverbed of the runoffs.	1-28	(1)
Gather and send for treatment and final disposal the residual waters generated by the hydrostatics tests performed in the facilities.	12-22	\$ 20 - \$ 30
Install portable latrines for the sanitary services to workers during the construction of the Power Station. No disposal of sanitary water in the property of the Power Station or surrounding areas will be authorized.	1-28	\$ 15 - \$ 20

	MONTHS FROM 1 TO 28	ESTIMATED COST (US\$ THOUSANDS)
	UNDERGROUND HYDROLOGY	\$ 25 - \$ 45
Request and supervise for the machinery and equipment to be in optimum mechanical conditions to avoid oil, lubricant and fuel leaks. This will be a specific requisite for the selection of the project's contractors in charge of the works inside the Power Station.	1-28	(3)
Build a fuel supply and maintenance area for machinery and equipment, with a concrete slab and with a collection of liquid residues system.	1-6	\$15 - \$25
To collect water with oil drags and send same for treatment and final disposal outside the property with an authorized service supplier.	1-28	\$ 10 - \$ 20
	SOCIOECONOMIC	\$ 40 - \$ 60
To maintain communication and continuous information with community through press releases, notices, radio broadcasts and information meetings, to hear the community's opinion with respect to the project. These will be carried out at least once a year or when there are important design and construction changes.	1-28	\$ 40 - \$ 60
	HYGIENE AND HEALTH	\$ 3 - \$ 5
To prepare introduction and training programs in the use of personal protection equipment and general safety and hygiene procedures for workers.	1-4	\$ 3 - \$ 5
The workers should be registered on the social welfare program (IMSS) and be provided with personal protection equipment. This will be a specific requirement for contractor companies and a criteria in the selection of service suppliers.	1-28	(3)
	INSTALLATION OF GAS PIPELINE	NA
Gas will be delivered by means of two connections to Pemex's 16" and 24" trunk gas pipelines. The connections will be performed hot, type "hot-tap", with a cutoff valve and an insulating joint between flanges in the common span. The hot connection will be performed by Pemex's specialized personnel.	20-22	(3)
All the piping that operate at a pressure of more than 100 psi will be subject to leak tests at 1.5 times the design pressure for 24 hours. The hydrostatic test method will be used with pressure correction based on the temperature.	7-19	(3)
The design, installation and use of pipelines, accessories and procedures for the construction of the gas pipeline will be carried out pursuant to the applicable national and international codes and standards.	1-22	(3)
The pipelines will have a passive protection system and a cathodic protection system.	7-19	(3)
The supervision and checking of pipe and welding works will be made by means of X-ray controls and will be protected with poliken type bands.	7-19	(3)
The tracing of the gas pipeline will be as straight as possible. Any changes in direction will be curved with a radius more than 20 times the diameter.	1-2	(3)
	GENERAL ABATEMENT PROCEDURE	\$ 48 - \$ 70
Training programs for workers and supervisory personnel will be provided on prevention and control of pollution, as well as safety and hygiene issues.	1-2, 13-14, 25-26	\$ 8 - \$ 10
To keep files on the training records and certificate, to evaluate the personnel's training levels and define future needs.	1-28	(1)
In the event vestiges of historical value were found, such as constructions, foundations, bowls, arrows, etc., the cleaning and clearing activities will be temporarily discontinued and notice will be given to the Regional Center of the National Anthropology and History Institute. The foregoing pursuant to the Federal Monuments and Archeological, Artistic and Historical Areas Law.	1-22	(1)
An update of the risk study will prepared (both for the Power Station and the gas pipeline), with the data of detail engineering once it has been defined, based on the provisions of the environmental resolution.	22-25	\$ 40 - \$ 60
	MONITORING PLAN	\$ 8 - \$ 12
Evaluate the noise levels of the receivers located in the areas surrounding the Power Station, based on the World Bank's specifications.	7-8, 19-20	\$ 8 - \$ 12
TOTAL ESTIMATE		\$ 440 - \$ 685

- (1) These activities correspond to inspection and supervision on the part of the person responsible for the implementation of the SAA, therefore the cost is included in the estimate on the system's management and supervision.
- (2) The cost only considers the corresponding part time administrative expenses (1/4 of the average time), that will be devoted by the personnel responsible for the implementation of the SAA, taking into consideration that this assignment includes other activities.
- (3) The implementation cost corresponds to the contractor or service renderer and only requires supervision from the personnel responsible for the SAA.

6.2 Operation and Maintenance Stage

During the operation and maintenance stage, the relative activities of the Environmental Management System, for the prevention and abatement of environmental impacts and the Monitoring Program should be performed periodically, except for the specific cases set forth that indicate that the installation or implementation is due only once (indicated as a punctual activity). In the latter case the cost will be mainly at the start-up of the operation and, thereafter, the cost will only correspond to the system's operation or supervision.

Therefore, for this stage there is no implementation schedule included, but the periodicity with which the activities are to be carried out and same are set forth in the point activity (one time only) or periodicity. In all cases the estimated implementation cost corresponds to current values, regardless of adjustment factors due to inflationary or financial indices at the time they will be carried out.

The punctual estimated value makes reference to procurement, installation and/or preparation costs, which are considered to be disbursed one time only, activities which in the future will only require revision or supervision.

The costs set forth on an annual basis, make reference to the activities that will be carried out periodically at least during the 25 years initially considered for the operation of the Power Station, thus, the value considers the estimated annual cost for such activities.

The implementation and costs program for the operation and maintenance stage of the Power Station is set forth in Table 6.2.

Table 6.2 Implementation and Estimated Costs Program for the Operation and Maintenance Stage

CENTRAL SALTILLO, S. A. DE C. V.

	PERIODICITY OF THE ACTIVITY	ESTIMATED COST (US\$ THOUSANDS)
ENVIRONMENTAL MANAGEMENT SYSTEM (SAA)	Punctual Annual Basis	\$ 25 - \$ 45 \$ 40 - \$ 60
Drafting of the Environmental Management Manuals and Specific Environmental Plans	Punctual	\$ 20 - \$ 25
Appointment of person Responsible for the Environment and of the Environmental Director	Punctual	(1)
Review of the SAA	Annual	(1)
Management and Supervision of the SSA	Continuous (annual estimated cost)	\$ 20 - \$ 30 (2)
Environmental supervision and inspection of the application of the prevention and abatement procedures.	Continuous	(1)
External environmental audits	Annual	\$ 20 - \$ 30
IMPACT ABATEMENT PROCEDURES	Punctual Annual Basis	\$ 5,732 - \$ 5,873 \$ 31 - \$ 60
AIR	Punctual Annual Basis	\$ 2,750 - \$ 2,780 N.A.
High efficiency equipment will be used, with low NOx combustion chamber.	Punctual	\$ 2,000
The combustion equipment will have an water injection system when diesel is used as a fuel.	Punctual	\$ 200
Installation and operation of a continuous measurement equipment for chimney emissions in the chimney, to analyze the following parameters: CO, O ₂ , NOx, SO ₂ , PST and PM ₁₀ .	Punctual	\$ 80 (4)
An air quality monitoring network will be installed to determine the NOx, CO, PST, PM ₁₀ and SO ₂ levels. The network will include three continuous monitoring stations and will provide information on the air quality in the region.	Punctual	\$ 400 (4)
Installation and operation of a meteorological station in one of the monitoring network stations.	Punctual	70 - 100 (4)
Monitoring and supervision of the combustion equipment efficiency.	Continuous	(1)
NOISE	Punctual Annual Basis	\$1,050-\$1,070 \$ 1 - \$ 2
To install a noise absorption hood or screen to reduce the noise output of the turbine.	Punctual	\$ 50 - \$ 70
The equipment with high noise generation levels will be installed with acoustic insulation to reduce noise emissions.	Punctual	\$ 1,000
Ear plugs will be provided for the personnel exposed to noise and mechanisms will be set forth to make the personnel aware of their importance and to supervise their adequate use.	Continuous (annual estimated cost)	\$ 1 - \$ 2
Provide a Monitoring Plan on the programs and procedures for noise evaluation from fixed sources, pursuant to NOM-081-ECOL-1994.	Punctual	(1)
Provide a Monitoring Plan on the programs and procedures for noise evaluation for receivers located outside the Power Station's boundaries, pursuant to the World Bank's guidelines.	Punctual	(1)
SOIL	Punctual Annual Basis	\$ 170 N.A.
Installation of hazardous materials and residues storage pursuant to the applicable specifications of the standards.	Punctual	20
Containment dike in the event of leaks or spills for the diesel storage tanks.	Punctual	150
Establish daily inspection procedures and special procedures for handling leaks and spills from storage tanks, containment dams and fuel pipelines.	Continuous	(1)
Measurement and control instruments in diesel storage tanks, as well as fire alarms and devices, pursuant to the applicable codes and procedures of ASME, ANSI and NFPA.	Punctual	(3)
VEGETATION	Punctual Annual Basis	N.A. N.A.
Supervision of the application of the internal regulations to avoid the collection and trading of vegetal species from the areas surrounding the Power Station.	Continuous	(1)
Set green areas with species proper of the region, in accordance with the Rescue Plan set forth and with the supervision of an authorized professional.	Punctual	(3)

	PERIODICITY OF THE ACTIVITY	ESTIMATED COST (US\$ THOUSANDS)
FAUNA	Punctual Annual Basis	N.A. N.A.
Supervision on the application of internal bylaws prohibiting hunting and trading with fauna species located in the Power Station's surrounding areas.	Continuous	(1)
SUPERFICIAL HYDROLOGY		\$350 N. A.
Construction and operation of separate drainage networks for process residual water, residual sanitary water and rainwater.	Punctual	\$ 50
Construction and operation of an evaporation lagoon, for the effluents generated by boilers, turbines and the demineralization process	Punctual	\$ 300
UNDERGROUND HYDROLOGY		\$100 - \$150 N. A.
Installation of at least three monitoring wells around the evaporation lagoon, to verify that the underground water is not affected by possible filtration or leaks from the evaporation lagoon.	Punctual	\$ 100 - \$ 150
Establish review and maintenance programs and procedures for the separate drainage system, so that all residual waters generated by the Power Station are captured and submitted to the various treatments.	Continuous	(1)
SOCIOECONOMY		N. A. \$5 - \$10
Continuity of the Public Consultation programs during the estimated 25 years of operation and maintenance.	Continuous (annual estimated cost)	\$ 5 - \$ 10
HEALTH AND HYGIENE		N. A. \$ 5 - \$ 8
Preparation of a program for work safety and hygiene issues that include: - Personnel training - Installation of hygiene and safety signs - Development of a prevention, reduction and control of accidents plan	Annual	\$5 - \$8
Maintain files about training records and certificates of participation of the personnel.	Continuous	(1)
Establish a Monitoring Plan on the programs and procedures for noise evaluation in the workplace environment, pursuant to NOM-011-STPS-1993 and NOM-080-STPS-1994.	Punctual	(1)
Give continuity to the social welfare provisions (IMSS) for the workers of the Power Station.	Continuous	(1)
OPERATION AND MAINTENANCE OF THE GAS PIPELINE		N. A. N. A.
Establish a maintenance program to include periodical revision of the passive protection systems and of the cathodic protection to be installed in the gas pipeline.	Annual	(3)
At least once a week, perform an inspection run along the gas pipeline right of way, to identify possible damages or leaks on same.	Weekly	(1)
At least once a week, perform a monitoring of the levels of explosion possibilities in the system facilities for piping gas (measurement stations, connection areas, valves and instruments).	Weekly	(1)
GENERAL ABATEMENT PROCEDURE		\$1,312-\$1,353 \$ 20 - \$ 40
With respect to hazardous residues issues, comply with the provisions of the Regulations of the General Ecological Balance and Environmental Protection Law with respect to Hazardous Residues matter, especially during temporary storage.	Continuous	(1)
The facilities will be designed so that they do not represent a risk or nuisance to the bordering population and adjacent agricultural properties.	Punctual	(3)
Establish a periodic inspection and maintenance program for the risk fluid flow measurement, pressure and temperature program.	Monthly	(3)
Establish training programs for workers and supervisors with respect to prevention and control of pollution and safety and hygiene issues, including the diffusion of internal procedures and commitments before the authorities and international organizations.	Continuous (annual estimated cost)	\$ 10 - \$ 20
Maintain files of training records and certificates, to evaluate the personnel's training level and define future needs.	Continuous	(1)
Establish information procedures for the surrounding population on how to act in a possible contingency arising from the fuels handled in the Power Station.	Annual	\$ 10 - \$ 20
Establish special training programs for the personnel that will operate and give maintenance to the high risk systems of the Power Station, such as turbines, boilers, generation and electrical equipment for high tension distribution.	Continuous	(3)

	PERIODICITY OF THE ACTIVITY	ESTIMATED COST (US\$ THOUSANDS)
	Punctual Annual Basis	
Prepare and implement an Accident Prevention Program, pursuant to the applicable standard requirements.	Punctual	\$ 60 - \$ 100
Installation and operation of a directable fire detection system, constituted by fire detectors, alarm pulsators and a central signaling switchboard.	Punctual	\$ 500
Construction of two water deposits for use in case of fire, 1,320 m3 each, and a safety deposit, with level indicators and low level alarms. Additionally, a fire network system based on hydrants and equipped fire hydrants (BIE).	Punctual	\$ 500
To install fire protection systems for the gas turbine, transformers and the diesel storage area, the latter by means of foam.	Punctual	\$ 100
Installation, operation and maintenance of safety and relief valves, fuses, rupture disks or other equipment protection devices in the Power Station.	Punctual	\$ 100
Pressure sensors, thermostats, advance contact ends, threshold relays, etc., that fulfill a safety function will be independent from those used for control purposes.	Punctual	\$ 50
Design and installation of electrical equipment to avoid contact risk with a portion under tension, an electrical arch incident, splash of lubricant or melted metal. All the metal parts that are not under tension and those which can be reached from the outside will be connected to a grounded connection system to land.	Punctual	(3)
Install safety showers and eye rinsing equipment in the areas where corrosive products are used.	Punctual	\$ 2 - \$ 3
MONITORING PLAN		N. A. \$ 28 - \$ 46
Operation and maintenance of the continuous monitoring system for chimney emissions from the Power Station.	Continuous	(3)
Operation and maintenance of the monitoring air quality network to be installed in the areas surrounding the Power Station.	Continuous	(3)
Sampling and analysis of residual water discharged according to the parameters set forth in NOM-001-ECOL-1996 or in the specific discharge conditions requested by CNA.	Monthly (Annual estimated cost)	\$ 5-\$ 10
Sampling & analysis of underground water from the monitoring wells.	Annual	\$10-\$15
Noise evaluation from fixed sources, pursuant to NOM-081-ECOL-1994.	Annual	\$ 3 - \$ 5
Noise evaluation from specific receivers outside the limits of the Power Station, pursuant to the World Bank's guidelines.	Annual	\$ 3 - \$ 5
Noise evaluation in the workplace environment, pursuant to NOM-011-STPS-1993 and NOM-080-STPS-1994.	Annual	\$4 - \$ 6
Evaluation of the exposure levels to high thermal conditions, pursuant to NOM-015-STPS-1993.	Annual	\$3 - \$ 5
ESTIMATED TOTAL	Punctual Annual Basis	\$ 5,752-\$ 5,898 \$99-\$166

- (1) These activities correspond to the inspection and supervision on the part of the person responsible for the implementation of the SAA, therefore, the cost is included in the estimate for management and supervision of the system.
- (2) The cost only considers the administrative expense corresponding to partial time (1/4 time average), that will be devoted by the personnel responsible for the implementation of the SAA, taking into account that their assignment includes other activities.
- (3) These activities are a part of the design, operation and normal maintenance criteria of the facilities, therefore, it is not considered a specific cost as part of the implementation of the SAA.
- (4) The estimated cost only corresponds to the procurement and installation of the equipment; operation and maintenance are apart of the facilities' operation.

According to the previous estimates, an investment cost for punctual activities of approximately US\$5,750,000 to US\$6,000,000 is being considered, the largest portion of which correspond to activities that should be executed before the

operation start-up at the Power Station. However, they are included in the operation and maintenance stage, because it is during this stage when their correct operation will help to ease environmental impacts .

As in the case of the preparation and construction stage, the previous estimate does not include construction or installation costs of elements that are a part of the design of the Power Station, such as the evaporation lagoon or the separate drainage system.

For the activities that should be periodically performed, an estimated annual investment cost between US\$100,000 and US\$170,000 is estimated for their application and execution.

6.3 Financing Sources and Allocation of Resources

The resources required to apply the procedures and carry out the activities set forth in the Environmental Management Manual herein, during the preparation of the site and construction stage and the point costs set forth for the operation and maintenance stage, by and large amount to approximately between US\$6,200,000 and US\$6,585,000, are considered as part of the US\$114 millions investment estimate required for the construction of Central Saltillo.

The majority of those resources corresponds to the monitoring equipment and control of emissions costs and installations considered in the Power Station's design documents, which ensure its implementation and the corresponding allocation of resources .

The resources to be applied annually during the operation and maintenance stage of the Power Station and estimated between US\$100,000 and US\$170,000 will be considered within the fixed operation costs, so that the assignment of same to carry out the activities set forth may be allocated.

7.0 PUBLIC CONSULTATION AND DISCLOSURE PLAN

Central Saltillo has prepared a Public Consultation and Disclosure Plan that was submitted to the IFC, wherein it sets forth the communication of information and advisory services provided to the population and organizations interested with respect to the Central Saltillo project.

This Plan includes the identification of parties interested in the project, including federal, state and municipal authorities, non-governmental organizations, industrial, marketing and bordering towns. The information methods and the results of the first meetings with respect to the project have been established.

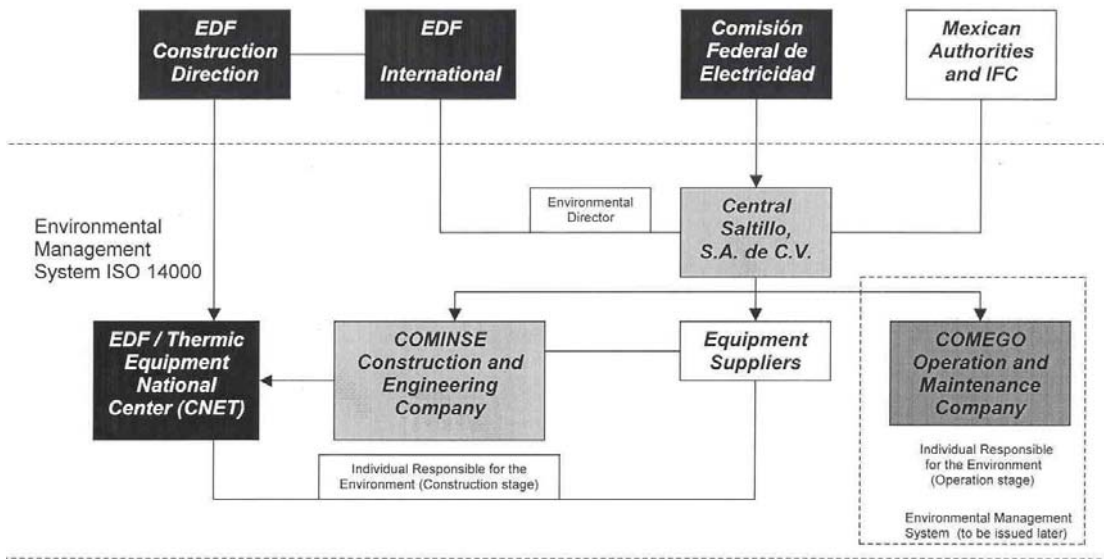
This Plan sets forth the commitment, ratified in this Manual, to maintain the information mechanisms during all the project's development, including a suggestions booklet on site, to know the opinion of all interested parties, to answer any questions and to consider suggestions. All this in order to maintain an amicable relationship with the population surrounding the site where the Power Station is located.

At least once a year, or when there is relevant information press releases will be disclosed through the local communication media, including information relative to the progress or changes to the project.

The results of the public conference will be included in the annual reports to be submitted to the International Finance Corporation of the World Bank.

REFERENCES:

1. Public Consultation and Disclosure Plan (PCDP). Central Saltillo, S. A. de C.V. Mexico. June 1999.



ENVIRONMENTAL MANAGEMENT ORGANIZATION PLAN
Environmental Management Manual

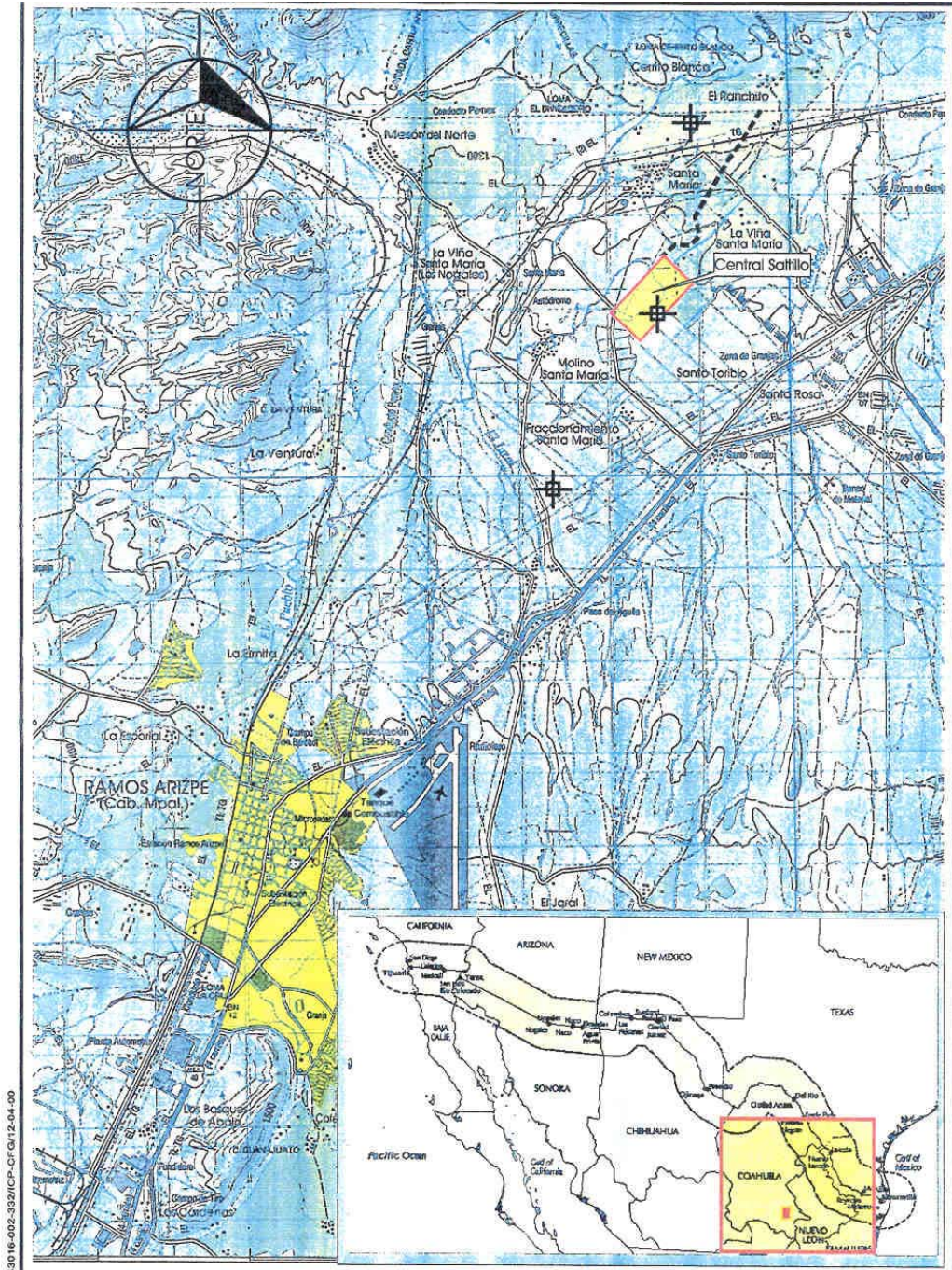
April 2000

Ramos Arizpe, Coahuila.

CENTRAL SALTILLO, S.A. DE C.V.



FIGURE 1



SYMBOLY

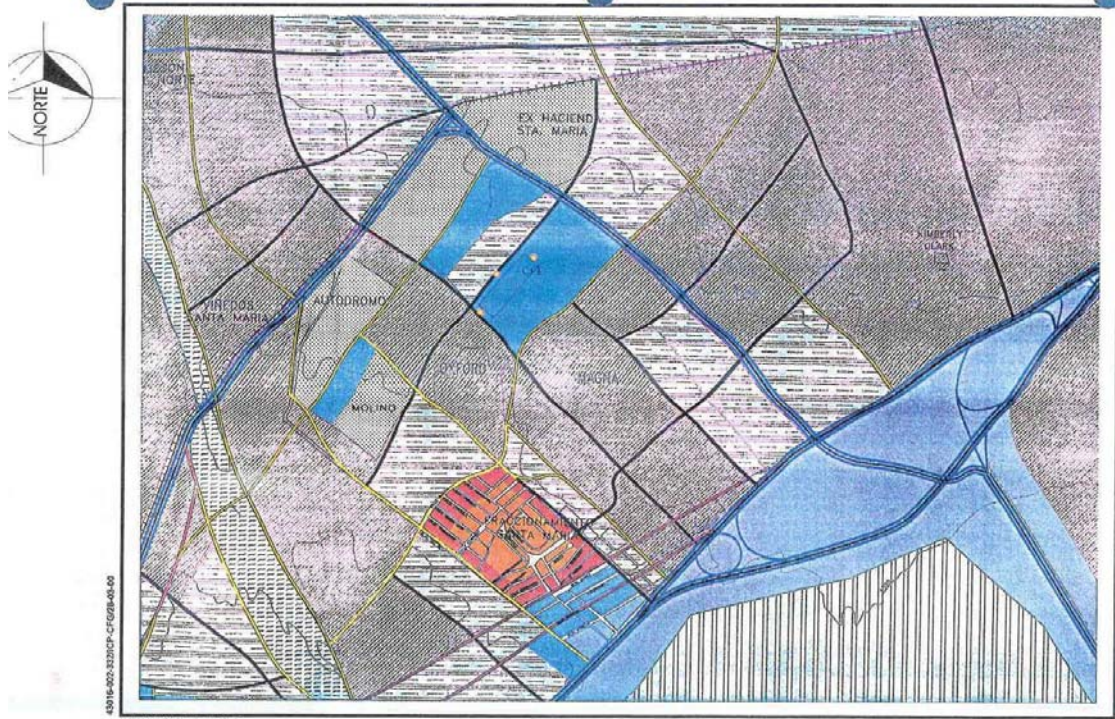
- Río Bravo Power Station
- Gas Pipeline
- + Air Quality Monitoring Stations



PROPOSED LOCATION FOR THE AIR QUALITY MONITORING STATIONS

Environmental Management Manual
 April 2000
 43016-002-332
 CENTRAL SALTILLO, S.A. DE C.V. FIGURE 2





Fuente: CSO Central Saltillo

SYMBOLOLOGY

● Underground Water Monitoring Wells

▭ Evaporation Lagoon

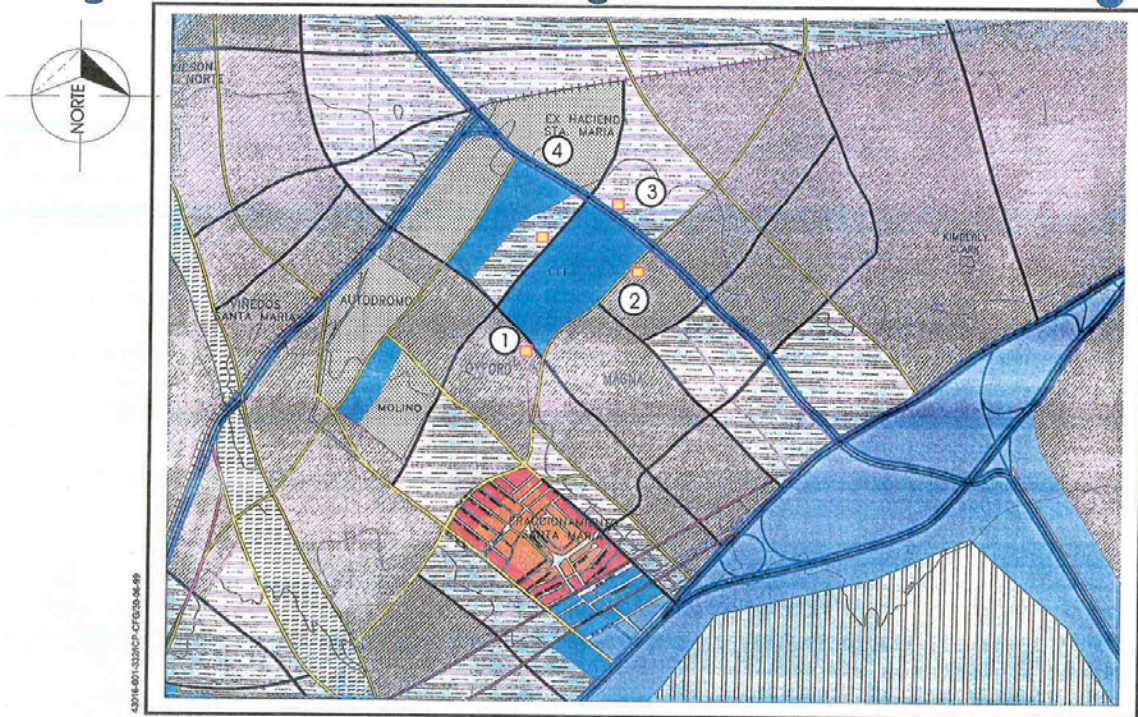
PROPOSED LOCATION FOR THE UNDERGROUND WATER MONITORING WELLS
Environmental Management Manual

April 2000
43016-002-332
CENTRAL SALTILLO, S.A. DE C.V.

Ramos Arizpe, Coahuila

FIGURE 3





43016-001-032800P-07600-06-99

Fuente: CSO Central Saltillo

- SYMBOLY**
- # Receivers Monitoring**
1. Planta Oxford
 2. El Pollo III
 3. La Viña Santa María
 4. Ex Hacienda Santa maría
- Monitoring at the boundaries**

PROPOSED LOCATION FOR THE NOISE MONITORING POINTS

Environmental Management Manual
Ramos Arzpe, Coahuila

April 2000
43016-002-332
CENTRAL SALTILLO, S.A. DE C.V.

FIGURE 4

