

Border Environment Cooperation Commission

Wastewater Collection and Treatment System for Salem/Ogaz, Doña Ana County, New Mexico

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General Criteria

1. Type of Project. The project consists of construction of a wastewater collection system and wastewater treatment plant.

2. Location of Project. The community of Salem is located approximately four miles northwest of the village of Hatch in Doña Ana County, New Mexico. Ogaz is a small subdivision immediately east of Salem. The project is located within the 100 km border region. The 2000 population of Salem/Ogaz is approximately 1,112 people, and is expected to reach 2,320 people by the year 2020. To determine the population a historical growth rate of 4.0% was used and reduced to 3% by the end of the planning horizon.

3. Description of Project and Tasks.

The community of Salem at present does not have any form of wastewater collection and treatment system other than on-site disposal systems. The on-site disposal systems include individual septic tanks with leach fields, or cesspools. Health concerns have been expressed due to the possible failure of these disposal systems and lack of adequate area for proper treatment through percolation. Many of these on-site systems are not properly sized or properly constructed. As this area continues to develop with on-site disposal systems, not only is the biological contamination of the groundwater inevitable, but also nitrogen contamination.

In order to address this lack of wastewater service, the proposed project will include providing service to the residents through 4-inch diameter sewer services connected directly to each customer's plumbing system. The wastewater will be collected by a conventional gravity sewer system and conveyed through a forcemain located approximately 1.25 miles away to the wastewater treatment plant. The proposed wastewater treatment system includes an activated sludge type treatment process (sequencing batch reactor) at a preferred site located approximately 3/4 mile south of the community and immediately north of the Rio Grande. The treated effluent from the wastewater treatment facility will be discharged to the Rio Grande and meet the NPDES (National Pollutant Discharge Elimination System) standards of less than 30 mg/l of biochemical oxygen demand, 30 mg/l of total suspended solids, 20 mg/l of nitrogen, and 500 organisms/100 ml of total coliform. The wastewater sludge will be transported to the solid waste landfill located west of Las Cruces after proper treatment, which includes aerobic digestion and air-drying. The capacity of the treatment facility is 200,000 gallons per day (gpd) and will meet 2020

demands. The standard per capita wastewater flow for residential areas of 85 gallons per day was used. Additionally, this community is predominately residential and there are no significant commercial, industrial, or agricultural wastewater flow anticipated.

A summary of the components are addressed below:

Collection and Conveyance System:

- 20,700 lf of 8-inch PVC gravity sewer line
- 65 4 feet diameter manholes
- 1 lift station
- 6,750 lf of 6" forcemain
- 278 hook-ups

Treatment System (0.2mgd):

- Headworks with 1-manual bar screen and 1-grit removal chamber
- 2 SBR basins
- 1 aerobic digester
- 3.5 acres of land

Effluent Disposal System:

- Post-Equalization basin
- 2- UV disinfections units
- 300 lf of 8-inch gravity discharge to Rio Grande

Sludge Disposal System:

- 500 sq ft of concrete drying beds
- 1,000 sq. ft of asphalt staging pad

- 4. Compliance with international Treaties and Agreements.** The project sponsor submitted a statement that the project complies with the rights and obligations established in applicable treaties and agreements

Human Health and Environment

- 1. Human Health and Environment.** The community of Salem at present does not have any form of wastewater collection and treatment system other than on-site disposal systems. The on-site disposal systems include individual septic tanks with leach fields, or cesspools. Health concerns have been expressed due to the possible failure of these disposal systems and lack of adequate area for proper treatment through percolation. Many of these on-site systems are not properly sized or properly constructed. The soils in the area are generally well drained loamy sands, which have high permeability. Due to the development density and highly permeable soils, the potential for contamination of the shallow groundwater is high. As this area continues to develop with on-site disposal systems, biological and nitrogen contamination of the groundwater is inevitable.

Hepatitis A is a liver disease associated with unsanitary disposal of sewage and inadequate or contaminated water supplies. The incidence rate of Hepatitis A for Dona Ana County was 36.2 cases per 100,000 persons in 1997, which is over 79% higher than for the State of New Mexico. The baseline value in 1994 for Hepatitis A was 16 cases per 100,000 persons in New Mexico. In addition, the number of cases of Shigella in Dona Ana County is 12% higher than for the rest of the State. Shigellosis often results from poor sanitation, lack of water/wastewater facilities, contaminated water and food and is common in colonias areas.

- 2. Environmental Assessment:** An Environmental Information Document (EID) was developed in association with the Salem Facility Plan. After preliminary review by BECC, Dona Ana County and the New Mexico Environment Department (NMED), a revised EID was submitted to NMED for joint NMED/Dona Ana County submittal to EPA.

EPA has produced an Environmental Assessment (EA) based on the EID, the Facilities Engineering Plan, and other available information. The EA and FONSI (Finding of No Significant Impact) will be available for public review and comment through early June, 2001.

- 3. Compliance with Environmental and Cultural Resources Law and Regulations.** As part of the environmental review, the EID considered any and all crosscutting environmental and cultural/historical laws, Executive Orders and regulations, including among others, Significant, Unique or Important Farmlands, National Natural Landmarks, Wilderness Protection, Wild and Scenic Rivers, Wetlands Protection, Floodplain Management, Fish and Wildlife Protection, Endangered Species Protection, Historical, Architectural, Archeological, and Cultural Sites, Air Quality, and Environmental Justice. The project is in compliance with all applicable environmental and cultural resource laws and regulations.

A plant and wildlife Threatened, Endangered and Sensitive (TSE) species survey was conducted in June 2000. The survey consisted of a pedestrian survey of the project areas. The survey concluded that the site did not provide suitable habitat for any of the regional listed threatened or endangered species. The proposed lift station and treatment plant sites appear to have been or are under cultivation. Areas where collection pipelines are to be installed have been converted to residential use. No evidence of any TSE plants and animals were noted.

A cultural resource survey was conducted in July 2000. During the survey, no registered properties, standing historic buildings and archaeological artifact were identified. The cultural resource survey report recommended that no further culture resources studies are necessary prior to development of the proposed wastewater treatment site. Monitoring, however, is recommended during installation of the wastewater collection pipelines, due to the presence of multiple archaeological sites in the regional vicinity. Subsurface artifacts may be uncovered during excavation, and care must be taken not to damage them. The complete cultural resource survey report was submitted to the State Historic Preservation Office for review and concurrence. In addition, the new Section 106 regulations for Native

American/Tribal consultation have been concluded. The Mescalero Apache raised no issues of concern.

Technical Feasibility

1. **Appropriate Technology.**

A wastewater facility plan was completed in 2000 for the project through the BECC technical assistance program. The facility plan included a planning horizon of 20 years and completed the following alternative analysis:

- **Wastewater Collection Alternatives:** Two alternatives were analyzed which include the septic tank effluent pumping system and the selected alternative of a conventional gravity system.
- **Wastewater Treatment Alternatives:** Four alternatives were analyzed which include a stabilization pond system, recirculating sand filter system, aerated facultative pond, and the selected alternative of the activated sludge utilizing a sequencing batch reactor configuration.
- **Effluent Disposal Alternatives:** Three effluent disposal alternatives were analyzed which include an evaporation lagoon, surface irrigation, and the selected alternative of discharge to the Rio Grande.
- **Sludge Management:** Three alternatives were analyzed which include accumulation at the bottom of the ponds, disposal in a County liquid waste facility, and the selected alternative of disposal in a County Landfill.

The alternatives discussed above were ranked based on reliability, reduction of energy use, water supply implication, process complexity and appropriateness, environmental impacts, and implementability. The selected alternative and the best alternative was selected used on a combination of these criteria, lowest initial investment and lowest operation and maintenance cost during the planning period. Additionally, the discharge permit has already been obtained and the site secured for the plant.

2. **Operation and Maintenance Plan.** New Mexico Environment Department requires that a project plan of operation be prepared during the construction phase as well as an O&M manual for the lift station and wastewater treatment plant. After approval of the manual, an operator training course will be conducted as the facility is coming on-line. Additionally, a monitoring period of one year is required; quarterly project performance reports will be completed.
3. **Compliance with applicable design norms and regulations.** This project is in compliance with applicable design standards and regulations which are required by the New Mexico Water Quality Control Commission and NMED Groundwater Bureau

Financial Feasibility and Project Management

1. Financial Feasibility.

The project has a total project cost is \$2,889,204 which includes \$417,000 for hookups. The following table illustrates the details of the estimated project cost.

Table 1. Wastewater System Components and Estimated Costs	
Wastewater System Components	Estimated Cost
Facility Planning	\$70,703
Collection System	\$1,257,684
20,700 ft of 8" PVC gravity sewer lines with 65-4" diameter manhole, 6,750 ft of 6" pressure lines, One lift station with 2-10 hp submersible pumps rated at 52 feet of Total Dynamic Head @ 235 gpm	\$983,000
Contingency (10%)	\$98,300
Administration and Engineering	\$107,297
New Mexico Gross Receipt Tax	\$69,087
Treatment System	\$901,417
Headworks with 1-manual bar screen and 1-grit removal chamber, 2-SBR basins, each at 36"x36"x14"; 3-positive displacement blowers @ 20 hp each; 4-25 tube retrievable fine bubble diffuser assemblies; 2 floating mixers @ 5 hp each; 2-submersible sludge pumps at 2 hp each, 1-aerobic digester at 36"x20"x14"; 1-positive displacement blowers @15 hp; 1 fixed coarse bubble diffuser; 1-floating mixer @ 5 hp and 1-submersible sludge transfer pump @ 2 hp	\$689,000
Contingency (10%)	\$68,900
Administration and Engineering	\$94,000
New Mexico Gross Receipt Tax	\$49,517
Effluent Disposal System	\$90,800
Post-Equalization basin, UV disinfection unit, 8" gravity discharge to Rio Grande,	\$68,000

River discharge structure,	
Land leasing fee	
Contingency (10%)	\$6,800
Administration and Engineering	\$11,000
New Mexico Gross Receipt Tax	\$5,000
Sludge Disposal System	\$151,600
5,000 sq. ft of concrete drying bed,	\$113,000
1,000 sq. ft of asphalt staging pad,	
½ yd gas engine bucket loader with aerator attachment,	
½ hp decant return pump	
Contingency (10%)	\$11,300
Administration and Engineering	\$19,000
New Mexico Gross Receipt Tax	\$8,300
TOTAL CONSTRUCTION COST	\$2,472,204
Hook-Up Cost for 278 households at start-up and \$1,500 per household	\$417,000

The project has received \$1.77M in funding from BECC for facility planning and final design, New Mexico Environment Department through the EPA funded Colonias Program for construction, and also a Community Development Block Grant for construction. The remaining unfunded portion of \$1.1 will be funded through a combination of BEIF and loan funds. Additionally, in order to maintain the proposed rate structure transition assistance of \$151,588 will also be provided. The following table summarizes the financial structure of the project.

FINANCIAL STRUCTURE OF SALEM WASTEWATER FACILITY						
DESCRIPTION	TOTAL COST	PROJECT FUNDING				
		EPA/NMED FUNDS (GRANT)	BECC FUNDS (GRANT)	CDBG FUNDS (GRANT)	NM STATE REVOLVING LOAN FUND (LOAN)	BEIF FUNDS (GRANT)
PLANNING	\$70,703	\$0	\$70,703	\$0	\$0	\$0
ENGINEERING/ MANAGEMENT	\$244,797	\$65,500	\$179,297	\$0	\$0	\$0
CONSTRUCTION/ CONTINGENCY/TAX	\$2,156,704	\$1,101,500	\$0	\$350,000	\$281,850	\$423,354
TOTAL COST	\$2,472,204	\$1,167,000	\$250,000	\$350,000	\$281,850	\$423,354
PERCENTAGE FUNDING OF TOTAL	100%	47%	10%	14%	12%	17%

HOOK-UP CONSTRUCTION	\$417,000	\$0	\$0	\$0	\$0	\$417,000
TOTAL COST W/ HOOK-UP	\$2,889,204	\$1,167,000	\$250,000	\$350,000	\$281,850	\$840,354
PERCENTAGE FUNDING OF TOTAL	100%	40%	9%	12%	10%	29%
TRANSITION FUND	\$151,558	\$0	\$0	\$0	\$0	\$151,558

2. **Rate Model:** There are currently no wastewater facilities serving this area and therefore no historic fee/rate schedules. The financial model shows an initial user fee of \$21.00 per residential connection per month, billed as a fixed rate. It is anticipated that the user fees will initiate in FY 2002. In FY 2005 the user fee will be increased to \$22.00, in FY 2007 to \$23.00 and in FY 2008 to \$24.00. The financial model also illustrates in each year revenues are sufficient to offset expenses, with the cumulative total funds from all sources building each year. Included in the expenses is a repair/replacement line item that builds at a rate of 10 to 20% of the total operations and maintenance expenses for that year. The percentage increases as the utility ages.
2. **Project Management.** Organizationally, the utility will be managed by County staff and operated by one or more contract operations companies. Initially, the County utility staff will include a Utility Administrator, Assistant Utility Administrator, Financial Specialist, General Foreman, Utility Operations, Senior Secretary/Administrative Assistant, Customer Service Manager, and Project Manager. Key support personnel will include field coordinator and various field personnel. Other support will come from personnel in various County departments.

Public Participation

1. **Comprehensive Public Participation Plan:** Doña Ana County and the Salem-Ogaz steering committee developed a public participation plan that includes per certification requirements the development of a steering committee, meeting local organizations, development of a public information campaign, and public meetings. Activities carried out in fulfillment of this plan are summarized below.
2. **Steering Committee:** A steering committee came out of the Salem Organizing Project and consisted of Ruben Nuñez, Martina Rodriguez, Julieta Gallegos, Antonio Piñeda, Eva Nuñez, and Leticia Carrasco, all residents of Salem-Ogaz. The committee met six times to follow up on the development on the public participation project.
3. **Local Organizations:** Meetings were held with a several local organizations to present the project and solicit support for and understanding of the project. These organizations include the Colonias Development Council; Garfield Mutual Domestic Water Consumers Association; International Boundary Water Commission; Salem Catholic Church; El Paso Electric; State Land Office and the Elephant Butte Irrigation District.
4. **Public Information:** Project information, such as the Facility Plan and Environmental Information Document were available in several locations such as the Colonias Development Council (Hatch, NM) and Doña An County offices in Las Cruces, NM. Public meeting notices were published in Las Cruces Sun News, local church's bulletin; Post Office and Garfield Mutual Domestic office in Salem. Fact sheets were delivered door to door by the steering committee and mailed by Doña An County to the residents of Salem and Ogaz.
4. **Public Meetings:** Two public meetings were held. The first public meeting took place on January 30 and the second meeting on April 5, 2001. Over 100 people attended these meetings. An exit survey taken shows that 92% support the project and the proposed rate structure.

Sustainable Development

- 1. Definition and Principles** The proposed project complies with BECC's definition of Sustainable Development: *Conservation oriented social and economic development that emphasizes the protection and sustainable use of resources, while addressing both current and future needs, and present and future impact of human actions.*

The project is in general compliance with the definition as follows:

- Social impacts are positive because the colonia properties are added to the tax base of the area, allowing for increased social services and improvements to schools.
- It has a positive economic impact because it will strengthen property values. Increased value will mean better chances for homeowners to access credit, improve their lives, and increase their net worth.
- It improves the impact of current human activity on the environment while at the same time eliminating further degradation to the environment.
- It has been developed with protections for water resources, floodplains, cultural resources, and threatened, endangered and protected species.

It addresses current need for services in the rural communities outside of the city limits, and incorporates modest historical expectations for growth. Future growth can be managed and regulated by the countywide wastewater utility.

Principle 1: The project is centered on the needs of the residents of the communities of Salem and Ogaz in Dona Ana County, New Mexico.

Principle 2: The rights of the residents to adequately raise their standard of living and develop their properties are recognized and underlie the reasons for undertaking the project.

Principle 3: Environmental protection is integral to the project.

Principle 4: Stakeholders have been involved and have had the opportunity to participate in the decision-making process. This not only includes the local residents, but also local, regional, state, and federal agencies with statutory interest and standing in the issues at hand.

- 2. Institutional and Human Capacity Building.** This project is one of several in the southern New Mexico region and is a component of the County's commitment to regional planning. This is a significant development in the planning necessary to successfully address emerging infrastructure needs and is a basic component of sustainable development. Dona Ana County has begun the process of strengthening its institutional infrastructure. A significant amount of technical and managerial training and development will be directed into the area. Operations and personnel will receive extensive training on equipment and environmental issues.

- 3. Conformance with Applicable Local/Regional Conservation and Development Plans.**

The project conforms to the following local and regional plans:

- Dona Ana County Comprehensive Plan, 1994
- Dona Ana County Wastewater Facilities Plan, 1997
- Dona Ana County Resolution 96-36, passed May 14, 1996

- 4. Conservation of Natural Resources.**

The project will eliminate the inadequate on-site wastewater disposal systems currently used in the project area as sources of potential ground and surface water contamination. Protection of the Rio Grande as a source of water for neighbors to the south, including El

Paso, is enhanced. The County is developing a series of comprehensive ordinances to address statutory requirements of the Clean Water Act and its related laws. These ordinances have been drafted and are structured on EPA model ordinances.

Dona Ana County participates in local and regional water conservation programs and efforts. The County's leadership is committed to developing water conservation goals and policies as part of its water management program. Reuse alternatives have been considered in planning for all facility development. Appropriate alternatives will be implemented to support each facility's capacity and water management program goals. Also, it is recognized that legal/institutional capacities and economic incentives must exist if water users are to significantly conserve water. Dona Ana County is committed to developing these policies and assisting the community water providers for similar policy development.

5. Community Development.

Through the development of this project and the close working relationships developed with the community members, individuals have realized the importance of addressing environmental issues as a community. This has fostered and strengthened the existing community groups, empowering them to take action on their own behalf. A number of private nonprofit agencies and task forces have banded together to advocate infrastructure development in the unincorporated colonias areas. The Colonias Development Council, an independent community organization of over 15 government and private agencies, has applied for a grant from the U.S. Department of Housing and Urban Development. By providing the integral infrastructure of sewer collection and treatment, the planning area will appear more attractive and inexpensive for new community services, such as schools, churches, and recreational facilities, encouraging them to move into the area.

List of Documents

1. Wastewater Facility Plan Update for Community of Salem, New Mexico, prepared by Bohannon Huston Inc., March 2001. (This document was submitted to the Border Environment Cooperation Commission in March 2001).
2. Environmental Information Document Wastewater Collection and Treatment Facility Plan Update for Community of Salem, New Mexico, prepared by Terracon, march 2001. (This document was submitted to the Border Environment Cooperation Commission in March 2001.)